Climax Molybdenum
A Freeport-McMoRan Company

COLORADO OPERATIONS
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May 2, 2025

Submitted Via Email

Ms. Nikie Gagnon
Division of Reclamation Mining and Safety
1313 Sherman St., Rm. 215
Denver, CO 80203

RE: Climax Molybdenum Company, Henderson Mill, Permit No. M-1977-342, Technical Revision No. 37, Groundwater Management Plan (GWMP) Update, Adequacy Review Response

Dear Ms. Gagnon:

Climax Molybdenum Company (Climax) is providing this letter in response to DRMS' Adequacy Review letter dated February 4, 2025, related to the Henderson Reclamation Permit, Technical Revisions No. 37 (TR 37), Groundwater Management Plan (GWMP) Update. DRMS Adequacy Review comments are included below in italics, followed by Henderson's responses.

1. *<u>Appendix C Figures 1-3 Site Diagrams</u>: The diagrams for the Mine and the Mill do not show the permit boundary. Please revise the maps to display the permit boundary rather than the property boundary. Please also use different symbols for groundwater and surface water monitoring locations.*

   Henderson uses the terms "permit boundary" to define all lands owned and "affected lands boundary" to define all areas approved for disturbance pursuant to the Reclamation Permit. Appendix C, Figures 1-3 Site Diagrams of the GWMP (Attachment 1) have been updated to show both the permit boundary and the affected land boundary. Additionally, different symbols for groundwater and surface water monitoring locations have been adopted.

2. *<u>Appendix C Figures 1-3 Site Diagrams</u>: Monitoring well MLGW-37 replaces MLGW-ACR for the POC for domestic water supply standards. The map shows this well constructed within the property boundary. Is the well located outside the permit boundary and/or the affected area boundary? Please show the GW flow direction in the area of this well on the site diagram.*

   Appendix C, Figures 1-3 Site Diagrams of the GWMP (Attachment 1) have been updated to clarify that MLGW-37 is located outside of the affected land boundary but inside of the permit boundary. Additionally, a groundwater flow direction arrow in the area of MLGW-37 has been added to the diagram.

3. *<u>What is the status of MLGW-ACR</u>. Will this well be plugged and abandoned? Additionally, is the Colorado Water Quality Control Division aware of the new location for the monitoring well?*

   MLGW-ACR serves as water supply for Aspen Canyon Ranch and the continued use or abandonment and plugging will be up to the property owners. Henderson proposes to designate MLGW-37 as a groundwater POC monitoring location for water supply related parameters within the GWMP that will serve as an indicator of downstream water quality inside the permit area. The GWMP (Attachment 1) has been updated to reflect this designation. Henderson acknowledges that

MLGW-ACR is also designated by the Water Quality Control Commission for assessment of iron and manganese surface water standards for the Williams Fork River and does plan to follow up with the Water Quality Control Division.

4. *<u>Section 3.1.6.1 POC Groundwater Monitoring Locations</u>: According to the May 2024 Annual Monitoring Report submitted to the Division, a new monitoring well was installed in 2023 adjacent to POC well MNGW-1, within the same geohydrologic setting downgradient of the mine operations. This well was constructed to investigate the relationship between low pH at No Name Gulch and the groundwater chemistry measured at MNGW-1.*

   Additionally, in a May 27, 2022, adequacy response, Henderson stated that supplement sampling surveys along No Name Gulch (NNG) are needed to better evaluate any trends and understand the factor(s) causing the pH levels measured in NNG and MNGW-1. Henderson indicated the additional evaluations would be presented in a future submittal. Please update Section 3.1.6.1 in the Groundwater Management Plan to describe the new monitoring well and subsequent evaluations. Additionally, please submit a copy of the well completion details, well permit, and monitoring data collected to date to the Division.

   Section 3.1.6.1 of the GWMP (Attachment 1) has been updated to summarize investigations related to low pH in MNGW-1 and NNG conducted between 2013-2024 and the proposed establishment of a Site Specific Indicator Value for pH. Additionally, a summary of ongoing and planned investigations is included in item #7 below.

   Henderson installed monitoring well MNGW-5 in November 2023. An As-Built drawing and well permit for MNGW-5 is included as Attachment 3. Henderson initiated groundwater monitoring at MNGW-5 following development of the new well. Henderson is in the process of collecting two years (6 triannual sampling events) of water level and water quality data from MNGW-5 to establish baseline conditions that include seasonal trends, and to determine the efficacy of the well for potential ongoing monitoring and establishment as a replacement POC well for MNGW-1. Henderson anticipates baseline sampling will be concluded in the fourth quarter of 2025. A summary of baseline conditions, data interpretation, and determination of the appropriateness of MNGW-5 as a replacement POC well will be presented to the DRMS in the first quarter of 2026. If MNGW-5 is determined to be appropriate as a replacement POC well under the GWMP, necessary revisions to the GWMP will be made at that time, including Section 3.1.6.1.

5. *<u>Sections 3.1.6.2 and 3.2.6.2 Internal Groundwater Monitoring Wells</u>. The text states that Henderson will continue to monitor key internal monitoring wells on a routine basis as part of its overall water monitoring program. Please submit maps displaying the referenced internal monitoring wells at the Mine and the Mill and show the extraction wells installed at the Mill.*

   Appendix C, Figures 1-3 Site Diagrams of the GWMP (Attachment 1) have been updated to illustrate extraction wells installed at the Mill and key internal monitoring wells upgradient of the POC wells including MLGW-11, 20, 21, 22, 23, 24, and 25. Note that the current extraction well system (MLEX wells) have been included in the diagrams, however inactive historic HMEX and THP extraction wells were not included to reduce confusion. Please also note that sampling at key internal monitoring wells, if any, is variable. The need for monitoring is based on a variety of factors including, for example, conceptual site model development and refinement, groundwater flow models, seasonal patterns, water quality assessments, operational needs, and/or other similar projects.

6. *<u>Section 4.1 and Table 4-1 Indicator Parameters</u> identifies parameters that have a reasonable potential of being transported from mining materials to surface and groundwater systems. The rational for the indicator parameter selection describes pH monitoring as an instantaneous snapshot of physical field data. Henderson is proposing a NPL range for pH of 5.9-8.5 for POC wells MLGW-7, MLGW-15 and MLGW-17 downgradient from the Mill. What would be an indicator of seepage from the Mill measured by pH values?*

As noted in your comment and in Section 4.1 of the GWMP, the purpose of including pH as an indicator parameter is to “provide an instantaneous snapshot of physical field data” and not as a direct indicator of seepage. The purpose of the physical field data is as an indicator of groundwater characteristics at the time of sampling to help ensure sampling representativeness. The data may also be useful as supplementary information to help interpret the results of the other indicator parameters more directly indicative of seepage. However, pH should not be utilized as a direct indication of seepage as it carries a high level of uncertainty since variability in pH can be caused by a variety of other factors including ambient conditions. This is further supported by data from MLGW-7, MLGW-15, and MLGW-17 at the Mill and MNGW-1 at the Mine (see Mine and Mill pH vs Metals Plots in Attachment 4). The plots include data from the period of record for wells MLGW-7, MLGW-15, and MLGW-17 at the Mill and well MNGW-1 the Mine. The pH versus metals comparison graphs suggest there is no correlation between pH and metals concentrations, with all r2 values less than 0.13 (using criteria that a statistically significant correlation is indicated by an r2 value of at least 0.5). These plots support a finding that decreases in pH do not directly correlate with increases in metal concentrations.

7. *Section 5.1.1 Table 5-1 presents the Numeric Protection Limits for MNGW-1. According to the table, the NPL for pH is 6.5-8.5. Monthly groundwater quality measurements at MNGW-1 routinely show exceedances of the pH NPL. According to Section 5.3 Notification and Consultation on page 23 of the Plan, Henderson is required to notify DRMS of NPL exceedances. A review of the permit file shows the operator is complying with this requirement. However, the text in Section 5.4 states, “if a trend suggests increasing concentrations in parameters, Henderson will evaluate downgradient data, consider potential sources or causes of the trend and if necessary, develop a plan for increased monitoring or further actions.” Please provide a summary of the investigations to date and update the Division on findings and mitigation strategies.*

   Section 3.1.6.1 of the GWMP (Attachment 1) has been updated to summarize investigations related to low pH in MNGW-1 and NNG conducted between 2013-2024 and the proposed establishment of a Site Specific Indicator Value for pH. Additional supporting details are incorporated in the below correspondence to the DRMS:

   - Groundwater Quality Assessment Technical Memorandum (AJAX/Clear Creek, 2013)
   - Investigation of pH Conditions at Monitor Well MNGW-1 (AJAX/Clear Creek, 2021)
   - Henderson Mine Point of Compliance Well MNGW-1 Low pH Status Update Response to DRMS Comments (Climax Molybdenum Company, 2021)
   - Response to MNGW-1 Low pH Status Update Review Follow-up Memo from DRMS (Climax Molybdenum Company, 2022)
   - Henderson Mine POC Well MNGW-1 Low pH Status Update Response to DRMS (Climax Molybdenum Company, 2022)
   - Henderson Mine POC Well MNGW-1 Low pH Status Update - Fourth (4th) Adequacy Review (Climax Molybdenum Company, 2023)

   Subsequent to these investigations and in accordance with the 4th Adequacy Review correspondence to DRMS (dated March 3, 2023), Henderson performed or is continuing to perform the following additional investigations:

   - Samples were collected in August 2023 at transect locations established along No Name Gulch during previous pH studies. The analyte list for the 2023 sampling event included field and water quality parameters (anions, cations, metals, acidity, alkalinity, and total, inorganic, and organic carbon), which are needed to better understand geochemical conditions along No Name Gulch.
   - A soil sample was collected in July 2024 upstream of No Name Gulch and the diversion ditch to evaluate geochemical conditions of soil in a location upstream of the gulch. The acid-base-accounting (ABA) and paste pH results support collection of additional soil

samples along the lower reaches of the diversion ditch and in the vicinity of MNGW-1. Henderson intends to collect these soil samples in fall 2025.

- As discussed in more detail in item #4 above, Henderson installed monitoring well MNGW-5 in November 2023 and is in the process of collecting two years (6 triannual sampling events) of water level and water quality data to establish baseline conditions including seasonal trends, and to determine the efficacy of the well for potential ongoing monitoring and establishment as a replacement POC well for MNGW-1. Henderson anticipates baseline sampling will be concluded in the fourth quarter of 2025.

Henderson will provide a summary report(s) to the DRMS for the above investigations in the first quarter of 2026.

8. *<u>Section 6.1 Henderson Mine Table 6-1</u> presents the Mine Monitoring Frequencies and shows samples are collected 3x/year at MNGW-1. However, Henderson is conducting monthly sampling of MNGW-1 for pH. Please add a footnote to Table 6-1 to show this revised monitoring frequency.*

   Monthly monitoring for pH at MNGW-1 represents an increased monitoring frequency in accordance with Section 5.4 Additional Data Evaluation which states, "if a trend suggests increasing concentrations in parameters, Henderson will evaluate downgradient data, consider potential sources or causes of the trend and if necessary, develop a plan for increased monitoring or further actions." Upon approval of TR-37 and related establishment of Site Specific Indicator Values, Henderson intends to return to the Table 6-1 default sampling frequency of "3x/year". As such, an update to Table 6-1 would not be appropriate at this time.

9. *<u>Appendix K Section 2.1 Site Selection</u> states that MLGW-37 will be representative of domestic water supply well conditions in the William's Fork River Valley, and POC wells 15 and 17 will monitor for potential impacts from the TSF and Mill. Please provide a discussion about if impacts were to be detected in MLGW-15 and/or MLGW-17 how long would it take for those impacts to arrive at MLGW-37. Include a discussion about possible dilution occurring over the approximately 2-mile distance between the wells.*

   MLGW-37 is located over two miles northwest of MLGW-15 and over three miles northwest of MLGW-17. As noted in the GWMP, groundwater levels and hydraulic characteristics in the glacial and alluvial deposits are expected to be highly variable. To develop an estimate of travel time for groundwater to migrate from MLGW-15 and MLGW-17 to MLGW-37, Henderson used conservative estimates for hydraulic conductivity (10 to 50 feet per day) and effective porosity (0.3). The assumed range of hydraulic conductivities is based on lithologic characteristics of the formation material and is within the higher range of published estimates for alluvial and glacial deposits that contain clay or till (Fetter, 1994). Based on these assumptions, Henderson estimates an average groundwater flow velocity range of approximately 0.5 to 2.5 feet per day. This results in a calculated transport time between MLGW-15 and MLGW-37 of over a decade to several decades. The travel time from MLGW-17 would be longer due to its location upgradient from MLGW-15. This is a simple velocity-based calculation, it does not consider dilution and other processes, such as geochemical attenuation, that would impact the fate and transport rates of any impacted groundwater observed in MLGW-15 and MLGW-17. Such processes include dilution associated with surficial recharge (e.g., infiltration of rainfall/snowmelt), mixing with unimpacted groundwater, and interaction and geochemical reactions between impacted groundwater and sediments. These processes would extend the timeframe for any impacts, should they be observed in MLGW-15 and MLGW-17, to migrate to MLGW-37. Ultimately, there would be ample time to identify and respond to any potential impacts observed in MLGW-15 and MLGW-17. It is also noted that relative to MLGW-ACR, MLGW-37 is located over a mile closer to the TSF/Mill, which would allow for earlier detection and response of any future impacts at the water supply point of compliance.

To clarify iterative revisions since the submittal of the revised GWMP on December 13, 2024, Henderson is providing both a “clean” compiled version of the GWMP (Attachment 1) as well as a “red-lined” version of the main body of the GWMP summarizing substantive revisions (Attachment 2).

If you have any questions regarding this submittal, please contact me at (720) 942-3255.

Sincerely,

Ben Bates
Senior Environmental Engineer
Climax Molybdenum Company
Henderson Operations

Attachments:

1. Groundwater Management Plan (“Clean” compiled version)
2. Groundwater Management Plan (“Red-Lined” version)
3. Well Permit and As-Built drawing for MNGW-5
4. Mine and Mill pH vs Metals Plots

cc (via email)
M. Hamarat, Climax
R. Hickman, Climax

ATTACHMENT 1

Groundwater Management Plan (“Clean” compiled version)

CLIMAX MOLYBDENUM COMPANY
HENDERSON OPERATIONS

Technical Revision 37 (TR-37) to Permit M-77-342
Groundwater Management Plan

April 2025

Submitted To:

Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, Colorado 80203

Prepared by:

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List of Acronyms and Abbreviations

CBSG – Colorado Water Quality Control Commission Basic Standards for Groundwater (5 CCR 1002-41)

CDPHE – Colorado Department of Public Health and Environment

CDPS – Colorado Discharge Permit System

CRS – Colorado Revised Statute

DMO – Designated Mining Operation

EBR – East Branch Reservoir

EPF – Environmental Protection Facility

DRMS – Division of Reclamation, Mining and Safety

EPP – Environmental Protection Plan

mg/L – milligrams per liter

MOA – Memorandum of Agreement

NPL – Numeric Protection Level

POC – Point of Compliance

SPCC/MCP – Spill Prevention Control and Countermeasures / Materials Containment Plan

s.u. – standard units

SWMP – Stormwater Management Plan

TR – Total Recoverable

TR – Technical Revision

µg/L – microgram per liter

µS/cm – microsiemens per centimeter

WQCC – Water Quality Control Commission

WQCD – Water Quality Control Division

1.0 Purpose of Permitting Action

Climax Molybdenum Company - Henderson Operations (Henderson) is submitting this document concerning the protection of groundwater quality pursuant to Rule 3.1.7(5) of the Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal, and Designated Mining Operations (the "Rules"). This section states as follows:

> *(5) Any Operator, on a voluntary basis, may submit information concerning the protection of the quality of groundwater affected by the operation to the Office. The Operator may submit such information and a plan for monitoring, where appropriate, including monitoring at points of compliance, for the Office's consideration. The information submitted must satisfy the requirements of Paragraphs 3.1.7(6) and (7). Such voluntary submission by an Operator shall be considered a Technical Revision provided the submittal satisfies Section 1.8, or NOI modification.*

This permitting action provides an update to the plan for groundwater monitoring at the Henderson Mine and Mill. This document constitutes the Henderson Groundwater Management Plan (GWMP) and is being formally submitted as Technical Revision 37 (TR-37) to the Henderson Mine and Mill Reclamation Permit No. M-1977-342, as required. This TR supersedes TR-16 and TR-05 that were previously submitted to the Division of Reclamation, Mining and Safety (DRMS).

TR-37 establishes the program by which the Henderson Mine and Mill will demonstrate compliance with applicable groundwater quality requirements and, by reference, Colorado Water Quality Control Commission (WQCC) standards. As such, this Technical Revision establishes permit conditions protective of groundwater. Once approved, this technical revision will become part of the existing permit.

Both the Henderson Mine and the Henderson Mill are represented in this Technical Revision. Figure 1 illustrates the general locations of the Henderson Mine and Mill and Figures 2 and 3 illustrate major site features and drainage basins. Specific conditions at each location are addressed individually throughout this document.

2.0 Site Descriptions

2.1 Henderson Mine

The Henderson Mine is located in Clear Creek County west of Empire, Colorado. The Henderson Mine is situated on the northern flanks of Red Mountain located in the Dailey-Jones Pass mining district along the eastern edge of the Continental Divide. Figure 1 provides an overview of Henderson operations.

The Henderson ore body was discovered in the early 1960's. Shortly thereafter mine development began and continues today. The main ore haulage from the underground mine is a 9.6 mile tunnel to the Henderson Mill site located on the western side of the Continental Divide in the Williams Fork Valley.

Currently, formally non-tributary developed water from rock fracture interception coupled with water intercepted by the Henderson glory hole is pumped from the mine workings to the surface where it is treated and discharged under the authority of the Colorado Discharge Permit Systems (CDPS) Wastewater Discharge Permit No. CO-0041467. Surface treatment consists of a high density sludge water treatment process. This process treats incoming water via lime neutralization, precipitation, settling and pH adjustment. Clarifier underflow is recycled to seed incoming untreated water. The balance of the sludge is pumped to two dewatering beds on an alternating basis. Dried sludge is collected and disposed of off-site in accordance with applicable solid waste regulations.

Stormwater at the Henderson Mine is discharged under the authority of the CDPS Stormwater General Permit COR-040000, specifically authorization number COR-040079, as well as the previously identified CDPS wastewater discharge permit. Stormwater not discharged under the wastewater discharge permit is discharged via identified stormwater outfalls and via sheet flow to the West Fork of Clear Creek. In addition, stormwater diversionary canals have been constructed on the south side of surface operations, around the west end and along the north side of the Henderson Mine property. These diversionary interceptors serve to deliver unimpacted stormwater to the West Fork of Clear Creek.

Henderson currently maintains its operations of underground workings in a dewatered condition. This GWMP assumes post mining dewatering and treatment. Henderson will obtain the necessary authorizations to address the potential impacts of mine flooding prior to ceasing dewatering.

2.2 Henderson Mill

Henderson Mill is located in the upper Williams Fork River drainage basin just north of Ute Pass in Grand County, Colorado. The mill, located on the west side of the Continental Divide, is linked by a tunnel to the Henderson Mine on the east side of the Continental Divide. The major components associated with the mill facility include the mill, process water storage reservoir, and the main tailings storage facility (TSF). Figure 1 provides an overview of Henderson operations.

Tailings storage began at the Henderson Mill site in the mid 1970's. Tailings related seep water is currently collected downgradient of the storage area in a collection channel and via the Ute Park extraction wellfield (see Section 3.2.8 for additional information). The collected seep water is then pumped back up to the TSF for re-use.

Process water associated with the Henderson Mill may be discharged under the authority of CDPS Wastewater Discharge Permit No. CO-0000230. Process water is captured and reused in the milling circuit. Additionally, the construction and operation of a new Mill water treatment plant (WTP) is planned based upon forecasted future operating conditions to provide treatment of excess process water (see Section 3.2.7 for additional information).

Stormwater at the Henderson Mill is discharged under the authority of CDPS Wastewater Discharge Permit No. CO-0000230. Stormwater not captured in the milling circuit or discharged under the wastewater discharge permit is discharged via identified stormwater outfalls and via sheet flow to the Williams Fork River. To minimize the volume of stormwater that comes into contact with the facility's industrial operations, interceptor canals have been constructed around the west and north end of the tailings pond to deliver unimpacted stormwater to the Williams Fork River. A collection system has also been constructed for drainages southwest of the Henderson Mill property that transmits unimpacted stormwater through an underground diversion pipe to the Williams Fork River.

2.3 Existing Monitoring Program

Henderson has been conducting routine groundwater quality monitoring at the Mine and Mill since 1995. Analytical data available from 1995-2012 prior to the original GWMP (TR-16) approval are provided in Appendix A for both the Mine (MNGW-1) and the Mill (MLGW-7) Point of Compliance (POC) wells (see related POC discussion in Section 3.0). Groundwater data subsequent to 2012 have been routinely submitted to the DRMS consistent with the GWMP.

In addition to groundwater monitoring, Henderson has also performed sampling as part of an established surface water monitoring plan. The plan includes monitoring locations both upgradient and downgradient of the Mine and Mill as summarized in Table 2-1.

Table 2-1: Surface Water Monitoring Locations

Site	*Upgradient Sampling Locations*	*Downgradient Sampling Locations*
Henderson Mine	CC-10 and BG-20	CC-30
Henderson Mill	WFR-20	WFR-40

Analytical data from five quarterly surface water sampling events collected immediately prior to the original GWMP (TR-16) submittal and approval are provided in Appendix B. Surface water data subsequent to 2012 have been routinely submitted to the DRMS consistent with the GWMP. Surface water quality data indicate that Mine and Mill operations are not adversely impacting water quality downstream of the sites.

Note that Henderson revised sampling location nomenclature in 2012 to improve efficiencies. Sampling locations referenced in correspondence with DRMS prior to 2012 may still be active but have been assigned a new name.

3.0 Drainage Basins and Selection of Monitoring Locations

This section provides a summary of:

- Classified stream segments;
- Existing and potential future uses of groundwater;
- Potential contamination sources;
- Geologic and hydrogeologic conditions at the Henderson Mine and Henderson Mill;
- Groundwater monitoring locations; and
- Surface water monitoring locations.

The geologic and hydrogeologic assessments presented herein are a summary of information previously provided to the DRMS. The original source of the data presented is referenced as applicable.

POC monitoring locations were selected in accordance with Rule 3.1.7(6) of the Rules and related discussions in this section.

3.1 Henderson Mine

3.1.1 Location and Description of Classified Stream Segments

Adjacent to the Henderson Mine, Segment 4 of Clear Creek runs from the source of the West Fork of Clear Creek to the confluence with Woods Creek and is classified as Aquatic Life (cold) Class 1, Recreation E, Water Supply, and Agriculture. Downstream of the Henderson Mine, Segment 5 of Clear Creek runs from the confluence with Woods Creek to the confluence with Clear Creek and is classified as Aquatic Life (cold) Class 1, Recreation E, Water Supply and Agriculture. Stream segments are noted, relative to mine operations, in Figure 3 of Appendix C.

3.1.2 Existing and Potential Future Uses of Groundwater

As discussed in Section 3.1.5, groundwater at the Henderson Mine is limited to a thin lens of colluvium that is bounded on all sides by low permeability Precambrian Silver Plume Granite. As the groundwater approaches the lower end of the drainage, the colluvium pinches out, and groundwater is forced to surface into the West Fork of Clear Creek. Therefore, the current and future groundwater use at the site is limited to recharge of the West Fork of Clear Creek. The site hydrogeologic conditions cannot support development of groundwater resources for any other beneficial use.

3.1.3 Potential Contamination Sources and Environmental Protection Facilities (EPFs)

Sources of potential contamination of groundwater from the Henderson Mine include infiltration of water from historical water treatment ponds and development rock piles. Potential contaminant sources and established EPFs at the Henderson Mine will be managed in accordance with Section 7.1 of the revised Environmental Protection Plan (EPP).

3.1.4 Geology

The bedrock of the area surrounding the Henderson Mine site is relatively shallow and is composed primarily of Precambrian Silver Plume Granite and Tertiary Period stock and dike granitic intrusions that are highly altered by hydrothermal activity. The intrusions are upgradient from the mine site and may produce significant naturally occurring background concentrations of dissolved metals in the groundwater. The Vasquez Fault and a related fracture zone may affect the groundwater flow, but the fate of any percolation into the fault would be recirculation into the established mine water system. The expected fate of all other potential contamination would be accumulation in the stream flow and shallow groundwater associated with the West Fork of Clear Creek (WW Wheeler and Associates, 1991).

3.1.5 Hydrogeology

Groundwater occurrence at the Henderson Mine is primarily limited to a thin, well-defined colluvial deposit which is bounded on all sides by the Precambrian Silver Plume Granite Formation. Groundwater occurrence within the Precambrian Silver Plume Granite is limited. The low permeability of the granite is evident in the mine workings where groundwater inflow has remained unchanged in the life of the Henderson operation. Additionally, because process water is pumped from the mine workings to the surface for treatment (as discussed in Section 2.1), increased exposure of sulfides to oxidation through the underground mining activities does not impact groundwater quality near the underground workings.

As shown in Figure 3 of Appendix C, groundwater flow direction within the colluvium generally flows from the upper end of the drainage to the lower end. Upgradient of the confluence with Woods Creek, the colluvium pinches out and groundwater is forced to surface into the West Fork of Clear Creek.

3.1.6 Groundwater Monitoring Locations

3.1.6.1 POC Groundwater Monitoring Locations

The groundwater quality for the West Fork of Clear Creek basin has historically been monitored at well MNGW-1, located downgradient of the Henderson Mine. MNGW-1 is constructed in the colluvium and is representative of shallow groundwater conditions downgradient of mine operations. Completion details for the well are not available. MNGW-1 will be analyzed for the constituents listed in Table 4-1 and monitored at the frequencies summarized in Section 6.0.

Henderson Mine installed MNGW-2, a deeper Precambrian bedrock well, in 1993. This well has been dry since its completion. Henderson also conducted a hydraulic conductivity study of the Precambrian Silver Plume Granite in the Urad Valley and determined that groundwater flow is limited (WW Wheeler and Associates, 1993). As a result of these findings and consistent with Section 3.1.5, Henderson and the DRMS agreed that MNGW-1 was appropriate for characterizing groundwater at the Mine.

Henderson initiated increased frequency monitoring (monthly) for pH at MNGW-1 shortly after the establishment of the GWMP in 2012, when further evaluations were triggered consistent with the requirements of section 5.4 of the GWMP. Monthly pH monitoring at MNGW-1 continued through 2025 in addition to supplementary investigations that were conducted between 2013 and 2024 to help assess and determine low pH causes. Updates were provided to the DRMS during this time and are included as part of the permit record. Investigations included, in part, sampling along No Name Gulch which conveys water from Red Mountain around the south side of the Mine to the West Fork of Clear Creek. No Name Gulch is a natural stream that transitions at the base of the mountain, just south of the Mine facilities, to an unlined diversion ditch which routes water around the southern and eastern edge of the surface facilities.

Results of these investigations indicate that the naturally low pH water conveyed by No Name Gulch is contributing to low pH conditions observed in MNGW-1 and is likely contributing or directly causing pH values at the POC to drop below the 6.5 s.u. NPL. The naturally acidic water from No Name Gulch is believed to be the result of acid-rock drainage (ARD) conditions that existed in the system well before mine development and facility construction. This is supported by the presence of certain mineral deposits (manganocrete and ferricrete) in and adjacent to the channel which indicate the long-term existence of ARD. Further, there also appears to be a likelihood that ARD has caused some level of exhaustion of the natural alkaline buffering capacity in No Name Gulch, particularly in the materials used to create the No Name Gulch diversion ditch. Further exhaustion of these materials could lead to continued decreasing trends in pH in the future and will require adjustments to Site Specific Indicator Values. Data also indicates that decreases in pH do not specifically correlate with increases in indicator parameter concentrations. As such and based on current data, Henderson is proposing a Site Specific Indicator Value pH range of 5.6-8.5 to bracket these naturally occurring conditions. The background threshold values were established consistent with the Technical Memorandum Establishing Background Threshold Values for MNGW-1, (Appendix L). Upon approval of TR-37, Henderson will return to the standard monitoring frequencies referenced in Section 6.0, Table 6-1.

3.1.6.2 Internal Groundwater Monitoring

Internal monitoring wells include those monitoring wells not specifically defined as POC wells in this GWMP. Henderson will continue to monitor key internal monitoring wells (Figure 1) on a routine basis as a part of its overall water monitoring program. Note that sampling at key internal monitoring wells, if any, is variable. The need for monitoring is based on a variety of factors including, for example, conceptual site model development and refinement, groundwater flow models, seasonal patterns, water quality assessments, operational needs, and/or other similar projects.

3.1.7 Surface Water Monitoring Locations

3.1.7.1 CDPS Permit Monitoring

The Henderson Mine wastewater treatment system manages, in part, groundwater that is pumped from the mine workings and discharges the effluent through the permitted outfall. This surface water discharge is authorized under CDPS discharge permit No. CO-0041467. Surface water sampling at the outfall is performed in accordance with the permit and is not included in the scope of this Plan. Ongoing compliance with discharge requirements demonstrates the overall effectiveness of the collection and treatment facilities.

3.1.7.2 Clear Creek Surface Water Monitoring Locations

Henderson Mine will continue to monitor existing surface water monitoring locations: CC-10, upgradient of the Henderson Mine in the West Fork of Clear Creek; BG-20, upgradient of the Henderson Mine in Butler Gulch; and CC-30, downgradient of the Henderson Mine in the West Fork of Clear Creek. These sites will allow additional monitoring and trending of data and enable detection of potential changes in water quality from surface runoff in the vicinity of the mine facilities.

Surface water samples will be analyzed for the constituents listed in Table 4-4 and monitored at the frequencies summarized in Section 6.0. Figure 3 of Appendix C illustrates monitoring locations at the Henderson Mine.

3.2 Henderson Mill

3.2.1 Location and Description of Classified Stream Segments

Adjacent to the Henderson Mill, the Williams Fork River, from its source to the confluence with the Colorado River, is Segment 8 of the Upper Colorado River basin. This segment is classified as Aquatic Life (cold) Class 1, Recreation E, Water Supply, and Agriculture. Stream segment location is noted, relative to mill operations, in Figure 2 of Appendix C.

3.2.2 Existing and Potential Future Uses of Groundwater

Current and future groundwater uses at the Henderson Mill are limited. Groundwater within the Henderson Mill property boundary occurs primarily in the areas downstream of the TSF. Within these areas, current and future domestic and agricultural development of groundwater would not be likely given the site location and climate conditions. The current and future groundwater use at the site is limited to recharge of the Williams Fork River.

3.2.3 Potential Contamination Sources and EPFs

Sources of potential contamination of groundwater from the Henderson Mill include infiltration of process water from the TSF and the East Branch Reservoir (EBR), a process water impoundment in the East Branch of Ute Creek. Potential contaminant sources and established EPFs at the Henderson Mine will be managed in accordance with Section 7.2 of the revised EPP.

3.2.4 Site Geology

The Henderson Mill and tailings storage facilities are located in the Ute Creek Basin of the Williams Fork drainage basin. The Ute Creek Basin is bounded on the west by the Vasquez Mountain Range and bounded on the north, south and east by northwest trending Williams Fork Mountains. The Ute Creek Basin basement rocks consist of weathered and unweathered Precambrian gneiss and schist of the Idaho Springs Formation and Silver Plume Granite. In some areas of the basin, the Miocene-aged Troublesome Formation consists mostly of unconsolidated and semi-consolidated lensed clays, silts, sands, gravels and volcanic ash grading to consolidated siltstone, sandstone, conglomerate and claystone derived from the weathering of the Williams Fork Mountain Range. Pleistocene-aged glacial end-moraines, lake sediments and outwash material encroach on the Ute Creek Basin and overlie the Troublesome Formation. End-moraines are a conglomeration of boulders, cobbles, gravels, sands, silts and clays. Glacial lake sediments cover low flat sections while glacial outwash was deposited in braided stream beds. Glacial outwash consists of gravels, cobbles and sands. The Troublesome Formation is generally blanketed by a 2 to 10-foot thick layer of recent slopewash and residual soils. Alluvial material generally lies within the present stream valleys.

The Henderson Mill and adjacent facilities are constructed on the Idaho Springs Formation and Silver Plume Granite. The tailings storage area is located on the western slope of the Williams Fork River Valley and is constructed primarily on the Troublesome Formation although some areas overlay glacial and alluvial deposits.

3.2.5 Hydrogeology

Hydrogeologic conditions at the Henderson Mill were investigated by advancing seven borings into the alluvium and weathered bedrock in the fall of 1993. Of the seven borings, six borings were completed as monitoring wells (designated as GW-2 through GW-7). Based on the site geology, boring logs and observation of groundwater levels, three primary hydrostratigraphic units can be identified at the Henderson Mill site: 1) unconsolidated glacial and alluvial deposits, 2) the Troublesome Formation, and 3) the Idaho Springs Formation and Silver Plume Granite. The following sections summarize the hydraulic characteristics of each hydrostratigraphic unit. Within and downgradient of the TSF, groundwater primarily occurs within the glacial and alluvial deposits, while little groundwater flow is present in the Troublesome Formation, Idaho Springs Formation and Silver Plume Granite.

Glacial and Alluvial Materials

Field data from test pits and borings advanced prior to and after tailings deposition (Woodward-Clyde, 1983, Hydrokinetics, 1993) show that the groundwater levels within the glacial and alluvial materials are hydraulically connected. Since both the glacial and alluvial materials consist of gravels, sands and clay deposits, and are hydraulically connected, these materials are considered a single hydrostratigraphic unit.

The groundwater levels measured within the glacial and alluvial materials vary considerably across the site. When correlated to geologic data, it is evident that the variability of the groundwater levels can be attributed to multiple perched water zones present within pervious layers which overlay impervious layers. Therefore, the groundwater levels and hydraulic properties of this hydrostratigraphic unit are expected to be highly variable.

As shown in Figure 2 of Appendix C, the primary groundwater flow path is generally from southwest to northeast. Data indicates that the direction of groundwater flow is essentially northward near GW-4, and bends northeastward (towards the William Fork River) in the area of well GW-7 (Hydrokinetics, 1993).

Troublesome Formation

The Troublesome Formation has been documented to contain discontinuous sands, gravels, lensed clays, and silts underlain by semi-consolidated siltstones, sandstones, conglomerates and claystones. Data from test pits and borings within the Troublesome indicate that the presence of groundwater within this unit is highly variable. A site study conducted by Woodward-Clyde (1983) concluded that this formation is not considered to be a continuous aquifer because of the limited extent of the sand layers in the formation which would preclude significant groundwater flow.

Idaho Springs Formation and Silver Plume Granite

The weathered and unweathered Precambrian Idaho Springs Formation and Silver Plume Granite are considered to be relatively impermeable compared to the overlying glacial, alluvial and Troublesome Formation deposits. The low permeability nature of the Idaho Springs Formation and the Silver Plume Granite have been documented through packer and geophysical testing in the Precambrian bedrock. These data indicate that the Precambrian bedrock is not capable of transmitting significant quantities of groundwater as compared to the overlying glacial and alluvial deposits and show a defined decrease in hydraulic conductivity with depth.

3.2.6 Groundwater Monitoring Locations

3.2.6.1 POC Groundwater Monitoring Locations

The groundwater quality for the Upper Colorado River drainage basin has historically been, and at the time of the original GWMP (TR-16) approval, monitored at well MLGW-7, located downgradient of the Henderson Mill. MLGW-7 is constructed in the alluvium and considered representative of shallow groundwater conditions below the Henderson Mill. The geologic well log and construction details for MLGW-7 are included in Appendix D (Hydrokinetics, 1993). MLGW-7 will be analyzed for the constituents listed in Table 4-1 and monitored at the frequencies summarized in Section 6.0.

The original GWMP (TR-16) provided that Henderson would conduct further groundwater studies at the Henderson Mill to determine the appropriateness of current POC locations as well as the potential for establishing new POC locations below 1-Dam and in the Potato Gulch drainage. The results of this study were submitted in the 2014 5-Quarter Water Quality Data and Baseline Parameters Report (see Appendix J) and confirmed the appropriateness of the approved POC locations and recommended that new POC locations be established at MLGW-15 and MLGW-17. The report further recommended these POC locations be monitored on an ongoing basis for the indicator parameters listed in Table 4-1 and monitored at the frequencies summarized in Section 6.0. The DRMS preliminarily approved the POC locations, NPLs, and monitoring schedules in April 2015. Geologic well construction details for MLGW-15 and MLGW-17 were provided to the DRMS as part of the Groundwater Monitoring Point of Compliance (POC) Technical Memorandum (AJAX and Clear Creek Associates, 2013).

Segment 8 of the Upper Colorado River drainage basin has been classified as water supply; however, the closest actual water supply use is a substantial distance downstream of the Henderson facility. As such, and as a result of related rulemaking hearings, the Water Quality Control Commission established the Aspen Canyon Ranch well (5 CCR 1002-33, see

Appendix E) as the "point of compliance" for water supply related parameters iron and manganese. Since sulfate (which is discussed here because it is included as an "indicator parameter" in Section 4.1) is only applicable because of a potential water supply classification, it follows that the POC would also be located at the Aspen Canyon Ranch well. As such, the Aspen Canyon Ranch well (MLGW-ACR) originally served as the POC for domestic water supply standards. The original GWMP (TR-16) provided that Henderson conduct baseline monitoring to establish NPLs at MLGW-ACR. The results of this study were submitted in the 2014 5-Quarter Water Quality Data and Baseline Parameters Report (see Appendix J) including proposed NPLs, with exception of dissolved iron and manganese due to the well conditions discussed below.

However, the Aspen Canyon Ranch property was sold in 2023, and Henderson was not able to gain access to complete required sampling at MLGW-ACR. Further, as discussed in prior Henderson annual water quality reports and other communications, MLGW-ACR has an unconventional well design that is believed to cause elevated iron and manganese levels due to corrosion and stagnation within the well casing. As such, Henderson is proposing to establish well MLGW-37 as the internal POC monitoring location for domestic water supply standards under the GWMP. MLGW-37 is a newly constructed well located on Henderson property, within proximity to and in the same aquifer system as MLWG-ACR, alleviating both access issues and issues associated with MLGW-ACR's well design. A Technical Memo summarizing the results of the MLGW-37 assessment as a potential POC for domestic water supply standards is included as Appendix K.

In accordance with Section 4.2, a baseline dataset will be collected at MLGW-37 over a period of time necessary to provide a minimum of 5 triannual sampling events. Once sampling has been completed, the baseline data will be assessed to determine a final list of domestic water supply parameters and related Limits for long-term monitoring. Henderson will present the results of this assessment to DRMS for review and approval. Upon approval, Limit and monitoring information will be updated in Sections 5.0 and 6.0, if required. In the interim, Henderson proposes to adopt Limits based on the table value standards listed in Tables 1 and 2 (Domestic Water Supply) of the Colorado Basic Standards for Groundwater (CBSG) for the indicator parameters listed in Table 4-1 and that also appear in CBSG Tables 1 and 2.

3.2.6.2 Internal Groundwater Monitoring

Internal monitoring wells include those monitoring wells not specifically defined as POC wells in this GWMP. Henderson will continue to monitor key internal monitoring wells (Figure 2) on a routine basis as a part of its overall water monitoring program. Note that sampling at key internal monitoring wells, if any, is variable. The need for monitoring is based on a variety of factors including, for example, conceptual site model development and refinement, groundwater flow models, seasonal patterns, water quality assessments, operational needs, and/or other similar projects.

3.2.7 Surface Water Monitoring Locations

3.2.7.1 CDPS Permit Monitoring

Henderson Mill process water may be discharged under the authority of CDPS Wastewater Discharge Permit No. CO-0000230. The Mill facility has operated as a zero-discharge facility since the beginning of operations in 1976; however, under forecasted operating and climate conditions, a surplus water scenario is possible which results in water that must be stored in the TSF or EBR. The construction and operation of a new Mill WTP is planned to treat excess process water to provide operational flexibility and allow appropriate management of stored water volumes under a variety of conditions. The WTP has been designated as an EPF in the Henderson EPP approved as part of TR-34. Additional WTP design details are provided in TR-35. Future discharge and any surface water sampling conducted in accordance with the CDPS Permit is not included in the scope of this GWMP. Ongoing compliance with discharge requirements is expected to demonstrate the overall effectiveness of the collection and treatment facilities.

3.2.7.2 Williams Fork Surface Water Monitoring Locations

Henderson will continue to monitor existing surface water monitoring locations: WFR-20, upgradient of the Henderson Mill in the Williams Fork River, and WFR-40, downgradient of the Henderson Mill in the Williams Fork River. These sites will allow additional monitoring and trending of data and enable the detection of potential changes in water quality from surface runoff in the vicinity of the mill facilities.

Surface water samples will be analyzed for the constituents listed in Table 4-4 and monitored at the frequencies summarized in Section 6.0. Figure 2 of Appendix C illustrates the location of monitoring locations at the Henderson Mill.

3.2.8 Ute Park Extraction Wellfield

The Henderson Mill TSF was constructed by the upstream deposition method and is comprised of tailings material. Some of the water from the tailings pond and dam migrates through the tailings material and is captured in seepage collection canals located at the toe of the tailings dam. The canals direct the water to the Ute Creek Pump Station which pumps it back into the mill water circuit for reuse. This seep water collection and return system is identified as Mill EPF 1.5 and managed in accordance with the revised EPP.

1-Dam was constructed over the Ute Creek drainage and its alluvial channels which form a shallow groundwater unit. Based on previous characterization studies, the Ute Creek alluvial and glacial drift deposits were reported to be the primary water-bearing unit underlying and downgradient of the tailings dam. Seepage from the 1-Dam tailings facility that is not captured in the seepage collection canals reports to the underlying alluvium and is captured by an extraction wellfield. The purpose of the extraction wellfield is to effectively intercept and capture seepage affected groundwater below 1-Dam and pump it back into the Mill process water system. The extraction wellfield is currently comprised of seven extraction wells located downgradient of 1-Dam. Water from the extraction wellfield system is routed to the Ute Park Pump House and pumped back to the tailing pond for reuse in the milling circuit. The Ute Park Extraction Wellfield is identified as Mill EPF 1.6 and managed in accordance with the revised EPP.

4.0 Monitoring Parameters

Monitoring under this GWMP is intended to provide data for:

- Demonstrating that EPP requirements are being met; and
- Evaluating changes in water quality that may be related to mining and milling operations at the site.

This section describes the selection of monitoring parameters.

4.1 Indicator Parameters

A Geochemical Evaluation and Sampling Plan (see Appendix F) was submitted and approved by the DRMS in May 2010. Subsequent sampling was performed on June 14-15, 2010 at the Mine to identify those parameters that have a reasonable potential of being transported from mining materials to surface and groundwater systems. A DRMS representative was present and observed this sampling event.

Geochemical evaluation monitoring results (see Appendix G) were subsequently analyzed by Henderson and the DRMS with the goal of identifying a short list of indicator parameters that track overall water quality. An indicator parameters list was selected and approved by the DRMS and is summarized in Table 4-1.

Table 4-1: Groundwater Indicator Monitoring Parameters

***Indicator Parameters*[1]**	
Selenium	Conductivity
Iron	Sulfate
Manganese	pH
Zinc	

Footnotes:
[1] Metals measured as dissolved fraction

The following provides a brief rationale for indicator parameter selection based on related discussions and correspondence between Henderson and the DRMS:

- Iron, manganese and zinc were selected to provide a reasonable indication of how trace elemental cations are behaving;
- Sulfate was selected to provide a reasonable indication of how anionic species are behaving. Sulfate is a constituent associated with sulfide ore and is known to occur in the water fraction of the tailings. Sulfate is also a naturally occurring constituent in surface and groundwater in this area;
- Selenium was selected to provide an indication of how elements that exist in natural waters primarily as oxyanions (antimony, arsenic, molybdenum, selenium and uranium), which do not track with the metal cations, are behaving; and
- pH and conductivity provide an instantaneous snapshot of physical field data.

4.2 Baseline Parameters

Newly monitored or constructed groundwater monitoring POC locations will, in addition to those indicator parameters listed in Section 4.1, be monitored for the baseline parameters summarized in Table 4-2 or Table 4-3, as appropriate. The baseline dataset will be collected over a period of time necessary to provide a minimum of 5 triannual sampling events. Once sampling has been completed, the indicator parameter list will be reviewed against the baseline data, and parameters may be added or removed from the lists for long-term monitoring. Henderson will present the results of this assessment to DRMS for review and approval. Upon approval, these monitoring locations will be added to the tables in Section 6.0, as appropriate, for long-term monitoring. Upon completion of baseline monitoring at domestic water supply POC monitoring locations, only those indicator parameters that also appear in CBSG Tables 1 and 2 (Domestic Water Supply) will be monitored on an ongoing basis.

The baseline parameters in Table 4-2 are a compilation of those parameters listed in CBSG Table 3 Agricultural Standards, but excluding those parameters already included in the indicator parameter list in Table 4-1. The baseline parameters in Table 4-3 are a compilation of those parameters listed in CBSG Tables 1 and 2 for domestic water supply, but excluding those parameters already included in the indicator parameter list in Table 4-1 and excluding asbestos, cyanide [Free], total coliforms, odor, color and foaming agents as these constituents would not reasonably be expected to be present or necessary.

Table 4-2: Groundwater Baseline Monitoring Parameters – Agriculture (CBSG Table 3)

Groundwater Baseline Parameters[1]	
Aluminum	Fluoride
Arsenic	Lead
Beryllium	Lithium
Boron	Mercury
Cadmium	Nickel
Chromium	Nitrite (NO_2-N)
Cobalt	Nitrite & Nitrate (NO_2 + NO_3-N)
Copper	Vanadium

Footnotes:
[1] Metals, Nitrite, and Nitrite & Nitrate measured as dissolved fraction

Table 4-3: Groundwater Baseline Monitoring Parameters - Domestic Water Supply (CBSG Tables 1 and 2)

Groundwater Baseline Parameters - Domestic Water Supply[1]	
Inorganic	
Antimony	Mercury (inorganic)
Arsenic	Molybdenum
Barium	Nickel
Beryllium	Nitrate (NO_3)
Cadmium	Nitrite & Nitrate (NO_2 + NO_3-N)
Chromium	Silver
Fluoride	Thallium
Lead	Uranium
Radiological	
Gross Alpha Particle Activity	Beta and Photon Emitters
Drinking Water	
Chlorophenol	Corrosivity
Chloride	Phenol
Copper	

Footnotes:
[1] Metals, Nitrate, Nitrite & Nitrate, Fluoride, and Chloride measured as dissolved fraction

4.3 Surface Water Monitoring Parameters

Surface water monitoring locations will be monitored for the parameters listed in Table 4-4.

Table 4-4: Surface Water Monitoring Parameters

Surface Water Monitoring Parameters[1]	
Selenium	Conductivity
Iron	Sulfate
Manganese	pH
Zinc	Hardness[2]

Footnotes:
[1] Metals measured as dissolved fraction
[2] Hardness included in the surface water parameters list to allow for the calculation of table value standards

5.0 Limits, Data Analysis, Notification and Revisions to Groundwater Standards

This section presents the approach to be utilized to establish Limits and the data analysis and reporting procedures for POC wells.

5.1 NPLs (Numeric Protection Levels) for POC Wells

Colorado Revised Statute (C.R.S.) 25-8-202(7) and the December 14, 2010 Memorandum of Agreement (MOA) between the Colorado Department of Public Health and Environment (CDPHE), the Water Quality Control Commission (WQCC), and DRMS clarify that WQCC is the entity solely responsible to adopt water quality standards and classifications for state waters. The MOA provides that DRMS will establish points of compliance for discharges to groundwater and must provide reasonable assurance to the Water Quality Control Division (WQCD) and WQCC that compliance with the C.R.S. 25-8-202(7) has been obtained by using the groundwater standards and classifications established by WQCC as the basis for setting enforceable performance standards, adopting rules and regulations to establish points of compliance for discharges to state waters other than point source discharges to surface water, and other requirements as included in the MOA. The WQCC has not established classified uses for groundwater at or near Henderson Mine or Mill for which standards specific to the area have been adopted, therefore the Interim Narrative Standard under CBSG is applicable. DRMS Rule 3.1.7(2)(c), requires the use of the groundwater quality table values in the CBSG as a guide for establishing numeric protection limits or permit conditions. In situations where ambient groundwater exceeds groundwater table values, the rule requires establishing permit conditions to protect existing and reasonably potential future uses against further lowering of groundwater quality. The Interim Narrative Statewide Standard (CBSG Section 41.5(C)(6)(b)(i)) states that groundwater quality shall be maintained for each parameter at whichever of the following levels is least restrictive: existing ambient quality as of January 31, 1994, or the most stringent criteria set forth in Tables 1 through 4 of the CBSG.

Consistent with DRMS rules, Limits will be established for POC groundwater wells using the CBSG Table Value Standards as a guide with consideration given to baseline data, where available. In instances where the ambient groundwater quality exceeds CBSG table values, Site Specific Indicator Values are established to protect against the further lowering of groundwater quality.

Where ambient data are to be used to establish Site Specific Indicator Values, baseline concentrations will be established using monitoring data from a minimum of 5 representative triannual sampling events (or more where data is available). Site Specific Indicator Values will be determined using a methodology consistent with that summarized in the Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese included in Appendix H.

The Limits are discussed below for each of the watersheds. The data analysis approach to be used in evaluating data against the Limits is described in Section 5.2.

5.1.1 Henderson Mine

The POC for Henderson Mine is MNGW-1 (see Figure 3). The monitoring well is located downgradient, near the east end of the disturbed industrial area. Table 5-1 lists the parameters to be measured, applicable Limits, and the basis for establishing the Limits.

Table 5-1: MNGW-1 Numeric Protection Limits

Analytical Parameter	***Limit (mg/L)***	***Basis (see footnotes)***
Iron, dissolved	5	Table 3, CBSG
Manganese, dissolved	0.79	Site Specific Indicator Value[1]
Selenium, dissolved	0.02	Table 3, CBSG
Zinc, dissolved	2	Table 3, CBSG
Conductivity, µS/cm	NA (report)	NA
pH, s.u.	5.6 – 8.5	Site Specific Indicator Value[2]
Sulfate, mg/L	NA (report)	NA

Footnotes:

Table 3, CBSG: Agricultural Use Standards

[1]See Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese included in Appendix H as previously approved in the GWMP TR-16

[2]See Technical Memorandum Establishing Background Threshold Values for MNGW-1 included in Appendix L

5.1.2 Henderson Mill

The POC locations for Henderson Mill, parameters to be measured, applicable Limits, and the basis for establishing the Limits for each POC location are summarized in the below tables.

Table 5-2: MLGW-7 Numeric Protection Limits

Analytical Parameter	***Limit (mg/L)***	***Basis (see footnotes)***
Iron, dissolved	5	Table 3, CBSG
Manganese, dissolved	0.42	Site Specific Indicator Value [1]
Selenium, dissolved	0.02	Table 3, CBSG
Zinc, dissolved	2	Table 3, CBSG
Conductivity, µS/cm	NA (report)	NA
pH, s.u.	5.9 – 8.5	Site Specific Indicator Value[2]
Sulfate, mg/L	NA (report)	NA

Footnotes:

Table 3, CBSG: Agricultural Use Standards

[1]See Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese included in Appendix H as previously approved in the GWMP TR-16

[2]See 5-Quarter Water Quality Data and Baseline Parameters Report (Appendix J); Technical Consulting Report - Establishing Background Threshold Values (BTV) - Henderson Mill (Gateway Enterprises, 2014)

Table 5-3: MLGW-15 Numeric Protection Limits

Analytical Parameter	***Limit (mg/L)***	***Basis (see footnotes)***
Iron, dissolved	5	Table 3, CBSG
Manganese, dissolved	0.42	Site Specific Indicator Value[1]
Selenium, dissolved	0.02	Table 3, CBSG
Zinc, dissolved	2	Table 3, CBSG
Conductivity, µS/cm	NA (report)	NA
pH, s.u.	5.9 – 8.5	Site Specific Indicator Value[2]
Sulfate, mg/L	NA (report)	NA

Footnotes:

Table 3, CBSG: Agricultural Use Standards

[1]See Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese included in Appendix H as previously approved in the GWMP TR-16

[2]See 5-Quarter Water Quality Data and Baseline Parameters Report (Appendix J); Technical Consulting Report - Establishing Background Threshold Values (BTV) - Henderson Mill (Gateway Enterprises, 2014)

Table 5-4: MLGW-17 Numeric Protection Limits

Analytical Parameter	***Limit (mg/L)***	***Basis (see footnotes)***
Iron, dissolved	5	Table 3, CBSG
Manganese, dissolved	0.42	Site Specific Indicator Value[1]
Selenium, dissolved	0.02	Table 3, CBSG
Zinc, dissolved	2	Table 3, CBSG
Conductivity, µS/cm	NA (report)	NA
pH, s.u.	5.9 – 8.5	Site Specific Indicator Value[2]
Sulfate, mg/L	NA (report)	NA

Footnotes:

Table 3, CBSG: Agricultural Use Standards

[1]See Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese included in Appendix H as previously approved in the GWMP TR-16

[2]See 5-Quarter Water Quality Data and Baseline Parameters Report (Appendix J); Technical Consulting Report - Establishing Background Threshold Values (BTV) - Henderson Mill (Gateway Enterprises, 2014)

Table 5-5: MLGW-37 Numeric Protection Limits

Analytical Parameter	*Limit (mg/L)*	*Basis (see footnotes)*
Iron, dissolved	0.3[1]	Table 2, CBSG
Manganese, dissolved	0.05[1]	Table 2, CBSG
Selenium, dissolved	0.05[1]	Table 1, CBSG
Zinc, dissolved	5[1]	Table 2, CBSG
pH, s.u.	6.5-8.5[1]	Table 2, CBSG
Sulfate, dissolved	250[1]	Table 2, CBSG

Footnotes:

[1]Interim Limit established during the baseline monitoring (a minimum of 5 triannual sampling events), baseline data assessment, and determination of a final list of domestic water supply parameters and related Limits for long-term monitoring (see Section 3.2.6 for additional information).

Table 1, CBSG: Domestic Water Supply – Human Health Standards

Table 2, CBSG: Domestic Water Supply – Drinking Water Standards

5.2 Data Analysis

This section presents the data analysis and reporting procedures established for POC wells. The data evaluation for the POC wells involves a comparison against Limits.

For POC wells, the first step in evaluating individual event results will be a simple comparison against the Limit. If a sample result exceeds the Limit, field forms will be reviewed and the laboratory will be contacted to check for potential errors. If the initial data quality review does not reveal any errors, the DRMS will be notified and the well will be resampled within 30 days of the receipt of the analytical data. If the second analytical result does not exceed the Limit, sampling will continue at the normally scheduled frequency. If the second sample confirms the first result, additional data evaluation including outlier tests and data distribution and trend analyses will be performed, along with the additional steps presented below.

5.3 Notification and Consultation

If a result is confirmed to have exceeded an Limit and Henderson’s data trend analysis does not find the result to be anomalous, or an obvious outlier, the following steps outline the procedure that will be taken:

1. Henderson will verbally notify DRMS that an exceedance has occurred within 10 days of receiving the analytical results for the second sample and in writing within 30 days. Written notification will include, at a minimum, the following information:
    a. The constituent identified to be in excess of established action level or standard.
    b. The location at which the exceedance was identified.
    c. Analytical data, including the date the samples were collected and the concentrations at which the constituent was measured.

d. Increased monitoring measures being undertaken.

Notifications will be submitted to the following location:

Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, Colorado 80203

2. The increased-monitoring proposal will address a modified sampling frequency for the POC location. The proposal will include a schedule for reporting and follow up discussions with DRMS.
3. If the results of the additional monitoring data indicate that water quality may be affected, Henderson will notify DRMS and initiate timely discussions with DRMS on the appropriate actions to be implemented.

5.4 Additional Data Evaluation

5.4.1 Trend Evaluation

Henderson will evaluate water quality trends for the POC groundwater monitoring sites identified above on an annual basis, and report findings in accordance with Section 7.0. This trend evaluation will be performed by viewing and presenting the data graphically and evaluating any observable visual trend. Evaluation of trends can be complicated by seasonal changes in precipitation and recharge, and by delayed response to events. Therefore, the evaluation will consider short-term changes (such as seasonal effects) in determining whether a declining trend in water quality exists. In other words, if seasonal concentration peaks occur, the evaluation should be performed to determine if there are trends in the peak concentrations.

If graphical trends do not suggest declining water quality, no further action is required and monitoring will continue in accordance with Section 6.1 and 6.2, access and weather conditions permitting. However, if a trend that suggests increasing concentrations in parameters is observed, Henderson will evaluate downgradient data, consider potential sources or causes of the trend, and if necessary, develop a plan for increased monitoring frequency or further actions.

5.4.2 Outlier Identification

Outlier results can and do occur in environmental monitoring. The general practice will be to not remove outliers from the water-quality data set, but to consider them in the visual and statistical trend evaluations. However, Henderson will perform outlier testing using Rosner's outlier or other applicable test, considering the size of the available sample set and the validity of statistical tests for the circumstance, and report the results in its annual monitoring report. Test results identified as "outlier" will be maintained in the monitoring database, but may be excluded in trend or statistical analyses.

5.5 Revisions to Water Quality Standards

The Limits established in this section reflect the numeric water quality standards (5 CCR 1002-41 CBSG) in effect at the time this GWMP was submitted. In the event that the applicable water quality standards are revised, the Limits established herein will default to the revised numeric standards. However, Limits that have been established based on ambient water quality shall not be affected by changes to state water quality standards, unless such changes reflect an increase in the standard above the established limitation.

6.0 Monitoring Summary

This section summarizes the long-term monitoring locations, frequencies, sample types, parameters to be monitored for, and applicable Limits at the Henderson Mine and Mill. This section does not address baseline monitoring, which will, as summarized in Section 4.2, be conducted over a period of time necessary to provide a minimum of 5 triannual sampling events. Upon completion of baseline monitoring for newly constructed or monitored locations and determination of appropriate parameter list, these locations will be added to the below tables for long-term monitoring. Monitoring shall commence upon approval of this Technical Revision.

6.1 Henderson Mine

Table 6-1: Mine Monitoring Frequencies

Monitoring Locations	*Frequency*	*Type*	*Parameters*	*Limits*
MNGW-1	3x/year*	Groundwater	Table 4-1	Table 5-1
BG-20	3x/year*	Surface Water	Table 4-4	NA
CC-10	3x/year*	Surface Water	Table 4-4	NA
CC-30	3x/year*	Surface Water	Table 4-4	NA

Notes:
3x/year – samples shall be collected during spring run-off (Apr-Jun), summer months (July-Aug) and low flow (Sep-Dec).

6.2 Henderson Mill

Table 6-2: Mill Monitoring Frequencies

Monitoring Locations	*Frequency*	*Type*	*Parameters*	*Limits*
MLGW-7	3x/year*	Groundwater	Table 4-1	Table 5-2
MLGW-15	3x/year*	Groundwater	Table 4-1	Table 5-3
MLGW-17	3x/year*	Groundwater	Table 4-1	Table 5-4
MLGW-37	3x/year*	Groundwater	Table 5-5	Table 5-5
WFR-20	3x/year*	Surface Water	Table 4-4	NA
WFR-40	3x/year*	Surface Water	Table 4-4	NA

Notes:
3x/year – samples shall be collected during spring run-off (Apr-Jun), summer months (July-Aug) and low flow (Sep-Dec).

6.3 Triannual Monitoring

Due to the harsh winter weather conditions at Henderson, monitoring during the winter months has proved to be a logistical difficulty, and more importantly requires significant management to reduce safety risks. Sampling procedures during the middle of winter (normally January through March timeframe) are often complicated by deep powder snowshoe access, freezing conditions, equipment difficulties, avalanche concerns, communication requirements (radio/beacons) and increased staffing requirements (safety spotters). For these reasons, Henderson has developed a monitoring schedule that includes a sampling frequency of three (3) times per year (triannual) that limits sampling activities during these times while delivering equivalent data results when compared to the historic calendar quarter monitoring schedule. The three monitoring periods will be spring runoff (April-June), summer months (July-August) and low flow conditions in the fall/winter (Sep-Dec). The following discussion provides the basis for this determination.

Using EPA's ProUCL, a number of statistical calculations were conducted that were designed to determine what impacts a reduced frequency of monitoring would have on the anticipated results. In order to do this, the full data set for Wells MLGW-7 and MNGW-1 were compared to reduced data sets generated when first, second, third, or fourth quarter data were removed. This produces comparisons that can be used to show what the impact of reduced sampling would have been in the past, and by extension, a likely projection of what it would be in the future.

This statistical analysis was performed to develop an indication of the likely effects of reduced sampling on all parameters. To perform a statistical test of this type, an appropriate null hypothesis is first established. In this case the null hypothesis is that the mean/median of data sets with one quarter's sampling removed is statistically equal to the mean/median of the full data set. If it is equal, then there is not any statistical impact of eliminating that quarter of sampling data.

The indicator parameter set was used to perform this evaluation. The indicator analytes include manganese, zinc, iron, selenium, conductivity, sulfate, and pH. Conductivity data was not available at the time and so TDS was used as a substitute. In addition, the number of data points available for selenium was not sufficient to allow a statistically significant evaluation and so it was not included in the evaluation. In its place, molybdenum was used since it is also a metal for which oxyanions predominate in solution.

Detailed results for all these parameters are shown in Appendix I. A summary of the results for each parameter is shown in Table 6-3 for MLGW-7 and for MNGW-1.

In the case of MNGW-1, sulfate had an insufficient number of points that did not cover all quarters of sampling, so the hypothesis test could not be performed for that analyte. For MLGW-7, iron, zinc and molybdenum had coverage of all quarters but the number of points is relatively small such that the statistical evaluation becomes less certain. Otherwise, the data clearly show that the mean/median for all sets with any single quarter removed is statistically equal to the full data set.

The exception to this is total dissolved solids, which displays a higher mean/median when the third quarter of data is removed for well MNGW-1 (highlighted in Table 6-3). The degree of this effect can be seen in the appropriate data table in Appendix I.

The conclusion that can be reached from these results is that a properly-designed sampling program in which samples are taken three times per year will produce equivalent results as the quarterly (i.e., four times per year) program in place at this time. This means that any seasonal fluctuations can be accounted for using a triannual frequency of sampling, and there is no evidence of any trend that would skew the results.

Table 6-3: Results of Hypothesis Test for Indicator Parameters in MNGW-1 and MLGW-7

Well	***Parameter***	***Data Points in Full Set***	***Result of Hypothesis Test, Q1 Removed***	***Result of Hypothesis Test, Q2 Removed***	***Result of Hypothesis Test, Q3 Removed***	***Result of Hypothesis Test, Q4 Removed***
MNGW-1	Manganese	66	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Iron	67	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Zinc	67	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Sulfate*	16	NA	NA	NA	NA
	Molybdenum	67	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	TDS	65	Equal to full set	Equal to full set	**Mean > Full Set**	Equal to full set
	pH	61	Equal to full set	Equal to full set	Equal to full set	Equal to full set
MLGW-7	Manganese	121	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Iron**	19	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Zinc**	17	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Sulfate	47	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Molybdenum**	22	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	TDS	31	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	pH	114	Equal to full set	Equal to full set	Equal to full set	Equal to full set

* The number of data points is not sufficient for sulfate in well MNGW-1 to provide coverage of all quarters and the hypothesis test was not run.

**For MLGW-7, iron, zinc, and molybdenum have a relatively small number of data points and the hypothesis test may be less reliable than for the other parameters in this well.

6.4 Reduced Monitoring

Where data indicate that water quality is consistently meeting Limits established in the GWMP and that no trend of increased contamination is being observed over time, taking into account potential seasonal fluctuations, Henderson may submit a request to the DRMS for reduced monitoring until such time that monitoring under the Henderson Permit is no longer deemed necessary.

6.5 Access to Monitoring Locations and Personnel Safety

Monitoring shall not be required during periods where weather and access conditions pose a risk to personnel safety. Failure to monitor due to unsafe access conditions shall not be deemed a violation of this GWMP.

7.0 Reporting and Recordkeeping

7.1 Reporting

A copy of monitoring data gathered in accordance with the requirements contained herein will be submitted to the DRMS on an annual basis. This annual report will be submitted separately from the annual Reclamation Report, by May 31 of each year for the prior year's data. The report shall be submitted to DRMS at the following address:

Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, Colorado 80203

7.2 Recordkeeping

Henderson Mine and Henderson Mill will establish and maintain records. Records will include the following:

a. The date, type and location of sampling;
b. The individual who performed the sampling;
c. The date the analyses was performed;
d. The individual performing the analyses;
e. The analytical technique or methods; and
f. Results of analyses.

Records will be maintained for a minimum of three years and will be made available upon request of the DRMS.

8.0 Sampling and Analytical Methods

The Henderson Mine and Henderson Mill will establish, implement and maintain sampling procedures to meet the following minimum requirements:

- Generally, all ground and surface water samples shall be collected and analyzed in accordance with approved industry standards using methodologies, including quality assurance/quality control, similar to those required of major Federal and State monitoring programs and other programs of systematic monitoring or academic research;
- Surface water samples and measurements shall be representative of the nature of the monitored water body; and
- Groundwater samples will be collected and managed in accordance with the Colorado Department of Public Health and Environment's *Suggested Sampling Protocol for Groundwater Monitoring Wells*, as well as internally developed procedures.

Where possible, the analytical method selected for a parameter shall have a detection limit below the Limits established in this GWMP. Where the most sensitive analytical method has a detection limit greater than or equal to a limit established herein, "less than (the detection limit)" shall be reported and will not be considered an exceedance of the applicable Limit.

References

AJAX and Clear Creek Associates, 2013, Groundwater Monitoring Point of Compliance (POC) Technical Memorandum, Henderson Mill, May, 2013.

Hydrokinetics, 1993, Well Construction and Flow Analysis – Troublesome Formation and Alluvial Materials

W.W. Wheeler and Associates, Inc., 1991, Recommendations for Groundwater Monitoring at the Henderson Minesite Near Empire.

W.W. Wheeler and Associates, Inc., 1993, Hydraulic Conductivity of Precambrian Granite in Upper Clear Creek Area

Woodward Clyde, 1983, Henderson Tailing Area Geohydrology, Report No. 20997-9407 to Amax, Inc.

Appendix A

Existing Monitoring Program – Groundwater Data

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY2012	MNGW-1	02/01/2012	0	Alkalinity, Total	mg/l as CaCO3	48.4
1st - RY2012	MNGW-1	02/01/2012	1	Alkalinity, Total	mg/l as CaCO3	46.7
2nd - RY1995	MNGW-1	04/25/1995	0	Aluminum, Dissolved	ug/l as Al	<50
2nd - RY1995	MNGW-1	06/13/1995	0	Aluminum, Dissolved	ug/l as Al	120
3rd - RY1995	MNGW-1	08/09/1995	0	Aluminum, Dissolved	ug/l as Al	<50
4th - RY1995	MNGW-1	10/24/1995	0	Aluminum, Dissolved	ug/l as Al	<50
1st - RY1996	MNGW-1	03/04/1996	0	Aluminum, Dissolved	ug/l as Al	120
2nd - RY1996	MNGW-1	04/29/1996	0	Aluminum, Dissolved	ug/l as Al	<50
3rd - RY1996	MNGW-1	07/31/1996	0	Aluminum, Dissolved	ug/l as Al	50
4th - RY1996	MNGW-1	10/09/1996	0	Aluminum, Dissolved	ug/l as Al	<30
2nd - RY1997	MNGW-1	05/12/1997	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY1997	MNGW-1	07/02/1997	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY1997	MNGW-1	12/11/1997	0	Aluminum, Dissolved	ug/l as Al	<200
1st - RY1998	MNGW-1	01/07/1998	0	Aluminum, Dissolved	ug/l as Al	<30
2nd - RY1998	MNGW-1	05/06/1998	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY1998	MNGW-1	07/08/1998	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY1998	MNGW-1	10/14/1998	0	Aluminum, Dissolved	ug/l as Al	<30
1st - RY1999	MNGW-1	01/13/1999	0	Aluminum, Dissolved	ug/l as Al	<30
2nd - RY1999	MNGW-1	04/07/1999	0	Aluminum, Dissolved	ug/l as Al	60
3rd - RY1999	MNGW-1	07/07/1999	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY1999	MNGW-1	10/13/1999	0	Aluminum, Dissolved	ug/l as Al	140
1st - RY2000	MNGW-1	01/13/2000	0	Aluminum, Dissolved	ug/l as Al	40
2nd - RY2000	MNGW-1	05/10/2000	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY2000	MNGW-1	07/12/2000	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY2000	MNGW-1	12/12/2000	0	Aluminum, Dissolved	ug/l as Al	<100
1st - RY2001	MNGW-1	03/07/2001	0	Aluminum, Dissolved	ug/l as Al	<100
2nd - RY2001	MNGW-1	04/04/2001	0	Aluminum, Dissolved	ug/l as Al	<100
3rd - RY2001	MNGW-1	07/11/2001	0	Aluminum, Dissolved	ug/l as Al	<100
4th - RY2001	MNGW-1	10/03/2001	0	Aluminum, Dissolved	ug/l as Al	<100
1st - RY2002	MNGW-1	01/02/2002	0	Aluminum, Dissolved	ug/l as Al	<100
2nd - RY2002	MNGW-1	04/03/2002	0	Aluminum, Dissolved	ug/l as Al	<100
3rd - RY2002	MNGW-1	09/04/2002	0	Aluminum, Dissolved	ug/l as Al	<100
4th - RY2002	MNGW-1	10/03/2002	0	Aluminum, Dissolved	ug/l as Al	<100
2nd - RY2003	MNGW-1	06/20/2003	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY2003	MNGW-1	08/13/2003	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY2003	MNGW-1	10/22/2003	0	Aluminum, Dissolved	ug/l as Al	<30
1st - RY2004	MNGW-1	02/18/2004	0	Aluminum, Dissolved	ug/l as Al	<30
2nd - RY2004	MNGW-1	06/09/2004	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY2004	MNGW-1	09/08/2004	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY2004	MNGW-1	10/20/2004	0	Aluminum, Dissolved	ug/l as Al	<30
1st - RY2005	MNGW-1	03/09/2005	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY2005	MNGW-1	07/20/2005	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY2005	MNGW-1	09/14/2005	0	Aluminum, Dissolved	ug/l as Al	<60
4th - RY2005	MNGW-1	11/09/2005	0	Aluminum, Dissolved	ug/l as Al	<30
1st - RY2006	MNGW-1	02/08/2006	0	Aluminum, Dissolved	ug/l as Al	160
3rd - RY2006	MNGW-1	07/12/2006	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY2006	MNGW-1	09/20/2006	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY2006	MNGW-1	10/26/2006	0	Aluminum, Dissolved	ug/l as Al	60
1st - RY2007	MNGW-1	03/07/2007	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY2007	MNGW-1	07/31/2007	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY2007	MNGW-1	09/26/2007	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY2007	MNGW-1	10/18/2007	0	Aluminum, Dissolved	ug/l as Al	40
1st - RY2008	MNGW-1	03/28/2008	0	Aluminum, Dissolved	ug/l as Al	60
3rd - RY2008	MNGW-1	07/30/2008	0	Aluminum, Dissolved	ug/l as Al	11.6
3rd - RY2008	MNGW-1	09/24/2008	0	Aluminum, Dissolved	ug/l as Al	15.8

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY22009	MNGW-1	02/18/2009	0	Aluminum, Dissolved	ug/l as Al	52.2
3rd - RY2009	MNGW-1	07/15/2009	0	Aluminum, Dissolved	ug/l as Al	14.1
3rd - RY2009	MNGW-1	09/09/2009	0	Aluminum, Dissolved	ug/l as Al	5.84
4th - RY2009	MNGW-1	11/04/2009	0	Aluminum, Dissolved	ug/l as Al	17
1st - RY2010	MNGW-1	02/17/2010	0	Aluminum, Dissolved	ug/l as Al	9.3
3rd - RY2010	MNGW-1	07/21/2010	0	Aluminum, Dissolved	ug/l as Al	134
3rd - RY2010	MNGW-1	09/22/2010	0	Aluminum, Dissolved	ug/l as Al	<11
4th - RY2010	MNGW-1	10/13/2010	0	Aluminum, Dissolved	ug/l as Al	102
1st - RY2011	MNGW-1	02/22/2011	0	Aluminum, Dissolved	ug/l as Al	<11
3rd - RY2011	MNGW-1	07/20/2011	0	Aluminum, Dissolved	ug/l as Al	22.1
3rd - RY2011	MNGW-1	09/14/2011	0	Aluminum, Dissolved	ug/l as Al	<9.6
4th - RY2011	MNGW-1	10/19/2011	1	Aluminum, Dissolved	ug/l as Al	<9.6
1st - RY2012	MNGW-1	02/01/2012	0	Aluminum, Dissolved	ug/l as Al	136
1st - RY2012	MNGW-1	02/01/2012	1	Aluminum, Dissolved	ug/l as Al	79.6
1st - RY2012	MNGW-1	02/01/2012	0	Antimony, Dissolved	ug/l as Sb	0.21
1st - RY2012	MNGW-1	02/01/2012	1	Antimony, Dissolved	ug/l as Sb	0.08
2nd - RY1995	MNGW-1	04/25/1995	0	Arsenic, Dissolved	ug/l as As	<1
2nd - RY1995	MNGW-1	06/13/1995	0	Arsenic, Dissolved	ug/l as As	<1
3rd - RY1995	MNGW-1	08/09/1995	0	Arsenic, Dissolved	ug/l as As	<1
4th - RY1995	MNGW-1	10/24/1995	0	Arsenic, Dissolved	ug/l as As	2
1st - RY1996	MNGW-1	03/04/1996	0	Arsenic, Dissolved	ug/l as As	<1
2nd - RY1996	MNGW-1	04/29/1996	0	Arsenic, Dissolved	ug/l as As	<1
3rd - RY1996	MNGW-1	07/31/1996	0	Arsenic, Dissolved	ug/l as As	1
4th - RY1996	MNGW-1	10/09/1996	0	Arsenic, Dissolved	ug/l as As	1
2nd - RY1997	MNGW-1	05/12/1997	0	Arsenic, Dissolved	ug/l as As	<1
3rd - RY1997	MNGW-1	07/02/1997	0	Arsenic, Dissolved	ug/l as As	<1
4th - RY1997	MNGW-1	12/11/1997	0	Arsenic, Dissolved	ug/l as As	1
1st - RY1998	MNGW-1	01/07/1998	0	Arsenic, Dissolved	ug/l as As	<1
2nd - RY1998	MNGW-1	05/06/1998	0	Arsenic, Dissolved	ug/l as As	<1
3rd - RY1998	MNGW-1	07/08/1998	0	Arsenic, Dissolved	ug/l as As	<1
4th - RY1998	MNGW-1	10/14/1998	0	Arsenic, Dissolved	ug/l as As	<1
1st - RY1999	MNGW-1	01/13/1999	0	Arsenic, Dissolved	ug/l as As	<1
2nd - RY1999	MNGW-1	04/07/1999	0	Arsenic, Dissolved	ug/l as As	<1
3rd - RY1999	MNGW-1	07/07/1999	0	Arsenic, Dissolved	ug/l as As	<1
4th - RY1999	MNGW-1	10/13/1999	0	Arsenic, Dissolved	ug/l as As	<1
1st - RY2000	MNGW-1	01/13/2000	0	Arsenic, Dissolved	ug/l as As	<1
2nd - RY2000	MNGW-1	05/10/2000	0	Arsenic, Dissolved	ug/l as As	<1
3rd - RY2000	MNGW-1	07/12/2000	0	Arsenic, Dissolved	ug/l as As	<1
4th - RY2000	MNGW-1	12/12/2000	0	Arsenic, Dissolved	ug/l as As	<10
1st - RY2001	MNGW-1	03/07/2001	0	Arsenic, Dissolved	ug/l as As	<10
2nd - RY2001	MNGW-1	04/04/2001	0	Arsenic, Dissolved	ug/l as As	<10
3rd - RY2001	MNGW-1	07/11/2001	0	Arsenic, Dissolved	ug/l as As	<10
4th - RY2001	MNGW-1	10/03/2001	0	Arsenic, Dissolved	ug/l as As	<10
1st - RY2002	MNGW-1	01/02/2002	0	Arsenic, Dissolved	ug/l as As	<10
2nd - RY2002	MNGW-1	04/03/2002	0	Arsenic, Dissolved	ug/l as As	<10
3rd - RY2002	MNGW-1	09/04/2002	0	Arsenic, Dissolved	ug/l as As	<10
4th - RY2002	MNGW-1	10/03/2002	0	Arsenic, Dissolved	ug/l as As	<10
2nd - RY2003	MNGW-1	06/20/2003	0	Arsenic, Dissolved	ug/l as As	<0.5
3rd - RY2003	MNGW-1	08/13/2003	0	Arsenic, Dissolved	ug/l as As	<0.05
4th - RY2003	MNGW-1	10/22/2003	0	Arsenic, Dissolved	ug/l as As	0.1
2nd - RY2004	MNGW-1	06/09/2004	0	Arsenic, Dissolved	ug/l as As	0.1
3rd - RY2004	MNGW-1	09/08/2004	0	Arsenic, Dissolved	ug/l as As	<0.5
4th - RY2004	MNGW-1	10/20/2004	0	Arsenic, Dissolved	ug/l as As	0.6
1st - RY2005	MNGW-1	03/09/2005	0	Arsenic, Dissolved	ug/l as As	<0.5
3rd - RY2005	MNGW-1	07/20/2005	0	Arsenic, Dissolved	ug/l as As	<0.5

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2005	MNGW-1	11/09/2005	0	Arsenic, Dissolved	ug/l as As	<0.1
1st - RY2006	MNGW-1	02/08/2006	0	Arsenic, Dissolved	ug/l as As	<0.5
3rd - RY2006	MNGW-1	07/12/2006	0	Arsenic, Dissolved	ug/l as As	<0.5
3rd - RY2006	MNGW-1	09/20/2006	0	Arsenic, Dissolved	ug/l as As	<0.5
4th - RY-2006	MNGW-1	10/26/2006	0	Arsenic, Dissolved	ug/l as As	<0.5
1st - RY2007	MNGW-1	03/07/2007	0	Arsenic, Dissolved	ug/l as As	<0.5
3rd - RY2007	MNGW-1	07/31/2007	0	Arsenic, Dissolved	ug/l as As	<0.5
3rd - RY2007	MNGW-1	09/26/2007	0	Arsenic, Dissolved	ug/l as As	<0.5
4th - RY2007	MNGW-1	10/18/2007	0	Arsenic, Dissolved	ug/l as As	<0.5
1st - RY2008	MNGW-1	03/28/2008	0	Arsenic, Dissolved	ug/l as As	<0.5
3rd - RY2008	MNGW-1	07/30/2008	0	Arsenic, Dissolved	ug/l as As	50
3rd - RY2008	MNGW-1	09/24/2008	0	Arsenic, Dissolved	ug/l as As	<50
1st - RY2009	MNGW-1	02/18/2009	0	Arsenic, Dissolved	ug/l as As	<50
3rd - RY2009	MNGW-1	07/15/2009	0	Arsenic, Dissolved	ug/l as As	<0.5
3rd - RY2009	MNGW-1	09/09/2009	0	Arsenic, Dissolved	ug/l as As	<0.5
4th - RY2009	MNGW-1	11/04/2009	0	Arsenic, Dissolved	ug/l as As	<0.5
1st - RY2010	MNGW-1	02/17/2010	0	Arsenic, Dissolved	ug/l as As	<0.37
3rd - RY2010	MNGW-1	07/21/2010	0	Arsenic, Dissolved	ug/l as As	<0.74
3rd - RY2010	MNGW-1	09/22/2010	0	Arsenic, Dissolved	ug/l as As	<0.62
4th - RY2010	MNGW-1	10/13/2010	0	Arsenic, Dissolved	ug/l as As	<0.62
1st - RY2011	MNGW-1	02/22/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
3rd - RY2011	MNGW-1	07/20/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
3rd - RY2011	MNGW-1	09/14/2011	0	Arsenic, Dissolved	ug/l as As	0.49
4th - RY2011	MNGW-1	10/19/2011	1	Arsenic, Dissolved	ug/l as As	<0.38
1st - RY2012	MNGW-1	02/01/2012	0	Arsenic, Dissolved	ug/l as As	<0.38
1st - RY2012	MNGW-1	02/01/2012	1	Arsenic, Dissolved	ug/l as As	<0.38
1st - RY2012	MNGW-1	02/01/2012	0	Barium, Dissolved	ug/l as Ba	4
1st - RY2012	MNGW-1	02/01/2012	1	Barium, Dissolved	ug/l as Ba	3.7
1st - RY2012	MNGW-1	02/01/2012	0	Beryllium, Dissolved	ug/l as Be	0.34
1st - RY2012	MNGW-1	02/01/2012	1	Beryllium, Dissolved	ug/l as Be	0.33
2nd - RY1995	MNGW-1	04/25/1995	0	Cadmium, Dissolved	ug/l as Cd	<0.3
2nd - RY1995	MNGW-1	06/13/1995	0	Cadmium, Dissolved	ug/l as Cd	<0.3
3rd - RY1995	MNGW-1	08/09/1995	0	Cadmium, Dissolved	ug/l as Cd	<0.3
4th - RY1995	MNGW-1	10/24/1995	0	Cadmium, Dissolved	ug/l as Cd	<0.3
1st - RY1996	MNGW-1	03/04/1996	0	Cadmium, Dissolved	ug/l as Cd	0.4
2nd - RY1996	MNGW-1	04/29/1996	0	Cadmium, Dissolved	ug/l as Cd	0.7
3rd - RY1996	MNGW-1	07/31/1996	0	Cadmium, Dissolved	ug/l as Cd	0.3
4th - RY1996	MNGW-1	10/09/1996	0	Cadmium, Dissolved	ug/l as Cd	<3
2nd - RY1997	MNGW-1	05/12/1997	0	Cadmium, Dissolved	ug/l as Cd	<6
3rd - RY1997	MNGW-1	07/02/1997	0	Cadmium, Dissolved	ug/l as Cd	<3
4th - RY1997	MNGW-1	12/11/1997	0	Cadmium, Dissolved	ug/l as Cd	<20
1st - RY1998	MNGW-1	01/07/1998	0	Cadmium, Dissolved	ug/l as Cd	20
2nd - RY1998	MNGW-1	05/06/1998	0	Cadmium, Dissolved	ug/l as Cd	<3
3rd - RY1998	MNGW-1	07/08/1998	0	Cadmium, Dissolved	ug/l as Cd	<3
4th - RY1998	MNGW-1	10/14/1998	0	Cadmium, Dissolved	ug/l as Cd	<3
1st - RY1999	MNGW-1	01/13/1999	0	Cadmium, Dissolved	ug/l as Cd	<3
2nd - RY1999	MNGW-1	04/07/1999	0	Cadmium, Dissolved	ug/l as Cd	<3
3rd - RY1999	MNGW-1	07/07/1999	0	Cadmium, Dissolved	ug/l as Cd	<3
4th - RY1999	MNGW-1	10/13/1999	0	Cadmium, Dissolved	ug/l as Cd	<3
1st - RY2000	MNGW-1	01/13/2000	0	Cadmium, Dissolved	ug/l as Cd	<3
2nd - RY2000	MNGW-1	05/10/2000	0	Cadmium, Dissolved	ug/l as Cd	<3
3rd - RY2000	MNGW-1	07/12/2000	0	Cadmium, Dissolved	ug/l as Cd	<3
4th - RY2000	MNGW-1	12/12/2000	0	Cadmium, Dissolved	ug/l as Cd	<2
1st - RY2001	MNGW-1	03/07/2001	0	Cadmium, Dissolved	ug/l as Cd	<2
2nd - RY2001	MNGW-1	04/04/2001	0	Cadmium, Dissolved	ug/l as Cd	<2

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
3rd - RY2001	MNGW-1	07/11/2001	0	Cadmium, Dissolved	ug/l as Cd	3
4th - RY2001	MNGW-1	10/03/2001	0	Cadmium, Dissolved	ug/l as Cd	<5
1st - RY2002	MNGW-1	01/02/2002	0	Cadmium, Dissolved	ug/l as Cd	<5
2nd - RY2002	MNGW-1	04/03/2002	0	Cadmium, Dissolved	ug/l as Cd	<5
3rd - RY2002	MNGW-1	09/04/2002	0	Cadmium, Dissolved	ug/l as Cd	<5
4th - RY2002	MNGW-1	10/03/2002	0	Cadmium, Dissolved	ug/l as Cd	<5
2nd - RY2003	MNGW-1	06/20/2003	0	Cadmium, Dissolved	ug/l as Cd	<0.1
3rd - RY2003	MNGW-1	08/13/2003	0	Cadmium, Dissolved	ug/l as Cd	<0.1
4th - RY2003	MNGW-1	10/22/2003	0	Cadmium, Dissolved	ug/l as Cd	<0.1
1st - RY2004	MNGW-1	02/18/2004	0	Cadmium, Dissolved	ug/l as Cd	<0.1
2nd - RY2004	MNGW-1	06/09/2004	0	Cadmium, Dissolved	ug/l as Cd	0.1
3rd - RY2004	MNGW-1	09/08/2004	0	Cadmium, Dissolved	ug/l as Cd	<0.1
4th - RY2004	MNGW-1	10/20/2004	0	Cadmium, Dissolved	ug/l as Cd	<0.1
1st - RY2005	MNGW-1	03/09/2005	0	Cadmium, Dissolved	ug/l as Cd	<0.1
3rd - RY2005	MNGW-1	07/20/2005	0	Cadmium, Dissolved	ug/l as Cd	<0.1
3rd - RY2005	MNGW-1	09/14/2005	0	Cadmium, Dissolved	ug/l as Cd	<0.1
4th - RY2005	MNGW-1	11/09/2005	0	Cadmium, Dissolved	ug/l as Cd	<0.1
1st - RY2006	MNGW-1	02/08/2006	0	Cadmium, Dissolved	ug/l as Cd	0.2
3rd - RY2006	MNGW-1	07/12/2006	0	Cadmium, Dissolved	ug/l as Cd	<0.1
3rd - RY2006	MNGW-1	09/20/2006	0	Cadmium, Dissolved	ug/l as Cd	<0.1
4th - RY2006	MNGW-1	10/26/2006	0	Cadmium, Dissolved	ug/l as Cd	0.1
1st - RY2007	MNGW-1	03/07/2007	0	Cadmium, Dissolved	ug/l as Cd	<0.1
3rd - RY2007	MNGW-1	07/31/2007	0	Cadmium, Dissolved	ug/l as Cd	<0.1
3rd - RY2007	MNGW-1	09/26/2007	0	Cadmium, Dissolved	ug/l as Cd	<0.1
4th - RY2007	MNGW-1	10/18/2007	0	Cadmium, Dissolved	ug/l as Cd	<0.1
1st - RY2008	MNGW-1	03/28/2008	0	Cadmium, Dissolved	ug/l as Cd	<0.1
3rd - RY2008	MNGW-1	09/24/2008	0	Cadmium, Dissolved	ug/l as Cd	<10
1st - RY2009	MNGW-1	02/18/2009	0	Cadmium, Dissolved	ug/l as Cd	<10
4th - RY2009	MNGW-1	11/04/2009	0	Cadmium, Dissolved	ug/l as Cd	<0.5
1st - RY2010	MNGW-1	02/17/2010	0	Cadmium, Dissolved	ug/l as Cd	0.05
3rd - RY2010	MNGW-1	07/21/2010	0	Cadmium, Dissolved	ug/l as Cd	0.28
3rd - RY2010	MNGW-1	09/22/2010	0	Cadmium, Dissolved	ug/l as Cd	<0.11
4th - RY2010	MNGW-1	10/13/2010	0	Cadmium, Dissolved	ug/l as Cd	0.18
1st - RY2011	MNGW-1	02/22/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
3rd - RY2011	MNGW-1	07/20/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
3rd - RY2011	MNGW-1	09/14/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
4th - RY2011	MNGW-1	10/19/2011	1	Cadmium, Dissolved	ug/l as Cd	<0.11
1st - RY2012	MNGW-1	02/01/2012	0	Cadmium, Dissolved	ug/l as Cd	<0.11
1st - RY2012	MNGW-1	02/01/2012	1	Cadmium, Dissolved	ug/l as Cd	0.14
3rd - RY2011	MNGW-1	09/14/2011	0	Calcium, Dissolved	ug/l as Ca	18,900
4th - RY2011	MNGW-1	10/19/2011	1	Calcium, Dissolved	ug/l as Ca	26,000
1st - RY2012	MNGW-1	02/01/2012	0	Calcium, Dissolved	ug/l as Ca	63,200
1st - RY2012	MNGW-1	02/01/2012	1	Calcium, Dissolved	ug/l as Ca	63,100
1st - RY2012	MNGW-1	02/01/2012	0	Carbon, Total Organic	mg/l as C	1.6
1st - RY2012	MNGW-1	02/01/2012	1	Carbon, Total Organic	mg/l as C	1.4
3rd - RY2007	MNGW-1	07/31/2007	0	Chloride,Total in Water	mg/l	2
3rd - RY2008	MNGW-1	07/30/2008	0	Chloride,Total in Water	mg/l	2.48
3rd - RY2008	MNGW-1	09/24/2008	0	Chloride,Total in Water	mg/l	2.4
1st - RY2009	MNGW-1	02/18/2009	0	Chloride,Total in Water	mg/l	9.3
3rd - RY2009	MNGW-1	07/15/2009	0	Chloride,Total in Water	mg/l	0.769
3rd - RY2009	MNGW-1	09/09/2009	0	Chloride,Total in Water	mg/l	0.97
1st - RY2010	MNGW-1	02/17/2010	0	Chloride,Total in Water	mg/l	10.8
3rd - RY2010	MNGW-1	07/21/2010	0	Chloride,Total in Water	mg/l	0.79
3rd - RY2010	MNGW-1	09/22/2010	0	Chloride,Total in Water	mg/l	1.5
4th - RY2010	MNGW-1	10/13/2010	0	Chloride,Total in Water	mg/l	2.1

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY2011	MNGW-1	02/22/2011	0	Chloride,Total in Water	mg/l	4.6
3rd - RY2011	MNGW-1	07/20/2011	0	Chloride,Total in Water	mg/l	0.6
3rd - RY2011	MNGW-1	09/14/2011	0	Chloride,Total in Water	mg/l	0.62
4th - RY2011	MNGW-1	10/19/2011	1	Chloride,Total in Water	mg/l	0.59
1st - RY2012	MNGW-1	02/01/2012	0	Chloride,Total in Water	mg/l	7.1
1st - RY2012	MNGW-1	02/01/2012	1	Chloride,Total in Water	mg/l	6.5
1st - RY2012	MNGW-1	02/01/2012	0	Chromium, Dissolved	ug/l as Cr	<0.22
1st - RY2012	MNGW-1	02/01/2012	1	Chromium, Dissolved	ug/l as Cr	<0.22
1st - RY2012	MNGW-1	02/01/2012	0	Cobalt, Dissolved	ug/l as Co	0.11
1st - RY2012	MNGW-1	02/01/2012	1	Cobalt, Dissolved	ug/l as Co	<0.022
2nd - RY1995	MNGW-1	04/25/1995	0	Copper, Dissolved	ug/l as Cu	<20
2nd - RY1995	MNGW-1	06/13/1995	0	Copper, Dissolved	ug/l as Cu	6
3rd - RY1995	MNGW-1	08/09/1995	0	Copper, Dissolved	ug/l as Cu	<1
4th - RY1995	MNGW-1	10/24/1995	0	Copper, Dissolved	ug/l as Cu	<1
1st - RY1996	MNGW-1	03/04/1996	0	Copper, Dissolved	ug/l as Cu	12
2nd - RY1996	MNGW-1	35184	0	Copper, Dissolved	ug/l as Cu	2
3rd - RY1996	MNGW-1	35277	0	Copper, Dissolved	ug/l as Cu	13
4th - RY1996	MNGW-1	35347	0	Copper, Dissolved	ug/l as Cu	<10
2nd - RY1997	MNGW-1	35562	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY1997	MNGW-1	35613	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY1997	MNGW-1	35775	0	Copper, Dissolved	ug/l as Cu	<50
1st - RY1998	MNGW-1	35802	0	Copper, Dissolved	ug/l as Cu	<50
2nd - RY1998	MNGW-1	35921	0	Copper, Dissolved	ug/l as Cu	10
3rd - RY1998	MNGW-1	35984	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY1998	MNGW-1	36082	0	Copper, Dissolved	ug/l as Cu	<10
1st - RY1999	MNGW-1	36173	0	Copper, Dissolved	ug/l as Cu	<10
2nd - RY1999	MNGW-1	36257	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY1999	MNGW-1	36348	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY1999	MNGW-1	36446	0	Copper, Dissolved	ug/l as Cu	<10
1st - RY2000	MNGW-1	36538	0	Copper, Dissolved	ug/l as Cu	<10
2nd - RY2000	MNGW-1	36656	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2000	MNGW-1	36719	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2000	MNGW-1	36872	0	Copper, Dissolved	ug/l as Cu	40
1st - RY2001	MNGW-1	36957	0	Copper, Dissolved	ug/l as Cu	<10
2nd - RY2001	MNGW-1	36985	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2001	MNGW-1	37083	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2001	MNGW-1	37167	0	Copper, Dissolved	ug/l as Cu	<10
1st - RY2002	MNGW-1	37258	0	Copper, Dissolved	ug/l as Cu	<10
2nd - RY202	MNGW-1	37349	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2002	MNGW-1	37503	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2002	MNGW-1	37532	0	Copper, Dissolved	ug/l as Cu	<10
2nd - RY203	MNGW-1	37792	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2003	MNGW-1	37846	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2003	MNGW-1	37916	0	Copper, Dissolved	ug/l as Cu	<10
1st - RY2004	MNGW-1	38035	0	Copper, Dissolved	ug/l as Cu	<10
2nd - RY2004	MNGW-1	38147	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2004	MNGW-1	38238	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2004	MNGW-1	38280	0	Copper, Dissolved	ug/l as Cu	<10
1st - RY2005	MNGW-1	38420	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2005	MNGW-1	38553	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2005	MNGW-1	38609	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2005	MNGW-1	38665	0	Copper, Dissolved	ug/l as Cu	<10
1st - RY2006	MNGW-1	38756	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2006	MNGW-1	38910	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2006	MNGW-1	38980	0	Copper, Dissolved	ug/l as Cu	<10

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4th - RY2006	MNGW-1	39016	0	Copper, Dissolved	ug/l as Cu	<10
1st - RY2007	MNGW-1	39148	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2007	MNGW-1	39294	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2007	MNGW-1	39351	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2007	MNGW-1	39373	0	Copper, Dissolved	ug/l as Cu	<10
1st - RY2008	MNGW-1	39535	0	Copper, Dissolved	ug/l as Cu	<10
3rd - RY2008	MNGW-1	39715	0	Copper, Dissolved	ug/l as Cu	<5
1st - RY2009	MNGW-1	39862	0	Copper, Dissolved	ug/l as Cu	<5
4th - RY2009	MNGW-1	40121	0	Copper, Dissolved	ug/l as Cu	5
1st - RY2010	MNGW-1	40226	0	Copper, Dissolved	ug/l as Cu	0.68
3rd - RY2010	MNGW-1	40380	0	Copper, Dissolved	ug/l as Cu	132
3rd - RY2010	MNGW-1	40443	0	Copper, Dissolved	ug/l as Cu	<0.71
4th - RY2010	MNGW-1	40464	0	Copper, Dissolved	ug/l as Cu	11.2
1st - RY2011	MNGW-1	40596	0	Copper, Dissolved	ug/l as Cu	<0.71
3rd - RY2011	MNGW-1	40744	0	Copper, Dissolved	ug/l as Cu	0.69
3rd - RY2011	MNGW-1	40800	0	Copper, Dissolved	ug/l as Cu	<0.4
4th - RY2011	MNGW-1	40835	1	Copper, Dissolved	ug/l as Cu	0.43
1st - RY2012	MNGW-1	40940	0	Copper, Dissolved	ug/l as Cu	0.97
1st - RY2012	MNGW-1	40940	1	Copper, Dissolved	ug/l as Cu	0.88
1st - RY2012	MNGW-1	40940	0	Fluoride, Total	mg/l as F	0.49
1st - RY2012	MNGW-1	40940	1	Fluoride, Total	mg/l as F	0.48
2nd - RY1995	MNGW-1	34814	0	Iron, Dissolved	ug/l as Fe	<20
2nd - RY1995	MNGW-1	34863	0	Iron, Dissolved	ug/l as Fe	140
3rd - RY1995	MNGW-1	34920	0	Iron, Dissolved	ug/l as Fe	<20
4th - RY1995	MNGW-1	34996	0	Iron, Dissolved	ug/l as Fe	<20
1st - RY1996	MNGW-1	35128	0	Iron, Dissolved	ug/l as Fe	20
2nd - RY1996	MNGW-1	35184	0	Iron, Dissolved	ug/l as Fe	40
3rd - RY1996	MNGW-1	35277	0	Iron, Dissolved	ug/l as Fe	20
4th - RY1996	MNGW-1	35347	0	Iron, Dissolved	ug/l as Fe	10
2nd - RY1997	MNGW-1	35562	0	Iron, Dissolved	ug/l as Fe	<10
3rd - RY1997	MNGW-1	35613	0	Iron, Dissolved	ug/l as Fe	10
4th - RY1997	MNGW-1	35775	0	Iron, Dissolved	ug/l as Fe	<50
1st - RY1998	MNGW-1	35802	0	Iron, Dissolved	ug/l as Fe	10
2nd - RY1998	MNGW-1	35921	0	Iron, Dissolved	ug/l as Fe	<10
3rd - RY1998	MNGW-1	35984	0	Iron, Dissolved	ug/l as Fe	<10
4th - RY1998	MNGW-1	36082	0	Iron, Dissolved	ug/l as Fe	<10
1st - RY1999	MNGW-1	36173	0	Iron, Dissolved	ug/l as Fe	<10
2nd - RY1999	MNGW-1	36257	0	Iron, Dissolved	ug/l as Fe	40
3rd - RY1999	MNGW-1	36348	0	Iron, Dissolved	ug/l as Fe	<10
4th - RY1999	MNGW-1	36446	0	Iron, Dissolved	ug/l as Fe	120
1st - RY2000	MNGW-1	36538	0	Iron, Dissolved	ug/l as Fe	10
2nd - RY2000	MNGW-1	36656	0	Iron, Dissolved	ug/l as Fe	<10
3rd - RY2000	MNGW-1	36719	0	Iron, Dissolved	ug/l as Fe	<10
4th - RY2000	MNGW-1	36872	0	Iron, Dissolved	ug/l as Fe	160
1st - RY2001	MNGW-1	36957	0	Iron, Dissolved	ug/l as Fe	<30
2nd - RY2001	MNGW-1	36985	0	Iron, Dissolved	ug/l as Fe	<30
3rd - RY2001	MNGW-1	37083	0	Iron, Dissolved	ug/l as Fe	170
4th - RY2001	MNGW-1	37167	0	Iron, Dissolved	ug/l as Fe	<100
1st - RY2002	MNGW-1	37258	0	Iron, Dissolved	ug/l as Fe	<100
2nd - RY2002	MNGW-1	37349	0	Iron, Dissolved	ug/l as Fe	<100
3rd - RY2002	MNGW-1	37503	0	Iron, Dissolved	ug/l as Fe	<100
4th - RY2002	MNGW-1	37532	0	Iron, Dissolved	ug/l as Fe	<100
2nd - RY2003	MNGW-1	37792	0	Iron, Dissolved	ug/l as Fe	<10
3rd - RY2003	MNGW-1	37846	0	Iron, Dissolved	ug/l as Fe	<10
4th - RY2003	MNGW-1	37916	0	Iron, Dissolved	ug/l as Fe	<10

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1st - RY2004	MNGW-1	38035	0	Iron, Dissolved	ug/l as Fe	50
2nd - RY2004	MNGW-1	38147	0	Iron, Dissolved	ug/l as Fe	<10
3rd - RY2004	MNGW-1	38238	0	Iron, Dissolved	ug/l as Fe	<10
4th - RY2004	MNGW-1	38280	0	Iron, Dissolved	ug/l as Fe	<10
1st - RY2005	MNGW-1	38420	0	Iron, Dissolved	ug/l as Fe	<10
3rd - RY2005	MNGW-1	38553	0	Iron, Dissolved	ug/l as Fe	<20
3rd - RY2005	MNGW-1	38609	0	Iron, Dissolved	ug/l as Fe	<40
4th - RY2005	MNGW-1	38665	0	Iron, Dissolved	ug/l as Fe	<20
1st - RY2006	MNGW-1	38756	0	Iron, Dissolved	ug/l as Fe	220
3rd - RY2006	MNGW-1	38910	0	Iron, Dissolved	ug/l as Fe	<20
3rd - RY2006	MNGW-1	38980	0	Iron, Dissolved	ug/l as Fe	<20
4th - RY2006	MNGW-1	39016	0	Iron, Dissolved	ug/l as Fe	<20
1st - RY2007	MNGW-1	39148	0	Iron, Dissolved	ug/l as Fe	<20
3rd - RY2007	MNGW-1	39294	0	Iron, Dissolved	ug/l as Fe	<20
3rd - RY2007	MNGW-1	39351	0	Iron, Dissolved	ug/l as Fe	<20
4th - RY2007	MNGW-1	39373	0	Iron, Dissolved	ug/l as Fe	30
1st - RY2008	MNGW-1	39535	0	Iron, Dissolved	ug/l as Fe	<20
3rd - RY2008	MNGW-1	39659	0	Iron, Dissolved	ug/l as Fe	70
3rd - RY2008	MNGW-1	39715	0	Iron, Dissolved	ug/l as Fe	<70
1st - RY2009	MNGW-1	39862	0	Iron, Dissolved	ug/l as Fe	44.6
3rd - RY2009	MNGW-1	40009	0	Iron, Dissolved	ug/l as Fe	33.5
3rd - RY2009	MNGW-1	40065	0	Iron, Dissolved	ug/l as Fe	53.1
4th - RY2009	MNGW-1	40121	0	Iron, Dissolved	ug/l as Fe	128
1st - RY2010	MNGW-1	40226	0	Iron, Dissolved	ug/l as Fe	174
3rd - RY2010	MNGW-1	40380	0	Iron, Dissolved	ug/l as Fe	213
3rd - RY2010	MNGW-1	40443	0	Iron, Dissolved	ug/l as Fe	24.7
4th - RY2010	MNGW-1	40464	0	Iron, Dissolved	ug/l as Fe	301
1st - RY2011	MNGW-1	40596	0	Iron, Dissolved	ug/l as Fe	148
3rd - RY2011	MNGW-1	40744	0	Iron, Dissolved	ug/l as Fe	33.1
3rd - RY2011	MNGW-1	40800	0	Iron, Dissolved	ug/l as Fe	83.6
4th - RY2011	MNGW-1	40835	1	Iron, Dissolved	ug/l as Fe	135
1st - RY2012	MNGW-1	40940	0	Iron, Dissolved	ug/l as Fe	524
1st - RY2012	MNGW-1	40940	1	Iron, Dissolved	ug/l as Fe	488
2nd - RY1995	MNGW-1	34814	0	Lead, Dissolved	ug/l as Pb	<1
2nd - RY1995	MNGW-1	34863	0	Lead, Dissolved	ug/l as Pb	<1
3rd - RY1995	MNGW-1	34920	0	Lead, Dissolved	ug/l as Pb	<1
4th - RY1995	MNGW-1	34996	0	Lead, Dissolved	ug/l as Pb	<1
1st - RY1996	MNGW-1	35128	0	Lead, Dissolved	ug/l as Pb	<1
2nd - RY1996	MNGW-1	35184	0	Lead, Dissolved	ug/l as Pb	<1
3rd - RY19966	MNGW-1	35277	0	Lead, Dissolved	ug/l as Pb	1
4th - RY1996	MNGW-1	35347	0	Lead, Dissolved	ug/l as Pb	<20
2nd - RY1997	MNGW-1	35562	0	Lead, Dissolved	ug/l as Pb	<40
3rd - RY1997	MNGW-1	35613	0	Lead, Dissolved	ug/l as Pb	<40
4th - RY1997	MNGW-1	35775	0	Lead, Dissolved	ug/l as Pb	<200
1st - RY1998	MNGW-1	35802	0	Lead, Dissolved	ug/l as Pb	200
2nd - RY1998	MNGW-1	35921	0	Lead, Dissolved	ug/l as Pb	<40
3rd - RY1998	MNGW-1	35984	0	Lead, Dissolved	ug/l as Pb	<40
4th - RY1998	MNGW-1	36082	0	Lead, Dissolved	ug/l as Pb	<40
1st - RY1999	MNGW-1	36173	0	Lead, Dissolved	ug/l as Pb	<40
2nd - RY1999	MNGW-1	36257	0	Lead, Dissolved	ug/l as Pb	<40
3rd - RY1999	MNGW-1	36348	0	Lead, Dissolved	ug/l as Pb	<40
4th - RY1999	MNGW-1	36446	0	Lead, Dissolved	ug/l as Pb	<40
1st - RY2000	MNGW-1	36538	0	Lead, Dissolved	ug/l as Pb	<40
2nd - RY2000	MNGW-1	36656	0	Lead, Dissolved	ug/l as Pb	<40
3rd - RY2000	MNGW-1	36719	0	Lead, Dissolved	ug/l as Pb	<40

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4th - RY2000	MNGW-1	36872	0	Lead, Dissolved	ug/l as Pb	<50
1st - RY2001	MNGW-1	36957	0	Lead, Dissolved	ug/l as Pb	<50
2nd - RY2001	MNGW-1	36985	0	Lead, Dissolved	ug/l as Pb	<50
3rd - RY2001	MNGW-1	37083	0	Lead, Dissolved	ug/l as Pb	<50
4th - RY2001	MNGW-1	37167	0	Lead, Dissolved	ug/l as Pb	<3
1st - RY2002	MNGW-1	37258	0	Lead, Dissolved	ug/l as Pb	<3
2nd - RY2002	MNGW-1	37349	0	Lead, Dissolved	ug/l as Pb	<3
3rd - RY2002	MNGW-1	37503	0	Lead, Dissolved	ug/l as Pb	<3
4th - RY2002	MNGW-1	37532	0	Lead, Dissolved	ug/l as Pb	<3
2nd - RY2003	MNGW-1	37792	0	Lead, Dissolved	ug/l as Pb	<0.1
3rd - RY2003	MNGW-1	37846	0	Lead, Dissolved	ug/l as Pb	<0.1
4th - RY2003	MNGW-1	37916	0	Lead, Dissolved	ug/l as Pb	<0.1
1st - RY2004	MNGW-1	38035	0	Lead, Dissolved	ug/l as Pb	<0.1
2nd - RY2004	MNGW-1	38147	0	Lead, Dissolved	ug/l as Pb	<0.1
3rd - RY2004	MNGW-1	38238	0	Lead, Dissolved	ug/l as Pb	0.1
4th - RY2004	MNGW-1	38280	0	Lead, Dissolved	ug/l as Pb	<0.1
1st - RY2005	MNGW-1	38420	0	Lead, Dissolved	ug/l as Pb	<0.1
3rd - RY2005	MNGW-1	38553	0	Lead, Dissolved	ug/l as Pb	<0.1
3rd - RY2005	MNGW-1	38609	0	Lead, Dissolved	ug/l as Pb	0.3
4th - RY2005	MNGW-1	38665	0	Lead, Dissolved	ug/l as Pb	<0.1
1st - RY2006	MNGW-1	38756	0	Lead, Dissolved	ug/l as Pb	7
3rd - RY2006	MNGW-1	38910	0	Lead, Dissolved	ug/l as Pb	<0.1
3rd - RY2006	MNGW-1	38980	0	Lead, Dissolved	ug/l as Pb	<0.1
4th - RY2006	MNGW-1	39016	0	Lead, Dissolved	ug/l as Pb	<0.1
1st - RY2007	MNGW-1	39148	0	Lead, Dissolved	ug/l as Pb	<0.1
3rd - RY2007	MNGW-1	39294	0	Lead, Dissolved	ug/l as Pb	<0.1
3rd - RY2007	MNGW-1	39351	0	Lead, Dissolved	ug/l as Pb	<0.1
4th - RY2007	MNGW-1	39373	0	Lead, Dissolved	ug/l as Pb	0.3
1st - RY2008	MNGW-1	39535	0	Lead, Dissolved	ug/l as Pb	<0.1
3rd - RY2008	MNGW-1	39715	0	Lead, Dissolved	ug/l as Pb	<73
1st - RY2009	MNGW-1	39862	0	Lead, Dissolved	ug/l as Pb	<73
4th - RY2009	MNGW-1	40121	0	Lead, Dissolved	ug/l as Pb	0.317
1st - RY2010	MNGW-1	40226	0	Lead, Dissolved	ug/l as Pb	0.12
3rd - RY2010	MNGW-1	40380	0	Lead, Dissolved	ug/l as Pb	25.6
3rd - RY2010	MNGW-1	40443	0	Lead, Dissolved	ug/l as Pb	0.23
4th - RY2010	MNGW-1	40464	0	Lead, Dissolved	ug/l as Pb	5.8
1st - RY2011	MNGW-1	40596	0	Lead, Dissolved	ug/l as Pb	0.12
3rd - RY2011	MNGW-1	40744	0	Lead, Dissolved	ug/l as Pb	0.65
3rd - RY2011	MNGW-1	40800	0	Lead, Dissolved	ug/l as Pb	0.1
4th - RY2011	MNGW-1	40835	1	Lead, Dissolved	ug/l as Pb	<0.092
1st - RY2012	MNGW-1	40940	0	Lead, Dissolved	ug/l as Pb	2.4
1st - RY2012	MNGW-1	40940	1	Lead, Dissolved	ug/l as Pb	1.6
3rd - RY2008	MNGW-1	39659	0	Magnesium, Dissolved	ug/l as Mg	1,180
3rd - RY2011	MNGW-1	40800	0	Magnesium, Dissolved	ug/l as Mg	2,020
4th - RY2011	MNGW-1	40835	1	Magnesium, Dissolved	ug/l as Mg	2,140
1st - RY2012	MNGW-1	40940	0	Magnesium, Dissolved	ug/l as Mg	5,750
1st - RY2012	MNGW-1	40940	1	Magnesium, Dissolved	ug/l as Mg	5,770
2nd - RY1995	MNGW-1	34814	0	Manganese, Dissolved	ug/l as Mn	<20
2nd - RY1995	MNGW-1	34863	0	Manganese, Dissolved	ug/l as Mn	80
3rd - RY1995	MNGW-1	34920	0	Manganese, Dissolved	ug/l as Mn	<20
4th - RY1995	MNGW-1	34996	0	Manganese, Dissolved	ug/l as Mn	<20
1st - RY1996	MNGW-1	35128	0	Manganese, Dissolved	ug/l as Mn	60
2nd - RY1996	MNGW-1	35184	0	Manganese, Dissolved	ug/l as Mn	50
3rd - RY1996	MNGW-1	35277	0	Manganese, Dissolved	ug/l as Mn	30
4th - RY1996	MNGW-1	35347	0	Manganese, Dissolved	ug/l as Mn	<5

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
2nd - RY1997	MNGW-1	35562	0	Manganese, Dissolved	ug/l as Mn	<5
3rd - RY1997	MNGW-1	35613	0	Manganese, Dissolved	ug/l as Mn	25
4th - RY1997	MNGW-1	35775	0	Manganese, Dissolved	ug/l as Mn	150
1st - RY1998	MNGW-1	35802	0	Manganese, Dissolved	ug/l as Mn	370
2nd - RY1998	MNGW-1	35921	0	Manganese, Dissolved	ug/l as Mn	168
3rd - RY1998	MNGW-1	35984	0	Manganese, Dissolved	ug/l as Mn	8
4th - RY1998	MNGW-1	36082	0	Manganese, Dissolved	ug/l as Mn	2,650
1st - RY1999	MNGW-1	36173	0	Manganese, Dissolved	ug/l as Mn	115
2nd - RY1999	MNGW-1	36257	0	Manganese, Dissolved	ug/l as Mn	93
3rd - RY1999	MNGW-1	36348	0	Manganese, Dissolved	ug/l as Mn	<5
4th - RY1999	MNGW-1	36446	0	Manganese, Dissolved	ug/l as Mn	1,300
1st - RY2000	MNGW-1	36538	0	Manganese, Dissolved	ug/l as Mn	10
2nd - RY2000	MNGW-1	36656	0	Manganese, Dissolved	ug/l as Mn	22
3rd - RY2000	MNGW-1	36719	0	Manganese, Dissolved	ug/l as Mn	6
4th - RY2000	MNGW-1	36872	0	Manganese, Dissolved	ug/l as Mn	490
1st - RY2001	MNGW-1	36957	0	Manganese, Dissolved	ug/l as Mn	20
2nd - RY2001	MNGW-1	36985	0	Manganese, Dissolved	ug/l as Mn	100
3rd - RY2001	MNGW-1	37083	0	Manganese, Dissolved	ug/l as Mn	2,120
4th - RY2001	MNGW-1	37167	0	Manganese, Dissolved	ug/l as Mn	<10
1st - RY2002	MNGW-1	37258	0	Manganese, Dissolved	ug/l as Mn	410
2nd - RY2002	MNGW-1	37349	0	Manganese, Dissolved	ug/l as Mn	15.4
3rd - RY2002	MNGW-1	37503	0	Manganese, Dissolved	ug/l as Mn	23
4th - RY2002	MNGW-1	37532	0	Manganese, Dissolved	ug/l as Mn	1,900
2nd - RY2003	MNGW-1	37792	0	Manganese, Dissolved	ug/l as Mn	19
3rd - RY2003	MNGW-1	37846	0	Manganese, Dissolved	ug/l as Mn	7
4th - RY2003	MNGW-1	37916	0	Manganese, Dissolved	ug/l as Mn	12
1st - RY2004	MNGW-1	38035	0	Manganese, Dissolved	ug/l as Mn	141
2nd - RY2004	MNGW-1	38147	0	Manganese, Dissolved	ug/l as Mn	17
3rd - RY2004	MNGW-1	38238	0	Manganese, Dissolved	ug/l as Mn	9
4th - RY2004	MNGW-1	38280	0	Manganese, Dissolved	ug/l as Mn	190
1st - RY2005	MNGW-1	38420	0	Manganese, Dissolved	ug/l as Mn	32
3rd - RY2005	MNGW-1	38553	0	Manganese, Dissolved	ug/l as Mn	<5
3rd - RY2005	MNGW-1	38609	0	Manganese, Dissolved	ug/l as Mn	<10
4th - RY2005	MNGW-1	38665	0	Manganese, Dissolved	ug/l as Mn	20
1st - RY2006	MNGW-1	38756	0	Manganese, Dissolved	ug/l as Mn	434
3rd - RY2006	MNGW-1	38910	0	Manganese, Dissolved	ug/l as Mn	8
3rd - RY2006	MNGW-1	38980	0	Manganese, Dissolved	ug/l as Mn	61
4th - RY2006	MNGW-1	39016	0	Manganese, Dissolved	ug/l as Mn	520
1st - RY2007	MNGW-1	39148	0	Manganese, Dissolved	ug/l as Mn	175
3rd - RY2007	MNGW-1	39294	0	Manganese, Dissolved	ug/l as Mn	6
3rd - RY2007	MNGW-1	39351	0	Manganese, Dissolved	ug/l as Mn	<5
4th - RY2007	MNGW-1	39373	0	Manganese, Dissolved	ug/l as Mn	14
1st - RY2008	MNGW-1	39535	0	Manganese, Dissolved	ug/l as Mn	44
3rd - RY2008	MNGW-1	39715	0	Manganese, Dissolved	ug/l as Mn	17.1
1st - RY2009	MNGW-1	39862	0	Manganese, Dissolved	ug/l as Mn	168
3rd - RY2009	MNGW-1	40009	0	Manganese, Dissolved	ug/l as Mn	5.14
3rd - RY2009	MNGW-1	40065	0	Manganese, Dissolved	ug/l as Mn	6.23
4th - RY2009	MNGW-1	40121	0	Manganese, Dissolved	ug/l as Mn	13
1st - RY2010	MNGW-1	40226	0	Manganese, Dissolved	ug/l as Mn	4.7
3rd - RY2010	MNGW-1	40380	0	Manganese, Dissolved	ug/l as Mn	164
3rd - RY2010	MNGW-1	40443	0	Manganese, Dissolved	ug/l as Mn	15.8
4th - RY2010	MNGW-1	40464	0	Manganese, Dissolved	ug/l as Mn	218
1st - RY2011	MNGW-1	40596	0	Manganese, Dissolved	ug/l as Mn	37
3rd - RY2011	MNGW-1	40744	0	Manganese, Dissolved	ug/l as Mn	14
3rd - RY2011	MNGW-1	40800	0	Manganese, Dissolved	ug/l as Mn	9

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2011	MNGW-1	40835	1	Manganese, Dissolved	ug/l as Mn	115
1st - RY2012	MNGW-1	40940	0	Manganese, Dissolved	ug/l as Mn	35.9
1st - RY2012	MNGW-1	40940	1	Manganese, Dissolved	ug/l as Mn	25
2nd - RY1995	MNGW-1	34814	0	Molybdenum, Dissolved	ug/l as Mo	<20
2nd - RY1995	MNGW-1	34863	0	Molybdenum, Dissolved	ug/l as Mo	<20
3rd - RY1995	MNGW-1	34920	0	Molybdenum, Dissolved	ug/l as Mo	<20
4th - RY1995	MNGW-1	34996	0	Molybdenum, Dissolved	ug/l as Mo	<20
1st - RY1996	MNGW-1	35128	0	Molybdenum, Dissolved	ug/l as Mo	<20
2nd - RY1996	MNGW-1	35184	0	Molybdenum, Dissolved	ug/l as Mo	40
3rd - RY1996	MNGW-1	35277	0	Molybdenum, Dissolved	ug/l as Mo	20
4th - RY1996	MNGW-1	35347	0	Molybdenum, Dissolved	ug/l as Mo	<10
2nd - RY1997	MNGW-1	35562	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY1997	MNGW-1	35613	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY1997	MNGW-1	35775	0	Molybdenum, Dissolved	ug/l as Mo	10
1st - RY1998	MNGW-1	35802	0	Molybdenum, Dissolved	ug/l as Mo	<50
2nd - RY1998	MNGW-1	35921	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY1998	MNGW-1	35984	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY1998	MNGW-1	36082	0	Molybdenum, Dissolved	ug/l as Mo	<10
1st - RY1999	MNGW-1	36173	0	Molybdenum, Dissolved	ug/l as Mo	<10
2nd - RY1999	MNGW-1	36257	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY1999	MNGW-1	36348	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY1999	MNGW-1	36446	0	Molybdenum, Dissolved	ug/l as Mo	<10
1st - RY2000	MNGW-1	36538	0	Molybdenum, Dissolved	ug/l as Mo	<10
2nd - RY2000	MNGW-1	36656	0	Molybdenum, Dissolved	ug/l as Mo	10
3rd - RY2000	MNGW-1	36719	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY2000	MNGW-1	36872	0	Molybdenum, Dissolved	ug/l as Mo	<100
1st - RY2001	MNGW-1	36957	0	Molybdenum, Dissolved	ug/l as Mo	<100
2nd - RY2001	MNGW-1	36985	0	Molybdenum, Dissolved	ug/l as Mo	<100
3rd - RY2001	MNGW-1	37083	0	Molybdenum, Dissolved	ug/l as Mo	<100
4th - RY2001	MNGW-1	37167	0	Molybdenum, Dissolved	ug/l as Mo	<20
1st - RY2002	MNGW-1	37258	0	Molybdenum, Dissolved	ug/l as Mo	<20
2nd - RY2002	MNGW-1	37349	0	Molybdenum, Dissolved	ug/l as Mo	<20
3rd - RY2002	MNGW-1	37503	0	Molybdenum, Dissolved	ug/l as Mo	<20
4th - RY2002	MNGW-1	37532	0	Molybdenum, Dissolved	ug/l as Mo	<20
2nd - RY2003	MNGW-1	37792	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2003	MNGW-1	37846	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY2003	MNGW-1	37916	0	Molybdenum, Dissolved	ug/l as Mo	<10
1st - RY2004	MNGW-1	38035	0	Molybdenum, Dissolved	ug/l as Mo	<10
2nd - RY2004	MNGW-1	38147	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2004	MNGW-1	38238	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY2004	MNGW-1	38280	0	Molybdenum, Dissolved	ug/l as Mo	<10
1st - RY2005	MNGW-1	38420	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2005	MNGW-1	38553	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2005	MNGW-1	38609	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY2005	MNGW-1	38665	0	Molybdenum, Dissolved	ug/l as Mo	<10
1st - RY2006	MNGW-1	38756	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2006	MNGW-1	38910	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2006	MNGW-1	38980	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY2006	MNGW-1	39016	0	Molybdenum, Dissolved	ug/l as Mo	<10
1st - RY2007	MNGW-1	39148	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2007	MNGW-1	39294	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2007	MNGW-1	39351	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY2007	MNGW-1	39373	0	Molybdenum, Dissolved	ug/l as Mo	<10
1st - RY2008	MNGW-1	39535	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2008	MNGW-1	39659	0	Molybdenum, Dissolved	ug/l as Mo	5

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
3rd - RY2008	MNGW-1	39715	0	Molybdenum, Dissolved	ug/l as Mo	3.91
1st - RY2009	MNGW-1	39862	0	Molybdenum, Dissolved	ug/l as Mo	13.5
3rd - RY2009	MNGW-1	40009	0	Molybdenum, Dissolved	ug/l as Mo	0.251
3rd - RY2009	MNGW-1	40065	0	Molybdenum, Dissolved	ug/l as Mo	0.211
4th - RY2009	MNGW-1	40121	0	Molybdenum, Dissolved	ug/l as Mo	0.209
1st - RY2010	MNGW-1	40226	0	Molybdenum, Dissolved	ug/l as Mo	0.14
3rd - RY2010	MNGW-1	40380	0	Molybdenum, Dissolved	ug/l as Mo	0.19
3rd - RY2010	MNGW-1	40443	0	Molybdenum, Dissolved	ug/l as Mo	0.24
4th - RY2010	MNGW-1	40464	0	Molybdenum, Dissolved	ug/l as Mo	4
1st - RY2011	MNGW-1	40596	0	Molybdenum, Dissolved	ug/l as Mo	0.35
3rd - RY2011	MNGW-1	40744	0	Molybdenum, Dissolved	ug/l as Mo	0.25
3rd - RY2011	MNGW-1	40800	0	Molybdenum, Dissolved	ug/l as Mo	0.17
4th - RY2011	MNGW-1	40835	1	Molybdenum, Dissolved	ug/l as Mo	0.53
1st - RY2012	MNGW-1	40940	0	Molybdenum, Dissolved	ug/l as Mo	2
1st - RY2012	MNGW-1	40940	1	Molybdenum, Dissolved	ug/l as Mo	1.8
2nd - RY1995	MNGW-1	34814	0	Nickel, Dissolved	ug/l as Ni	<20
2nd - RY1995	MNGW-1	34863	0	Nickel, Dissolved	ug/l as Ni	3
3rd - RY1995	MNGW-1	34920	0	Nickel, Dissolved	ug/l as Ni	<1
4th - RY1995	MNGW-1	34996	0	Nickel, Dissolved	ug/l as Ni	<1
1st - RY1996	MNGW-1	35128	0	Nickel, Dissolved	ug/l as Ni	<1
2nd - RY1996	MNGW-1	35184	0	Nickel, Dissolved	ug/l as Ni	<1
3rd - RY1996	MNGW-1	35277	0	Nickel, Dissolved	ug/l as Ni	2
4th - RY1996	MNGW-1	35347	0	Nickel, Dissolved	ug/l as Ni	<10
2nd - RY1997	MNGW-1	35562	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY1997	MNGW-1	35613	0	Nickel, Dissolved	ug/l as Ni	<10
4th - RY1997	MNGW-1	35775	0	Nickel, Dissolved	ug/l as Ni	<50
1st - RY1998	MNGW-1	35802	0	Nickel, Dissolved	ug/l as Ni	<10
2nd - RY1998	MNGW-1	35921	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY1998	MNGW-1	35984	0	Nickel, Dissolved	ug/l as Ni	<10
4th - RY1998	MNGW-1	36082	0	Nickel, Dissolved	ug/l as Ni	<10
1st - RY1999	MNGW-1	36173	0	Nickel, Dissolved	ug/l as Ni	<10
2nd - RY1999	MNGW-1	36257	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY1999	MNGW-1	36348	0	Nickel, Dissolved	ug/l as Ni	<10
4th - RY1999	MNGW-1	36446	0	Nickel, Dissolved	ug/l as Ni	<10
1st - RY2000	MNGW-1	36538	0	Nickel, Dissolved	ug/l as Ni	<10
2nd - RY2000	MNGW-1	36656	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY2000	MNGW-1	36719	0	Nickel, Dissolved	ug/l as Ni	<10
4th - RY2000	MNGW-1	36872	0	Nickel, Dissolved	ug/l as Ni	440
1st - RY2001	MNGW-1	36957	0	Nickel, Dissolved	ug/l as Ni	<20
2nd - RY2001	MNGW-1	36985	0	Nickel, Dissolved	ug/l as Ni	<20
3rd - RY2001	MNGW-1	37083	0	Nickel, Dissolved	ug/l as Ni	<20
4th - RY2001	MNGW-1	37167	0	Nickel, Dissolved	ug/l as Ni	<40
1st - RY2002	MNGW-1	37258	0	Nickel, Dissolved	ug/l as Ni	<40
2nd - RY2002	MNGW-1	37349	0	Nickel, Dissolved	ug/l as Ni	<40
3rd - RY2002	MNGW-1	37503	0	Nickel, Dissolved	ug/l as Ni	<40
4th - RY2002	MNGW-1	37532	0	Nickel, Dissolved	ug/l as Ni	<40
2nd - RY2003	MNGW-1	37792	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY2003	MNGW-1	37846	0	Nickel, Dissolved	ug/l as Ni	<10
4th - RY2003	MNGW-1	37916	0	Nickel, Dissolved	ug/l as Ni	<10
1st - RY2004	MNGW-1	38035	0	Nickel, Dissolved	ug/l as Ni	<10
2nd - RY2004	MNGW-1	38147	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY2004	MNGW-1	38238	0	Nickel, Dissolved	ug/l as Ni	<10
4th - RY2004	MNGW-1	38280	0	Nickel, Dissolved	ug/l as Ni	<10
1st - RY2005	MNGW-1	38420	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY2005	MNGW-1	38553	0	Nickel, Dissolved	ug/l as Ni	<10

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
3rd - RY2005	MNGW-1	38609	0	Nickel, Dissolved	ug/l as Ni	<20
4th - RY2005	MNGW-1	38665	0	Nickel, Dissolved	ug/l as Ni	<10
1st - RY2006	MNGW-1	38756	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY2006	MNGW-1	38910	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY2006	MNGW-1	38980	0	Nickel, Dissolved	ug/l as Ni	<10
4th - RY2006	MNGW-1	39016	0	Nickel, Dissolved	ug/l as Ni	<10
1st - RY2007	MNGW-1	39148	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY2007	MNGW-1	39294	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY2007	MNGW-1	39351	0	Nickel, Dissolved	ug/l as Ni	<10
4th - RY2007	MNGW-1	39373	0	Nickel, Dissolved	ug/l as Ni	<10
1st - RY2008	MNGW-1	39535	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY2008	MNGW-1	39659	0	Nickel, Dissolved	ug/l as Ni	30
3rd - RY2008	MNGW-1	39715	0	Nickel, Dissolved	ug/l as Ni	<30
1st - RY2009	MNGW-1	39862	0	Nickel, Dissolved	ug/l as Ni	<30
3rd - RY2009	MNGW-1	40009	0	Nickel, Dissolved	ug/l as Ni	0.165
3rd - RY2009	MNGW-1	40065	0	Nickel, Dissolved	ug/l as Ni	0.573
4th - RY2009	MNGW-1	40121	0	Nickel, Dissolved	ug/l as Ni	1.23
1st - RY2010	MNGW-1	40226	0	Nickel, Dissolved	ug/l as Ni	1.5
3rd - RY2010	MNGW-1	40380	0	Nickel, Dissolved	ug/l as Ni	2.7
3rd - RY2010	MNGW-1	40443	0	Nickel, Dissolved	ug/l as Ni	1.2
4th - RY2010	MNGW-1	40464	0	Nickel, Dissolved	ug/l as Ni	4.4
1st - RY2011	MNGW-1	40596	0	Nickel, Dissolved	ug/l as Ni	1.8
3rd - RY2011	MNGW-1	40744	0	Nickel, Dissolved	ug/l as Ni	0.71
3rd - RY2011	MNGW-1	40800	0	Nickel, Dissolved	ug/l as Ni	0.83
4th - RY2011	MNGW-1	40835	1	Nickel, Dissolved	ug/l as Ni	1.1
1st - RY2012	MNGW-1	40940	0	Nickel, Dissolved	ug/l as Ni	6.3
1st - RY2012	MNGW-1	40940	1	Nickel, Dissolved	ug/l as Ni	6.1
4th - RY2010	MNGW-1	40464	0	Nitrate Nitrogen, Total	mg/l as N	0.35
1st - RY2011	MNGW-1	40596	0	Nitrate Nitrogen, Total	mg/l as N	0.77
3rd - RY2011	MNGW-1	40744	0	Nitrate Nitrogen, Total	mg/l as N	0.11
3rd - RY2011	MNGW-1	40800	0	Nitrate Nitrogen, Total	mg/l as N	0.056
4th - RY2011	MNGW-1	40835	1	Nitrate Nitrogen, Total	mg/l as N	0.047
1st - RY2012	MNGW-1	40940	0	Nitrate Nitrogen, Total	mg/l as N	0.75
1st - RY2012	MNGW-1	40940	1	Nitrate Nitrogen, Total	mg/l as N	0.7
4th - RY2010	MNGW-1	40464	0	Nitrite Nitrogen, Total	mg/l as N	<0.061
1st - RY2011	MNGW-1	40596	0	Nitrite Nitrogen, Total	mg/l as N	<0.061
3rd - RY2011	MNGW-1	40744	0	Nitrite Nitrogen, Total	mg/l as N	<0.061
3rd - RY2011	MNGW-1	40800	0	Nitrite Nitrogen, Total	mg/l as N	<0.061
4th - RY2011	MNGW-1	40835	1	Nitrite Nitrogen, Total	mg/l as N	<0.061
1st - RY2012	MNGW-1	40940	0	Nitrite Nitrogen, Total	mg/l as N	<0.061
1st - RY2012	MNGW-1	40940	1	Nitrite Nitrogen, Total	mg/l as N	<0.061
4th - RY2010	MNGW-1	40464	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
1st - RY2011	MNGW-1	40596	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
3rd - RY2011	MNGW-1	40744	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
3rd - RY2011	MNGW-1	40800	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2011	MNGW-1	40835	1	Nitrogen, Ammonia, Total	mg/l as N	<0.1
1st - RY2012	MNGW-1	40940	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
1st - RY2012	MNGW-1	40940	1	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2010	MNGW-1	40464	0	Nitrogen,total kjeldahl	mg/l	0.57
1st - RY2011	MNGW-1	40596	0	Nitrogen,total kjeldahl	mg/l	0.89
3rd - RY2011	MNGW-1	40744	0	Nitrogen,total kjeldahl	mg/l	<0.3
3rd - RY2011	MNGW-1	40800	0	Nitrogen,total kjeldahl	mg/l	0.3
4th - RY2011	MNGW-1	40835	1	Nitrogen,total kjeldahl	mg/l	<0.3
1st - RY2012	MNGW-1	40940	0	Nitrogen,total kjeldahl	mg/l	0.57
1st - RY2012	MNGW-1	40940	1	Nitrogen,total kjeldahl	mg/l	0.62

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY2012	MNGW-1	40940	0	ORP	mV	178
1st - RY2012	MNGW-1	40940	0	Oxygen, Dissolved	mg/l	37.52
2nd - RY1995	MNGW-1	34863	0	pH, Field	Standard Units	7.2
3rd - RY1995	MNGW-1	34920	0	pH, Field	Standard Units	6.8
4th - RY1995	MNGW-1	34996	0	pH, Field	Standard Units	7.1
1st - RY1996	MNGW-1	35128	0	pH, Field	Standard Units	7
2nd - RY1996	MNGW-1	35184	0	pH, Field	Standard Units	7.1
3rd - RY1996	MNGW-1	35277	0	pH, Field	Standard Units	6.6
4th - RY1996	MNGW-1	35347	0	pH, Field	Standard Units	7
2nd - RY1997	MNGW-1	35562	0	pH, Field	Standard Units	7.07
3rd - RY1997	MNGW-1	35613	0	pH, Field	Standard Units	7.82
4th - RY1997	MNGW-1	35775	0	pH, Field	Standard Units	6.61
1st - RY1998	MNGW-1	35802	0	pH, Field	Standard Units	6.64
2nd - RY1998	MNGW-1	35921	0	pH, Field	Standard Units	7.08
3rd - RY1998	MNGW-1	35984	0	pH, Field	Standard Units	7
4th - RY1998	MNGW-1	36082	0	pH, Field	Standard Units	7.07
1st - RY1999	MNGW-1	36173	0	pH, Field	Standard Units	6.46
2nd - RY1999	MNGW-1	36257	0	pH, Field	Standard Units	6.41
3rd - RY1999	MNGW-1	36348	0	pH, Field	Standard Units	6.29
4th - RY1999	MNGW-1	36446	0	pH, Field	Standard Units	6.67
1st - RY2000	MNGW-1	36538	0	pH, Field	Standard Units	6.76
2nd - RY2000	MNGW-1	36656	0	pH, Field	Standard Units	7
3rd - RY2000	MNGW-1	36719	0	pH, Field	Standard Units	6.5
4th - RY2000	MNGW-1	36872	0	pH, Field	Standard Units	7.21
1st - RY2001	MNGW-1	36957	0	pH, Field	Standard Units	7.21
2nd - RY2001	MNGW-1	36985	0	pH, Field	Standard Units	7.09
3rd - RY2001	MNGW-1	37083	0	pH, Field	Standard Units	7.91
4th - RY2001	MNGW-1	37167	0	pH, Field	Standard Units	7.14
1st - RY2002	MNGW-1	37258	0	pH, Field	Standard Units	6.89
2nd - RY2002	MNGW-1	37349	0	pH, Field	Standard Units	7.63
3rd - RY2002	MNGW-1	37503	0	pH, Field	Standard Units	7.43
4th - RY2002	MNGW-1	37532	0	pH, Field	Standard Units	8.02
2nd - RY2003	MNGW-1	37792	0	pH, Field	Standard Units	7.47
3rd - RY2003	MNGW-1	37846	0	pH, Field	Standard Units	7.42
4th - RY2003	MNGW-1	37916	0	pH, Field	Standard Units	6.92
1st - RY2004	MNGW-1	38035	0	pH, Field	Standard Units	7.02
2nd - RY2004	MNGW-1	38147	0	pH, Field	Standard Units	6.86
3rd - RY2004	MNGW-1	38238	0	pH, Field	Standard Units	6.83
4th - RY2004	MNGW-1	38280	0	pH, Field	Standard Units	6.81
1st - RY2005	MNGW-1	38420	0	pH, Field	Standard Units	6.31
3rd - RY2005	MNGW-1	38553	0	pH, Field	Standard Units	6.81
4th - RY2005	MNGW-1	38665	0	pH, Field	Standard Units	6.9
1st - RY2006	MNGW-1	38756	0	pH, Field	Standard Units	6.85
3rd - RY2006	MNGW-1	38910	0	pH, Field	Standard Units	6.89
3rd - RY2006	MNGW-1	38980	0	pH, Field	Standard Units	6.88
4th - RY2006	MNGW-1	39016	0	pH, Field	Standard Units	7.72
1st - RY2007	MNGW-1	39148	0	pH, Field	Standard Units	6.84
3rd - RY2007	MNGW-1	39294	0	pH, Field	Standard Units	6.71
3rd - RY2007	MNGW-1	39351	0	pH, Field	Standard Units	6.97
4th - RY2007	MNGW-1	39373	0	pH, Field	Standard Units	6.9
1st - RY2008	MNGW-1	39535	0	pH, Field	Standard Units	6.43
1st - RY2009	MNGW-1	39862	0	pH, Field	Standard Units	6.5
3rd - RY2009	MNGW-1	40009	0	pH, Field	Standard Units	7.4
3rd - RY2009	MNGW-1	40065	0	pH, Field	Standard Units	7.5
4th - RY2009	MNGW-1	40121	0	pH, Field	Standard Units	6.04

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY2010	MNGW-1	40226	0	pH, Field	Standard Units	6.4
3rd - RY2010	MNGW-1	40380	0	pH, Field	Standard Units	6.9
3rd - RY2010	MNGW-1	40443	0	pH, Field	Standard Units	7.1
4th - RY2010	MNGW-1	40464	0	pH, Field	Standard Units	7
1st - RY2011	MNGW-1	40596	0	pH, Field	Standard Units	6
3rd - RY2011	MNGW-1	40800	0	pH, Field	Standard Units	6.6
4th - RY2011	MNGW-1	40835	1	pH, Field	Standard Units	7
1st - RY2012	MNGW-1	40940	0	pH, Field	Standard Units	7.3
4th - RY2010	MNGW-1	40464	0	Phosphate, Ortho	mg/l as PO4	1.3
1st - RY2011	MNGW-1	40596	0	Phosphate, Ortho	mg/l as PO4	0.58
3rd - RY2011	MNGW-1	40744	0	Phosphate, Ortho	mg/l as PO4	<0.1
3rd - RY2011	MNGW-1	40800	0	Phosphate, Ortho	mg/l as PO4	<0.2
4th - RY2011	MNGW-1	40835	1	Phosphate, Ortho	mg/l as PO4	0.12
1st - RY2012	MNGW-1	40940	0	Phosphate, Ortho	mg/l as PO4	<0.5
1st - RY2012	MNGW-1	40940	1	Phosphate, Ortho	mg/l as PO4	<1
1st - RY212	MNGW-1	40940	0	Potassium, Dissolved	ug/l as K	4,170
1st - RY2012	MNGW-1	40940	1	Potassium, Dissolved	ug/l as K	4,140
4th - RY2010	MNGW-1	40464	0	Selenium, Dissolved	ug/l as Se	0.63
1st - RY2011	MNGW-1	40596	0	Selenium, Dissolved	ug/l as Se	<0.19
3rd - RY2011	MNGW-1	40744	0	Selenium, Dissolved	ug/l as Se	0.83
3rd - RY2011	MNGW-1	40800	0	Selenium, Dissolved	ug/l as Se	<0.64
4th - RY2011	MNGW-1	40835	1	Selenium, Dissolved	ug/l as Se	<0.64
1st - RY2012	MNGW-1	40940	0	Selenium, Dissolved	ug/l as Se	<0.64
1st - RY2012	MNGW-1	40940	1	Selenium, Dissolved	ug/l as Se	<0.64
2nd - RY1995	MNGW-1	34814	0	Silver, Dissolved	ug/l as Ag	<0.1
2nd - RY1995	MNGW-1	34863	0	Silver, Dissolved	ug/l as Ag	<0.1
3rd - RY1995	MNGW-1	34920	0	Silver, Dissolved	ug/l as Ag	<0.1
4th - RY1995	MNGW-1	34996	0	Silver, Dissolved	ug/l as Ag	<0.1
1st - RY1996	MNGW-1	35128	0	Silver, Dissolved	ug/l as Ag	<0.1
2nd - RY1996	MNGW-1	35184	0	Silver, Dissolved	ug/l as Ag	<0.1
3rd - RY1996	MNGW-1	35277	0	Silver, Dissolved	ug/l as Ag	0.1
4th - RY1996	MNGW-1	35347	0	Silver, Dissolved	ug/l as Ag	5
2nd - RY1997	MNGW-1	35562	0	Silver, Dissolved	ug/l as Ag	<5
3rd - RY1997	MNGW-1	35613	0	Silver, Dissolved	ug/l as Ag	<5
4th - RY1997	MNGW-1	35775	0	Silver, Dissolved	ug/l as Ag	<5
1st - RY1998	MNGW-1	35802	0	Silver, Dissolved	ug/l as Ag	<5
2nd - RY1998	MNGW-1	35921	0	Silver, Dissolved	ug/l as Ag	<5
3rd - RY1998	MNGW-1	35984	0	Silver, Dissolved	ug/l as Ag	<5
4th - RY1998	MNGW-1	36082	0	Silver, Dissolved	ug/l as Ag	<5
1st - RY1999	MNGW-1	36173	0	Silver, Dissolved	ug/l as Ag	<5
2nd - RY1999	MNGW-1	36257	0	Silver, Dissolved	ug/l as Ag	<5
3rd - RY1999	MNGW-1	36348	0	Silver, Dissolved	ug/l as Ag	<5
4th - RY1999	MNGW-1	36446	0	Silver, Dissolved	ug/l as Ag	<5
1st - RY2000	MNGW-1	36538	0	Silver, Dissolved	ug/l as Ag	<5
2nd - RY2000	MNGW-1	36656	0	Silver, Dissolved	ug/l as Ag	<5
3rd - RY2000	MNGW-1	36719	0	Silver, Dissolved	ug/l as Ag	<5
4th - RY2000	MNGW-1	36872	0	Silver, Dissolved	ug/l as Ag	40
1st - RY2001	MNGW-1	36957	0	Silver, Dissolved	ug/l as Ag	20
2nd - RY2001	MNGW-1	36985	0	Silver, Dissolved	ug/l as Ag	<20
3rd - RY2001	MNGW-1	37083	0	Silver, Dissolved	ug/l as Ag	310
4th - RY2001	MNGW-1	37167	0	Silver, Dissolved	ug/l as Ag	<10
1st - RY2002	MNGW-1	37258	0	Silver, Dissolved	ug/l as Ag	<10
2nd - RY2002	MNGW-1	37349	0	Silver, Dissolved	ug/l as Ag	<10
3rd - RY2002	MNGW-1	37503	0	Silver, Dissolved	ug/l as Ag	<10
4th - RY2002	MNGW-1	37532	0	Silver, Dissolved	ug/l as Ag	<10

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
2nd - RY2003	MNGW-1	37792	0	Silver, Dissolved	ug/l as Ag	<5
3rd - RY2003	MNGW-1	37846	0	Silver, Dissolved	ug/l as Ag	<5
4th - RY2003	MNGW-1	37916	0	Silver, Dissolved	ug/l as Ag	<5
1st - RY2004	MNGW-1	38035	0	Silver, Dissolved	ug/l as Ag	<5
2nd - RY2004	MNGW-1	38147	0	Silver, Dissolved	ug/l as Ag	<5
3rd - RY2004	MNGW-1	38238	0	Silver, Dissolved	ug/l as Ag	<5
4th - RY2004	MNGW-1	38280	0	Silver, Dissolved	ug/l as Ag	<5
1st - RY2005	MNGW-1	38420	0	Silver, Dissolved	ug/l as Ag	<5
3rd - RY2005	MNGW-1	38553	0	Silver, Dissolved	ug/l as Ag	<10
3rd - RY2005	MNGW-1	38609	0	Silver, Dissolved	ug/l as Ag	<10
4th - RY2005	MNGW-1	38665	0	Silver, Dissolved	ug/l as Ag	<10
1st - RY2005	MNGW-1	38756	0	Silver, Dissolved	ug/l as Ag	<10
3rd - RY2006	MNGW-1	38910	0	Silver, Dissolved	ug/l as Ag	<10
3rd - RY2006	MNGW-1	38980	0	Silver, Dissolved	ug/l as Ag	<10
4th - RY2006	MNGW-1	39016	0	Silver, Dissolved	ug/l as Ag	<10
1st - RY2007	MNGW-1	39148	0	Silver, Dissolved	ug/l as Ag	<10
3rd - RY2007	MNGW-1	39294	0	Silver, Dissolved	ug/l as Ag	<10
3rd - RY2007	MNGW-1	39351	0	Silver, Dissolved	ug/l as Ag	<10
4th - RY2007	MNGW-1	39373	0	Silver, Dissolved	ug/l as Ag	<10
1st - RY2008	MNGW-1	39535	0	Silver, Dissolved	ug/l as Ag	<10
3rd - RY2008	MNGW-1	39659	0	Silver, Dissolved	ug/l as Ag	30
3rd - RY2008	MNGW-1	39715	0	Silver, Dissolved	ug/l as Ag	<30
1st - RY2009	MNGW-1	39862	0	Silver, Dissolved	ug/l as Ag	<30
3rd - RY2009	MNGW-1	40009	0	Silver, Dissolved	ug/l as Ag	<0.04
3rd - RY2009	MNGW-1	40065	0	Silver, Dissolved	ug/l as Ag	<0.04
4th - RY2009	MNGW-1	40121	0	Silver, Dissolved	ug/l as Ag	<0.04
1st - RY2010	MNGW-1	40226	0	Silver, Dissolved	ug/l as Ag	<0.078
3rd - RY2010	MNGW-1	40380	0	Silver, Dissolved	ug/l as Ag	<0.16
3rd - RY2010	MNGW-1	40443	0	Silver, Dissolved	ug/l as Ag	0.006
4th - RY2010	MNGW-1	40464	0	Silver, Dissolved	ug/l as Ag	0.008
1st - RY2011	MNGW-1	40596	0	Silver, Dissolved	ug/l as Ag	<0.0034
3rd - RY2011	MNGW-1	40744	0	Silver, Dissolved	ug/l as Ag	<0.1
3rd - RY2011	MNGW-1	40800	0	Silver, Dissolved	ug/l as Ag	<0.1
4th - RY2011	MNGW-1	40835	1	Silver, Dissolved	ug/l as Ag	<0.1
1st - RY2012	MNGW-1	40940	0	Silver, Dissolved	ug/l as Ag	<0.1
1st - RY2012	MNGW-1	40940	1	Silver, Dissolved	ug/l as Ag	<0.1
1st - RY2012	MNGW-1	40940	0	Sodium, Dissolved	ug/l as Na	7,530
1st - RY2012	MNGW-1	40940	1	Sodium, Dissolved	ug/l as Na	7,480
1st - RY2012	MNGW-1	40940	0	Specific Conductance	umhos/cm @ 25C	346
3rd - RY2007	MNGW-1	39294	0	Sulfate, Total	mg/l as SO4	50
3rd - RY2008	MNGW-1	39659	0	Sulfate, Total	mg/l as SO4	39.1
3rd - RY2008	MNGW-1	39715	0	Sulfate, Total	mg/l as SO4	59.1
1st - RY2009	MNGW-1	39862	0	Sulfate, Total	mg/l as SO4	145
3rd - RY2009	MNGW-1	40009	0	Sulfate, Total	mg/l as SO4	31.1
3rd - RY2009	MNGW-1	40065	0	Sulfate, Total	mg/l as SO4	51.1
1st - RY2010	MNGW-1	40226	0	Sulfate, Total	mg/l as SO4	202
3rd - RY2010	MNGW-1	40380	0	Sulfate, Total	mg/l as SO4	46.1
3rd - RY2010	MNGW-1	40443	0	Sulfate, Total	mg/l as SO4	58.6
4th - RY2010	MNGW-1	40464	0	Sulfate, Total	mg/l as SO4	85
1st - RY2011	MNGW-1	40596	0	Sulfate, Total	mg/l as SO4	125
3rd - RY2011	MNGW-1	40744	0	Sulfate, Total	mg/l as SO4	30.9
3rd - RY2011	MNGW-1	40800	0	Sulfate, Total	mg/l as SO4	52.7
4th - RY2011	MNGW-1	40835	1	Sulfate, Total	mg/l as SO4	66.9
1st - RY2012	MNGW-1	40940	0	Sulfate, Total	mg/l as SO4	146
1st - RY2012	MNGW-1	40940	1	Sulfate, Total	mg/l as SO4	141

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
2nd - RY1995	MNGW-1	34814	0	TDS - Residue,Total Filtrable (Dried At	mg/l	910
2nd - RY1995	MNGW-1	34863	0	TDS - Residue,Total Filtrable (Dried At	mg/l	186
3rd - RY1995	MNGW-1	34920	0	TDS - Residue,Total Filtrable (Dried At	mg/l	81
4th - RY1995	MNGW-1	34996	0	TDS - Residue,Total Filtrable (Dried At	mg/l	100
1st - RY1996	MNGW-1	35128	0	TDS - Residue,Total Filtrable (Dried At	mg/l	988
2nd - RY1996	MNGW-1	35184	0	TDS - Residue,Total Filtrable (Dried At	mg/l	894
3rd - RY1996	MNGW-1	35277	0	TDS - Residue,Total Filtrable (Dried At	mg/l	88
4th - RY1996	MNGW-1	35347	0	TDS - Residue,Total Filtrable (Dried At	mg/l	100
3rd - RY1997	MNGW-1	35562	0	TDS - Residue,Total Filtrable (Dried At	mg/l	500
3rd - RY1997	MNGW-1	35613	0	TDS - Residue,Total Filtrable (Dried At	mg/l	70
4th - RY1997	MNGW-1	35775	0	TDS - Residue,Total Filtrable (Dried At	mg/l	830
1st - RY1998	MNGW-1	35802	0	TDS - Residue,Total Filtrable (Dried At	mg/l	860
2nd - RY1998	MNGW-1	35921	0	TDS - Residue,Total Filtrable (Dried At	mg/l	510
3rd - RY1998	MNGW-1	35984	0	TDS - Residue,Total Filtrable (Dried At	mg/l	50
4th - RY1998	MNGW-1	36082	0	TDS - Residue,Total Filtrable (Dried At	mg/l	110
1st - RY1999	MNGW-1	36173	0	TDS - Residue,Total Filtrable (Dried At	mg/l	560
2nd - RY1999	MNGW-1	36257	0	TDS - Residue,Total Filtrable (Dried At	mg/l	500
3rd - RY1999	MNGW-1	36348	0	TDS - Residue,Total Filtrable (Dried At	mg/l	70
4th - RY1999	MNGW-1	36446	0	TDS - Residue,Total Filtrable (Dried At	mg/l	120
1st - RY2000	MNGW-1	36538	0	TDS - Residue,Total Filtrable (Dried At	mg/l	380
2nd - RY2000	MNGW-1	36656	0	TDS - Residue,Total Filtrable (Dried At	mg/l	210
3rd - RY2000	MNGW-1	36719	0	TDS - Residue,Total Filtrable (Dried At	mg/l	90
2nd - RY2001	MNGW-1	36985	0	TDS - Residue,Total Filtrable (Dried At	mg/l	408
3rd - RY2001	MNGW-1	37083	0	TDS - Residue,Total Filtrable (Dried At	mg/l	105
4th - RY2001	MNGW-1	37167	0	TDS - Residue,Total Filtrable (Dried At	mg/l	122
1st - RY2002	MNGW-1	37258	0	TDS - Residue,Total Filtrable (Dried At	mg/l	318
2nd - RY2002	MNGW-1	37349	0	TDS - Residue,Total Filtrable (Dried At	mg/l	417
3rd - RY2002	MNGW-1	37503	0	TDS - Residue,Total Filtrable (Dried At	mg/l	190
4th - RY2002	MNGW-1	37532	0	TDS - Residue,Total Filtrable (Dried At	mg/l	130
2nd - RY2003	MNGW-1	37792	0	TDS - Residue,Total Filtrable (Dried At	mg/l	130
3rd - RY2003	MNGW-1	37846	0	TDS - Residue,Total Filtrable (Dried At	mg/l	100
4th - RY2003	MNGW-1	37916	0	TDS - Residue,Total Filtrable (Dried At	mg/l	130
1st - RY2004	MNGW-1	38035	0	TDS - Residue,Total Filtrable (Dried At	mg/l	380
2nd - RY2004	MNGW-1	38147	0	TDS - Residue,Total Filtrable (Dried At	mg/l	130
3rd - RY2004	MNGW-1	38238	0	TDS - Residue,Total Filtrable (Dried At	mg/l	150
4th - RY2004	MNGW-1	38280	0	TDS - Residue,Total Filtrable (Dried At	mg/l	250
1st - RY2005	MNGW-1	38420	0	TDS - Residue,Total Filtrable (Dried At	mg/l	440
3rd - RY2005	MNGW-1	38553	0	TDS - Residue,Total Filtrable (Dried At	mg/l	90
3rd - RY2005	MNGW-1	38609	0	TDS - Residue,Total Filtrable (Dried At	mg/l	110
4th - RY2005	MNGW-1	38665	0	TDS - Residue,Total Filtrable (Dried At	mg/l	240
1st - RY2006	MNGW-1	38756	0	TDS - Residue,Total Filtrable (Dried At	mg/l	360
3rd - RY2006	MNGW-1	38910	0	TDS - Residue,Total Filtrable (Dried At	mg/l	80
3rd - RY2006	MNGW-1	38980	0	TDS - Residue,Total Filtrable (Dried At	mg/l	130
4th - RY2006	MNGW-1	39016	0	TDS - Residue,Total Filtrable (Dried At	mg/l	230
1st - RY2007	MNGW-1	39148	0	TDS - Residue,Total Filtrable (Dried At	mg/l	420
3rd - RY2007	MNGW-1	39294	0	TDS - Residue,Total Filtrable (Dried At	mg/l	110
3rd - RY2007	MNGW-1	39351	0	TDS - Residue,Total Filtrable (Dried At	mg/l	120
4th - RY2007	MNGW-1	39373	0	TDS - Residue,Total Filtrable (Dried At	mg/l	160
1st - RY2008	MNGW-1	39535	0	TDS - Residue,Total Filtrable (Dried At	mg/l	320
3rd - RY2008	MNGW-1	39659	0	TDS - Residue,Total Filtrable (Dried At	mg/l	106
3rd - RY2008	MNGW-1	39715	0	TDS - Residue,Total Filtrable (Dried At	mg/l	137
1st - RY2009	MNGW-1	39862	0	TDS - Residue,Total Filtrable (Dried At	mg/l	338
3rd - RY2009	MNGW-1	40009	0	TDS - Residue,Total Filtrable (Dried At	mg/l	124
3rd - RY2009	MNGW-1	40065	0	TDS - Residue,Total Filtrable (Dried At	mg/l	122
4th - RY2009	MNGW-1	40121	0	TDS - Residue,Total Filtrable (Dried At	mg/l	204

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY2010	MNGW-1	40226	0	TDS - Residue,Total Filtrable (Dried At	mg/l	416
3rd - RY2010	MNGW-1	40380	0	TDS - Residue,Total Filtrable (Dried At	mg/l	100
3rd - RY2010	MNGW-1	40443	0	TDS - Residue,Total Filtrable (Dried At	mg/l	128
4th - RY2010	MNGW-1	40464	0	TDS - Residue,Total Filtrable (Dried At	mg/l	186
1st - RY2011	MNGW-1	40596	0	TDS - Residue,Total Filtrable (Dried At	mg/l	292
3rd - RY2011	MNGW-1	40744	0	TDS - Residue,Total Filtrable (Dried At	mg/l	136
3rd - RY2011	MNGW-1	40800	0	TDS - Residue,Total Filtrable (Dried At	mg/l	156
4th - RY2011	MNGW-1	40835	1	TDS - Residue,Total Filtrable (Dried At	mg/l	148
1st - RY2012	MNGW-1	40940	0	TDS - Residue,Total Filtrable (Dried At	mg/l	302
1st - RY2012	MNGW-1	40940	1	TDS - Residue,Total Filtrable (Dried At	mg/l	308
2nd - RY1997	MNGW-1	35562	0	Temperature, Water	^oC	5
3rd - RY1997	MNGW-1	35613	0	Temperature, Water	^oC	7.4
4th - RY1997	MNGW-1	35775	0	Temperature, Water	^oC	4.7
1st - RY1998	MNGW-1	35802	0	Temperature, Water	^oC	5.3
2nd - RY1998	MNGW-1	35921	0	Temperature, Water	^oC	5.4
3rd - RY1998	MNGW-1	35984	0	Temperature, Water	^oC	6.6
4th - RY1998	MNGW-1	36082	0	Temperature, Water	^oC	9.1
1st - RY1999	MNGW-1	36173	0	Temperature, Water	^oC	4.4
2nd - RY1999	MNGW-1	36257	0	Temperature, Water	^oC	6.7
3rd - RY1999	MNGW-1	36348	0	Temperature, Water	^oC	5.7
4th - RY1999	MNGW-1	36446	0	Temperature, Water	^oC	8.4
1st - RY2000	MNGW-1	36538	0	Temperature, Water	^oC	40
2nd - RY2000	MNGW-1	36656	0	Temperature, Water	^oC	6
3rd - RY2000	MNGW-1	36719	0	Temperature, Water	^oC	7
4th - RY2000	MNGW-1	36872	0	Temperature, Water	^oC	5.6
1st - RY2001	MNGW-1	36957	0	Temperature, Water	^oC	5.6
2nd - RY2001	MNGW-1	36985	0	Temperature, Water	^oC	5.6
3rd - RY2001	MNGW-1	37083	0	Temperature, Water	^oC	8.3
4th - RY2001	MNGW-1	37167	0	Temperature, Water	^oC	8.7
1st - RY2002	MNGW-1	37258	0	Temperature, Water	^oC	2.3
2nd - RY2002	MNGW-1	37349	0	Temperature, Water	^oC	8.4
3rd - RY2002	MNGW-1	37503	0	Temperature, Water	^oC	10.2
4th - RY2002	MNGW-1	37532	0	Temperature, Water	^oC	7.9
2nd - RY2003	MNGW-1	37792	0	Temperature, Water	^oC	6.2
3rd - RY2003	MNGW-1	37846	0	Temperature, Water	^oC	8.8
4th - RY2003	MNGW-1	37916	0	Temperature, Water	^oC	6.4
1st - RY2004	MNGW-1	38035	0	Temperature, Water	^oC	5.3
2nd - RY2004	MNGW-1	38147	0	Temperature, Water	^oC	6.9
3rd - RY2004	MNGW-1	38238	0	Temperature, Water	^oC	9.3
4th - RY2004	MNGW-1	38280	0	Temperature, Water	^oC	7.3
1st - RY2005	MNGW-1	38420	0	Temperature, Water	^oC	4.1
3rd - RY2005	MNGW-1	38553	0	Temperature, Water	^oC	9.1
4th - RY2005	MNGW-1	38665	0	Temperature, Water	^oC	7.6
1st - RY2006	MNGW-1	38756	0	Temperature, Water	^oC	5.4
3rd - RY2006	MNGW-1	38910	0	Temperature, Water	^oC	10.2
3rd - RY2006	MNGW-1	38980	0	Temperature, Water	^oC	7.9
4th - RY2006	MNGW-1	39016	0	Temperature, Water	^oC	6.9
1st - RY2007	MNGW-1	39148	0	Temperature, Water	^oC	4
3rd - RY2007	MNGW-1	39294	0	Temperature, Water	^oC	7.5

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
3rd - RY2007	MNGW-1	39351	0	Temperature, Water	^{o}C	7.4
4th - RY2007	MNGW-1	39373	0	Temperature, Water	^{o}C	7.1
1st - RY2008	MNGW-1	39535	0	Temperature, Water	^{o}C	4.8
1st - RY2009	MNGW-1	39862	0	Temperature, Water	^{o}C	3.6
3rd - RY2009	MNGW-1	40009	0	Temperature, Water	^{o}C	4.5
3rd - RY2009	MNGW-1	40065	0	Temperature, Water	^{o}C	6.6
4th - RY2009	MNGW-1	40121	0	Temperature, Water	^{o}C	5.9
1st - RY2010	MNGW-1	40226	0	Temperature, Water	^{o}C	4.4
3rd - RY2010	MNGW-1	40380	0	Temperature, Water	^{o}C	6.2
3rd - RY2010	MNGW-1	40443	0	Temperature, Water	^{o}C	7.1
4th - RY2010	MNGW-1	40464	0	Temperature, Water	^{o}C	7.3
1st - RY2011	MNGW-1	40596	0	Temperature, Water	^{o}C	3.7
3rd - RY2011	MNGW-1	40800	0	Temperature, Water	^{o}C	7.3
4th - RY2011	MNGW-1	40835	1	Temperature, Water	^{o}C	6.1
1st - RY2012	MNGW-1	40940	0	Thallium, Dissolved	ug/l as Tl	0.081
1st - RY2012	MNGW-1	40940	1	Thallium, Dissolved	ug/l as Tl	<0.068
1st - RY2012	MNGW-1	40940	0	Total Suspend Solids (Tot. Nonfilterab	mg	228
1st - RY2012	MNGW-1	40940	1	Total Suspend Solids (Tot. Nonfilterab	mg	277
1st - RY2012	MNGW-1	40940	0	Total Well Depth	Feet	15.29
2nd - RY1995	MNGW-1	34814	0	Uranium, Natural, Dissolved	ug/l	46
2nd - RY1995	MNGW-1	34863	0	Uranium, Natural, Dissolved	ug/l	4
3rd - RY1995	MNGW-1	34920	0	Uranium, Natural, Dissolved	ug/l	<2
4th - RY1995	MNGW-1	34996	0	Uranium, Natural, Dissolved	ug/l	<2
1st - RY1996	MNGW-1	35128	0	Uranium, Natural, Dissolved	ug/l	36
2nd - RY1996	MNGW-1	35184	0	Uranium, Natural, Dissolved	ug/l	30
3rd - RY1996	MNGW-1	35277	0	Uranium, Natural, Dissolved	ug/l	2
4th - RY2010	MNGW-1	40464	0	Uranium, Natural, Dissolved	ug/l	2.7
1st - RY2011	MNGW-1	40596	0	Uranium, Natural, Dissolved	ug/l	0.67
3rd - RY2011	MNGW-1	40744	0	Uranium, Natural, Dissolved	ug/l	0.22
3rd - RY2011	MNGW-1	40800	0	Uranium, Natural, Dissolved	ug/l	0.17
4th - RY2011	MNGW-1	40835	1	Uranium, Natural, Dissolved	ug/l	0.26
1st - RY2012	MNGW-1	40940	0	Uranium, Natural, Dissolved	ug/l	1.4
1st - RY2012	MNGW-1	40940	1	Uranium, Natural, Dissolved	ug/l	1.3
3rd - RY2009	MNGW-1	40009	0	Water Level,Distance From Measuring	Feet	4.6
1st - RY2012	MNGW-1	40940	0	Water Level,Distance From Measuring	Feet	14
2nd - RY1995	MNGW-1	34814	0	Zinc, Dissolved	ug/l as Zn	<20
2nd - RY1995	MNGW-1	34863	0	Zinc, Dissolved	ug/l as Zn	80
3rd - RY1995	MNGW-1	34920	0	Zinc, Dissolved	ug/l as Zn	<20
4th - RY1995	MNGW-1	34996	0	Zinc, Dissolved	ug/l as Zn	<20
1st - RY1996	MNGW-1	35128	0	Zinc, Dissolved	ug/l as Zn	<20
2nd - RY1996	MNGW-1	35184	0	Zinc, Dissolved	ug/l as Zn	<20
3rd - RY1996	MNGW-1	35277	0	Zinc, Dissolved	ug/l as Zn	20
4th - RY1996	MNGW-1	35347	0	Zinc, Dissolved	ug/l as Zn	<10
2nd - RY1997	MNGW-1	35562	0	Zinc, Dissolved	ug/l as Zn	10
3rd - RY1997	MNGW-1	35613	0	Zinc, Dissolved	ug/l as Zn	20
4th - RY1997	MNGW-1	35775	0	Zinc, Dissolved	ug/l as Zn	40
1st - RY1998	MNGW-1	35802	0	Zinc, Dissolved	ug/l as Zn	290
2nd - RY1998	MNGW-1	35921	0	Zinc, Dissolved	ug/l as Zn	50
3rd - RY1998	MNGW-1	35984	0	Zinc, Dissolved	ug/l as Zn	10
4th - RY1998	MNGW-1	36082	0	Zinc, Dissolved	ug/l as Zn	650
1st - RY1999	MNGW-1	36173	0	Zinc, Dissolved	ug/l as Zn	70
2nd - RY1999	MNGW-1	36257	0	Zinc, Dissolved	ug/l as Zn	60
3rd - RY1999	MNGW-1	36348	0	Zinc, Dissolved	ug/l as Zn	10

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY1999	MNGW-1	36446	0	Zinc, Dissolved	ug/l as Zn	340
1st - RY2000	MNGW-1	36538	0	Zinc, Dissolved	ug/l as Zn	20
2nd - RY2000	MNGW-1	36656	0	Zinc, Dissolved	ug/l as Zn	20
3rd - RY2000	MNGW-1	36719	0	Zinc, Dissolved	ug/l as Zn	10
4th - RY2000	MNGW-1	36872	0	Zinc, Dissolved	ug/l as Zn	59
1st - RY2001	MNGW-1	36957	0	Zinc, Dissolved	ug/l as Zn	44
2nd - RY2001	MNGW-1	36985	0	Zinc, Dissolved	ug/l as Zn	208
3rd - RY2001	MNGW-1	37083	0	Zinc, Dissolved	ug/l as Zn	24
4th - RY2001	MNGW-1	37167	0	Zinc, Dissolved	ug/l as Zn	20.9
1st - RY2002	MNGW-1	37258	0	Zinc, Dissolved	ug/l as Zn	34.4
2nd - RY2002	MNGW-1	37349	0	Zinc, Dissolved	ug/l as Zn	24
3rd - RY2002	MNGW-1	37503	0	Zinc, Dissolved	ug/l as Zn	<20
4th - RY2002	MNGW-1	37532	0	Zinc, Dissolved	ug/l as Zn	<20
2nd - RY2003	MNGW-1	37792	0	Zinc, Dissolved	ug/l as Zn	10
3rd - RY2003	MNGW-1	37846	0	Zinc, Dissolved	ug/l as Zn	20
4th - RY2003	MNGW-1	37916	0	Zinc, Dissolved	ug/l as Zn	20
1st - RY2004	MNGW-1	38035	0	Zinc, Dissolved	ug/l as Zn	40
2nd - RY2004	MNGW-1	38147	0	Zinc, Dissolved	ug/l as Zn	10
3rd - RY2004	MNGW-1	38238	0	Zinc, Dissolved	ug/l as Zn	10
4th - RY2004	MNGW-1	38280	0	Zinc, Dissolved	ug/l as Zn	20
1st - RY2005	MNGW-1	38420	0	Zinc, Dissolved	ug/l as Zn	20
3rd - RY2005	MNGW-1	38553	0	Zinc, Dissolved	ug/l as Zn	<10
3rd - RY2005	MNGW-1	38609	0	Zinc, Dissolved	ug/l as Zn	<20
4th - RY2005	MNGW-1	38665	0	Zinc, Dissolved	ug/l as Zn	20
1st - RY2006	MNGW-1	38756	0	Zinc, Dissolved	ug/l as Zn	40
3rd - RY2006	MNGW-1	38910	0	Zinc, Dissolved	ug/l as Zn	<10
3rd - RY2006	MNGW-1	38980	0	Zinc, Dissolved	ug/l as Zn	20
4th - RY2006	MNGW-1	39016	0	Zinc, Dissolved	ug/l as Zn	60
1st - RY2007	MNGW-1	39148	0	Zinc, Dissolved	ug/l as Zn	30
3rd - RY2007	MNGW-1	39294	0	Zinc, Dissolved	ug/l as Zn	<10
3rd - RY2007	MNGW-1	39351	0	Zinc, Dissolved	ug/l as Zn	<10
4th - RY2007	MNGW-1	39373	0	Zinc, Dissolved	ug/l as Zn	40
1st - RY2008	MNGW-1	39535	0	Zinc, Dissolved	ug/l as Zn	20
3rd - RY2008	MNGW-1	39659	0	Zinc, Dissolved	ug/l as Zn	12.7
3rd - RY2008	MNGW-1	39715	0	Zinc, Dissolved	ug/l as Zn	<30
1st - RY2009	MNGW-1	39862	0	Zinc, Dissolved	ug/l as Zn	19.7
3rd - RY2009	MNGW-1	40009	0	Zinc, Dissolved	ug/l as Zn	14.9
3rd - RY2009	MNGW-1	40065	0	Zinc, Dissolved	ug/l as Zn	8.27
4th - RY2009	MNGW-1	40121	0	Zinc, Dissolved	ug/l as Zn	13.2
1st - RY2010	MNGW-1	40226	0	Zinc, Dissolved	ug/l as Zn	24.4
3rd - RY2010	MNGW-1	40380	0	Zinc, Dissolved	ug/l as Zn	399
3rd - RY2010	MNGW-1	40443	0	Zinc, Dissolved	ug/l as Zn	9.3
4th - RY2010	MNGW-1	40464	0	Zinc, Dissolved	ug/l as Zn	80.2
1st - RY2011	MNGW-1	40596	0	Zinc, Dissolved	ug/l as Zn	20.4
3rd - RY2011	MNGW-1	40744	0	Zinc, Dissolved	ug/l as Zn	7.2
3rd - RY2011	MNGW-1	40800	0	Zinc, Dissolved	ug/l as Zn	8.8
4th - RY2011	MNGW-1	40835	1	Zinc, Dissolved	ug/l as Zn	19.8
1st - RY2012	MNGW-1	40940	0	Zinc, Dissolved	ug/l as Zn	24
1st - RY2012	MNGW-1	40940	1	Zinc, Dissolved	ug/l as Zn	24.3

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY1994	MLGW-7	03/28/1994	0	Alkalinity, Total	mg/l as CaCO3	48
2nd - RY1994	MLGW-7	06/23/1994	0	Alkalinity, Total	mg/l as CaCO3	58
3rd - RY1994	MLGW-7	09/28/1994	0	Alkalinity, Total	mg/l as CaCO3	40
4th - RY1994	MLGW-7	12/20/1994	0	Alkalinity, Total	mg/l as CaCO3	43
2nd - RY2007	MLGW-7	05/17/2007	0	Alkalinity, Total	mg/l as CaCO3	38
2nd - RY2007	MLGW-7	06/21/2007	0	Alkalinity, Total	mg/l as CaCO3	43
3rd - RY2007	MLGW-7	07/26/2007	0	Alkalinity, Total	mg/l as CaCO3	48
3rd - RY2007	MLGW-7	08/23/2007	0	Alkalinity, Total	mg/l as CaCO3	51
4th - RY2007	MLGW-7	10/30/2007	0	Alkalinity, Total	mg/l as CaCO3	55
4th - RY2007	MLGW-7	11/29/2007	0	Alkalinity, Total	mg/l as CaCO3	53
4th - RY2007	MLGW-7	12/20/2007	0	Alkalinity, Total	mg/l as CaCO3	51
1st - RY2008	MLGW-7	01/29/2008	0	Alkalinity, Total	mg/l as CaCO3	51
1st - RY2008	MLGW-7	02/28/2008	0	Alkalinity, Total	mg/l as CaCO3	54
2nd - RY2008	MLGW-7	05/29/2008	0	Alkalinity, Total	mg/l as CaCO3	41
3rd - RY2008	MLGW-7	09/30/2008	0	Alkalinity, Total	mg/l as CaCO3	43.8
4th - RY2008	MLGW-7	12/31/2008	0	Alkalinity, Total	mg/l as CaCO3	41.9
1st - RY2009	MLGW-7	02/26/2009	0	Alkalinity, Total	mg/l as CaCO3	41.2
2nd - RY2009	MLGW-7	06/11/2009	0	Alkalinity, Total	mg/l as CaCO3	38.4
3rd - RY2009	MLGW-7	08/18/2009	0	Alkalinity, Total	mg/l as CaCO3	46.3
3rd - RY2009	MLGW-7	09/29/2009	0	Alkalinity, Total	mg/l as CaCO3	45.3
4th - RY2009	MLGW-7	10/12/2009	0	Alkalinity, Total	mg/l as CaCO3	44.5
4th - RY2009	MLGW-7	12/08/2009	0	Alkalinity, Total	mg/l as CaCO3	47.5
1st - RY2010	MLGW-7	02/18/2010	0	Alkalinity, Total	mg/l as CaCO3	44.4
1st - RY2010	MLGW-7	03/16/2010	0	Alkalinity, Total	mg/l as CaCO3	43.5
2nd - RY2010	MLGW-7	06/22/2010	0	Alkalinity, Total	mg/l as CaCO3	39.7
2nd - RY2010	MLGW-7	06/29/2010	0	Alkalinity, Total	mg/l as CaCO3	38.7
3rd - RY2010	MLGW-7	08/10/2010	0	Alkalinity, Total	mg/l as CaCO3	47.6
4th - RY2010	MLGW-7	10/19/2010	0	Alkalinity, Total	mg/l as CaCO3	48.1
1st - RY2011	MLGW-7	02/15/2011	0	Alkalinity, Total	mg/l as CaCO3	48.2
2nd - RY2011	MLGW-7	06/14/2011	0	Alkalinity, Total	mg/l as CaCO3	42
3rd - RY2011	MLGW-7	08/16/2011	0	Alkalinity, Total	mg/l as CaCO3	45.3
4th - RY2011	MLGW-7	10/25/2011	0	Alkalinity, Total	mg/l as CaCO3	44.7
4th - RY2011	MLGW-7	10/25/2011	1	Alkalinity, Total	mg/l as CaCO3	44.5
1st - RY2000	MLGW-7	01/21/2000	0	Aluminum, Dissolved	ug/l as Al	<30
2nd - RY2007	MLGW-7	05/17/2007	0	Aluminum, Dissolved	ug/l as Al	<30
2nd - RY2007	MLGW-7	06/21/2007	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY2007	MLGW-7	07/26/2007	0	Aluminum, Dissolved	ug/l as Al	<30
3rd - RY2007	MLGW-7	08/23/2007	0	Aluminum, Dissolved	ug/l as Al	70
4th - RY2007	MLGW-7	10/30/2007	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY2007	MLGW-7	11/29/2007	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY2007	MLGW-7	12/20/2007	0	Aluminum, Dissolved	ug/l as Al	<30
1st - RY2008	MLGW-7	01/29/2008	0	Aluminum, Dissolved	ug/l as Al	<30
1st - RY2008	MLGW-7	02/28/2008	0	Aluminum, Dissolved	ug/l as Al	50
2nd - RY2008	MLGW-7	05/29/2008	0	Aluminum, Dissolved	ug/l as Al	<30
4th - RY2010	MLGW-7	10/19/2010	0	Aluminum, Dissolved	ug/l as Al	<11
1st - RY2011	MLGW-7	02/15/2011	0	Aluminum, Dissolved	ug/l as Al	<11
2nd - RY2011	MLGW-7	06/14/2011	0	Aluminum, Dissolved	ug/l as Al	<11
3rd - RY2011	MLGW-7	08/16/2011	0	Aluminum, Dissolved	ug/l as Al	<9.6
4th - RY2011	MLGW-7	10/25/2011	0	Aluminum, Dissolved	ug/l as Al	17.8
4th - RY2011	MLGW-7	10/25/2011	1	Aluminum, Dissolved	ug/l as Al	18.6
1st - RY2000	MLGW-7	01/21/2000	0	Arsenic, Dissolved	ug/l as As	<1
2nd - RY2007	MLGW-7	06/21/2007	0	Arsenic, Dissolved	ug/l as As	<0.5
4th - RY2007	MLGW-7	10/30/2007	0	Arsenic, Dissolved	ug/l as As	<0.5
4th - RY2007	MLGW-7	11/29/2007	0	Arsenic, Dissolved	ug/l as As	<0.5

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2007	MLGW-7	12/20/2007	0	Arsenic, Dissolved	ug/l as As	<0.5
2nd - RY2008	MLGW-7	05/29/2008	0	Arsenic, Dissolved	ug/l as As	<0.5
4th - RY2010	MLGW-7	10/19/2010	0	Arsenic, Dissolved	ug/l as As	<0.62
1st - RY2011	MLGW-7	02/15/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
2nd - RY2011	MLGW-7	06/14/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
3rd - RY2011	MLGW-7	08/16/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
4th - RY2011	MLGW-7	10/25/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
4th - RY2011	MLGW-7	10/25/2011	1	Arsenic, Dissolved	ug/l as As	<0.38
3rd - RY1993	MLGW-7	09/30/1993	0	Cadmium, Dissolved	ug/l as Cd	<0.3
1st - RY1994	MLGW-7	03/28/1994	0	Cadmium, Dissolved	ug/l as Cd	<0.3
2nd - RY1994	MLGW-7	06/23/1994	0	Cadmium, Dissolved	ug/l as Cd	<0.3
3rd - RY1994	MLGW-7	09/28/1994	0	Cadmium, Dissolved	ug/l as Cd	<0.3
4th - RY1994	MLGW-7	12/20/1994	0	Cadmium, Dissolved	ug/l as Cd	<0.3
1st - RY2000	MLGW-7	01/21/2000	0	Cadmium, Dissolved	ug/l as Cd	<3
2nd - RY2007	MLGW-7	06/21/2007	0	Cadmium, Dissolved	ug/l as Cd	<0.1
4th - RY2007	MLGW-7	10/30/2007	0	Cadmium, Dissolved	ug/l as Cd	<0.1
4th - RY2007	MLGW-7	11/29/2007	0	Cadmium, Dissolved	ug/l as Cd	<0.1
4th - RY2007	MLGW-7	12/20/2007	0	Cadmium, Dissolved	ug/l as Cd	<0.1
2nd - RY2008	MLGW-7	05/29/2008	0	Cadmium, Dissolved	ug/l as Cd	<0.1
4th - RY2010	MLGW-7	10/19/2010	0	Cadmium, Dissolved	ug/l as Cd	0.16
1st - RY2011	MLGW-7	02/15/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
2nd - RY2011	MLGW-7	06/14/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
3rd - RY2011	MLGW-7	08/16/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
4th - RY2011	MLGW-7	10/25/2011	0	Cadmium, Dissolved	ug/l as Cd	0.11
4th - RY2011	MLGW-7	10/25/2011	1	Cadmium, Dissolved	ug/l as Cd	<0.11
1st - RY1994	MLGW-7	03/28/1994	0	Calcium, Dissolved	ug/l as Ca	25,300
2nd - RY1994	MLGW-7	06/23/1994	0	Calcium, Dissolved	ug/l as Ca	23,400
3rd - RY1994	MLGW-7	09/28/1994	0	Calcium, Dissolved	ug/l as Ca	22,600
4th - RY1994	MLGW-7	12/20/1994	0	Calcium, Dissolved	ug/l as Ca	23,300
2nd - RY2007	MLGW-7	05/17/2007	0	Calcium, Dissolved	ug/l as Ca	67,000
2nd - RY2007	MLGW-7	06/21/2007	0	Calcium, Dissolved	ug/l as Ca	62,300
3rd - RY2007	MLGW-7	07/26/2007	0	Calcium, Dissolved	ug/l as Ca	53,900
3rd - RY2007	MLGW-7	08/23/2007	0	Calcium, Dissolved	ug/l as Ca	46,400
4th - RY2007	MLGW-7	10/30/2007	0	Calcium, Dissolved	ug/l as Ca	41,100
4th - RY2007	MLGW-7	11/29/2007	0	Calcium, Dissolved	ug/l as Ca	43,600
4th - RY2007	MLGW-7	12/20/2007	0	Calcium, Dissolved	ug/l as Ca	46,600
1st - RY2008	MLGW-7	01/29/2008	0	Calcium, Dissolved	ug/l as Ca	50,100
1st - RY2008	MLGW-7	02/28/2008	0	Calcium, Dissolved	ug/l as Ca	47,200
2nd - RY2008	MLGW-7	05/29/2008	0	Calcium, Dissolved	ug/l as Ca	67,800
3rd - RY2009	MLGW-7	09/29/2009	0	Calcium, Dissolved	ug/l as Ca	70,000
4th - RY209	MLGW-7	12/08/2009	0	Calcium, Dissolved	ug/l as Ca	80,000
1st - RY2010	MLGW-7	03/16/2010	0	Calcium, Dissolved	ug/l as Ca	98,100
2nd - RY2010	MLGW-7	06/29/2010	0	Calcium, Dissolved	ug/l as Ca	67,100
3rd - RY2011	MLGW-7	08/16/2011	0	Calcium, Dissolved	ug/l as Ca	53,800
4th - RY2011	MLGW-7	10/25/2011	0	Calcium, Dissolved	ug/l as Ca	40,300
4th - RY2011	MLGW-7	10/25/2011	1	Calcium, Dissolved	ug/l as Ca	40,300
3rd - RY2009	MLGW-7	09/29/2009	0	Carbon, Total Organic	mg/l as C	1.6
4th - RY2009	MLGW-7	12/08/2009	0	Carbon, Total Organic	mg/l as C	1.4
1st - RY2010	MLGW-7	03/16/2010	0	Carbon, Total Organic	mg/l as C	2.4
2nd - RY2010	MLGW-7	06/29/2010	0	Carbon, Total Organic	mg/l as C	1.5
3rd - RY2011	MLGW-7	08/16/2011	0	Carbon, Total Organic	mg/l as C	2
4th - RY2011	MLGW-7	10/25/2011	0	Carbon, Total Organic	mg/l as C	1.7
4th - RY2011	MLGW-7	10/25/2011	1	Carbon, Total Organic	mg/l as C	1.7
1st - RY1994	MLGW-7	03/28/1994	0	Chloride,Total in Water	mg/l	9.3

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2nd - RY1994	MLGW-7	06/23/1994	0	Chloride,Total in Water	mg/l	5.6
3rd - RY1994	MLGW-7	09/28/1994	0	Chloride,Total in Water	mg/l	6.9
4th - RY1994	MLGW-7	12/20/1994	0	Chloride,Total in Water	mg/l	7.1
4th - RY1995	MLGW-7	10/03/1995	0	Chloride,Total in Water	mg/l	7.1
2nd - RY1996	MLGW-7	06/04/1996	0	Chloride,Total in Water	mg/l	6.6
3rd - RY1996	MLGW-7	09/10/1996	0	Chloride,Total in Water	mg/l	8
2nd - RY2005	MLGW-7	06/08/2005	0	Chloride,Total in Water	mg/l	29
3rd - RY2005	MLGW-7	08/19/2005	0	Chloride,Total in Water	mg/l	17
4th - RY2005	MLGW-7	10/19/2005	0	Chloride,Total in Water	mg/l	17
1st - RY2006	MLGW-7	02/22/2006	0	Chloride,Total in Water	mg/l	15
2nd - RY2006	MLGW-7	06/28/2006	0	Chloride,Total in Water	mg/l	9
3rd - RY2006	MLGW-7	08/30/2006	0	Chloride,Total in Water	mg/l	11
4th - RY2006	MLGW-7	10/10/2006	0	Chloride,Total in Water	mg/l	14
1st - RY2007	MLGW-7	02/14/2007	0	Chloride,Total in Water	mg/l	79
2nd - RY2007	MLGW-7	05/17/2007	0	Chloride,Total in Water	mg/l	49
2nd - RY2007	MLGW-7	06/21/2007	0	Chloride,Total in Water	mg/l	42
3rd - RY2007	MLGW-7	07/26/2007	0	Chloride,Total in Water	mg/l	32
3rd - RY2007	MLGW-7	08/23/2007	0	Chloride,Total in Water	mg/l	24
4th - RY2007	MLGW-7	10/30/2007	0	Chloride,Total in Water	mg/l	21
4th - RY2007	MLGW-7	11/29/2007	0	Chloride,Total in Water	mg/l	21
4th - RY2007	MLGW-7	12/20/2007	0	Chloride,Total in Water	mg/l	24
1st - RY2008	MLGW-7	01/29/2008	0	Chloride,Total in Water	mg/l	25
1st - RY2008	MLGW-7	02/28/2008	0	Chloride,Total in Water	mg/l	31
1st - RY2008	MLGW-7	03/31/2008	0	Chloride,Total in Water	mg/l	38
2nd - RY2008	MLGW-7	05/29/2008	0	Chloride,Total in Water	mg/l	41
2nd - RY2008	MLGW-7	06/27/2008	0	Chloride,Total in Water	mg/l	45
3rd - RY2008	MLGW-7	09/30/2008	0	Chloride,Total in Water	mg/l	40
4th - RY2008	MLGW-7	12/31/2008	0	Chloride,Total in Water	mg/l	60.9
1st - RY2009	MLGW-7	02/26/2009	0	Chloride,Total in Water	mg/l	80.2
2nd - RY2009	MLGW-7	06/11/2009	0	Chloride,Total in Water	mg/l	59.5
3rd - RY2009	MLGW-7	08/18/2009	0	Chloride,Total in Water	mg/l	34.2
3rd - RY2009	MLGW-7	09/29/2009	0	Chloride,Total in Water	mg/l	40.4
4th - RY2009	MLGW-7	10/12/2009	0	Chloride,Total in Water	mg/l	40.1
1st - RY2010	MLGW-7	02/18/2010	0	Chloride,Total in Water	mg/l	53.6
1st - RY2010	MLGW-7	03/16/2010	0	Chloride,Total in Water	mg/l	57.7
2nd - RY2010	MLGW-7	06/22/2010	0	Chloride,Total in Water	mg/l	40.1
2nd - RY2010	MLGW-7	06/29/2010	0	Chloride,Total in Water	mg/l	36.7
3rd - RY2010	MLGW-7	08/10/2010	0	Chloride,Total in Water	mg/l	25.9
4th - RY2010	MLGW-7	10/19/2010	0	Chloride,Total in Water	mg/l	29.3
1st - RY2011	MLGW-7	02/15/2011	0	Chloride,Total in Water	mg/l	44.2
2nd - RY2011	MLGW-7	06/14/2011	0	Chloride,Total in Water	mg/l	44.5
3rd - RY2011	MLGW-7	08/16/2011	0	Chloride,Total in Water	mg/l	30.2
4th - RY2011	MLGW-7	10/25/2011	0	Chloride,Total in Water	mg/l	28.3
4th - RY2011	MLGW-7	10/25/2011	1	Chloride,Total in Water	mg/l	28.2
3rd - RY1993	MLGW-7	09/30/1993	0	Copper, Dissolved	ug/l as Cu	<20
1st - RY1994	MLGW-7	03/28/1994	0	Copper, Dissolved	ug/l as Cu	<20
2nd - RY1994	MLGW-7	06/23/1994	0	Copper, Dissolved	ug/l as Cu	<20
3rd - RY1994	MLGW-7	09/28/1994	0	Copper, Dissolved	ug/l as Cu	<20
4th - RY1994	MLGW-7	12/20/1994	0	Copper, Dissolved	ug/l as Cu	<20
1st - RY2000	MLGW-7	01/21/2000	0	Copper, Dissolved	ug/l as Cu	<10
2nd - RY2007	MLGW-7	06/21/2007	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2007	MLGW-7	10/30/2007	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2007	MLGW-7	11/29/2007	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2007	MLGW-7	12/20/2007	0	Copper, Dissolved	ug/l as Cu	<10

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2nd - RY2008	MLGW-7	05/29/2008	0	Copper, Dissolved	ug/l as Cu	<10
4th - RY2010	MLGW-7	10/19/2010	0	Copper, Dissolved	ug/l as Cu	1.8
1st - RY2011	MLGW-7	02/15/2011	0	Copper, Dissolved	ug/l as Cu	1.3
2nd - RY2011	MLGW-7	06/14/2011	0	Copper, Dissolved	ug/l as Cu	3.5
3rd - RY2011	MLGW-7	08/16/2011	0	Copper, Dissolved	ug/l as Cu	1.4
4th - RY2011	MLGW-7	10/25/2011	0	Copper, Dissolved	ug/l as Cu	3.2
4th - RY2011	MLGW-7	10/25/2011	1	Copper, Dissolved	ug/l as Cu	3.2
3rd - RY1993	MLGW-7	09/30/1993	0	Fluoride, Total	mg/l as F	0.3
4th - RY1993	MLGW-7	11/30/1993	0	Fluoride, Total	mg/l as F	0.2
1st - RY1994	MLGW-7	03/28/1994	0	Fluoride, Total	mg/l as F	0.3
2nd - RY1994	MLGW-7	06/23/1994	0	Fluoride, Total	mg/l as F	0.25
3rd - RY1994	MLGW-7	09/28/1994	0	Fluoride, Total	mg/l as F	0.26
4th - RY1994	MLGW-7	12/20/1994	0	Fluoride, Total	mg/l as F	0.3
2nd - RY2007	MLGW-7	05/17/2007	0	Fluoride, Total	mg/l as F	0.1
2nd - RY2007	MLGW-7	06/21/2007	0	Fluoride, Total	mg/l as F	<0.1
3rd - RY2007	MLGW-7	07/26/2007	0	Fluoride, Total	mg/l as F	0.4
3rd - RY2007	MLGW-7	08/23/2007	0	Fluoride, Total	mg/l as F	0.1
4th - RY2007	MLGW-7	10/30/2007	0	Fluoride, Total	mg/l as F	0.1
4th - RY2007	MLGW-7	11/29/2007	0	Fluoride, Total	mg/l as F	0.1
4th - RY2007	MLGW-7	12/20/2007	0	Fluoride, Total	mg/l as F	0.1
1st - RY2008	MLGW-7	01/29/2008	0	Fluoride, Total	mg/l as F	0.1
1st - RY2008	MLGW-7	02/28/2008	0	Fluoride, Total	mg/l as F	0.2
3rd - RY1993	MLGW-7	09/30/1993	0	Iron, Dissolved	ug/l as Fe	<20
4th - RY1993	MLGW-7	11/30/1993	0	Iron, Dissolved	ug/l as Fe	<20
1st - RY1994	MLGW-7	03/28/1994	0	Iron, Dissolved	ug/l as Fe	120
2nd - RY1994	MLGW-7	06/23/1994	0	Iron, Dissolved	ug/l as Fe	<20
3rd - RY1994	MLGW-7	09/28/1994	0	Iron, Dissolved	ug/l as Fe	20
4th - RY1994	MLGW-7	12/20/1994	0	Iron, Dissolved	ug/l as Fe	20
1st - RY2000	MLGW-7	01/21/2000	0	Iron, Dissolved	ug/l as Fe	<10
2nd - RY2007	MLGW-7	05/17/2007	0	Iron, Dissolved	ug/l as Fe	<20
2nd - RY2007	MLGW-7	06/21/2007	0	Iron, Dissolved	ug/l as Fe	20
3rd - RY2007	MLGW-7	07/26/2007	0	Iron, Dissolved	ug/l as Fe	<20
3rd - RY2007	MLGW-7	08/23/2007	0	Iron, Dissolved	ug/l as Fe	<20
4th - RY2007	MLGW-7	10/30/2007	0	Iron, Dissolved	ug/l as Fe	20
4th - RY2007	MLGW-7	11/29/2007	0	Iron, Dissolved	ug/l as Fe	<20
4th - RY2007	MLGW-7	12/20/2007	0	Iron, Dissolved	ug/l as Fe	<20
1st - RY2008	MLGW-7	01/29/2008	0	Iron, Dissolved	ug/l as Fe	<20
1st - RY2008	MLGW-7	02/28/2008	0	Iron, Dissolved	ug/l as Fe	<20
2nd - RY2008	MLGW-7	05/29/2008	0	Iron, Dissolved	ug/l as Fe	<20
4th - RY2011	MLGW-7	10/25/2011	0	Iron, Dissolved	ug/l as Fe	292
4th - RY2011	MLGW-7	10/25/2011	1	Iron, Dissolved	ug/l as Fe	285
3rd - RY1993	MLGW-7	09/30/1993	0	Lead, Dissolved	ug/l as Pb	<1
1st - RY1994	MLGW-7	03/28/1994	0	Lead, Dissolved	ug/l as Pb	<1
2nd - RY1994	MLGW-7	06/23/1994	0	Lead, Dissolved	ug/l as Pb	<1
3rd - RY1994	MLGW-7	09/28/1994	0	Lead, Dissolved	ug/l as Pb	<1
4th - RY1994	MLGW-7	12/20/1994	0	Lead, Dissolved	ug/l as Pb	<1
1st - RY2000	MLGW-7	01/21/2000	0	Lead, Dissolved	ug/l as Pb	<40
2nd - RY207	MLGW-7	06/21/2007	0	Lead, Dissolved	ug/l as Pb	<0.1
4th - RY2007	MLGW-7	10/30/2007	0	Lead, Dissolved	ug/l as Pb	<0.1
4th - RY2007	MLGW-7	11/29/2007	0	Lead, Dissolved	ug/l as Pb	0.1
4th - RY2007	MLGW-7	12/20/2007	0	Lead, Dissolved	ug/l as Pb	<0.1
2nd - RY2008	MLGW-7	05/29/2008	0	Lead, Dissolved	ug/l as Pb	<0.1
3rd - RY1993	MLGW-7	09/30/1993	0	Magnesium, Dissolved	ug/l as Mg	4,390
4th - RY1993	MLGW-7	11/30/1993	0	Magnesium, Dissolved	ug/l as Mg	4,170

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1st - RY1994	MLGW-7	03/28/1994	0	Magnesium, Dissolved	ug/l as Mg	4,810
2nd - RY1994	MLGW-7	06/23/1994	0	Magnesium, Dissolved	ug/l as Mg	4,460
3rd - RY1994	MLGW-7	09/28/1994	0	Magnesium, Dissolved	ug/l as Mg	4,720
4th - RY1994	MLGW-7	12/20/1994	0	Magnesium, Dissolved	ug/l as Mg	4,640
2nd - RY2007	MLGW-7	05/17/2007	0	Magnesium, Dissolved	ug/l as Mg	13,700
2nd - RY2007	MLGW-7	06/21/2007	0	Magnesium, Dissolved	ug/l as Mg	12,700
3rd - RY2007	MLGW-7	07/26/2007	0	Magnesium, Dissolved	ug/l as Mg	11,000
3rd - RY2007	MLGW-7	08/23/2007	0	Magnesium, Dissolved	ug/l as Mg	9,300
4th - RY207	MLGW-7	10/30/2007	0	Magnesium, Dissolved	ug/l as Mg	8,200
4th - RY2007	MLGW-7	11/29/2007	0	Magnesium, Dissolved	ug/l as Mg	8,900
4th - RY2007	MLGW-7	12/20/2007	0	Magnesium, Dissolved	ug/l as Mg	9,400
1st - RY2008	MLGW-7	01/29/2008	0	Magnesium, Dissolved	ug/l as Mg	10,200
1st - RY2008	MLGW-7	02/28/2008	0	Magnesium, Dissolved	ug/l as Mg	9,600
2nd - RY2008	MLGW-7	05/29/2008	0	Magnesium, Dissolved	ug/l as Mg	13,900
3rd - RY2009	MLGW-7	09/29/2009	0	Magnesium, Dissolved	ug/l as Mg	14,000
4th - RY2009	MLGW-7	12/08/2009	0	Magnesium, Dissolved	ug/l as Mg	16,000
1st - RY2010	MLGW-7	03/16/2010	0	Magnesium, Dissolved	ug/l as Mg	18,200
2nd - RY2010	MLGW-7	06/29/2010	0	Magnesium, Dissolved	ug/l as Mg	13,900
3rd - RY2011	MLGW-7	08/16/2011	0	Magnesium, Dissolved	ug/l as Mg	10,300
4th - RY2011	MLGW-7	40841	0	Magnesium, Dissolved	ug/l as Mg	9,500
4th - RY2011	MLGW-7	40841	1	Magnesium, Dissolved	ug/l as Mg	9,620
3rd - RY1993	MLGW-7	34242	0	Manganese, Dissolved	ug/l as Mn	450
4th - RY1993	MLGW-7	34303	0	Manganese, Dissolved	ug/l as Mn	<20
1st - RY1994	MLGW-7	34421	0	Manganese, Dissolved	ug/l as Mn	200
2nd - RY1994	MLGW-7	34508	0	Manganese, Dissolved	ug/l as Mn	220
3rd - RY1994	MLGW-7	34605	0	Manganese, Dissolved	ug/l as Mn	<20
4th - RY1994	MLGW-7	34688	0	Manganese, Dissolved	ug/l as Mn	<20
4th - RY1995	MLGW-7	34975	0	Manganese, Dissolved	ug/l as Mn	<20
2nd - RY1996	MLGW-7	35220	0	Manganese, Dissolved	ug/l as Mn	60
3rd - RY1996	MLGW-7	35318	0	Manganese, Dissolved	ug/l as Mn	<20
2nd - RY1997	MLGW-7	35556	0	Manganese, Dissolved	ug/l as Mn	20
3rd - RY1997	MLGW-7	35612	0	Manganese, Dissolved	ug/l as Mn	190
3rd - RY1997	MLGW-7	35650	0	Manganese, Dissolved	ug/l as Mn	98
4th - RY1997	MLGW-7	35779	0	Manganese, Dissolved	ug/l as Mn	33
1st - RY1998	MLGW-7	35801	0	Manganese, Dissolved	ug/l as Mn	29
1st - RY1998	MLGW-7	35829	0	Manganese, Dissolved	ug/l as Mn	28
1st - RY1998	MLGW-7	35864	0	Manganese, Dissolved	ug/l as Mn	11
2nd - RY1998	MLGW-7	35893	0	Manganese, Dissolved	ug/l as Mn	22
2nd - RY1998	MLGW-7	35920	0	Manganese, Dissolved	ug/l as Mn	18
2nd - RY1998	MLGW-7	35948	0	Manganese, Dissolved	ug/l as Mn	11
3rd - RY1998	MLGW-7	35983	0	Manganese, Dissolved	ug/l as Mn	39
3rd - RY1998	MLGW-7	36011	0	Manganese, Dissolved	ug/l as Mn	21
3rd - RY1998	MLGW-7	36046	0	Manganese, Dissolved	ug/l as Mn	77
4th - RY1998	MLGW-7	36081	0	Manganese, Dissolved	ug/l as Mn	23
4th - RY1998	MLGW-7	36109	0	Manganese, Dissolved	ug/l as Mn	48
4th - RY1998	MLGW-7	36137	0	Manganese, Dissolved	ug/l as Mn	58
1st - RY1999	MLGW-7	36172	0	Manganese, Dissolved	ug/l as Mn	22
1st - RY1999	MLGW-7	36200	0	Manganese, Dissolved	ug/l as Mn	62
1st - RY1999	MLGW-7	36228	0	Manganese, Dissolved	ug/l as Mn	17
2nd - RY1999	MLGW-7	36256	0	Manganese, Dissolved	ug/l as Mn	14
2nd - RY1999	MLGW-7	36291	0	Manganese, Dissolved	ug/l as Mn	7
2nd - RY1999	MLGW-7	36314	0	Manganese, Dissolved	ug/l as Mn	68
3rd - RY1999	MLGW-7	36347	0	Manganese, Dissolved	ug/l as Mn	30
3rd - RY1999	MLGW-7	36384	0	Manganese, Dissolved	ug/l as Mn	26

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
3rd - RY1999	MLGW-7	36410	0	Manganese, Dissolved	ug/l as Mn	10
4th - RY1999	MLGW-7	36445	0	Manganese, Dissolved	ug/l as Mn	70
4th - RY1999	MLGW-7	36468	0	Manganese, Dissolved	ug/l as Mn	30
4th - RY1999	MLGW-7	36501	0	Manganese, Dissolved	ug/l as Mn	10
1st - RY2000	MLGW-7	36546	0	Manganese, Dissolved	ug/l as Mn	230
1st - RY2000	MLGW-7	36571	0	Manganese, Dissolved	ug/l as Mn	38
1st - RY2000	MLGW-7	36599	0	Manganese, Dissolved	ug/l as Mn	16
2nd - RY2000	MLGW-7	36634	0	Manganese, Dissolved	ug/l as Mn	19
2nd - RY2000	MLGW-7	36655	0	Manganese, Dissolved	ug/l as Mn	25
2nd - RY2000	MLGW-7	36692	0	Manganese, Dissolved	ug/l as Mn	9
3rd - RY2000	MLGW-7	36720	0	Manganese, Dissolved	ug/l as Mn	21
3rd - RY2000	MLGW-7	36748	0	Manganese, Dissolved	ug/l as Mn	32
3rd - RY2000	MLGW-7	36777	0	Manganese, Dissolved	ug/l as Mn	26
4th - RY2000	MLGW-7	36800	0	Manganese, Dissolved	ug/l as Mn	30
4th - RY2000	MLGW-7	36838	0	Manganese, Dissolved	ug/l as Mn	21
4th - RY2000	MLGW-7	36861	0	Manganese, Dissolved	ug/l as Mn	7
1st - RY2001	MLGW-7	36894	0	Manganese, Dissolved	ug/l as Mn	17
1st - RY2001	MLGW-7	36923	0	Manganese, Dissolved	ug/l as Mn	9
1st - RY2001	MLGW-7	36978	0	Manganese, Dissolved	ug/l as Mn	86
2nd - RY201	MLGW-7	36990	0	Manganese, Dissolved	ug/l as Mn	31
2nd - RY2001	MLGW-7	37014	0	Manganese, Dissolved	ug/l as Mn	26
2nd - RY2001	MLGW-7	37046	0	Manganese, Dissolved	ug/l as Mn	9
3rd - RY2001	MLGW-7	37074	0	Manganese, Dissolved	ug/l as Mn	52
3rd - RY2001	MLGW-7	37104	0	Manganese, Dissolved	ug/l as Mn	19
3rd - RY2011	MLGW-7	37141	0	Manganese, Dissolved	ug/l as Mn	26
4th - RY2001	MLGW-7	37165	0	Manganese, Dissolved	ug/l as Mn	19
4th - RY2001	MLGW-7	37201	0	Manganese, Dissolved	ug/l as Mn	2,040
4th - RY2001	MLGW-7	37230	0	Manganese, Dissolved	ug/l as Mn	32
1st - RY2002	MLGW-7	37264	0	Manganese, Dissolved	ug/l as Mn	63
1st - RY2002	MLGW-7	37294	0	Manganese, Dissolved	ug/l as Mn	21
1st - RY2002	MLGW-7	37322	0	Manganese, Dissolved	ug/l as Mn	32
2nd - RY2002	MLGW-7	37350	0	Manganese, Dissolved	ug/l as Mn	24
2nd - RY2002	MLGW-7	37385	0	Manganese, Dissolved	ug/l as Mn	23
2nd - RY2002	MLGW-7	37413	0	Manganese, Dissolved	ug/l as Mn	33
3rd - RY2002	MLGW-7	37447	0	Manganese, Dissolved	ug/l as Mn	265
3rd - RY2002	MLGW-7	37476	0	Manganese, Dissolved	ug/l as Mn	40
3rd - RY2002	MLGW-7	37511	0	Manganese, Dissolved	ug/l as Mn	37
4th - RY2002	MLGW-7	37537	0	Manganese, Dissolved	ug/l as Mn	209
4th - RY2002	MLGW-7	37574	0	Manganese, Dissolved	ug/l as Mn	58
4th - RY2002	MLGW-7	37602	0	Manganese, Dissolved	ug/l as Mn	34
1st - RY2003	MLGW-7	37630	0	Manganese, Dissolved	ug/l as Mn	39
1st - RY2003	MLGW-7	37658	0	Manganese, Dissolved	ug/l as Mn	9
1st - RY2003	MLGW-7	37692	0	Manganese, Dissolved	ug/l as Mn	62
2nd - RY2003	MLGW-7	37713	0	Manganese, Dissolved	ug/l as Mn	11
2nd - RY2003	MLGW-7	37753	0	Manganese, Dissolved	ug/l as Mn	22
4th - RY2003	MLGW-7	37902	0	Manganese, Dissolved	ug/l as Mn	<5
1st - RY2004	MLGW-7	38028	0	Manganese, Dissolved	ug/l as Mn	8
2nd - RY2004	MLGW-7	38153	0	Manganese, Dissolved	ug/l as Mn	<5
3rd - RY2004	MLGW-7	38217	0	Manganese, Dissolved	ug/l as Mn	<5
4th - RY2004	MLGW-7	38273	0	Manganese, Dissolved	ug/l as Mn	<5
2nd - RY2005	MLGW-7	38511	0	Manganese, Dissolved	ug/l as Mn	16
3rd - RY2005	MLGW-7	38583	0	Manganese, Dissolved	ug/l as Mn	112
3rd - RY2005	MLGW-7	38583	0	Manganese, Dissolved	ug/l as Mn	112
4th - RY2005	MLGW-7	38644	0	Manganese, Dissolved	ug/l as Mn	6

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2005	MLGW-7	38644	0	Manganese, Dissolved	ug/l as Mn	6
1st - RY2006	MLGW-7	38770	0	Manganese, Dissolved	ug/l as Mn	6
1st - RY2006	MLGW-7	38770	0	Manganese, Dissolved	ug/l as Mn	6
2nd - RY2006	MLGW-7	38896	0	Manganese, Dissolved	ug/l as Mn	12
2nd - RY2006	MLGW-7	38896	0	Manganese, Dissolved	ug/l as Mn	12
3rd - RY2006	MLGW-7	38959	0	Manganese, Dissolved	ug/l as Mn	22
3rd - RY2006	MLGW-7	38959	0	Manganese, Dissolved	ug/l as Mn	22
4th - RY2006	MLGW-7	39000	0	Manganese, Dissolved	ug/l as Mn	11
1st - RY2007	MLGW-7	39127	0	Manganese, Dissolved	ug/l as Mn	8
2nd - RY2007	MLGW-7	39219	0	Manganese, Dissolved	ug/l as Mn	<5
2nd - RY2007	MLGW-7	39254	0	Manganese, Dissolved	ug/l as Mn	<5
3rd - RY2007	MLGW-7	39289	0	Manganese, Dissolved	ug/l as Mn	<5
3rd - RY2007	MLGW-7	39317	0	Manganese, Dissolved	ug/l as Mn	6
3rd - RY2007	MLGW-7	39352	0	Manganese, Dissolved	ug/l as Mn	<5
4th - RY2007	MLGW-7	39385	0	Manganese, Dissolved	ug/l as Mn	<5
4th - RY2007	MLGW-7	39415	0	Manganese, Dissolved	ug/l as Mn	<5
4th - RY2007	MLGW-7	39436	0	Manganese, Dissolved	ug/l as Mn	<5
1st - RY2008	MLGW-7	39476	0	Manganese, Dissolved	ug/l as Mn	<5
1st - RY2008	MLGW-7	39506	0	Manganese, Dissolved	ug/l as Mn	<5
1st - RY2008	MLGW-7	39538	0	Manganese, Dissolved	ug/l as Mn	196,000
2nd - RY2008	MLGW-7	39597	0	Manganese, Dissolved	ug/l as Mn	11
2nd - RY208	MLGW-7	39626	0	Manganese, Dissolved	ug/l as Mn	<5
3rd - RY2008	MLGW-7	39721	0	Manganese, Dissolved	ug/l as Mn	180
4th - RY2008	MLGW-7	39813	0	Manganese, Dissolved	ug/l as Mn	190
1st - RY2009	MLGW-7	39870	0	Manganese, Dissolved	ug/l as Mn	2,210
2nd - RY2009	MLGW-7	39975	0	Manganese, Dissolved	ug/l as Mn	58,400
3rd - RY2009	MLGW-7	40043	0	Manganese, Dissolved	ug/l as Mn	18.3
4th - RY2009	MLGW-7	40098	0	Manganese, Dissolved	ug/l as Mn	5.72
1st - RY2010	MLGW-7	40227	0	Manganese, Dissolved	ug/l as Mn	59,900
2nd - RY2010	MLGW-7	40351	0	Manganese, Dissolved	ug/l as Mn	1.7
3rd - RY2010	MLGW-7	40400	0	Manganese, Dissolved	ug/l as Mn	2.7
4th - RY2010	MLGW-7	40470	0	Manganese, Dissolved	ug/l as Mn	3.1
1st - RY2011	MLGW-7	40589	0	Manganese, Dissolved	ug/l as Mn	2.2
2nd - RY2011	MLGW-7	40708	0	Manganese, Dissolved	ug/l as Mn	2.3
3rd - RY2011	MLGW-7	40771	0	Manganese, Dissolved	ug/l as Mn	3.1
4th - RY2011	MLGW-7	40841	0	Manganese, Dissolved	ug/l as Mn	19.9
4th - RY2011	MLGW-7	40841	1	Manganese, Dissolved	ug/l as Mn	19.3
3rd - RY1993	MLGW-7	34242	0	Molybdenum, Dissolved	ug/l as Mo	<20
1st - RY1994	MLGW-7	34421	0	Molybdenum, Dissolved	ug/l as Mo	<20
2nd - RY1994	MLGW-7	34508	0	Molybdenum, Dissolved	ug/l as Mo	<20
3rd - RY1994	MLGW-7	34605	0	Molybdenum, Dissolved	ug/l as Mo	100
4th - RY1994	MLGW-7	34688	0	Molybdenum, Dissolved	ug/l as Mo	<20
1st - RY2000	MLGW-7	36546	0	Molybdenum, Dissolved	ug/l as Mo	<10
2nd - RY2007	MLGW-7	39219	0	Molybdenum, Dissolved	ug/l as Mo	<10
2nd - RY2007	MLGW-7	39254	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2007	MLGW-7	39289	0	Molybdenum, Dissolved	ug/l as Mo	<10
3rd - RY2007	MLGW-7	39317	0	Molybdenum, Dissolved	ug/l as Mo	10
4th - RY2007	MLGW-7	39385	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY2007	MLGW-7	39415	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY2007	MLGW-7	39436	0	Molybdenum, Dissolved	ug/l as Mo	20
1st - RY2008	MLGW-7	39476	0	Molybdenum, Dissolved	ug/l as Mo	<10
1st - RY2008	MLGW-7	39506	0	Molybdenum, Dissolved	ug/l as Mo	<10
2nd - RY2008	MLGW-7	39597	0	Molybdenum, Dissolved	ug/l as Mo	<10
4th - RY2010	MLGW-7	40470	0	Molybdenum, Dissolved	ug/l as Mo	0.22

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY2011	MLGW-7	40589	0	Molybdenum, Dissolved	ug/l as Mo	0.18
2nd - RY2011	MLGW-7	40708	0	Molybdenum, Dissolved	ug/l as Mo	0.19
3rd - RY2011	MLGW-7	40771	0	Molybdenum, Dissolved	ug/l as Mo	0.33
4th - RY2011	MLGW-7	40841	0	Molybdenum, Dissolved	ug/l as Mo	0.43
4th - RY2011	MLGW-7	40841	1	Molybdenum, Dissolved	ug/l as Mo	0.49
1st - RY2000	MLGW-7	36546	0	Nickel, Dissolved	ug/l as Ni	<10
3rd - RY2009	MLGW-7	40085	0	Nitrate Nitrogen, Total	mg/l as N	0.162
1st - RY2010	MLGW-7	40253	0	Nitrate Nitrogen, Total	mg/l as N	0.21
2nd - RY2010	MLGW-7	40358	0	Nitrate Nitrogen, Total	mg/l as N	0.2
4th - RY2010	MLGW-7	40470	0	Nitrate Nitrogen, Total	mg/l as N	0.16
1st - RY2011	MLGW-7	40589	0	Nitrate Nitrogen, Total	mg/l as N	0.16
2nd - RY2011	MLGW-7	40708	0	Nitrate Nitrogen, Total	mg/l as N	0.41
3rd - RY2011	MLGW-7	40771	0	Nitrate Nitrogen, Total	mg/l as N	0.25
4th - RY2011	MLGW-7	40841	0	Nitrate Nitrogen, Total	mg/l as N	0.17
4th - RY2011	MLGW-7	40841	1	Nitrate Nitrogen, Total	mg/l as N	0.16
3rd - RY2009	MLGW-7	40085	0	Nitrite Nitrogen, Total	mg/l as N	0.31
4th - RY2009	MLGW-7	40155	0	Nitrite Nitrogen, Total	mg/l as N	<0.12
1st - RY2010	MLGW-7	40253	0	Nitrite Nitrogen, Total	mg/l as N	<0.061
2nd - RY2010	MLGW-7	40358	0	Nitrite Nitrogen, Total	mg/l as N	<0.061
4th - RY2010	MLGW-7	40470	0	Nitrite Nitrogen, Total	mg/l as N	<0.12
1st - RY2011	MLGW-7	40589	0	Nitrite Nitrogen, Total	mg/l as N	<0.12
2nd - RY2011	MLGW-7	40708	0	Nitrite Nitrogen, Total	mg/l as N	<0.31
3rd - RY2011	MLGW-7	40771	0	Nitrite Nitrogen, Total	mg/l as N	<0.12
4th - RY2011	MLGW-7	40841	0	Nitrite Nitrogen, Total	mg/l as N	<0.061
4th - RY2011	MLGW-7	40841	1	Nitrite Nitrogen, Total	mg/l as N	<0.061
4th - RY2010	MLGW-7	40470	0	Nitrogen, Ammonia, Total	mg/l as N	0.17
1st - RY2011	MLGW-7	40589	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
2nd - RY2011	MLGW-7	40708	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
3rd - RY2011	MLGW-7	40771	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2011	MLGW-7	40841	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2011	MLGW-7	40841	1	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2010	MLGW-7	40470	0	Nitrogen,total kjeldahl	mg/l	<0.3
1st - RY2011	MLGW-7	40589	0	Nitrogen,total kjeldahl	mg/l	<0.3
2nd - RY2011	MLGW-7	40708	0	Nitrogen,total kjeldahl	mg/l	<0.3
3rd - RY2011	MLGW-7	40771	0	Nitrogen,total kjeldahl	mg/l	<0.3
4th - RY2011	MLGW-7	40841	0	Nitrogen,total kjeldahl	mg/l	<0.3
4th - RY2011	MLGW-7	40841	1	Nitrogen,total kjeldahl	mg/l	<0.3
4th - RY2011	MLGW-7	34975	0	pH, Field	Standard Units	6.3
2nd - RY1996	MLGW-7	35220	0	pH, Field	Standard Units	6.2
3rd - RY1996	MLGW-7	35318	0	pH, Field	Standard Units	6.48
2nd - RY1997	MLGW-7	35556	0	pH, Field	Standard Units	6.8
3rd - RY1997	MLGW-7	35612	0	pH, Field	Standard Units	7.67
3rd - RY1997	MLGW-7	35650	0	pH, Field	Standard Units	6.78
4th - RY1997	MLGW-7	35779	0	pH, Field	Standard Units	6.68
1st - RY1998	MLGW-7	35801	0	pH, Field	Standard Units	6.76
1st - RY1998	MLGW-7	35829	0	pH, Field	Standard Units	6.17
1st - RY1998	MLGW-7	35864	0	pH, Field	Standard Units	6.43
2nd - RY1998	MLGW-7	35893	0	pH, Field	Standard Units	6.27
2nd - RY1998	MLGW-7	35920	0	pH, Field	Standard Units	6.39
2nd - RY1998	MLGW-7	35948	0	pH, Field	Standard Units	6.42
3rd - RY1998	MLGW-7	35983	0	pH, Field	Standard Units	6.43
3rd - RY1998	MLGW-7	36011	0	pH, Field	Standard Units	6.5
3rd - RY1998	MLGW-7	36046	0	pH, Field	Standard Units	6.28
4th - RY1998	MLGW-7	36081	0	pH, Field	Standard Units	6.66

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY1998	MLGW-7	36109	0	pH, Field	Standard Units	6.14
4th - RY1998	MLGW-7	36137	0	pH, Field	Standard Units	6.69
1st - RY1999	MLGW-7	36172	0	pH, Field	Standard Units	6.08
1st - RY1999	MLGW-7	36200	0	pH, Field	Standard Units	6.51
1st - RY1999	MLGW-7	36228	0	pH, Field	Standard Units	6
2nd - RY1999	MLGW-7	36256	0	pH, Field	Standard Units	6.15
2nd - RY1999	MLGW-7	36291	0	pH, Field	Standard Units	6.18
2nd - RY1999	MLGW-7	36314	0	pH, Field	Standard Units	6.4
3rd - RY1999	MLGW-7	36347	0	pH, Field	Standard Units	5.96
3rd - RY1999	MLGW-7	36384	0	pH, Field	Standard Units	6.22
3rd - RY1999	MLGW-7	36410	0	pH, Field	Standard Units	6.2
4th - RY1999	MLGW-7	36445	0	pH, Field	Standard Units	6.25
4th - RY1999	MLGW-7	36468	0	pH, Field	Standard Units	6.59
4th - RY1999	MLGW-7	36501	0	pH, Field	Standard Units	6.36
1st - RY2000	MLGW-7	36546	0	pH, Field	Standard Units	6.54
1st - RY2000	MLGW-7	36571	0	pH, Field	Standard Units	6.07
1st - RY2000	MLGW-7	36599	0	pH, Field	Standard Units	6.4
2nd - RY2000	MLGW-7	36634	0	pH, Field	Standard Units	6.3
2nd - RY2000	MLGW-7	36655	0	pH, Field	Standard Units	6.5
2nd - RY2000	MLGW-7	36692	0	pH, Field	Standard Units	6.6
3rd - RY2000	MLGW-7	36720	0	pH, Field	Standard Units	6.3
3rd - RY2000	MLGW-7	36748	0	pH, Field	Standard Units	8.2
3rd - RY2000	MLGW-7	36777	0	pH, Field	Standard Units	8.2
4th - RY2000	MLGW-7	36800	0	pH, Field	Standard Units	6.1
4th - RY2000	MLGW-7	36838	0	pH, Field	Standard Units	7.1
4th - RY2000	MLGW-7	36861	0	pH, Field	Standard Units	6.37
1st - RY2001	MLGW-7	36894	0	pH, Field	Standard Units	6.47
1st - RY2001	MLGW-7	36923	0	pH, Field	Standard Units	6.4
1st - RY2001	MLGW-7	36978	0	pH, Field	Standard Units	6.54
2nd - RY2001	MLGW-7	36990	0	pH, Field	Standard Units	6.4
2nd - RY2001	MLGW-7	37014	0	pH, Field	Standard Units	6.35
2nd - RY2001	MLGW-7	37046	0	pH, Field	Standard Units	6.6
3rd - RY2001	MLGW-7	37074	0	pH, Field	Standard Units	6.62
3rd - RY2001	MLGW-7	37104	0	pH, Field	Standard Units	6.47
3rd - RY2001	MLGW-7	37141	0	pH, Field	Standard Units	6.44
4th - RY2001	MLGW-7	37165	0	pH, Field	Standard Units	6.69
4th - RY2001	MLGW-7	37201	0	pH, Field	Standard Units	6.12
4th - RY2001	MLGW-7	37230	0	pH, Field	Standard Units	6.93
1st - RY2002	MLGW-7	37264	0	pH, Field	Standard Units	6.89
1st - RY2002	MLGW-7	37294	0	pH, Field	Standard Units	6.56
1st - RY2002	MLGW-7	37322	0	pH, Field	Standard Units	7.14
2nd - RY2002	MLGW-7	37350	0	pH, Field	Standard Units	7.27
2nd - RY2002	MLGW-7	37385	0	pH, Field	Standard Units	7.18
2nd - RY2002	MLGW-7	37413	0	pH, Field	Standard Units	6.81
3rd - RY2002	MLGW-7	37447	0	pH, Field	Standard Units	7.6
3rd - RY2002	MLGW-7	37476	0	pH, Field	Standard Units	6.97
3rd - RY2002	MLGW-7	37511	0	pH, Field	Standard Units	7.26
4th - RY2002	MLGW-7	37537	0	pH, Field	Standard Units	7.5
4th - RY2002	MLGW-7	37574	0	pH, Field	Standard Units	7.67
4th - RY2002	MLGW-7	37602	0	pH, Field	Standard Units	7.33
1st - RY2003	MLGW-7	37630	0	pH, Field	Standard Units	7.34
1st - RY2003	MLGW-7	37658	0	pH, Field	Standard Units	7.79
1st - RY2003	MLGW-7	37692	0	pH, Field	Standard Units	7.3
2nd - RY2003	MLGW-7	37713	0	pH, Field	Standard Units	7.34

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
2nd - RY2003	MLGW-7	37753	0	pH, Field	Standard Units	7.86
4th - RY2003	MLGW-7	37902	0	pH, Field	Standard Units	6.6
1st - RY2004	MLGW-7	38028	0	pH, Field	Standard Units	7.2
2nd - RY2004	MLGW-7	38153	0	pH, Field	Standard Units	6.51
3rd - RY2004	MLGW-7	38217	0	pH, Field	Standard Units	6.15
4th - RY2004	MLGW-7	38273	0	pH, Field	Standard Units	6.58
4th - RY2004	MLGW-7	38273	0	pH, Field	Standard Units	6.6
2nd - RY2005	MLGW-7	38511	0	pH, Field	Standard Units	6.3
3rd - RY2005	MLGW-7	38583	0	pH, Field	Standard Units	6.2
3rd - RY2005	MLGW-7	38583	0	pH, Field	Standard Units	6.2
4th - RY2005	MLGW-7	38644	0	pH, Field	Standard Units	6.9
4th - RY2005	MLGW-7	38644	0	pH, Field	Standard Units	6.9
1st - RY2006	MLGW-7	38770	0	pH, Field	Standard Units	6.46
1st - RY2006	MLGW-7	38770	0	pH, Field	Standard Units	6.46
2nd - RY2006	MLGW-7	38896	0	pH, Field	Standard Units	6.58
2nd - RY2006	MLGW-7	38896	0	pH, Field	Standard Units	6.58
3rd - RY2006	MLGW-7	38959	0	pH, Field	Standard Units	6.66
3rd - RY2006	MLGW-7	38959	0	pH, Field	Standard Units	6.66
4th - RY2006	MLGW-7	39000	0	pH, Field	Standard Units	6.36
1st - RY2007	MLGW-7	39127	0	pH, Field	Standard Units	6.32
2nd - RY2007	MLGW-7	39254	0	pH, Field	Standard Units	6.39
3rd - RY2007	MLGW-7	39317	0	pH, Field	Standard Units	6.49
3rd - RY2007	MLGW-7	39352	0	pH, Field	Standard Units	6.43
4th - RY2007	MLGW-7	39385	0	pH, Field	Standard Units	6.46
4th - RY2007	MLGW-7	39415	0	pH, Field	Standard Units	6.45
4th - RY2007	MLGW-7	39436	0	pH, Field	Standard Units	7.14
1st - RY2008	MLGW-7	39476	0	pH, Field	Standard Units	6.44
1st - RY2008	MLGW-7	39506	0	pH, Field	Standard Units	6.11
1st - RY2008	MLGW-7	39538	0	pH, Field	Standard Units	6.5
2nd - RY2008	MLGW-7	39597	0	pH, Field	Standard Units	6.38
2nd - RY2008	MLGW-7	39626	0	pH, Field	Standard Units	5.9
3rd - RY2008	MLGW-7	39721	0	pH, Field	Standard Units	6.42
4th - RY2008	MLGW-7	39813	0	pH, Field	Standard Units	6.41
3rd - RY2009	MLGW-7	40043	0	pH, Field	Standard Units	6.48
1st - RY2010	MLGW-7	40227	0	pH, Field	Standard Units	6.3
1st - RY2010	MLGW-7	40253	0	pH, Field	Standard Units	<0.1
2nd - RY2010	MLGW-7	40351	0	pH, Field	Standard Units	6.45
3rd - RY2010	MLGW-7	40400	0	pH, Field	Standard Units	6.7
4th - RY2010	MLGW-7	40470	0	pH, Field	Standard Units	6.6
1st - RY2011	MLGW-7	40589	0	pH, Field	Standard Units	6.1
2nd - RY2011	MLGW-7	40708	0	pH, Field	Standard Units	6.4
2nd - RY2011	MLGW-7	40716	0	pH, Field	Standard Units	6.6
3rd - RY2011	MLGW-7	40771	0	pH, Field	Standard Units	6.5
4th - RY2011	MLGW-7	40841	0	pH, Field	Standard Units	6.5
4th - RY2010	MLGW-7	40470	0	Phosphate, Ortho	mg/l as PO4	<0.1
1st - RY2011	MLGW-7	40589	0	Phosphate, Ortho	mg/l as PO4	0.25
2nd - RY2011	MLGW-7	40708	0	Phosphate, Ortho	mg/l as PO4	<0.1
3rd - RY2011	MLGW-7	40771	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2011	MLGW-7	40841	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2011	MLGW-7	40841	1	Phosphate, Ortho	mg/l as PO4	<0.1
2nd - RY2007	MLGW-7	39219	0	Potassium, Dissolved	ug/l as K	2,400
2nd - RY2007	MLGW-7	39254	0	Potassium, Dissolved	ug/l as K	2,500
3rd - RY2007	MLGW-7	39289	0	Potassium, Dissolved	ug/l as K	2,400
3rd - RY2007	MLGW-7	39317	0	Potassium, Dissolved	ug/l as K	2,300

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2007	MLGW-7	39385	0	Potassium, Dissolved	ug/l as K	2,300
4th - RY2007	MLGW-7	39415	0	Potassium, Dissolved	ug/l as K	2,200
4th - RY2007	MLGW-7	39436	0	Potassium, Dissolved	ug/l as K	2,200
1st - RY2008	MLGW-7	39476	0	Potassium, Dissolved	ug/l as K	2,400
1st - RY2008	MLGW-7	39506	0	Potassium, Dissolved	ug/l as K	2,200
2nd - RY2008	MLGW-7	39597	0	Potassium, Dissolved	ug/l as K	2,600
3rd - RY2009	MLGW-7	40085	0	Potassium, Dissolved	ug/l as K	2,800
4th - RY2009	MLGW-7	40155	0	Potassium, Dissolved	ug/l as K	3,100
1st - RY2010	MLGW-7	40253	0	Potassium, Dissolved	ug/l as K	2,940
2nd - RY2010	MLGW-7	40358	0	Potassium, Dissolved	ug/l as K	2,480
3rd - RY2011	MLGW-7	40771	0	Potassium, Dissolved	ug/l as K	2,090
4th - RY2011	MLGW-7	40841	0	Potassium, Dissolved	ug/l as K	2,240
4th - RY2011	MLGW-7	40841	1	Potassium, Dissolved	ug/l as K	2,270
4th - RY2010	MLGW-7	40470	0	Selenium, Dissolved	ug/l as Se	0.26
1st - RY2011	MLGW-7	40589	0	Selenium, Dissolved	ug/l as Se	0.74
2nd - RY2011	MLGW-7	40708	0	Selenium, Dissolved	ug/l as Se	0.34
3rd - RY2011	MLGW-7	40771	0	Selenium, Dissolved	ug/l as Se	0.69
4th - RY2011	MLGW-7	40841	0	Selenium, Dissolved	ug/l as Se	<0.64
4th - RY2011	MLGW-7	40841	1	Selenium, Dissolved	ug/l as Se	1
1st - RY2000	MLGW-7	36546	0	Silver, Dissolved	ug/l as Ag	<5
2nd - RY2007	MLGW-7	39254	0	Silver, Dissolved	ug/l as Ag	<10
4th - RY2007	MLGW-7	39385	0	Silver, Dissolved	ug/l as Ag	<10
4th - RY2007	MLGW-7	39415	0	Silver, Dissolved	ug/l as Ag	<10
4th - RY2007	MLGW-7	39436	0	Silver, Dissolved	ug/l as Ag	<10
2nd - RY2008	MLGW-7	39597	0	Silver, Dissolved	ug/l as Ag	<10
1st - RY1994	MLGW-7	34421	0	Sodium, Dissolved	ug/l as Na	7,130
2nd - RY1994	MLGW-7	34508	0	Sodium, Dissolved	ug/l as Na	7,220
3rd - RY1994	MLGW-7	34605	0	Sodium, Dissolved	ug/l as Na	7,070
4th - RY1994	MLGW-7	34688	0	Sodium, Dissolved	ug/l as Na	7,540
2nd - RY2007	MLGW-7	39219	0	Sodium, Dissolved	ug/l as Na	23,600
2nd - RY2007	MLGW-7	39254	0	Sodium, Dissolved	ug/l as Na	23,000
3rd - RY2007	MLGW-7	39289	0	Sodium, Dissolved	ug/l as Na	22,200
3rd - RY2007	MLGW-7	39317	0	Sodium, Dissolved	ug/l as Na	20,100
4th - RY2007	MLGW-7	39385	0	Sodium, Dissolved	ug/l as Na	19,400
4th - RY2007	MLGW-7	39415	0	Sodium, Dissolved	ug/l as Na	20,600
4th - RY2007	MLGW-7	39436	0	Sodium, Dissolved	ug/l as Na	20,400
1st - RY2008	MLGW-7	39476	0	Sodium, Dissolved	ug/l as Na	22,400
1st - RY2008	MLGW-7	39506	0	Sodium, Dissolved	ug/l as Na	21,400
2nd - RY2008	MLGW-7	39597	0	Sodium, Dissolved	ug/l as Na	35,700
3rd - RY2009	MLGW-7	40085	0	Sodium, Dissolved	ug/l as Na	30,000
4th - RY2009	MLGW-7	40155	0	Sodium, Dissolved	ug/l as Na	34,000
1st - RY2010	MLGW-7	40253	0	Sodium, Dissolved	ug/l as Na	33,600
2nd - RY2010	MLGW-7	40358	0	Sodium, Dissolved	ug/l as Na	30,200
3rd - RY2011	MLGW-7	40771	0	Sodium, Dissolved	ug/l as Na	27,300
4th - RY2011	MLGW-7	40841	0	Sodium, Dissolved	ug/l as Na	28,700
4th - RY2011	MLGW-7	40841	1	Sodium, Dissolved	ug/l as Na	28,800
2nd - RY2000	MLGW-7	36655	0	Specific Conductance	umhos/cm @ 25C	382
3rd - RY1993	MLGW-7	34242	0	Sulfate, Total	mg/l as SO4	30
4th - RY1993	MLGW-7	34303	0	Sulfate, Total	mg/l as SO4	30
1st - RY1994	MLGW-7	34421	0	Sulfate, Total	mg/l as SO4	32
2nd - RY1994	MLGW-7	34508	0	Sulfate, Total	mg/l as SO4	29
3rd - RY1994	MLGW-7	34605	0	Sulfate, Total	mg/l as SO4	32
4th - RY1994	MLGW-7	34688	0	Sulfate, Total	mg/l as SO4	33
4th - RY1995	MLGW-7	34975	0	Sulfate, Total	mg/l as SO4	37

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
2nd - RY1996	MLGW-7	35220	0	Sulfate, Total	mg/l as SO4	29
3rd - RY1996	MLGW-7	35318	0	Sulfate, Total	mg/l as SO4	38
2nd - RY2005	MLGW-7	38511	0	Sulfate, Total	mg/l as SO4	110
3rd - RY2005	MLGW-7	38583	0	Sulfate, Total	mg/l as SO4	80
4th - RY2005	MLGW-7	38644	0	Sulfate, Total	mg/l as SO4	70
1st - RY2006	MLGW-7	38770	0	Sulfate, Total	mg/l as SO4	60
2nd - RY2006	MLGW-7	38896	0	Sulfate, Total	mg/l as SO4	50
3rd - RY2006	MLGW-7	38959	0	Sulfate, Total	mg/l as SO4	60
4th - RY2006	MLGW-7	39000	0	Sulfate, Total	mg/l as SO4	60
1st - RY2007	MLGW-7	39127	0	Sulfate, Total	mg/l as SO4	320
2nd - RY2007	MLGW-7	39219	0	Sulfate, Total	mg/l as SO4	160
2nd - RY2007	MLGW-7	39254	0	Sulfate, Total	mg/l as SO4	190
3rd - RY2007	MLGW-7	39289	0	Sulfate, Total	mg/l as SO4	120
3rd - RY2007	MLGW-7	39317	0	Sulfate, Total	mg/l as SO4	100
4th - RY2007	MLGW-7	39385	0	Sulfate, Total	mg/l as SO4	90
4th - RY2007	MLGW-7	39415	0	Sulfate, Total	mg/l as SO4	100
4th - RY2007	MLGW-7	39436	0	Sulfate, Total	mg/l as SO4	100
1st - RY2008	MLGW-7	39476	0	Sulfate, Total	mg/l as SO4	110
1st - RY2008	MLGW-7	39506	0	Sulfate, Total	mg/l as SO4	120
1st - RY2008	MLGW-7	39538	0	Sulfate, Total	mg/l as SO4	140
2nd - RY2008	MLGW-7	39597	0	Sulfate, Total	mg/l as SO4	170
2nd - RY2008	MLGW-7	39626	0	Sulfate, Total	mg/l as SO4	160
3rd - RY2008	MLGW-7	39721	0	Sulfate, Total	mg/l as SO4	175
4th - RY2008	MLGW-7	39813	0	Sulfate, Total	mg/l as SO4	258
1st - RY2009	MLGW-7	39870	0	Sulfate, Total	mg/l as SO4	316
2nd - RY2009	MLGW-7	39975	0	Sulfate, Total	mg/l as SO4	255
3rd - RY2009	MLGW-7	40043	0	Sulfate, Total	mg/l as SO4	163
3rd - RY2009	MLGW-7	40085	0	Sulfate, Total	mg/l as SO4	196
4th - RY2009	MLGW-7	40098	0	Sulfate, Total	mg/l as SO4	202
1st - RY2010	MLGW-7	40227	0	Sulfate, Total	mg/l as SO4	262
1st - RY2010	MLGW-7	40253	0	Sulfate, Total	mg/l as SO4	275
2nd - RY2010	MLGW-7	40351	0	Sulfate, Total	mg/l as SO4	206
2nd - RY2010	MLGW-7	40358	0	Sulfate, Total	mg/l as SO4	195
3rd - RY2010	MLGW-7	40400	0	Sulfate, Total	mg/l as SO4	135
4th - RY2010	MLGW-7	40470	0	Sulfate, Total	mg/l as SO4	155
1st - RY2011	MLGW-7	40589	0	Sulfate, Total	mg/l as SO4	201
2nd - RY2011	MLGW-7	40708	0	Sulfate, Total	mg/l as SO4	186
3rd - RY2011	MLGW-7	40771	0	Sulfate, Total	mg/l as SO4	139
4th - RY2011	MLGW-7	40841	0	Sulfate, Total	mg/l as SO4	134
4th - RY2011	MLGW-7	40841	1	Sulfate, Total	mg/l as SO4	133
4th - RY1993	MLGW-7	34303	0	TDS - Residue,Total Filtrable (Dried At	mg/l	121
1st - RY1994	MLGW-7	34421	0	TDS - Residue,Total Filtrable (Dried At	mg/l	128
2nd - RY1994	MLGW-7	34508	0	TDS - Residue,Total Filtrable (Dried At	mg/l	128
3rd - RY1994	MLGW-7	34605	0	TDS - Residue,Total Filtrable (Dried At	mg/l	156
4th - RY1994	MLGW-7	34688	0	TDS - Residue,Total Filtrable (Dried At	mg/l	186
1st - RY2000	MLGW-7	36546	0	TDS - Residue,Total Filtrable (Dried At	mg/l	290
2nd - RY2007	MLGW-7	39219	0	TDS - Residue,Total Filtrable (Dried At	mg/l	370
2nd - RY2007	MLGW-7	39254	0	TDS - Residue,Total Filtrable (Dried At	mg/l	350
3rd - RY2007	MLGW-7	39289	0	TDS - Residue,Total Filtrable (Dried At	mg/l	320
3rd - RY2007	MLGW-7	39317	0	TDS - Residue,Total Filtrable (Dried At	mg/l	250
4th - RY2007	MLGW-7	39385	0	TDS - Residue,Total Filtrable (Dried At	mg/l	220
4th - RY2007	MLGW-7	39415	0	TDS - Residue,Total Filtrable (Dried At	mg/l	260
4th - RY2007	MLGW-7	39436	0	TDS - Residue,Total Filtrable (Dried At	mg/l	270
1st - RY2008	MLGW-7	39476	0	TDS - Residue,Total Filtrable (Dried At	mg/l	280

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY2008	MLGW-7	39506	0	TDS - Residue,Total Filtrable (Dried At	mg/l	280
2nd - RY2008	MLGW-7	39597	0	TDS - Residue,Total Filtrable (Dried At	mg/l	350
3rd - RY2008	MLGW-7	39721	0	TDS - Residue,Total Filtrable (Dried At	mg/l	384
4th - RY2008	MLGW-7	39813	0	TDS - Residue,Total Filtrable (Dried At	mg/l	562
1st - RY2009	MLGW-7	39870	0	TDS - Residue,Total Filtrable (Dried At	mg/l	681
2nd - RY2009	MLGW-7	39975	0	TDS - Residue,Total Filtrable (Dried At	mg/l	554
3rd - RY2009	MLGW-7	40043	0	TDS - Residue,Total Filtrable (Dried At	mg/l	386
4th - RY2009	MLGW-7	40098	0	TDS - Residue,Total Filtrable (Dried At	mg/l	424
1st - RY2010	MLGW-7	40227	0	TDS - Residue,Total Filtrable (Dried At	mg/l	538
2nd - RY2010	MLGW-7	40351	0	TDS - Residue,Total Filtrable (Dried At	mg/l	450
3rd - RY2010	MLGW-7	40400	0	TDS - Residue,Total Filtrable (Dried At	mg/l	332
4th - RY2010	MLGW-7	40470	0	TDS - Residue,Total Filtrable (Dried At	mg/l	340
1st - RY2011	MLGW-7	40589	0	TDS - Residue,Total Filtrable (Dried At	mg/l	442
2nd - RY2011	MLGW-7	40708	0	TDS - Residue,Total Filtrable (Dried At	mg/l	426
3rd - RY2011	MLGW-7	40771	0	TDS - Residue,Total Filtrable (Dried At	mg/l	328
4th - RY2011	MLGW-7	40841	0	TDS - Residue,Total Filtrable (Dried At	mg/l	316
4th - RY2011	MLGW-7	40841	1	TDS - Residue,Total Filtrable (Dried At	mg/l	306
4th - RY1995	MLGW-7	34975	0	Temperature, Water	^{o}C	7.8
2nd - RY1996	MLGW-7	35220	0	Temperature, Water	^{o}C	8.3
3rd - RY1996	MLGW-7	35318	0	Temperature, Water	^{o}C	8.9
2nd - RY1997	MLGW-7	35556	0	Temperature, Water	^{o}C	7.3
3rd - RY1997	MLGW-7	35612	0	Temperature, Water	^{o}C	9.4
3rd - RY1997	MLGW-7	35650	0	Temperature, Water	^{o}C	9.2
4th - RY1997	MLGW-7	35779	0	Temperature, Water	^{o}C	8.3
1st - RY1998	MLGW-7	35801	0	Temperature, Water	^{o}C	7.4
1st - RY1998	MLGW-7	35829	0	Temperature, Water	^{o}C	6.1
1st - RY1998	MLGW-7	35864	0	Temperature, Water	^{o}C	6.4
2nd - RY1998	MLGW-7	35893	0	Temperature, Water	^{o}C	5.7
2nd - RY1998	MLGW-7	35920	0	Temperature, Water	^{o}C	5.6
2nd - RY1998	MLGW-7	35948	0	Temperature, Water	^{o}C	7.3
3rd - RY1998	MLGW-7	35983	0	Temperature, Water	^{o}C	8.4
3rd - RY1998	MLGW-7	36011	0	Temperature, Water	^{o}C	7.3
3rd - RY1998	MLGW-7	36046	0	Temperature, Water	^{o}C	9.5
4th - RY1998	MLGW-7	36081	0	Temperature, Water	^{o}C	8.9
4th - RY1998	MLGW-7	36109	0	Temperature, Water	^{o}C	7.9
4th - RY1998	MLGW-7	36137	0	Temperature, Water	^{o}C	4.7
1st - RY1999	MLGW-7	36172	0	Temperature, Water	^{o}C	7.4
1st - RY1999	MLGW-7	36200	0	Temperature, Water	^{o}C	9.4
1st - RY1999	MLGW-7	36228	0	Temperature, Water	^{o}C	7.1
2nd - RY1999	MLGW-7	36256	0	Temperature, Water	^{o}C	6
2nd - RY1999	MLGW-7	36291	0	Temperature, Water	^{o}C	5
2nd - RY1999	MLGW-7	36314	0	Temperature, Water	^{o}C	7
3rd - RY1999	MLGW-7	36347	0	Temperature, Water	^{o}C	9.5
3rd - RY1999	MLGW-7	36384	0	Temperature, Water	^{o}C	9.5
3rd - RY1999	MLGW-7	36410	0	Temperature, Water	^{o}C	10.6
4th - RY1999	MLGW-7	36445	0	Temperature, Water	^{o}C	9.7
4th - RY1999	MLGW-7	36468	0	Temperature, Water	^{o}C	9.6
4th - RY1999	MLGW-7	36501	0	Temperature, Water	^{o}C	6.7
1st - RY2000	MLGW-7	36546	0	Temperature, Water	^{o}C	6.1

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY2000	MLGW-7	36571	0	Temperature, Water	°C	5.2
1st - RY2000	MLGW-7	36599	0	Temperature, Water	°C	6
2nd - RY2000	MLGW-7	36634	0	Temperature, Water	°C	8
2nd - RY2000	MLGW-7	36655	0	Temperature, Water	°C	6
2nd - RY2000	MLGW-7	36692	0	Temperature, Water	°C	7
3rd - RY2000	MLGW-7	36720	0	Temperature, Water	°C	8
3rd - RY2000	MLGW-7	36748	0	Temperature, Water	°C	9
3rd - RY2000	MLGW-7	36777	0	Temperature, Water	°C	9
4th - RY2000	MLGW-7	36800	0	Temperature, Water	°C	9
4th - RY2000	MLGW-7	36838	0	Temperature, Water	°C	7
4th - RY2000	MLGW-7	36861	0	Temperature, Water	°C	9.2
1st - RY2001	MLGW-7	36894	0	Temperature, Water	°C	7.2
1st - RY2001	MLGW-7	36923	0	Temperature, Water	°C	6.6
1st - RY2001	MLGW-7	36978	0	Temperature, Water	°C	7.2
2nd - RY2001	MLGW-7	36990	0	Temperature, Water	°C	8
2nd - RY2001	MLGW-7	37014	0	Temperature, Water	°C	8.1
2nd - RY2001	MLGW-7	37046	0	Temperature, Water	°C	7.2
3rd - RY2001	MLGW-7	37074	0	Temperature, Water	°C	25
3rd - RY2001	MLGW-7	37104	0	Temperature, Water	°C	7.2
3rd - RY2001	MLGW-7	37141	0	Temperature, Water	°C	9.1
4th - RY2001	MLGW-7	37165	0	Temperature, Water	°C	9.7
4th - RY2001	MLGW-7	37201	0	Temperature, Water	°C	8.3
4th - RY2001	MLGW-7	37230	0	Temperature, Water	°C	6.4
1st - RY2002	MLGW-7	37264	0	Temperature, Water	°C	6.3
1st - RY2002	MLGW-7	37294	0	Temperature, Water	°C	7.2
1st - RY2002	MLGW-7	37322	0	Temperature, Water	°C	4.9
2nd - RY2002	MLGW-7	37350	0	Temperature, Water	°C	6.5
2nd - RY2002	MLGW-7	37385	0	Temperature, Water	°C	6.7
2nd - RY2002	MLGW-7	37413	0	Temperature, Water	°C	7.9
3rd - RY2002	MLGW-7	37447	0	Temperature, Water	°C	8.5
3rd - RY2002	MLGW-7	37476	0	Temperature, Water	°C	8.7
3rd - RY2002	MLGW-7	37511	0	Temperature, Water	°C	9.2
4th - RY2002	MLGW-7	37537	0	Temperature, Water	°C	8.9
4th - RY2002	MLGW-7	37574	0	Temperature, Water	°C	6.9
4th - RY2002	MLGW-7	37602	0	Temperature, Water	°C	7
1st - RY2003	MLGW-7	37630	0	Temperature, Water	°C	6.6
1st - RY2003	MLGW-7	37658	0	Temperature, Water	°C	5.2
1st - RY2003	MLGW-7	37692	0	Temperature, Water	°C	5.2
2nd - RY2003	MLGW-7	37713	0	Temperature, Water	°C	6.7
2nd - RY2003	MLGW-7	37753	0	Temperature, Water	°C	6.3
4th - RY2003	MLGW-7	37902	0	Temperature, Water	°C	10.6
1st - RY2004	MLGW-7	38028	0	Temperature, Water	°C	3.2
2nd - RY2004	MLGW-7	38153	0	Temperature, Water	°C	9.9
3rd - RY2004	MLGW-7	38217	0	Temperature, Water	°C	8.9
4th - RY2004	MLGW-7	38273	0	Temperature, Water	°C	7.7
4th - RY2004	MLGW-7	38273	0	Temperature, Water	°C	7.7
2nd - RY2005	MLGW-7	38511	0	Temperature, Water	°C	8.8

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
3rd - RY2005	MLGW-7	38583	0	Temperature, Water	°C	9
3rd - RY2005	MLGW-7	38583	0	Temperature, Water	°C	9
4th - RY2005	MLGW-7	38644	0	Temperature, Water	°C	6.9
4th - RY2005	MLGW-7	38644	0	Temperature, Water	°C	6.9
1st - RY2006	MLGW-7	38770	0	Temperature, Water	°C	4.5
1st - RY2006	MLGW-7	38770	0	Temperature, Water	°C	4.5
2nd - RY2006	MLGW-7	38896	0	Temperature, Water	°C	8.9
2nd - RY2006	MLGW-7	38896	0	Temperature, Water	°C	8.9
3rd - RY2006	MLGW-7	38959	0	Temperature, Water	°C	9.8
3rd - RY2006	MLGW-7	38959	0	Temperature, Water	°C	9.8
4th - RY2006	MLGW-7	39000	0	Temperature, Water	°C	8.4
1st - RY2007	MLGW-7	39127	0	Temperature, Water	°C	6.9
2nd - RY2007	MLGW-7	39254	0	Temperature, Water	°C	6
3rd - RY2007	MLGW-7	39317	0	Temperature, Water	°C	8
3rd - RY2007	MLGW-7	39352	0	Temperature, Water	°C	9.7
4th - RY2007	MLGW-7	39385	0	Temperature, Water	°C	7.5
4th - RY2007	MLGW-7	39415	0	Temperature, Water	°C	5.7
4th - RY2007	MLGW-7	39436	0	Temperature, Water	°C	6.2
1st - RY2008	MLGW-7	39476	0	Temperature, Water	°C	6
1st - RY2008	MLGW-7	39506	0	Temperature, Water	°C	5.7
1st - RY2008	MLGW-7	39538	0	Temperature, Water	°C	4.5
2nd - RY2008	MLGW-7	39597	0	Temperature, Water	°C	6
2nd - RY2008	MLGW-7	39626	0	Temperature, Water	°C	8
1st - RY2010	MLGW-7	40227	0	Temperature, Water	°C	6
1st - RY2010	MLGW-7	40253	0	Temperature, Water	°C	6.2
2nd - RY2010	MLGW-7	40351	0	Temperature, Water	°C	6.1
2nd - RY2010	MLGW-7	40358	0	Temperature, Water	°C	5.6
3rd - RY2010	MLGW-7	40400	0	Temperature, Water	°C	6.7
4th - RY2010	MLGW-7	40470	0	Temperature, Water	°C	7.7
1st - RY2011	MLGW-7	40589	0	Temperature, Water	°C	6.4
2nd - RY2011	MLGW-7	40708	0	Temperature, Water	°C	6.8
2nd - RY2011	MLGW-7	40716	0	Temperature, Water	°C	6.1
3rd - RY2011	MLGW-7	40771	0	Temperature, Water	°C	7.9
4th - RY2011	MLGW-7	40841	0	Temperature, Water	°C	7.6
4th - RY2010	MLGW-7	40470	0	Uranium, Natural, Dissolved	ug/l	0.14
1st - RY2011	MLGW-7	40589	0	Uranium, Natural, Dissolved	ug/l	0.093
2nd - RY2011	MLGW-7	40708	0	Uranium, Natural, Dissolved	ug/l	0.16
3rd - RY2011	MLGW-7	40771	0	Uranium, Natural, Dissolved	ug/l	0.15
4th - RY2011	MLGW-7	40841	0	Uranium, Natural, Dissolved	ug/l	0.23
4th - RY2011	MLGW-7	40841	1	Uranium, Natural, Dissolved	ug/l	0.23
4th - RY1995	MLGW-7	34975	0	Water Level,Distance From Measuring	Feet	24.13
2nd - RY1996	MLGW-7	35220	0	Water Level,Distance From Measuring	Feet	21.83
3rd - RY1996	MLGW-7	35318	0	Water Level,Distance From Measuring	Feet	23.9
2nd - RY1998	MLGW-7	35920	0	Water Level,Distance From Measuring	Feet	22
3rd - RY1993	MLGW-7	34242	0	Zinc, Dissolved	ug/l as Zn	50
1st - RY1994	MLGW-7	34421	0	Zinc, Dissolved	ug/l as Zn	<20
2nd - RY1994	MLGW-7	34508	0	Zinc, Dissolved	ug/l as Zn	20
3rd - RY1994	MLGW-7	34605	0	Zinc, Dissolved	ug/l as Zn	<20
4th - RY1994	MLGW-7	34688	0	Zinc, Dissolved	ug/l as Zn	<20

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY2000	MLGW-7	36546	0	Zinc, Dissolved	ug/l as Zn	10
2nd - RY2007	MLGW-7	39219	0	Zinc, Dissolved	ug/l as Zn	30
2nd - RY2007	MLGW-7	39254	0	Zinc, Dissolved	ug/l as Zn	20
3rd - RY2007	MLGW-7	39289	0	Zinc, Dissolved	ug/l as Zn	<10
3rd - RY2007	MLGW-7	39317	0	Zinc, Dissolved	ug/l as Zn	<10
4th - RY2007	MLGW-7	39385	0	Zinc, Dissolved	ug/l as Zn	20
4th - RY2007	MLGW-7	39415	0	Zinc, Dissolved	ug/l as Zn	30
4th - RY2007	MLGW-7	39436	0	Zinc, Dissolved	ug/l as Zn	30
1st - RY008	MLGW-7	39476	0	Zinc, Dissolved	ug/l as Zn	30
1st - RY2008	MLGW-7	39506	0	Zinc, Dissolved	ug/l as Zn	30
2nd - RY2008	MLGW-7	39597	0	Zinc, Dissolved	ug/l as Zn	30
3rd - RY2009	MLGW-7	40085	0	Zinc, Dissolved	ug/l as Zn	4.9

Appendix B

Existing Monitoring Program – 5 Quarters of Surface Water Data

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2011	BG-20	10/19/2011	0	Aluminum, Dissolved	ug/l as Al	<9.6
3rd - RY2011	BG-20	09/14/2011	0	Aluminum, Dissolved	ug/l as Al	9.7
2nd - RY2011	BG-20	07/20/2011	0	Aluminum, Dissolved	ug/l as Al	24
1st - RY2011	BG-20	02/22/2011	0	Aluminum, Dissolved	ug/l as Al	<11
4th - RY2010	BG-20	10/13/2010	0	Aluminum, Dissolved	ug/l as Al	<11
4th - RY2011	BG-20	10/19/2011	0	Aluminum, Total	ug/l as Al	29.1
3rd - RY2011	BG-20	09/14/2011	0	Aluminum, Total	ug/l as Al	19.6
2nd - RY2011	BG-20	07/20/2011	0	Aluminum, Total	ug/l as Al	58.7
1st - RY2011	BG-20	02/22/2011	0	Aluminum, Total	ug/l as Al	15.4
4th - RY2010	BG-20	10/13/2010	0	Aluminum, Total	ug/l as Al	94.7
4th - RY2011	BG-20	10/19/2011	0	Arsenic, Dissolved	ug/l as As	0.59
3rd - RY2011	BG-20	09/14/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
2nd - RY2011	BG-20	07/20/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
1st - RY2011	BG-20	02/22/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
4th 0 RY2010	BG-20	10/13/2010	0	Arsenic, Dissolved	ug/l as As	<0.62
4th - RY2011	BG-20	10/19/2011	0	Arsenic, Total	ug/l as As	<0.38
3rd - RY2011	BG-20	09/14/2011	0	Arsenic, Total	ug/l as As	<0.38
2nd - RY2011	BG-20	07/20/2011	0	Arsenic, Total	ug/l as As	<0.38
1st - RY2011	BG-20	02/22/2011	0	Arsenic, Total	ug/l as As	<0.62
4th - RY2010	BG-20	10/13/2010	0	Arsenic, Total	ug/l as As	<0.62
4th - RY2011	BG-20	10/19/2011	0	Cadmium, Dissolved	ug/l as Cd	0.29
3rd - RY2011	BG-20	09/14/2011	0	Cadmium, Dissolved	ug/l as Cd	0.15
2nd - RY 2011	BG-20	07/20/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
1st - RY2011	BG-20	02/22/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
4th - RY2010	BG-20	10/13/2010	0	Cadmium, Dissolved	ug/l as Cd	<0.11
4th - RY2011	BG-20	10/19/2011	0	Cadmium, Total	ug/l as Cd	0.18
3rd - RY2011	BG-20	09/14/2011	0	Cadmium, Total	ug/l as Cd	<0.11
2nd - RY2011	BG-20	07/20/2011	0	Cadmium, Total	ug/l as Cd	<0.11
1st - RY2011	BG-20	02/22/2011	0	Cadmium, Total	ug/l as Cd	0.24
4th - RY2010	BG-20	10/13/2010	0	Cadmium, Total	ug/l as Cd	<0.11
4th - RY2011	BG-20	10/19/2011	0	Calcium, Dissolved	ug/l as Ca	8,520
3rd - RY2011	BG-20	09/14/2011	0	Calcium, Dissolved	ug/l as Ca	7,040
2nd - RY2011	BG-20	07/20/2011	0	Calcium, Total	ug/l as Ca	4,840
1st - RY2011	BG-20	02/22/2011	0	Calcium, Total	ug/l as Ca	9,980
4th -RY2010	BG-20	10/13/2010	0	Calcium, Total	ug/l as Ca	10,400
4th - RY2011	BG-20	10/19/2011	0	Copper, Dissolved	ug/l as Cu	0.4
3rd - RY2011	BG-20	09/14/2011	0	Copper, Dissolved	ug/l as Cu	<0.4
2nd - RY2011	BG-20	07/20/2011	0	Copper, Dissolved	ug/l as Cu	0.77
1st - RY2011	BG-20	02/22/2011	0	Copper, Dissolved	ug/l as Cu	<0.71
4th - RY2010	BG-20	10/13/2010	0	Copper, Dissolved	ug/l as Cu	1.1
4th - RY2011	BG-20	10/19/2011	0	Copper, Total	ug/l as Cu	0.44
3rd - RY2011	BG-20	09/14/2011	0	Copper, Total	ug/l as Cu	<1
2nd - RY2011	BG-20	07/20/2011	0	Copper, Total	ug/l as Cu	0.54
1st - RY2011	BG-20	02/22/2011	0	Copper, Total	ug/l as Cu	<0.71
4th - RY2010	BG-20	10/13/2010	0	Copper, Total	ug/l as Cu	0.83
4th - RY 2011	BG-20	10/19/2011	0	Hardness, Total	mg/l as CaCO3	25.8
3rd - RY2011	BG-20	09/14/2011	0	Hardness, Total	mg/l as CaCO3	21.4
2nd - RY2011	BG-20	07/20/2011	0	Hardness, Total	mg/l as CaCO3	14.7
1st - RY2011	BG-20	02/22/2011	0	Hardness, Total	mg/l as CaCO3	29.8
4th - RY2010	BG-20	10/13/2010	0	Hardness, Total	mg/l as CaCO3	30.5
4th - RY2011	BG-20	10/19/2011	0	Iron, Dissolved	ug/l as Fe	74.4
3rd - RY2011	BG-20	09/14/2011	0	Iron, Dissolved	ug/l as Fe	93.7
4th - RY2011	BG-20	10/19/2011	0	Iron, Total	ug/l as Fe	58.5
3rd - RY2011	BG-20	09/14/2011	0	Iron, Total	ug/l as Fe	<82
4th - RY2011	BG-20	10/19/2011	0	Magnesium, Dissolved	ug/l as Mg	1,090
3rd - RY2011	BG-20	09/14/2011	0	Magnesium, Dissolved	ug/l as Mg	940

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
2nd - RY2011	BG-20	07/20/2011	0	Magnesium, Total	ug/l as Mg	623
1st - RY 2011	BG-20	02/22/2011	0	Magnesium, Total	ug/l as Mg	1,190
4th- RY2010	BG-20	10/13/2010	0	Magnesium, Total	ug/l as Mg	1,100
4th - RY2011	BG-20	10/19/2011	0	Molybdenum, Dissolved	ug/l as Mo	1.3
3rd - RY2011	BG-20	09/14/2011	0	Molybdenum, Dissolved	ug/l as Mo	1.1
2nd - RY2011	BG-20	07/20/2011	0	Molybdenum, Dissolved	ug/l as Mo	1.1
1st - RY2011	BG-20	02/22/2011	0	Molybdenum, Dissolved	ug/l as Mo	1.5
4th - RY2010	BG-20	10/13/2010	0	Molybdenum, Dissolved	ug/l as Mo	2.4
4th - RY2011	BG-20	10/19/2011	0	Molybdenum, Total	ug/l as Mo	1.2
3rd - RY2011	BG-20	09/14/2011	0	Molybdenum, Total	ug/l as Mo	1.1
2nd - RY2011	BG-20	07/20/2011	0	Molybdenum, Total	ug/l as Mo	0.83
1st - RY2011	BG-20	02/22/2011	0	Molybdenum, Total	ug/l as Mo	1.6
4th - RY2010	BG-20	10/13/2010	0	Molybdenum, Total	ug/l as Mo	2.2
4th - RY2011	BG-20	10/19/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.11
3rd - RY2011	BG-20	09/14/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
2nd - RY2011	BG-20	07/20/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.57
1st - RY2011	BG-20	02/22/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.16
4th - RY2010	BG-20	10/13/2010	0	Nitrate Nitrogen, Total	mg/l as N	0.082
4th - RY2011	BG-20	10/19/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
3rd - RY 2011	BG-20	09/14/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
2nd - RY2011	BG-20	07/20/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
1st - RY2011	BG-20	02/22/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2010	BG-20	10/13/2010	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2011	BG-20	10/19/2011	0	Nitrogen Total Organic	mg/L	<0.4
3rd - RY2011	BG-20	09/14/2011	0	Nitrogen Total Organic	mg/L	<0.4
2nd - RY2011	BG-20	07/20/2011	0	Nitrogen Total Organic	mg/L	<0.4
1st - RY2011	BG-20	02/22/2011	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2010	BG-20	10/13/2010	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY 2011	BG-20	10/19/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
3rd - RY2011	BG-20	09/14/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
2nd - RY2011	BG-20	07/20/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
1st - RY2011	BG-20	02/22/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2010	BG-20	10/13/2010	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2011	BG-20	10/19/2011	0	Nitrogen,total kjeldahl	mg/l	<0.3
3rd - RY2011	BG-20	09/14/2011	0	Nitrogen,total kjeldahl	mg/l	<0.3
2nd - RY2011	BG-20	07/20/2011	0	Nitrogen,total kjeldahl	mg/l	<0.3
1st - RY2011	BG-20	02/22/2011	0	Nitrogen,total kjeldahl	mg/l	<0.3
4th - RY2010	BG-20	10/13/2010	0	Nitrogen,total kjeldahl	mg/l	<0.3
4th - RY2011	BG-20	10/19/2011	0	pH, Field	Standard Units	7.9
3rd - RY 2011	BG-20	09/14/2011	0	pH, Field	Standard Units	6.3
2nd - RY2011	BG-20	07/20/2011	0	pH, Field	Standard Units	6.7
1st - RY2011	BG-20	02/22/2011	0	pH, Field	Standard Units	6.7
4th - RY2010	BG-20	10/13/2010	0	pH, Field	Standard Units	6.7
4th - RY2011	BG-20	10/19/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
3rd - RY2011	BG-20	09/14/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
2nd - RY2011	BG-20	07/20/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
1st -RY2011	BG-20	02/22/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2010	BG-20	10/13/2010	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2011	BG-20	10/19/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
3rd - RY2011	BG-20	09/14/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
2nd - RY2011	BG-20	07/20/2011	0	Selenium, Dissolved	ug/l as Se	1.7
1st - RY2011	BG-20	02/22/2011	0	Selenium, Dissolved	ug/l as Se	0.22
4th - RY2010	BG-20	10/13/2010	0	Selenium, Dissolved	ug/l as Se	0.67
4th - RY2011	BG-20	10/19/2011	0	Selenium, Total	ug/l as Se	<0.64
3rd - RY2011	BG-20	09/14/2011	0	Selenium, Total	ug/l as Se	<1.6
2nd - RY2011	BG-20	07/20/2011	0	Selenium, Total	ug/l as Se	0.77

Appendix B

Existing Network - 5 Quarters of Surface Water Data

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
1st - RY2011	BG-20	02/22/2011	0	Selenium, Total	ug/l as Se	0.75
4th - RY2010	BG-20	10/13/2010	0	Selenium, Total	ug/l as Se	<0.19
4th - RY2011	BG-20	10/19/2011	0	Sulfate, Total	mg/l as SO4	12.5
3rd - RY 2011	BG-20	09/14/2011	0	Sulfate, Total	mg/l as SO4	10.4
2nd - RY2011	BG-20	07/20/2011	0	Sulfate, Total	mg/l as SO4	6.2
4th - RY2011	BG-20	10/19/2011	0	Temperature, Water	^{o}C	0.1
3rd - RY2011	BG-20	09/14/2011	0	Temperature, Water	^{o}C	4.9
2nd - RY2011	BG-20	07/20/2011	0	Temperature, Water	^{o}C	6.8
1st - RY2011	BG-20	02/22/2011	0	Temperature, Water	^{o}C	0.2
4th - RY2010	BG-20	10/13/2010	0	Temperature, Water	^{o}C	1.8
4th - RY2011	BG-20	10/19/2011	0	Temperature, Water	^{o}F	32.2
3rd - RY2011	BG-20	09/14/2011	0	Temperature, Water	^{o}F	40.8
2nd - RY2011	BG-20	07/20/2011	0	Temperature, Water	^{o}F	44.2
4th - RY2011	BG-20	10/19/2011	0	Uranium Total	ug/L	0.91
3rd - RY2011	BG-20	09/14/2011	0	Uranium Total	ug/L	0.82
2nd - RY2011	BG-20	07/20/2011	0	Uranium Total	ug/L	0.84
1st - RY2011	BG-20	02/22/2011	0	Uranium Total	ug/L	0.77
4th - RY2010	BG-20	10/13/2010	0	Uranium Total	ug/L	0.91
4th - RY2011	BG-20	10/19/2011	0	Uranium, Natural, Dissolved	ug/L	0.71
3rd - RY2011	BG-20	09/14/2011	0	Uranium, Natural, Dissolved	ug/L	0.64
2nd - RY2011	BG-20	07/20/2011	0	Uranium, Natural, Dissolved	ug/L	0.79
1st - RY2011	BG-20	02/22/2011	0	Uranium, Natural, Dissolved	ug/L	0.63
4th - RY2010	BG-20	10/13/2010	0	Uranium, Natural, Dissolved	ug/L	0.71

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2011	CC-10	10/19/2011	0	Aluminum, Dissolved	ug/l as Al	28.1
3rd - RY2011	CC-10	09/14/2011	0	Aluminum, Dissolved	ug/l as Al	17.8
2nd - RY2011	CC-10	07/20/2011	0	Aluminum, Dissolved	ug/l as Al	37.8
1st - RY2011	CC-10	02/22/2011	0	Aluminum, Dissolved	ug/l as Al	30.6
4th - RY2010	CC-10	10/13/2010	0	Aluminum, Dissolved	ug/l as Al	34.8
4th - RY2011	CC-10	10/19/2011	0	Aluminum, Total	ug/l as Al	30.1
3rd - RY2011	CC-10	09/14/2011	0	Aluminum, Total	ug/l as Al	25.4
2nd - RY2011	CC-10	07/20/2011	0	Aluminum, Total	ug/l as Al	72.7
1st - RY2011	CC-10	02/22/2011	0	Aluminum, Total	ug/l as Al	33.7
4th - RY2010	CC-10	10/13/2010	0	Aluminum, Total	ug/l as Al	330
4th - RY2011	CC-10	10/19/2011	0	Arsenic, Dissolved	ug/l as As	0.68
3rd - RY2011	CC-10	09/14/2011	0	Arsenic, Dissolved	ug/l as As	0.69
2nd - RY2011	CC-10	07/20/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
1st - RY2011	CC-10	02/22/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
4th - RY2010	CC-10	10/13/2010	0	Arsenic, Dissolved	ug/l as As	<0.62
4th - RY2011	CC-10	10/19/2011	0	Arsenic, Total	ug/l as As	<0.38
3rd - RY2011	CC-10	09/14/2011	0	Arsenic, Total	ug/l as As	0.44
2nd - RY2011	CC-10	07/20/2011	0	Arsenic, Total	ug/l as As	<0.38
1st - RY2011	CC-10	02/22/2011	0	Arsenic, Total	ug/l as As	<0.62
4th - RY2010	CC-10	10/13/2010	0	Arsenic, Total	ug/l as As	<0.62
4th - RY2011	CC-10	10/19/2011	0	Cadmium, Dissolved	ug/l as Cd	0.29
3rd - RY2011	CC-10	09/14/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
2nd - RY2011	CC-10	07/20/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
1st - RY2011	CC-10	02/22/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
4th - RY2010	CC-10	10/13/2010	0	Cadmium, Dissolved	ug/l as Cd	0.14
4th - RY2011	CC-10	10/19/2011	0	Cadmium, Total	ug/l as Cd	0.3
3rd - RY2011	CC-10	09/14/2011	0	Cadmium, Total	ug/l as Cd	<0.11
2nd - RY2011	CC-10	07/20/2011	0	Cadmium, Total	ug/l as Cd	<0.11
1st - RY2011	CC-10	02/22/2011	0	Cadmium, Total	ug/l as Cd	0.29
4th - RY2010	CC-10	10/13/2010	0	Cadmium, Total	ug/l as Cd	0.19
4th - RY2011	CC-10	10/19/2011	0	Calcium, Dissolved	ug/l as Ca	6,110
3rd - RY2011	CC-10	09/14/2011	0	Calcium, Dissolved	ug/l as Ca	4,870
2nd - RY2011	CC-10	07/20/2011	0	Calcium, Total	ug/l as Ca	2,480
1st - RY2011	CC-10	02/22/2011	0	Calcium, Total	ug/l as Ca	8,650
4th - RY2010	CC-10	10/13/2010	0	Calcium, Total	ug/l as Ca	8,000
4th - RY2011	CC-10	10/19/2011	0	Copper, Dissolved	ug/l as Cu	2.2
3rd - RY2011	CC-10	09/14/2011	0	Copper, Dissolved	ug/l as Cu	1.2
2nd - RY2011	CC-10	07/20/2011	0	Copper, Dissolved	ug/l as Cu	1.3
1st - RY2011	CC-10	02/22/2011	0	Copper, Dissolved	ug/l as Cu	2.3
4th - RY2010	CC-10	10/13/2010	0	Copper, Dissolved	ug/l as Cu	4.7
4th - RY2011	CC-10	10/19/2011	0	Copper, Total	ug/l as Cu	2.5
3rd - RY2011	CC-10	09/14/2011	0	Copper, Total	ug/l as Cu	8
2nd - RY2011	CC-10	07/20/2011	0	Copper, Total	ug/l as Cu	1.3
1st - RY2011	CC-10	02/22/2011	0	Copper, Total	ug/l as Cu	2.4
4th - RY2010	CC-10	10/13/2010	0	Copper, Total	ug/l as Cu	14.2
4th - RY2011	CC-10	10/19/2011	0	Hardness, Total	mg/l as CaCO3	19.5
3rd - RY2011	CC-10	09/14/2011	0	Hardness, Total	mg/l as CaCO3	15.3
2nd - RY2011	CC-10	07/20/2011	0	Hardness, Total	mg/l as CaCO4	8
1st - RY2011	CC-10	02/22/2011	0	Hardness, Total	mg/l as CaCO5	26.9
4th - RY2010	CC-10	10/13/2010	0	Hardness, Total	mg/l as CaCO6	24.6
4th - RY2011	CC-10	10/19/2011	0	Iron, Dissolved	ug/l as Fe	144
3rd - RY2011	CC-10	09/14/2011	0	Iron, Dissolved	ug/l as Fe	51.1
4th - RY2011	CC-10	10/19/2011	0	Iron, Total	ug/l as Fe	125
3rd - RY2011	CC-10	09/14/2011	0	Iron, Total	ug/l as Fe	79.4

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
2nd - RY2011	CC-10	07/20/2011	0	Iron, Total	ug/l as Fe	109
1st - RY2011	CC-10	02/22/2011	0	Iron, Total	ug/l as Fe	167
4th - RY2010	CC-10	10/13/2010	0	Iron, Total	ug/l as Fe	1,360
4th - RY2011	CC-10	10/19/2011	0	Lead, Dissolved	ug/l as Pb	0.25
3rd - RY2011	CC-10	09/14/2011	0	Lead, Dissolved	ug/l as Pb	0.16
2nd - RY2011	CC-10	07/20/2011	0	Lead, Dissolved	ug/l as Pb	0.22
1st - RY2011	CC-10	02/22/2011	0	Lead, Dissolved	ug/l as Pb	0.37
4th - RY2010	CC-10	10/13/2010	0	Lead, Dissolved	ug/l as Pb	0.3
4th - RY2011	CC-10	10/19/2011	0	Magnesium, Dissolved	ug/l as Mg	1,030
3rd - RY2011	CC-10	09/14/2011	0	Magnesium, Dissolved	ug/l as Mg	755
2nd - RY2011	CC-10	07/20/2011	0	Magnesium, Total	ug/l as Mg	441
1st - RY2011	CC-10	02/22/2011	0	Magnesium, Total	ug/l as Mg	1,290
4th - RY2010	CC-10	10/13/2010	0	Magnesium, Total	ug/l as Mg	1,130
4th -RY2011	CC-10	10/19/2011	0	Manganese, Dissolved	ug/l as Mn	20.1
3rd - RY 2011	CC-10	09/14/2011	0	Manganese, Dissolved	ug/l as Mn	6.9
2nd - RY2011	CC-10	07/20/2011	0	Manganese, Dissolved	ug/l as Mn	23.5
1st - RY 2011	CC-10	02/22/2011	0	Manganese, Dissolved	ug/l as Mn	2.5
4th - RY 2010	CC-10	10/13/2010	0	Manganese, Dissolved	ug/l as Mn	52.4
4th- RY2011	CC-10	10/19/2011	0	Mercury, Total	ug/l as Hg	0.071
3rd - RY2011	CC-10	09/14/2011	0	Mercury, Total	ug/l as Hg	<0.014
2nd - RY2011	CC-10	07/20/2011	0	Mercury, Total	ug/l as Hg	<0.014
1st - RY2011	CC-10	02/22/2011	0	Mercury, Total	ug/l as Hg	0.025
4th - RY2010	CC-10	10/13/2010	0	Mercury, Total	ug/l as Hg	<0.014
4th - RY2011	CC-10	10/19/2011	0	Molybdenum, Dissolved	ug/l as Mo	0.43
3rd - RY2011	CC-10	09/14/2011	0	Molybdenum, Dissolved	ug/l as Mo	0.36
2nd - RY2011	CC-10	07/20/2011	0	Molybdenum, Dissolved	ug/l as Mo	0.38
1st - RY2011	CC-10	02/22/2011	0	Molybdenum, Dissolved	ug/l as Mo	0.49
4th - RY2010	CC-10	10/13/2010	0	Molybdenum, Dissolved	ug/l as Mo	0.63
4th - RY2011	CC-10	10/19/2011	0	Molybdenum, Total	ug/l as Mo	0.35
3rd - RY2011	CC-10	09/14/2011	0	Molybdenum, Total	ug/l as Mo	0.39
2nd - RY2011	CC-10	07/20/2011	0	Molybdenum, Total	ug/l as Mo	0.35
1st - RY2011	CC-10	02/22/2011	0	Molybdenum, Total	ug/l as Mo	0.57
4th - RY2010	CC-10	10/13/2010	0	Molybdenum, Total	ug/l as Mo	0.72
4th - RY2011	CC-10	10/19/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
3rd - RY2011	CC-10	09/14/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
2nd - RY2011	CC-10	07/20/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
1st - RY2011	CC-10	02/22/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.066
4th - RY2010	CC-10	10/13/2010	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
4th - RY2011	CC-10	10/19/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
3rd - RY2011	CC-10	09/14/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
2nd - RY2011	CC-10	07/20/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
1st - RY2011	CC-10	02/22/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2010	CC-10	10/13/2010	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2011	CC-10	10/19/2011	0	Nitrogen Total Organic	mg/L	<0.4
3rd - RY2011	CC-10	09/14/2011	0	Nitrogen Total Organic	mg/L	<0.4
2nd - RY 2011	CC-10	07/20/2011	0	Nitrogen Total Organic	mg/L	<0.4
1st - RY2011	CC-10	02/22/2011	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2010	CC-10	10/13/2010	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2011	CC-10	10/19/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
3rd - RY2011	CC-10	09/14/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
2nd - RY2011	CC-10	07/20/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
1st - RY2011	CC-10	02/22/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2010	CC-10	10/13/2010	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2011	CC-10	10/19/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
3rd - RY2011	CC-10	09/14/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
2nd - RY2011	CC-10	07/20/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
1st - RY2011	CC-10	02/22/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
4th - RY2010	CC-10	10/13/2010	0	Nitrogen,total kjeldahl	mg/L	<0.3
4th - RY 2011	CC-10	10/19/2011	0	pH, Field	Standard Units	6.8
3rd - RY2011	CC-10	09/14/2011	0	pH, Field	Standard Units	6.6
2nd - RY2011	CC-10	07/20/2011	0	pH, Field	Standard Units	6.1
1st - RY2011	CC-10	02/22/2011	0	pH, Field	Standard Units	6.7
4th - RY2010	CC-10	10/13/2010	0	pH, Field	Standard Units	6.5
4th - RY2011	CC-10	10/19/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
3rd - RY2011	CC-10	09/14/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
2nd - RY2011	CC-10	07/20/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
1st - RY2011	CC-10	02/22/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2010	CC-10	10/13/2010	0	Phosphate, Ortho	mg/l as PO4	0.1
4th - RY2011	CC-10	10/19/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
3rd - RY2011	CC-10	09/14/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
2nd - RY2011	CC-10	07/20/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
1st - RY2011	CC-10	02/22/2011	0	Selenium, Dissolved	ug/l as Se	<0.19
4th - RY2010	CC-10	10/13/2010	0	Selenium, Dissolved	ug/l as Se	0.19
4th - RY2011	CC-10	10/19/2011	0	Selenium, Total	ug/l as Se	<0.64
3rd - RY2011	CC-10	09/14/2011	0	Selenium, Total	ug/l as Se	<0.64
2nd - RY2011	CC-10	07/20/2011	0	Selenium, Total	ug/l as Se	<0.64
1st - RY2011	CC-10	02/22/2011	0	Selenium, Total	ug/l as Se	0.22
4th - RY2010	CC-10	10/13/2010	0	Selenium, Total	ug/l as Se	0.19
4th - RY2011	CC-10	10/19/2011	0	Silver, Dissolved	ug/l as Ag	<0.1
3rd - RY2011	CC-10	09/14/2011	0	Silver, Dissolved	ug/l as Ag	<0.1
2nd - RY2011	CC-10	07/20/2011	0	Silver, Dissolved	ug/l as Ag	<0.1
1st - RY2011	CC-10	02/22/2011	0	Silver, Dissolved	ug/l as Ag	<0.0034
4th - RY2010	CC-10	10/13/2010	0	Silver, Dissolved	ug/l as Ag	0.018
4th - RY2011	CC-10	10/19/2011	0	Sulfate, Total	mg/l as SO4	6.6
3rd - RY2011	CC-10	09/14/2011	0	Sulfate, Total	mg/l as SO4	4.5
2nd - RY2011	CC-10	07/20/2011	0	Sulfate, Total	mg/l as SO4	2.1
4th - RY 2011	CC-10	10/19/2011	0	Temperature, Water	^{o}C	0.1
3rd - RY2011	CC-10	09/14/2011	0	Temperature, Water	^{o}C	5.5
2nd - RY2011	CC-10	07/20/2011	0	Temperature, Water	^{o}C	6.2
1st - RY2011	CC-10	02/22/2011	0	Temperature, Water	^{o}C	1
4th - RY2010	CC-10	10/13/2010	0	Temperature, Water	^{o}C	2.2
4th - RY2011	CC-10	10/19/2011	0	Temperature, Water	^{o}F	32.2
3rd - RY2011	CC-10	09/14/2011	0	Temperature, Water	^{o}F	41.9
2nd - RY2011	CC-10	07/20/2011	0	Temperature, Water	^{o}F	43.2
4th - RY2011	CC-10	10/19/2011	0	Uranium Total	ug/L	0.76
3rd - RY2011	CC-10	09/14/2011	0	Uranium Total	ug/L	0.48
2nd - RY2011	CC-10	07/20/2011	0	Uranium Total	ug/L	0.39
1st - RY2011	CC-10	02/22/2011	0	Uranium Total	ug/L	1.6
4th - RY2010	CC-10	10/13/2010	0	Uranium Total	ug/L	1.1
4th - RY2011	CC-10	10/19/2011	0	Uranium, Natural, Dissolved	ug/L	0.7
3rd - RY2011	CC-10	09/14/2011	0	Uranium, Natural, Dissolved	ug/L	0.48
2nd - RY2011	CC-10	07/20/2011	0	Uranium, Natural, Dissolved	ug/L	0.97
1st - RY2011	CC-10	02/22/2011	0	Uranium, Natural, Dissolved	ug/L	1.4
4th - RY2010	CC-10	10/13/2010	0	Uranium, Natural, Dissolved	ug/L	0.46
4th - RY2011	CC-10	10/19/2011	0	Zinc, Dissolved	ug/l as Zn	31.2

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
3rd - RY2011	CC-10	09/14/2011	0	Zinc, Dissolved	ug/l as Zn	17.7
2nd - RY2011	CC-10	07/20/2011	0	Zinc, Dissolved	ug/l as Zn	12.3
1st - RY2011	CC-10	02/22/2011	0	Zinc, Dissolved	ug/l as Zn	39.4
4th - RY2010	CC-10	10/13/2010	0	Zinc, Dissolved	ug/l as Zn	61.1

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2011	CC-30	10/19/2011	0	Aluminum, Dissolved	ug/l as Al	43.6
4th - RY2011	CC-30	10/19/2011	1	Aluminum, Dissolved	ug/l as Al	42
3rd - RY2011	CC-30	09/14/2011	0	Aluminum, Dissolved	ug/l as Al	68
2nd - RY2011	CC-30	07/20/2011	0	Aluminum, Dissolved	ug/l as Al	118
1st - RY2011	CC-30	02/22/2011	0	Aluminum, Dissolved	ug/l as Al	20.5
4th - RY2010	CC-30	10/13/2011	0	Aluminum, Dissolved	ug/l as Al	28
4th - RY2011	CC-30	10/19/2011	0	Aluminum, Total	ug/l as Al	60.5
4th - RY2011	CC-30	10/19/2011	1	Aluminum, Total	ug/l as Al	63.9
3rd - RY2011	CC-30	09/14/2011	0	Aluminum, Total	ug/l as Al	107
2nd - RY2011	CC-30	07/20/2011	0	Aluminum, Total	ug/l as Al	181
1st - RY2011	CC-30	02/22/2011	0	Aluminum, Total	ug/l as Al	53.3
4th - RY2010	CC-30	10/13/2011	0	Aluminum, Total	ug/l as Al	45.4
4th - RY2011	CC-30	10/19/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
4th - RY2011	CC-30	10/19/2011	1	Arsenic, Dissolved	ug/l as As	0.81
3rd - RY2011	CC-30	09/14/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
2nd - RY2011	CC-30	07/20/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
1st - RY2011	CC-30	02/22/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
4th - RY2010	CC-30	10/13/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
4th - RY2011	CC-30	10/19/2011	0	Arsenic, Total	ug/l as As	0.49
4th - RY2011	CC-30	10/19/2011	1	Arsenic, Total	ug/l as As	0.39
3rd - RY2011	CC-30	09/14/2011	0	Arsenic, Total	ug/l as As	<0.38
2nd - RY2011	CC-30	07/20/2011	0	Arsenic, Total	ug/l as As	<0.38
1st - RY2011	CC-30	02/22/2011	0	Arsenic, Total	ug/l as As	<0.62
4th - RY2010	CC-30	10/13/2011	0	Arsenic, Total	ug/l as As	<0.62
4th - RY2011	CC-30	10/19/2011	0	Cadmium, Dissolved	ug/l as Cd	0.33
4th - RY2011	CC-30	10/19/2011	1	Cadmium, Dissolved	ug/l as Cd	0.27
3rd - RY2011	CC-30	09/14/2011	0	Cadmium, Dissolved	ug/l as Cd	0.14
2nd - RY2011	CC-30	07/20/2011	0	Cadmium, Dissolved	ug/l as Cd	0.15
1st - RY2011	CC-30	02/22/2011	0	Cadmium, Dissolved	ug/l as Cd	0.11
4th - RY2010	CC-30	10/13/2011	0	Cadmium, Dissolved	ug/l as Cd	0.2
4th - RY2011	CC-30	10/19/2011	0	Cadmium, Total	ug/l as Cd	0.37
4th - RY2011	CC-30	10/19/2011	1	Cadmium, Total	ug/l as Cd	0.34
3rd - RY2011	CC-30	09/14/2011	0	Cadmium, Total	ug/l as Cd	0.31
2nd - RY2011	CC-30	07/20/2011	0	Cadmium, Total	ug/l as Cd	0.18
1st - RY2011	CC-30	02/22/2011	0	Cadmium, Total	ug/l as Cd	0.31
4th - RY2010	CC-30	10/13/2011	0	Cadmium, Total	ug/l as Cd	0.15
4th - RY2011	CC-30	10/19/2011	0	Calcium, Dissolved	ug/l as Ca	11,600
4th - RY2011	CC-30	10/19/2011	1	Calcium, Dissolved	ug/l as Ca	11,500
3rd - RY2011	CC-30	09/14/2011	0	Calcium, Dissolved	ug/l as Ca	9,530
2nd - RY2011	CC-30	07/20/2011	0	Calcium, Total	ug/l as Ca	4,210
1st - RY2011	CC-30	02/22/2011	0	Calcium, Total	ug/l as Ca	16,700
4th - RY2010	CC-30	10/13/2011	0	Calcium, Total	ug/l as Ca	17,300
4th - RY2011	CC-30	10/19/2011	0	Copper, Dissolved	ug/l as Cu	1.1
4th - RY2011	CC-30	10/19/2011	1	Copper, Dissolved	ug/l as Cu	1.3
3rd - RY2011	CC-30	09/14/2011	0	Copper, Dissolved	ug/l as Cu	0.9
2nd - RY2011	CC-30	07/20/2011	0	Copper, Dissolved	ug/l as Cu	1.8
1st - RY2011	CC-30	02/22/2011	0	Copper, Dissolved	ug/l as Cu	<0.71
4th - RY2010	CC-30	10/13/2011	0	Copper, Dissolved	ug/l as Cu	1.1
4th - RY2011	CC-30	10/19/2011	0	Copper, Total	ug/l as Cu	1.4
4th - RY2011	CC-30	10/19/2011	1	Copper, Total	ug/l as Cu	1.1
3rd - RY2011	CC-30	09/14/2011	0	Copper, Total	ug/l as Cu	1.4
2nd - RY2011	CC-30	07/20/2011	0	Copper, Total	ug/l as Cu	1.5
1st - RY2011	CC-30	02/22/2011	0	Copper, Total	ug/l as Cu	0.9
4th - RY2010	CC-30	10/13/2011	0	Copper, Total	ug/l as Cu	1.4
4th - RY2011	CC-30	10/19/2011	0	Hardness, Total	mg/l as CaCO3	34.9

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2011	CC-30	10/19/2011	1	Hardness, Total	mg/l as CaCO3	34.5
3rd - RY2011	CC-30	09/14/2011	0	Hardness, Total	mg/l as CaCO3	28.4
2nd - RY2011	CC-30	07/20/2011	0	Hardness, Total	mg/l as CaCO3	12.9
1st - RY2011	CC-30	02/22/2011	0	Hardness, Total	mg/l as CaCO3	49.7
4th - RY2010	CC-30	10/13/2011	0	Hardness, Total	mg/l as CaCO3	50
4th - RY2011	CC-30	10/19/2011	0	Iron, Dissolved	ug/l as Fe	112
4th - RY2011	CC-30	10/19/2011	1	Iron, Dissolved	ug/l as Fe	111
3rd - RY2011	CC-30	09/14/2011	0	Iron, Dissolved	ug/l as Fe	59
4th - RY2011	CC-30	10/19/2011	0	Iron, Total	ug/l as Fe	94
4th - RY2011	CC-30	10/19/2011	1	Iron, Total	ug/l as Fe	84
3rd - RY2011	CC-30	09/14/2011	0	Iron, Total	ug/l as Fe	167
2nd - RY2011	CC-30	07/20/2011	0	Iron, Total	ug/l as Fe	80.4
1st - RY2011	CC-30	02/22/2011	0	Iron, Total	ug/l as Fe	95.5
4th - RY2010	CC-30	10/13/2011	0	Iron, Total	ug/l as Fe	144
4th - RY2011	CC-30	10/19/2011	0	Lead, Dissolved	ug/l as Pb	<0.092
4th - RY2011	CC-30	10/19/2011	1	Lead, Dissolved	ug/l as Pb	0.1
3rd - RY2011	CC-30	09/14/2011	0	Lead, Dissolved	ug/l as Pb	0.12
2nd - RY2011	CC-30	07/20/2011	0	Lead, Dissolved	ug/l as Pb	0.26
1st - RY2011	CC-30	02/22/2011	0	Lead, Dissolved	ug/l as Pb	<0.078
4th - RY2010	CC-30	10/13/2011	0	Lead, Dissolved	ug/l as Pb	0.54
4th - RY2011	CC-30	10/19/2011	0	Magnesium, Dissolved	ug/l as Mg	1,450
4th - RY2011	CC-30	10/19/2011	1	Magnesium, Dissolved	ug/l as Mg	1,400
3rd - RY2011	CC-30	09/14/2011	0	Magnesium, Dissolved	ug/l as Mg	1,130
2nd - RY2011	CC-30	07/20/2011	0	Magnesium, Total	ug/l as Mg	578
1st - RY2011	CC-30	02/22/2011	0	Magnesium, Total	ug/l as Mg	1,950
4th - RY2010	CC-30	10/13/2011	0	Magnesium, Total	ug/l as Mg	1,660
4th - RY2011	CC-30	10/19/2011	0	Manganese, Dissolved	ug/l as Mn	153
4th - RY2011	CC-30	10/19/2011	1	Manganese, Dissolved	ug/l as Mn	150
3rd - RY2011	CC-30	09/14/2011	0	Manganese, Dissolved	ug/l as Mn	199
2nd - RY2011	CC-30	07/20/2011	0	Manganese, Dissolved	ug/l as Mn	82.4
1st - RY2011	CC-30	02/22/2011	0	Manganese, Dissolved	ug/l as Mn	161
4th - RY2010	CC-30	10/13/2011	0	Manganese, Dissolved	ug/l as Mn	225
4th - RY2011	CC-30	10/19/2011	0	Mercury, Total	ug/l as Hg	0.067
4th - RY2011	CC-30	10/19/2011	1	Mercury, Total	ug/l as Hg	0.068
3rd - RY2011	CC-30	09/14/2011	0	Mercury, Total	ug/l as Hg	<0.014
2nd - RY2011	CC-30	07/20/2011	0	Mercury, Total	ug/l as Hg	<0.014
1st - RY2011	CC-30	02/22/2011	0	Mercury, Total	ug/l as Hg	0.019
4th - RY2010	CC-30	10/13/2011	0	Mercury, Total	ug/l as Hg	<0.014
4th - RY2011	CC-30	10/19/2011	0	Molybdenum, Dissolved	ug/l as Mo	1.2
4th - RY2011	CC-30	10/19/2011	1	Molybdenum, Dissolved	ug/l as Mo	1.2
3rd - RY2011	CC-30	09/14/2011	0	Molybdenum, Dissolved	ug/l as Mo	1.2
2nd - RY2011	CC-30	07/20/2011	0	Molybdenum, Dissolved	ug/l as Mo	0.71
1st - RY2011	CC-30	02/22/2011	0	Molybdenum, Dissolved	ug/l as Mo	1.2
4th - RY2010	CC-30	10/13/2011	0	Molybdenum, Dissolved	ug/l as Mo	1.8
4th - RY2011	CC-30	10/19/2011	0	Molybdenum, Total	ug/l as Mo	1.2
4th - RY2011	CC-30	10/19/2011	1	Molybdenum, Total	ug/l as Mo	1.2
3rd - RY2011	CC-30	09/14/2011	0	Molybdenum, Total	ug/l as Mo	1.1
2nd - RY2011	CC-30	07/20/2011	0	Molybdenum, Total	ug/l as Mo	0.89
1st - RY2011	CC-30	02/22/2011	0	Molybdenum, Total	ug/l as Mo	1.2
4th - RY2010	CC-30	10/13/2011	0	Molybdenum, Total	ug/l as Mo	1.7
4th - RY2011	CC-30	10/19/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.085
4th - RY2011	CC-30	10/19/2011	1	Nitrate Nitrogen, Total	mg/l as N	0.53
3rd - RY2011	CC-30	09/14/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
2nd - RY2011	CC-30	07/20/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.1
1st - RY2011	CC-30	02/22/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.13

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2010	CC-30	10/13/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.06
4th - RY2011	CC-30	10/19/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2011	CC-30	10/19/2011	1	Nitrate Nitrogen, Total	mg/l as N	<0.061
3rd - RY2011	CC-30	09/14/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
2nd - RY2011	CC-30	07/20/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
1st - RY2011	CC-30	02/22/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2010	CC-30	10/13/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2011	CC-30	10/19/2011	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2011	CC-30	10/19/2011	1	Nitrogen Total Organic	mg/L	<0.4
3rd - RY2011	CC-30	09/14/2011	0	Nitrogen Total Organic	mg/L	<0.4
2nd - RY2011	CC-30	07/20/2011	0	Nitrogen Total Organic	mg/L	<0.4
1st - RY2011	CC-30	02/22/2011	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2010	CC-30	10/13/2011	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2011	CC-30	10/19/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2011	CC-30	10/19/2011	1	Nitrogen, Ammonia, Total	mg/l as N	<0.1
3rd - RY2011	CC-30	09/14/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
2nd - RY2011	CC-30	07/20/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
1st - RY2011	CC-30	02/22/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2010	CC-30	10/13/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2011	CC-30	10/19/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
4th - RY2011	CC-30	10/19/2011	1	Nitrogen,total kjeldahl	mg/L	<0.3
3rd - RY2011	CC-30	09/14/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
2nd - RY2011	CC-30	07/20/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
1st - RY2011	CC-30	02/22/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
4th - RY 2010	CC-30	10/13/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
4th - RY2011	CC-30	10/19/2011	0	pH, Field	Standard Units	7.2
3rd - RY2011	CC-30	09/14/2011	0	pH, Field	Standard Units	7.4
1st - RY2011	CC-30	02/22/2011	0	pH, Field	Standard Units	6.4
4th - RY2011	CC-30	10/19/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2011	CC-30	10/19/2011	1	Phosphate, Ortho	mg/l as PO4	<0.1
3rd - RY2011	CC-30	09/14/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
2nd - RY2011	CC-30	07/20/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
1st - RY 2011	CC-30	02/22/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2010	CC-30	10/13/2011	0	Phosphate, Ortho	mg/l as PO4	0.17
4th - RY2011	CC-30	10/19/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
4th - RY2011	CC-30	10/19/2011	1	Selenium, Dissolved	ug/l as Se	<0.64
3rd - RY2011	CC-30	09/14/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
2nd - RY2011	CC-30	07/20/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
1st - RY2011	CC-30	02/22/2011	0	Selenium, Dissolved	ug/l as Se	<0.19
4th - RY2010	CC-30	10/13/2011	0	Selenium, Dissolved	ug/l as Se	0.36
4th - RY2011	CC-30	10/19/2011	0	Selenium, Total	ug/l as Se	<0.64
4th - RY2011	CC-30	10/19/2011	1	Selenium, Total	ug/l as Se	<0.64
3rd - RY2011	CC-30	09/14/2011	0	Selenium, Total	ug/l as Se	<0.64
2nd - RY2011	CC-30	07/20/2011	0	Selenium, Total	ug/l as Se	<0.64
1st - RY2011	CC-30	02/22/2011	0	Selenium, Total	ug/l as Se	<0.19
4th - RY2010	CC-30	10/13/2011	0	Selenium, Total	ug/l as Se	<0.19
4th - RY2011	CC-30	10/19/2011	0	Silver, Dissolved	ug/l as Ag	<0.1
4th - RY2011	CC-30	10/19/2011	1	Silver, Dissolved	ug/l as Ag	<0.1
3rd - RY2011	CC-30	09/14/2011	0	Silver, Dissolved	ug/l as Ag	<0.1
2nd - RY2011	CC-30	07/20/2011	0	Silver, Dissolved	ug/l as Ag	<0.1
1st - RY2011	CC-30	02/22/2011	0	Silver, Dissolved	ug/l as Ag	<0.0034
4th - RY 2010	CC-30	10/13/2011	0	Silver, Dissolved	ug/l as Ag	0.024
4th - RY 2011	CC-30	10/19/2011	0	Sulfate, Total	mg/l as SO4	16.8
4th - RY2011	CC-30	10/19/2011	1	Sulfate, Total	mg/l as SO4	16.8
3rd - RY2011	CC-30	09/14/2011	0	Sulfate, Total	mg/l as SO4	15.1

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
2nd - RY2011	CC-30	07/20/2011	0	Sulfate, Total	mg/l as SO4	6.1
4th - RY2011	CC-30	10/19/2011	0	Temperature, Water	°C	1.1
3rd - RY2011	CC-30	09/14/2011	0	Temperature, Water	°C	7.2
1st - RY2011	CC-30	02/22/2011	0	Temperature, Water	°C	1
4th - RY2010	CC-30	10/13/2011	0	Temperature, Water	°C	3
4th - RY2011	CC-30	10/19/2011	0	Temperature, Water	°F	34
3rd - RY2011	CC-30	09/14/2011	0	Temperature, Water	°F	45
4th - RY2011	CC-30	10/19/2011	0	Uranium Total	ug/L	1
4th - RY2011	CC-30	10/19/2011	1	Uranium Total	ug/L	1
3rd - RY2011	CC-30	09/14/2011	0	Uranium Total	ug/L	0.86
2nd - RY2011	CC-30	07/20/2011	0	Uranium Total	ug/L	0.64
1st - RY2011	CC-30	02/22/2011	0	Uranium Total	ug/L	0.99
4th - RY 2010	CC-30	10/13/2011	0	Uranium Total	ug/L	1
4th - RY2011	CC-30	10/19/2011	0	Uranium, Natural, Dissolved	ug/L	0.88
4th - RY2011	CC-30	10/19/2011	1	Uranium, Natural, Dissolved	ug/L	0.86
3rd - RY2011	CC-30	09/14/2011	0	Uranium, Natural, Dissolved	ug/L	0.79
2nd - RY2011	CC-30	07/20/2011	0	Uranium, Natural, Dissolved	ug/L	0.58
1st - RY2011	CC-30	02/22/2011	0	Uranium, Natural, Dissolved	ug/L	0.84
4th - RY2010	CC-30	10/13/2011	0	Uranium, Natural, Dissolved	ug/L	0.85
4th - RY2011	CC-30	10/19/2011	0	Zinc, Dissolved	ug/l as Zn	55.8
4th - RY2011	CC-30	10/19/2011	1	Zinc, Dissolved	ug/l as Zn	54.2
3rd - RY2011	CC-30	09/14/2011	0	Zinc, Dissolved	ug/l as Zn	49.7
2nd - RY2011	CC-30	07/20/2011	0	Zinc, Dissolved	ug/l as Zn	38.9
1st - RY2011	CC-30	02/22/2011	0	Zinc, Dissolved	ug/l as Zn	59.8
4th- RY2010	CC-30	10/13/2011	0	Zinc, Dissolved	ug/l as Zn	70.7

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2011	WFR-20	10/25/2011	0	Aluminum, Dissolved	ug/l as Al	<9.6
3rd - RY2011	WFR-20	08/16/2011	0	Aluminum, Dissolved	ug/l as Al	<9.6
2nd - RY2011	WFR-20	06/14/2011	0	Aluminum, Dissolved	ug/l as Al	67
1st - RY2011	WFR-20	02/15/2011	0	Aluminum, Dissolved	ug/l as Al	<11
4th - RY2010	WFR-20	10/19/2010	0	Aluminum, Dissolved	ug/l as Al	<11
4th - RY2011	WFR-20	10/25/2011	0	Aluminum, Total	ug/l as Al	13
3rd - RY2011	WFR-20	08/16/2011	0	Aluminum, Total	ug/l as Al	65.5
2nd - RY2011	WFR-20	06/14/2011	0	Aluminum, Total	ug/l as Al	201
1st - RY2011	WFR-20	02/15/2011	0	Aluminum, Total	ug/l as Al	<11
4th - RY2010	WFR-20	10/19/2010	0	Aluminum, Total	ug/l as Al	22.8
4th - RY2011	WFR-20	10/25/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
3rd - RY2011	WFR-20	08/16/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
2nd - RY2011	WFR-20	06/14/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
1st - RY2011	WFR-20	02/15/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
4th - RY2010	WFR-20	10/19/2010	0	Arsenic, Dissolved	ug/l as As	<0.62
4th - RY2011	WFR-20	10/25/2011	0	Arsenic, Total	ug/l as As	<0.38
3rd - RY2011	WFR-20	08/16/2011	0	Arsenic, Total	ug/l as As	<0.38
2nd - RY2011	WFR-20	06/14/2011	0	Arsenic, Total	ug/l as As	<0.62
1st - RY2011	WFR-20	02/15/2011	0	Arsenic, Total	ug/l as As	<0.62
4th - RY2010	WFR-20	10/19/2010	0	Arsenic, Total	ug/l as As	<0.62
4th - RY2011	WFR-20	10/25/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
3rd - RY2011	WFR-20	08/16/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
2nd - RY2011	WFR-20	06/14/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
1st - RY2011	WFR-20	02/15/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
4th - RY2010	WFR-20	10/19/2010	0	Cadmium, Dissolved	ug/l as Cd	0.15
4th - RY2011	WFR-20	10/25/2011	0	Cadmium, Potentially Dissolved	ug/l as Cd	0.13
3rd - RY2011	WFR-20	08/16/2011	0	Cadmium, Potentially Dissolved	ug/l as Cd	<0.11
2nd - RY2011	WFR-20	06/14/2011	0	Cadmium, Potentially Dissolved	ug/l as Cd	<0.11
4th - RY2011	WFR-20	10/25/2011	0	Cadmium, Total	ug/l as Cd	0.15
3rd - RY2011	WFR-20	08/16/2011	0	Cadmium, Total (ug/l as Cd)	ug/l as Cd	0.33
2nd - RY2011	WFR-20	06/14/2011	0	Cadmium, Total (ug/l as Cd)	ug/l as Cd	<0.11
1st - RY2011	WFR-20	02/15/2011	0	Cadmium, Total (ug/l as Cd)	ug/l as Cd	<0.11
4th - RY2010	WFR-20	10/19/2010	0	Cadmium, Total (ug/l as Cd)	ug/l as Cd	0.14
4th - RY2011	WFR-20	10/25/2011	0	Calcium, Total	ug/l as Ca	10,100
3rd - RY2011	WFR-20	08/16/2011	0	Calcium, Total	ug/l as Ca	9,470
2nd - RY2011	WFR-20	06/14/2011	0	Calcium, Total	ug/l as Ca	5,500
1st - RY2011	WFR-20	02/15/2011	0	Calcium, Total	ug/l as Ca	11,500
4th - RY2010	WFR-20	10/19/2010	0	Calcium, Total	ug/l as Ca	12,200
4th - RY2011	WFR-20	10/25/2011	0	Copper, Dissolved	ug/l as Cu	0.58
3rd - RY2011	WFR-20	08/16/2011	0	Copper, Dissolved	ug/l as Cu	0.64
2nd - RY2011	WFR-20	06/14/2011	0	Copper, Dissolved	ug/l as Cu	0.94
1st - RY2011	WFR-20	02/15/2011	0	Copper, Dissolved	ug/l as Cu	<0.71
4th - RY2010	WFR-20	10/19/2010	0	Copper, Dissolved	ug/l as Cu	<0.71
4th - RY2011	WFR-20	10/25/2011	0	Copper, Potentially Dissolved	ug/l as Cu	0.62
3rd - RY2011	WFR-20	08/16/2011	0	Copper, Potentially Dissolved	ug/l as Cu	0.63
2nd - RY2011	WFR-20	06/14/2011	0	Copper, Potentially Dissolved	ug/l as Cu	0.91
4th - RY2011	WFR-20	10/25/2011	0	Copper, Total	ug/l as Cu	0.59
3rd - RY2011	WFR-20	08/16/2011	0	Copper, Total	ug/l as Cu	0.81
2nd - RY2011	WFR-20	06/14/2011	0	Copper, Total	ug/l as Cu	1.1
1st - RY2011	WFR-20	02/15/2011	0	Copper, Total	ug/l as Cu	<0.71
4th - RY2010	WFR-20	10/19/2010	0	Copper, Total	ug/l as Cu	<0.71
4th - RY2011	WFR-20	10/25/2011	0	Cyanide, Total	ug/l as CN	<0.005
3rd - RY2011	WFR-20	08/16/2011	0	Cyanide, Total	ug/l as CN	0.015

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
2nd - RY2011	WFR-20	06/14/2011	0	Cyanide, Total	ug/l as CN	<0.005
4th - RY2011	WFR-20	10/25/2011	0	Hardness, Total	mg/l as CaCO3	34.6
3rd - RY2011	WFR-20	08/16/2011	0	Hardness, Total	mg/l as CaCO3	31.3
2nd - RY2011	WFR-20	06/14/2011	0	Hardness, Total	mg/l as CaCO3	19.1
1st - RY2011	WFR-20	02/15/2011	0	Hardness, Total	mg/l as CaCO3	38.8
4th - RY2010	WFR-20	10/19/2010	0	Hardness, Total	mg/l as CaCO3	40.1
4th - RY2011	WFR-20	10/25/2011	0	Iron, Dissolved	ug/l as Fe	127
3rd - RY2011	WFR-20	08/16/2011	0	Iron, Dissolved	ug/l as Fe	112
2nd - RY2011	WFR-20	06/14/2011	0	Iron, Dissolved	ug/l as Fe	68.4
1st - RY2011	WFR-20	02/15/2011	0	Iron, Dissolved	ug/l as Fe	137
4th - RY2010	WFR-20	10/19/2010	0	Iron, Dissolved	ug/l as Fe	172
4th - RY2011	WFR-20	10/25/2011	0	Iron, Total	ug/l as Fe	135
3rd - RY2011	WFR-20	08/16/2011	0	Iron, Total	ug/l as Fe	314
2nd - RY2011	WFR-20	06/14/2011	0	Iron, Total	ug/l as Fe	240
1st - RY2011	WFR-20	02/15/2011	0	Iron, Total	ug/l as Fe	168
4th - RY2010	WFR-20	10/19/2010	0	Iron, Total	ug/l as Fe	266
4th - RY2011	WFR-20	10/25/2011	0	Lead, Dissolved	ug/l as Pb	2.5
3rd - RY2011	WFR-20	08/16/2011	0	Lead, Dissolved	ug/l as Pb	<0.092
2nd - RY2011	WFR-20	06/14/2011	0	Lead, Dissolved	ug/l as Pb	<0.078
1st - RY2011	WFR-20	02/15/2011	0	Lead, Dissolved	ug/l as Pb	<0.078
4th - RY2010	WFR-20	10/19/2010	0	Lead, Dissolved	ug/l as Pb	<0.078
4th - RY2011	WFR-20	10/25/2011	0	Lead, Potentially Dissolved	ug/l as Pb	<0.092
3rd - RY2011	WFR-20	08/16/2011	0	Lead, Potentially Dissolved	ug/l as Pb	0.096
2nd - RY2011	WFR-20	06/14/2011	0	Lead, Potentially Dissolved	ug/l as Pb	0.16
4th - RY2011	WFR-20	10/25/2011	0	Lead, Total	ug/l as Pb	<0.092
3rd - RY2011	WFR-20	08/16/2011	0	Lead, Total	ug/l as Pb	0.11
2nd - RY2011	WFR-20	06/14/2011	0	Lead, Total	ug/l as Pb	0.17
1st - RY2011	WFR-20	02/15/2011	0	Lead, Total	ug/l as Pb	0.078
4th - RY2010	WFR-20	10/19/2010	0	Lead, Total	ug/l as Pb	<0.078
4th - RY2011	WFR-20	10/25/2011	0	Magnesium, Total	ug/l as Mg	2,290
3rd - RY2011	WFR-20	08/16/2011	0	Magnesium, Total	ug/l as Mg	1,850
2nd - RY2011	WFR-20	06/14/2011	0	Magnesium, Total	ug/l as Mg	1,310
1st - RY2011	WFR-20	02/15/2011	0	Magnesium, Total	ug/l as Mg	2,460
4th - RY2010	WFR-20	10/19/2010	0	Magnesium, Total	ug/l as Mg	2,340
4th - RY2011	WFR-20	10/25/2011	0	Manganese, Dissolved	ug/l as Mn	10.3
3rd - RY2011	WFR-20	08/16/2011	0	Manganese, Dissolved	ug/l as Mn	15.1
2nd - RY2011	WFR-20	06/14/2011	0	Manganese, Dissolved	ug/l as Mn	6
1st - RY2011	WFR-20	02/15/2011	0	Manganese, Dissolved	ug/l as Mn	116
4th - RY2010	WFR-20	10/19/2010	0	Manganese, Dissolved	ug/l as Mn	7.8
4th - RY2011	WFR-20	10/25/2011	0	Mercury, Total	ug/l as Hg	0.031
3rd - RY2011	WFR-20	08/16/2011	0	Mercury, Total	ug/l as Hg	<0.014
2nd - RY2011	WFR-20	06/14/2011	0	Mercury, Total	ug/l as Hg	<0.014
1st - RY2011	WFR-20	02/15/2011	0	Mercury, Total	ug/l as Hg	0.027
4th - RY2010	WFR-20	10/19/2010	0	Mercury, Total	ug/l as Hg	<0.014
4th - RY2011	WFR-20	10/25/2011	0	Molybdenum, Dissolved	ug/l as Mo	1.4
3rd - RY2011	WFR-20	08/16/2011	0	Molybdenum, Dissolved	ug/l as Mo	0.94
2nd - RY2011	WFR-20	06/14/2011	0	Molybdenum, Dissolved	ug/l as Mo	0.69
1st - RY2011	WFR-20	02/15/2011	0	Molybdenum, Dissolved	ug/l as Mo	1
4th - RY2010	WFR-20	10/19/2010	0	Molybdenum, Dissolved	ug/l as Mo	0.9
4th - RY2011	WFR-20	10/25/2011	0	Molybdenum, Total	ug/l as Mo	1.3
3rd - RY2011	WFR-20	08/16/2011	0	Molybdenum, Total	ug/l as Mo	0.98
2nd - RY2011	WFR-20	06/14/2011	0	Molybdenum, Total	ug/l as Mo	0.7
1st - RY2011	WFR-20	02/15/2011	0	Molybdenum, Total	ug/l as Mo	0.95

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2010	WFR-20	10/19/2010	0	Molybdenum, Total	ug/l as Mo	0.95
4th - RY2011	WFR-20	10/25/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.049
3rd - RY2011	WFR-20	08/16/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
2nd - RY2011	WFR-20	06/14/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.046
1st - RY2011	WFR-20	02/15/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.081
4th - RY2010	WFR-20	10/19/2010	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
4th - RY2011	WFR-20	10/25/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
3rd - RY2011	WFR-20	08/16/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
2nd - RY2011	WFR-20	06/14/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
1st - RY2011	WFR-20	02/15/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2010	WFR-20	10/19/2010	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2011	WFR-20	10/25/2011	0	Nitrogen Total Organic	mg/L	<0.4
3rd - RY2011	WFR-20	08/16/2011	0	Nitrogen Total Organic	mg/L	<0.4
2nd - RY2011	WFR-20	06/14/2011	0	Nitrogen Total Organic	mg/L	<0.4
1st - RY2011	WFR-20	02/15/2011	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2010	WFR-20	10/19/2010	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2011	WFR-20	10/25/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
3rd - RY2011	WFR-20	08/16/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
2nd - RY2011	WFR-20	06/14/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
1st - RY2011	WFR-20	02/15/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2010	WFR-20	10/19/2010	0	Nitrogen, Ammonia, Total	mg/l as N	0.12
4th - RY2011	WFR-20	10/25/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
3rd - RY2011	WFR-20	08/16/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
2nd - RY2011	WFR-20	06/14/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
1st - RY2011	WFR-20	02/15/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
4th - RY2010	WFR-20	10/19/2010	0	Nitrogen,total kjeldahl	mg/L	<0.3
4th - RY2011	WFR-20	10/25/2011	0	pH, Field	Standard Units	7.1
3rd - RY2011	WFR-20	08/16/2011	0	pH, Field	Standard Units	6.8
2nd - RY2011	WFR-20	06/14/2011	0	pH, Field	Standard Units	6.5
1st - RY2011	WFR-20	02/15/2011	0	pH, Field	Standard Units	6.4
4th - RY2010	WFR-20	10/19/2010	0	pH, Field	Standard Units	7
4th - RY2011	WFR-20	10/25/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
3rd - RY2011	WFR-20	08/16/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
2nd - RY2011	WFR-20	06/14/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
1st - RY2011	WFR-20	02/15/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2010	WFR-20	10/19/2010	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2011	WFR-20	10/25/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
3rd - RY2011	WFR-20	08/16/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
2nd - RY2011	WFR-20	06/14/2011	0	Selenium, Dissolved	ug/l as Se	0.46
1st - RY2011	WFR-20	02/15/2011	0	Selenium, Dissolved	ug/l as Se	0.45
4th - RY2010	WFR-20	10/19/2010	0	Selenium, Dissolved	ug/l as Se	0.21
4th - RY2011	WFR-20	10/25/2011	0	Selenium, Total	ug/l as Se	<0.64
3rd - RY2011	WFR-20	08/16/2011	0	Selenium, Total	ug/l as Se	<0.64
2nd - RY2011	WFR-20	06/14/2011	0	Selenium, Total	ug/l as Se	<0.19
1st - RY2011	WFR-20	02/15/2011	0	Selenium, Total	ug/l as Se	<0.19
4th - RY2010	WFR-20	10/19/2010	0	Selenium, Total	ug/l as Se	0.19
4th - RY2011	WFR-20	10/25/2011	0	Sulfate, Total	mg/l as SO4	5
3rd - RY2011	WFR-20	08/16/2011	0	Sulfate, Total	mg/l as SO4	3.9
2nd - RY2011	WFR-20	06/14/2011	0	Sulfate, Total	mg/l as SO4	2.8
4th - RY2011	WFR-20	10/25/2011	0	Temperature, Water	^{o}C	3.9
3rd - RY2011	WFR-20	08/16/2011	0	Temperature, Water	^{o}C	10
2nd - RY2011	WFR-20	06/14/2011	0	Temperature, Water	^{o}C	4.5
1st - RY2011	WFR-20	02/15/2011	0	Temperature, Water	^{o}C	1.9

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2010	WFR-20	10/19/2010	0	Temperature, Water	°C	5.1
4th - RY2011	WFR-20	10/25/2011	0	Temperature, Water	°F	39
3rd - RY2011	WFR-20	08/16/2011	0	Temperature, Water	°F	50
2nd - RY2011	WFR-20	06/14/2011	0	Temperature, Water	°F	40.1
4th - RY2011	WFR-20	10/25/2011	0	Total Suspend Solids (Tot. Nonfilterab	mg	<5
3rd - RY2011	WFR-20	08/16/2011	0	Total Suspend Solids (Tot. Nonfilterab	mg	<5
2nd - RY2011	WFR-20	06/14/2011	0	Total Suspend Solids (Tot. Nonfilterab	mg	<5
1st - RY2011	WFR-20	02/15/2011	0	Total Suspend Solids (Tot. Nonfilterab	mg	<5
4th - RY2010	WFR-20	10/19/2010	0	Total Suspend Solids (Tot. Nonfilterab	mg	<5
4th - RY2011	WFR-20	10/25/2011	0	Uranium Total	ug/L	0.96
3rd - RY2011	WFR-20	08/16/2011	0	Uranium Total	ug/L	0.81
2nd - RY2011	WFR-20	06/14/2011	0	Uranium Total	ug/L	0.98
1st - RY2011	WFR-20	02/15/2011	0	Uranium Total	ug/L	0.85
4th - RY2010	WFR-20	10/19/2010	0	Uranium Total	ug/L	0.71
4th - RY2011	WFR-20	10/25/2011	0	Uranium, Natural, Dissolved	ug/L	1
3rd - RY2011	WFR-20	08/16/2011	0	Uranium, Natural, Dissolved	ug/L	0.68
2nd - RY2011	WFR-20	06/14/2011	0	Uranium, Natural, Dissolved	ug/L	0.79
1st - RY2011	WFR-20	02/15/2011	0	Uranium, Natural, Dissolved	ug/L	0.74
4th - RY2010	WFR-20	10/19/2010	0	Uranium, Natural, Dissolved	ug/L	0.73
4th - RY2011	WFR-20	10/25/2011	0	Zinc, Dissolved	ug/l as Zn	4.6
3rd - RY2011	WFR-20	08/16/2011	0	Zinc, Dissolved	ug/l as Zn	6.9
2nd - RY2011	WFR-20	06/14/2011	0	Zinc, Dissolved	ug/l as Zn	5.1
1st - RY2011	WFR-20	02/15/2011	0	Zinc, Dissolved	ug/l as Zn	6.8
4th - RY2010	WFR-20	10/19/2010	0	Zinc, Dissolved	ug/l as Zn	2.8
4th - RY2011	WFR-20	10/25/2011	0	Zinc, Potentially Dissolved	ug/l as Zn	2.3
3rd - RY2011	WFR-20	08/16/2011	0	Zinc, Potentially Dissolved	ug/l as Zn	2.4
2nd - RY2011	WFR-20	06/14/2011	0	Zinc, Potentially Dissolved	ug/l as Zn	2.3
4th - RY2011	WFR-20	10/25/2011	0	Zinc, Total	ug/l as Zn	1.7
3rd - RY2011	WFR-20	08/16/2011	0	Zinc, Total	ug/l as Zn	7
2nd - RY2011	WFR-20	06/14/2011	0	Zinc, Total	ug/l as Zn	3.5
1st - RY2011	WFR-20	02/15/2011	0	Zinc, Total	ug/l as Zn	12.6
4th - RY2010	WFR-20	10/19/2010	0	Zinc, Total	ug/l as Zn	6.9

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2011	WFR-40	10/25/2011	0	Aluminum, Dissolved	ug/l as Al	<9.6
4th - RY2011	WFR-40	10/25/2011	1	Aluminum, Dissolved	ug/l as Al	<9.6
3rd - RY2011	WFR-40	08/16/2011	0	Aluminum, Dissolved	ug/l as Al	<9.6
2nd - RY2011	WFR-40	06/14/2011	0	Aluminum, Dissolved	ug/l as Al	195
1st - RY2011	WFR-40	02/15/2011	0	Aluminum, Dissolved	ug/l as Al	<11
4th - RY2010	WFR-40	10/19/2010	0	Aluminum, Dissolved	ug/l as Al	<11
4th - RY2011	WFR-40	10/25/2011	0	Aluminum, Total	ug/l as Al	13.6
4th - RY2011	WFR-40	10/25/2011	1	Aluminum, Total	ug/l as Al	14.9
3rd - RY2011	WFR-40	08/16/2011	0	Aluminum, Total	ug/l as Al	41.4
2nd - RY2011	WFR-40	06/14/2011	0	Aluminum, Total	ug/l as Al	473
1st - RY2011	WFR-40	02/15/2011	0	Aluminum, Total	ug/l as Al	25.3
4th - RY2010	WFR-40	10/19/2010	0	Aluminum, Total	ug/l as Al	11.2
4th - RY2011	WFR-40	10/25/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
4th - RY2011	WFR-40	10/25/2011	1	Arsenic, Dissolved	ug/l as As	<0.38
3rd - RY2011	WFR-40	08/16/2011	0	Arsenic, Dissolved	ug/l as As	<0.38
2nd - RY2011	WFR-40	06/14/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
1st - RY2011	WFR-40	02/15/2011	0	Arsenic, Dissolved	ug/l as As	<0.62
4th - RY2010	WFR-40	10/19/2010	0	Arsenic, Dissolved	ug/l as As	<0.62
4th - RY2011	WFR-40	10/25/2011	0	Arsenic, Total	ug/l as As	<0.38
4th - RY2011	WFR-40	10/25/2011	1	Arsenic, Total	ug/l as As	<0.38
3rd - RY2011	WFR-40	08/16/2011	0	Arsenic, Total	ug/l as As	<0.38
2nd - RY2011	WFR-40	06/14/2011	0	Arsenic, Total	ug/l as As	<0.62
1st - RY2011	WFR-40	02/15/2011	0	Arsenic, Total	ug/l as As	<0.62
4th - RY2010	WFR-40	10/19/2010	0	Arsenic, Total	ug/l as As	<0.62
4th - RY2011	WFR-40	10/25/2011	0	Cadmium, Dissolved	ug/l as Cd	0.12
4th - RY2011	WFR-40	10/25/2011	1	Cadmium, Dissolved	ug/l as Cd	<0.11
3rd - RY2011	WFR-40	08/16/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
2nd - RY2011	WFR-40	06/14/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
1st - RY2011	WFR-40	02/15/2011	0	Cadmium, Dissolved	ug/l as Cd	<0.11
4th - RY2010	WFR-40	10/19/2010	0	Cadmium, Dissolved	ug/l as Cd	0.2
4th - RY2011	WFR-40	10/25/2011	0	Cadmium, Potentially Dissolved	ug/l as Cd	<0.11
4th - RY2011	WFR-40	10/25/2011	1	Cadmium, Potentially Dissolved	ug/l as Cd	<0.11
3rd - RY 2011	WFR-40	08/16/2011	0	Cadmium, Potentially Dissolved	ug/l as Cd	<0.11
2nd - Ry2011	WFR-40	06/14/2011	0	Cadmium, Potentially Dissolved	ug/l as Cd	<0.11
4th - RY2011	WFR-40	10/25/2011	0	Cadmium, Total	ug/l as Cd	<0.11
4th - RY2011	WFR-40	10/25/2011	1	Cadmium, Total	ug/l as Cd	<0.11
3rd - RY2011	WFR-40	08/16/2011	0	Cadmium, Total	ug/l as Cd	<0.11
2nd - RY2011	WFR-40	06/14/2011	0	Cadmium, Total	ug/l as Cd	<0.11
1st - RY2011	WFR-40	02/15/2011	0	Cadmium, Total	ug/l as Cd	<0.11
4th - RY2010	WFR-40	10/19/2010	0	Cadmium, Total	ug/l as Cd	0.14
4th - RY 2011	WFR-40	10/25/2011	0	Calcium, Total	ug/l as Ca	18,100
4th - RY2011	WFR-40	10/25/2011	1	Calcium, Total	ug/l as Ca	18,800
3rd - RY2011	WFR-40	08/16/2011	0	Calcium, Total	ug/l as Ca	14,900
2nd - RY2011	WFR-40	06/14/2011	0	Calcium, Total	ug/l as Ca	6,050
1st - RY2011	WFR-40	02/15/2011	0	Calcium, Total	ug/l as Ca	16,400
4th - RY2010	WFR-40	10/19/2010	0	Calcium, Total	ug/l as Ca	20,800
4th - RY2011	WFR-40	10/25/2011	0	Copper, Dissolved	ug/l as Cu	0.49
4th - RY 2011	WFR-40	10/25/2011	1	Copper, Dissolved	ug/l as Cu	0.49
3rd - RY2011	WFR-40	08/16/2011	0	Copper, Dissolved	ug/l as Cu	0.54
2nd - RY2011	WFR-40	06/14/2011	0	Copper, Dissolved	ug/l as Cu	2.4
1st - RY2011	WFR-40	02/15/2011	0	Copper, Dissolved	ug/l as Cu	<0.71
4th - RY2010	WFR-40	10/19/2010	0	Copper, Dissolved	ug/l as Cu	0.96
4th - RY 2011	WFR-40	10/25/2011	0	Copper, Potentially Dissolved	ug/l as Cu	0.93
4th - RY 2011	WFR-40	10/25/2011	1	Copper, Potentially Dissolved	ug/l as Cu	0.61
3rd - RY2011	WFR-40	08/16/2011	0	Copper, Potentially Dissolved	ug/l as Cu	0.74
2nd - RY2011	WFR-40	06/14/2011	0	Copper, Potentially Dissolved	ug/l as Cu	1

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2011	WFR-40	10/25/2011	0	Copper, Total	ug/l as Cu	0.61
4th - RY2011	WFR-40	10/25/2011	1	Copper, Total	ug/l as Cu	0.53
3rd - RY2011	WFR-40	08/16/2011	0	Copper, Total	ug/l as Cu	0.57
2nd - RY2011	WFR-40	06/14/2011	0	Copper, Total	ug/l as Cu	1.4
1st - RY2011	WFR-40	02/15/2011	0	Copper, Total	ug/l as Cu	<0.71
4th - RY2010	WFR-40	10/19/2010	0	Copper, Total	ug/l as Cu	<0.71
4th - RY2011	WFR-40	10/25/2011	0	Cyanide, Total	ug/l as CN	<0.005
4th - RY2011	WFR-40	10/25/2011	1	Cyanide, Total	ug/l as CN	<0.005
3rd - RY2011	WFR-40	08/16/2011	0	Cyanide, Total	ug/l as CN	<0.005
2nd - RY2011	WFR-40	06/14/2011	0	Cyanide, Total	ug/l as CN	<0.005
4th - RY2011	WFR-40	10/25/2011	0	Hardness, Total	mg/l as CaCO3	61.1
4th - RY2011	WFR-40	10/25/2011	1	Hardness, Total	mg/l as CaCO3	63.4
3rd - RY2011	WFR-40	08/16/2011	0	Hardness, Total	mg/l as CaCO3	49.1
2nd - RY2011	WFR-40	06/14/2011	0	Hardness, Total	mg/l as CaCO3	21.6
1st - RY2011	WFR-40	02/15/2011	0	Hardness, Total	mg/l as CaCO3	54.7
4th - RY2010	WFR-40	10/19/2010	0	Hardness, Total	mg/l as CaCO3	68.2
4th - RY2011	WFR-40	10/25/2011	0	Iron, Dissolved	ug/l as Fe	144
4th - RY2011	WFR-40	10/25/2011	1	Iron, Dissolved	ug/l as Fe	136
3rd - RY2011	WFR-40	08/16/2011	0	Iron, Dissolved	ug/l as Fe	116
2nd - RY2011	WFR-40	06/14/2011	0	Iron, Dissolved	ug/l as Fe	135
1st - RY2011	WFR-40	02/15/2011	0	Iron, Dissolved	ug/l as Fe	114
4th - RY2010	WFR-40	10/19/2010	0	Iron, Dissolved	ug/l as Fe	158
4th - RY2011	WFR-40	10/25/2011	0	Iron, Total	ug/l as Fe	152
4th - RY2011	WFR-40	10/25/2011	1	Iron, Total	ug/l as Fe	159
3rd - RY2011	WFR-40	08/16/2011	0	Iron, Total	ug/l as Fe	264
2nd - RY2011	WFR-40	06/14/2011	0	Iron, Total	ug/l as Fe	356
1st - RY2011	WFR-40	02/15/2011	0	Iron, Total	ug/l as Fe	179
4th - RY2010	WFR-40	10/19/2010	0	Iron, Total	ug/l as Fe	193
4th - RY2011	WFR-40	10/25/2011	0	Lead, Dissolved	ug/l as Pb	<0.092
4th - RY2011	WFR-40	10/25/2011	1	Lead, Dissolved	ug/l as Pb	<0.092
3rd - RY2011	WFR-40	08/16/2011	0	Lead, Dissolved	ug/l as Pb	<0.092
2nd - RY2011	WFR-40	06/14/2011	0	Lead, Dissolved	ug/l as Pb	0.14
1st - RY2011	WFR-40	02/15/2011	0	Lead, Dissolved	ug/l as Pb	<0.078
4th - RY2010	WFR-40	10/19/2010	0	Lead, Dissolved	ug/l as Pb	<0.078
4th - RY2011	WFR-40	10/25/2011	0	Lead, Potentially Dissolved	ug/l as Pb	<0.092
4th - RY2011	WFR-40	10/25/2011	1	Lead, Potentially Dissolved	ug/l as Pb	<0.092
3rd - RY2011	WFR-40	08/16/2011	0	Lead, Potentially Dissolved	ug/l as Pb	<0.092
2nd - RY2011	WFR-40	06/14/2011	0	Lead, Potentially Dissolved	ug/l as Pb	0.17
4th - RY2011	WFR-40	10/25/2011	0	Lead, Total	ug/l as Pb	1.3
4th - RY2011	WFR-40	10/25/2011	1	Lead, Total	ug/l as Pb	<0.092
3rd - RY2011	WFR-40	08/16/2011	0	Lead, Total	ug/l as Pb	<0.092
2nd - RY2011	WFR-40	06/14/2011	0	Lead, Total	ug/l as Pb	0.26
1st - RY2011	WFR-40	02/15/2011	0	Lead, Total	ug/l as Pb	<0.078
4th - RY2010	WFR-40	10/19/2010	0	Lead, Total	ug/l as Pb	<0.078
4th - RY2011	WFR-40	10/25/2011	0	Magnesium, Total	ug/l as Mg	3,860
4th - RY2011	WFR-40	10/25/2011	1	Magnesium, Total	ug/l as Mg	4,000
3rd - RY2011	WFR-40	08/16/2011	0	Magnesium, Total	ug/l as Mg	2,900
2nd - RY2011	WFR-40	06/14/2011	0	Magnesium, Total	ug/l as Mg	1,570
1st - RY2011	WFR-40	02/15/2011	0	Magnesium, Total	ug/l as Mg	3,330
4th - RY2010	WFR-40	10/19/2010	0	Magnesium, Total	ug/l as Mg	3,940
4th - RY2011	WFR-40	10/25/2011	0	Manganese, Dissolved	ug/l as Mn	8.5
4th - RY2011	WFR-40	10/25/2011	1	Manganese, Dissolved	ug/l as Mn	8.1
3rd - RY2011	WFR-40	08/16/2011	0	Manganese, Dissolved	ug/l as Mn	11.4
2nd - RY2011	WFR-40	06/14/2011	0	Manganese, Dissolved	ug/l as Mn	5.9
1st - RY2011	WFR-40	02/15/2011	0	Manganese, Dissolved	ug/l as Mn	5.2

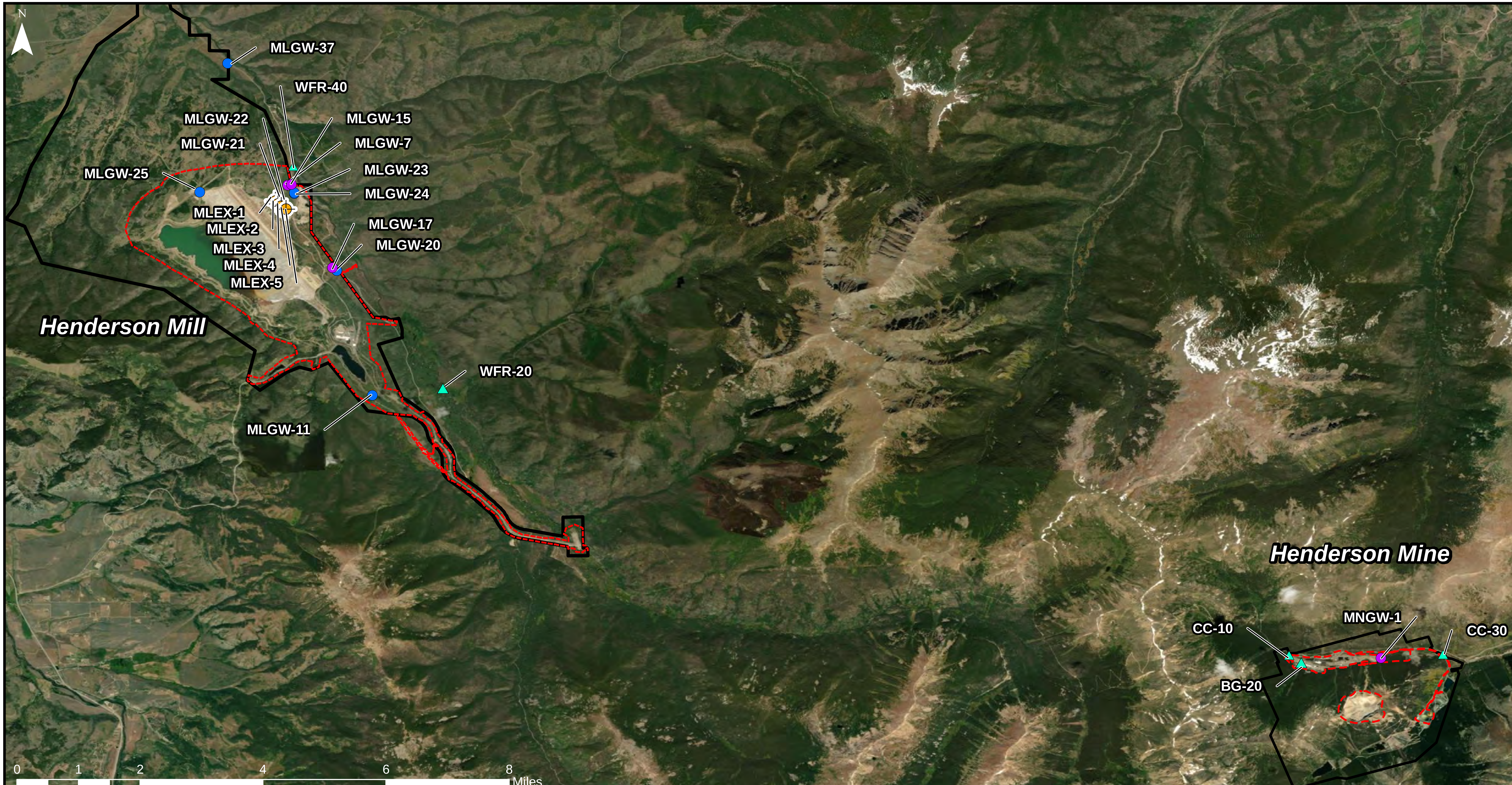
Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2010	WFR-40	10/19/2010	0	Manganese, Dissolved	ug/l as Mn	6.3
4th - RY2011	WFR-40	10/25/2011	0	Mercury, Total	ug/l as Hg	0.035
4th - RY2011	WFR-40	10/25/2011	1	Mercury, Total	ug/l as Hg	0.035
3rd - RY2011	WFR-40	08/16/2011	0	Mercury, Total	ug/l as Hg	0.022
2nd - RY2011	WFR-40	06/14/2011	0	Mercury, Total	ug/l as Hg	<0.014
1st - RY2011	WFR-40	02/15/2011	0	Mercury, Total	ug/l as Hg	0.042
4th - RY2010	WFR-40	10/19/2010	0	Mercury, Total	ug/l as Hg	<0.014
4th - RY2011	WFR-40	10/25/2011	0	Molybdenum, Dissolved	ug/l as Mo	1.1
4th - RY2011	WFR-40	10/25/2011	1	Molybdenum, Dissolved	ug/l as Mo	1
3rd - RY2011	WFR-40	08/16/2011	0	Molybdenum, Dissolved	ug/l as Mo	0.99
2nd - RY2011	WFR-40	06/14/2011	0	Molybdenum, Dissolved	ug/l as Mo	0.6
1st - RY2011	WFR-40	02/15/2011	0	Molybdenum, Dissolved	ug/l as Mo	1
4th Quarter 2010	WFR-40	10/19/2010	0	Molybdenum, Dissolved	ug/l as Mo	0.98
4th quarter 2011	WFR-40	10/25/2011	0	Molybdenum, Total	ug/l as Mo	1.1
4th quarter 2011	WFR-40	10/25/2011	1	Molybdenum, Total	ug/l as Mo	1
3rd - RY2011	WFR-40	08/16/2011	0	Molybdenum, Total	ug/l as Mo	1
2nd - RY2011	WFR-40	06/14/2011	0	Molybdenum, Total	ug/l as Mo	0.6
1st - RY2011	WFR-40	02/15/2011	0	Molybdenum, Total	ug/l as Mo	0.97
4th - RY2010	WFR-40	10/19/2010	0	Molybdenum, Total	ug/l as Mo	0.99
4th - RY2011	WFR-40	10/25/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.057
4th - RY2011	WFR-40	10/25/2011	1	Nitrate Nitrogen, Total	mg/l as N	0.31
3rd - RY2011	WFR-40	08/16/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
2nd - RY2011	WFR-40	06/14/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
1st - RY2011	WFR-40	02/15/2011	0	Nitrate Nitrogen, Total	mg/l as N	0.084
4th - RY2010	WFR-40	10/19/2010	0	Nitrate Nitrogen, Total	mg/l as N	<0.045
4th - RY2011	WFR-40	10/25/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2011	WFR-40	10/25/2011	1	Nitrate Nitrogen, Total	mg/l as N	<0.061
3rd - RY2011	WFR-40	08/16/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
2nd - RY2011	WFR-40	06/14/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
1st - RY2011	WFR-40	02/15/2011	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2010	WFR-40	10/19/2010	0	Nitrate Nitrogen, Total	mg/l as N	<0.061
4th - RY2011	WFR-40	10/25/2011	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2011	WFR-40	10/25/2011	1	Nitrogen Total Organic	mg/L	<0.4
3rd - RY2011	WFR-40	08/16/2011	0	Nitrogen Total Organic	mg/L	<0.4
2nd - RY2011	WFR-40	06/14/2011	0	Nitrogen Total Organic	mg/L	<0.4
1st - RY2011	WFR-40	02/15/2011	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2010	WFR-40	10/19/2010	0	Nitrogen Total Organic	mg/L	<0.4
4th - RY2011	WFR-40	10/25/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2011	WFR-40	10/25/2011	1	Nitrogen, Ammonia, Total	mg/l as N	<0.1
3rd - RY2011	WFR-40	08/16/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
2nd - RY2011	WFR-40	06/14/2011	0	Nitrogen, Ammonia, Total	mg/l as N	0.1
1st - RY2011	WFR-40	02/15/2011	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2010	WFR-40	10/19/2010	0	Nitrogen, Ammonia, Total	mg/l as N	<0.1
4th - RY2011	WFR-40	10/25/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
4th - RY2011	WFR-40	10/25/2011	1	Nitrogen,total kjeldahl	mg/L	<0.3
3rd - RY2011	WFR-40	08/16/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
2nd - RY2011	WFR-40	06/14/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
1st - RY2011	WFR-40	02/15/2011	0	Nitrogen,total kjeldahl	mg/L	<0.3
4th - RY2010	WFR-40	10/19/2010	0	Nitrogen,total kjeldahl	mg/L	<0.3
4th - RY2011	WFR-40	10/25/2011	0	pH, Field	Standard Units	7.3
4th - RY2011	WFR-40	10/25/2011	1	pH, Field	Standard Units	
3rd - RY2011	WFR-40	08/16/2011	0	pH, Field	Standard Units	6.9
2nd - RY2011	WFR-40	06/14/2011	0	pH, Field	Standard Units	6.7
2nd - RY2011	WFR-40	06/22/2011	0	pH, Field	Standard Units	7.7
1st - RY2011	WFR-40	02/15/2011	0	pH, Field	Standard Units	7.5

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
4th - RY2010	WFR-40	10/19/2010	0	pH, Field	Standard Units	7.6
4th - RY2011	WFR-40	10/25/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2011	WFR-40	10/25/2011	1	Phosphate, Ortho	mg/l as PO4	<0.1
3rd - RY2011	WFR-40	08/16/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
2nd - RY2011	WFR-40	06/14/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
1st - RY2011	WFR-40	02/15/2011	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2010	WFR-40	10/19/2010	0	Phosphate, Ortho	mg/l as PO4	<0.1
4th - RY2011	WFR-40	10/25/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
4th - RY2011	WFR-40	10/25/2011	1	Selenium, Dissolved	ug/l as Se	<0.64
3rd - RY2011	WFR-40	08/16/2011	0	Selenium, Dissolved	ug/l as Se	<0.64
2nd - RY2011	WFR-40	06/14/2011	0	Selenium, Dissolved	ug/l as Se	<0.19
1st - RY2011	WFR-40	02/15/2011	0	Selenium, Dissolved	ug/l as Se	0.39
4th - RY2010	WFR-40	10/19/2010	0	Selenium, Dissolved	ug/l as Se	<0.19
4th - RY2011	WFR-40	10/25/2011	0	Selenium, Total	ug/l as Se	<0.64
4th - RY2011	WFR-40	10/25/2011	1	Selenium, Total	ug/l as Se	<0.64
3rd - RY2011	WFR-40	08/16/2011	0	Selenium, Total	ug/l as Se	<0.64
2nd - RY2011	WFR-40	06/14/2011	0	Selenium, Total	ug/l as Se	0.89
1st - RY2011	WFR-40	02/15/2011	0	Selenium, Total	ug/l as Se	<0.96
4th - RY2010	WFR-40	10/19/2010	0	Selenium, Total	ug/l as Se	0.56
4th - RY2011	WFR-40	10/25/2011	0	Sulfate, Total	mg/l as SO4	35.9
4th - RY2011	WFR-40	10/25/2011	1	Sulfate, Total	mg/l as SO4	40.2
3rd - RY2011	WFR-40	08/16/2011	0	Sulfate, Total	mg/l as SO4	19
2nd - RY2011	WFR-40	06/14/2011	0	Sulfate, Total	mg/l as SO4	4.6
4th - RY2011	WFR-40	10/25/2011	0	Temperature, Water	°C	5.5
4th - RY2011	WFR-40	10/25/2011	1	Temperature, Water	°C	
3rd - RY2011	WFR-40	08/16/2011	0	Temperature, Water	°C	11.4
2nd - RY2011	WFR-40	06/14/2011	0	Temperature, Water	°C	6.1
2nd - RY2011	WFR-40	06/22/2011	0	Temperature, Water	°C	11.3
1st - RY2011	WFR-40	02/15/2011	0	Temperature, Water	°C	0.6
4th - RY2010	WFR-40	10/19/2010	0	Temperature, Water	°C	6.7
4th - RY2011	WFR-40	10/25/2011	0	Temperature, Water	°F	41.9
4th - RY2011	WFR-40	10/25/2011	1	Temperature, Water	°F	
3rd - RY2011	WFR-40	08/16/2011	0	Temperature, Water	°F	52.5
2nd - RY2011	WFR-40	06/14/2011	0	Temperature, Water	°F	43
2nd - RY2011	WFR-40	06/22/2011	0	Temperature, Water	°F	52.3
4th - RY2011	WFR-40	10/25/2011	0	Total Suspend Solids (Tot. Nonfilterabl	mg	<5
4th - RY2011	WFR-40	10/25/2011	1	Total Suspend Solids (Tot. Nonfilterabl	mg	<5
3rd - RY2011	WFR-40	08/16/2011	0	Total Suspend Solids (Tot. Nonfilterabl	mg	<5
2nd - RY2011	WFR-40	06/14/2011	0	Total Suspend Solids (Tot. Nonfilterabl	mg	<5
1st - RY2011	WFR-40	02/15/2011	0	Total Suspend Solids (Tot. Nonfilterabl	mg	<5
4th - RY2010	WFR-40	10/19/2010	0	Total Suspend Solids (Tot. Nonfilterabl	mg	<5
4th - RY2011	WFR-40	10/25/2011	0	Uranium Total	ug/L	0.94
4th - RY2011	WFR-40	10/25/2011	1	Uranium Total	ug/L	0.96
3rd - RY2011	WFR-40	08/16/2011	0	Uranium Total	ug/L	0.92
2nd - RY2011	WFR-40	06/14/2011	0	Uranium Total	ug/L	0.54
1st - RY2011	WFR-40	02/15/2011	0	Uranium Total	ug/L	0.94
4th - RY2010	WFR-40	10/19/2010	0	Uranium Total	ug/L	0.89
4th - RY2011	WFR-40	10/25/2011	0	Uranium, Natural, Dissolved	ug/L	1
4th - RY2011	WFR-40	10/25/2011	1	Uranium, Natural, Dissolved	ug/L	0.98
3rd - RY2011	WFR-40	08/16/2011	0	Uranium, Natural, Dissolved	ug/L	0.88
2nd - RY2011	WFR-40	06/14/2011	0	Uranium, Natural, Dissolved	ug/L	0.43
1st - RY2011	WFR-40	02/15/2011	0	Uranium, Natural, Dissolved	ug/L	0.95
4th - RY2010	WFR-40	10/19/2010	0	Uranium, Natural, Dissolved	ug/L	0.89
4th - RY2011	WFR-40	10/25/2011	0	Zinc, Dissolved	ug/l as Zn	1.6
4th - RY2011	WFR-40	10/25/2011	1	Zinc, Dissolved	ug/l as Zn	2

Quarter	Site Number	Sample Date	Duplicate Collected?	Analyte	Units	Results
3rd - RY2011	WFR-40	08/16/2011	0	Zinc, Dissolved	ug/l as Zn	4.4
2nd - RY2011	WFR-40	06/14/2011	0	Zinc, Dissolved	ug/l as Zn	26.1
1st - RY2011	WFR-40	02/15/2011	0	Zinc, Dissolved	ug/l as Zn	10.8
4th - RY2010	WFR-40	10/19/2010	0	Zinc, Dissolved	ug/l as Zn	3.6
4th - RY2011	WFR-40	10/25/2011	0	Zinc, Potentially Dissolved	ug/l as Zn	7.3
4th - RY2011	WFR-40	10/25/2011	1	Zinc, Potentially Dissolved	ug/l as Zn	1.9
3rd - RY2011	WFR-40	08/16/2011	0	Zinc, Potentially Dissolved	ug/l as Zn	2.6
2nd - RY2011	WFR-40	06/14/2011	0	Zinc, Potentially Dissolved	ug/l as Zn	3.5
4th - RY2011	WFR-40	10/25/2011	0	Zinc, Total	ug/l as Zn	2.1
4th - RY2011	WFR-40	10/25/2011	1	Zinc, Total	ug/l as Zn	4
3rd - RY2011	WFR-40	08/16/2011	0	Zinc, Total	ug/l as Zn	16.9
2nd - RY2011	WFR-40	06/14/2011	0	Zinc, Total	ug/l as Zn	6.2
1st - RY2011	WFR-40	02/15/2011	0	Zinc, Total	ug/l as Zn	6
4th - RY2010	WFR-40	10/19/2010	0	Zinc, Total	ug/l as Zn	3

Appendix C

Site Diagrams



LOCATION MAP

MAP FEATURES

- Affected Lands Boundary
- Permit Boundary
- POC Groundwater Monitoring Location
- Non-POC Groundwater Monitoring Location
- Surface Water Monitoring Location
- Extraction Well Location

REVISION / AUTHOR	DATE
Update drawing information	9/6/2011
Updated well names	2/17/2012
Removed MLGW-ACR; Added MLGW-15, 17 and 37. (MT)	11/15/24
Added Key Wells, Extraction Wells, Updated symbology	3/14/2025
Updated key wells and property boundary.	4/16/2025

Climax Molybdenum
A Freeport-McMoRan Company

HENDERSON OPERATIONS
1746 County Road
Empire, Colorado 80438

FIGURE 1
HENDERSON OPERATIONS OVERVIEW

Aquionix EHS Services
1841 Wadsworth Blvd.
Lakewood, CO 80214
303-289-7520
www.aquionix.com

DESIGNED BY: MT (AQUIONIX)
DRAWN BY: MT
DATE DRAWN: 2/7/2011

SCALE: 1:94,390
COORD. SYSTEM: GCS_North_American_1983

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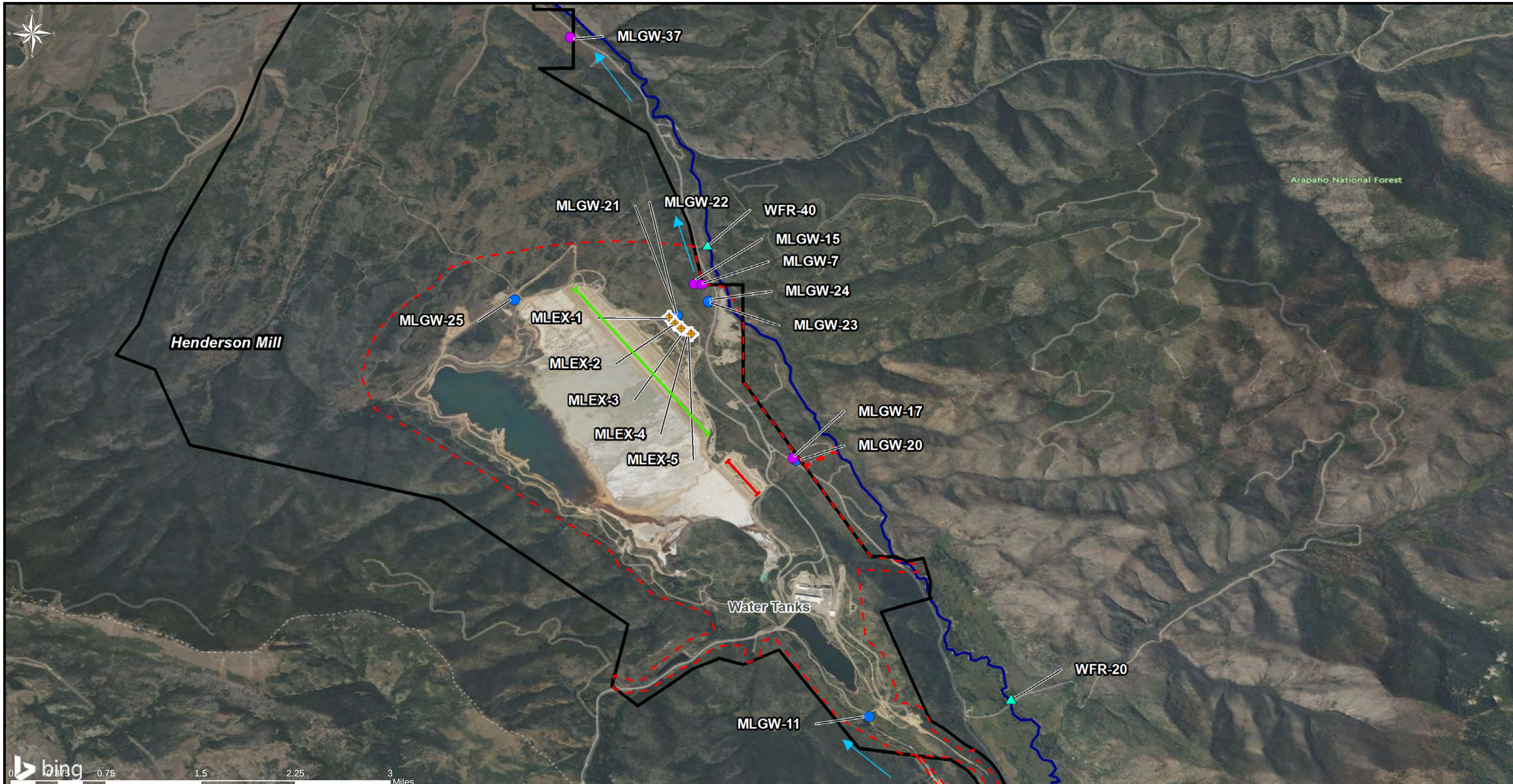

LOCATION MAP

MAP FEATURES

- Affected Lands Boundary
- Permit Boundary
- POC Groundwater Monitoring Location
- Non-POC Groundwater Monitoring Location
- Surface Water Monitoring Location
- Extraction Well Location
- 1-Dam
- 3-Dam
- Upper Colorado River Segment 8
- Groundwater Flow Direction

REVISION / AUTHOR	DATE
Update drawing information (MT)	9/6/11
Update sample names and locations (TSM)	2/17/12
Adjusted scale and property boundary (MT)	7/10/12
Removed MLGW-ACR; Added MLGW-15, 17 and 37. (MT)	11/15/24
Added Key Wells, Extraction Wells, Updated symbology	3/14/2025
Updated Key Wells and property boundary	4/16/2025

Aquionix EHS Services
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303-289-7520
www.aquionix.com

Climax Molybdenum
A Freeport-McMoRan Company

HENDERSON OPERATIONS
1746 County Road
Empire, Colorado 80438

FIGURE 2
HENDERSON MILL
SITE DIAGRAM

DESIGNED BY: MT (AQUIONIX)
DRAWN BY: MT
DATE DRAWN: 2/7/2011
SCALE: 1:16,000,000
COORD. SYSTEM: GCS_North_American_1983

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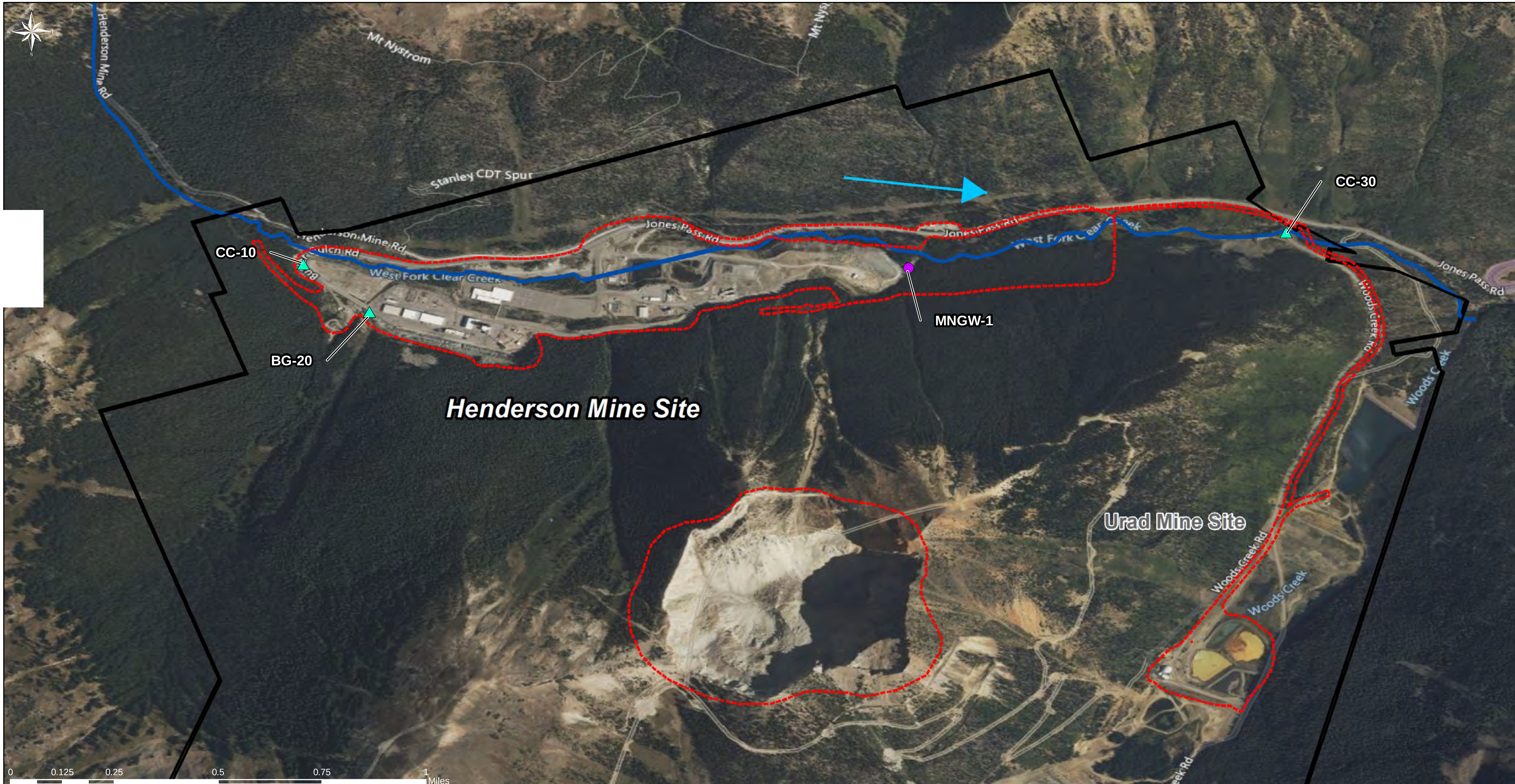

LOCATION MAP

MAP FEATURES

- Affected Lands Boundary
- Permit Boundary
- POC Groundwater Monitoring Location
- Surface Water Monitoring Location
- Clear Creek Segment 4
- Groundwater Flow Direction

REVISION / AUTHOR	DATE
Update drawing information	9/6/11
Update well names	2/17/12
Added Key Wells, Extraction Wells, Updated symbology	3/15/25

Climax Molybdenum
A Freeport-McMoRan Company

HENDERSON OPERATIONS
1746 County Road
Empire, Colorado 80438

FIGURE 3
HENDERSON MINE SITE DIAGRAM

Aquionix EHS Services
1841 Wadsworth Blvd.
Lakewood, CO 80214
303-289-7520
www.aquionix.com

DESIGNED BY: MT (AQUIONIX)
DRAWN BY: MT
DATE DRAWN: 2/7/2011

SCALE: 1:16,000,000
COORD. SYSTEM: GCS_North _American_1983

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Appendix D

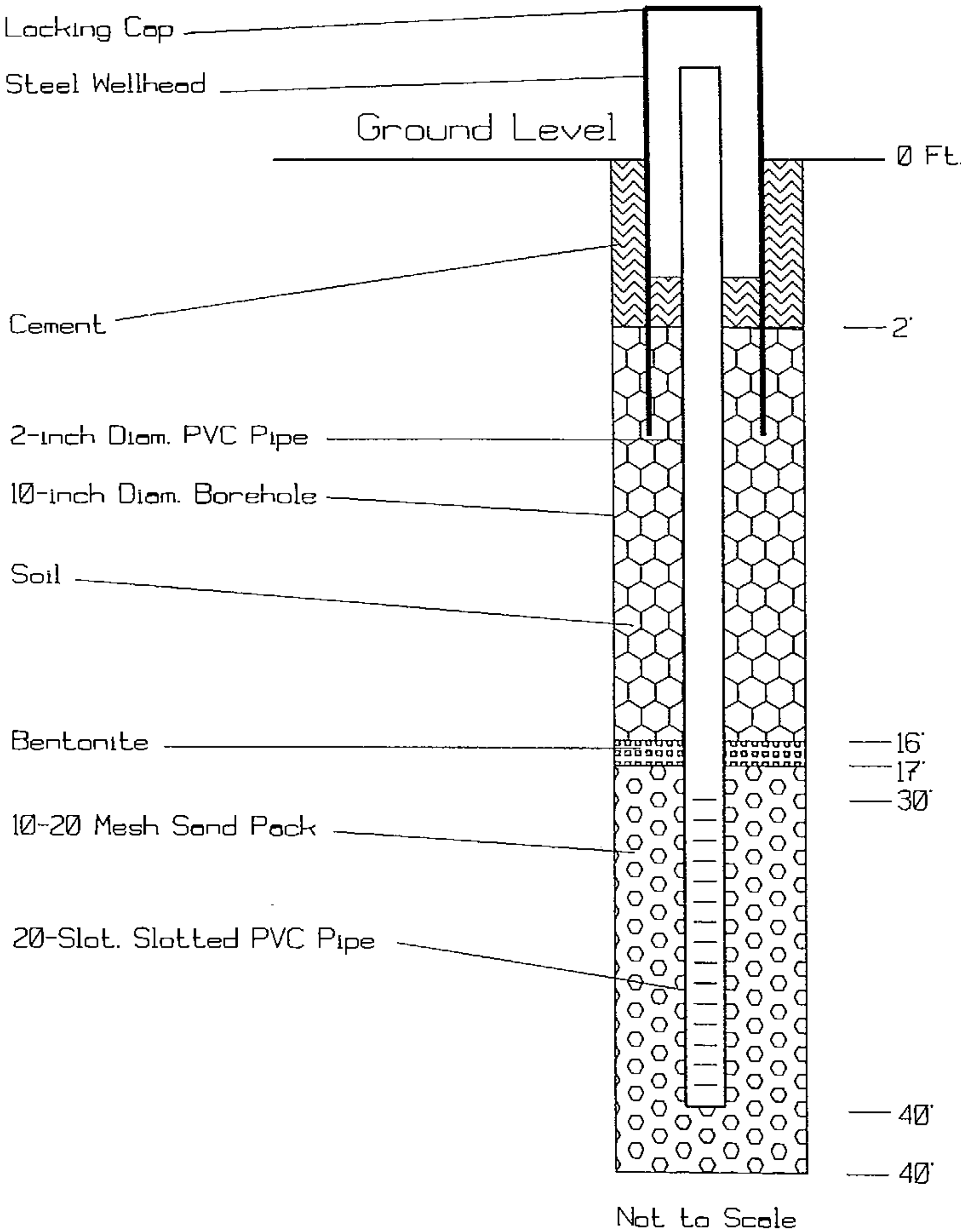
Geologic Well Logs and Construction Details

GEOLOGIC LOG

Project: Henderson Mill, Ground Water Monitoring Wells
Hole No.: GW7
Date Drilled: 9-28-93
Drilled by: Layne Environmental
Logged by: Pat O'Brien

Depth (Ft.)	Description	Remarks
0-2	Sand, medium to very coarse gr., silty, brown, dry.	
2-17	Boulders, sandy, with some gravel, brown, dry.	
17-20	Boulders, sandy, with some gravel, brown, wet.	
20-22	Sand, medium to very coarse gr., with some gravel, brown, wet.	
22-40	Cobbles, sandy, with some boulders, brown, wet.	

Borehole completed using the AP-1000, reverse air circulation, dual-tube hammer rig with 10-inch diameter drill pipe.



Well GW7 Construction Details.

Appendix E

Water Quality Control Commission Rulemaking Hearing – 5 CCR 1002-33

exemption should ensure the future protection of water quality within the segment, while recognizing legitimate pre-existing rights. The project exemption may be revisited once the project has finalized its development plans for the remaining project water rights in the area.

(3) Segments that needed descriptions of wilderness areas added. This addresses wilderness areas that were designated after the rulemaking hearing that originally established the segment. In this hearing, the only segments affected were Upper Colorado segment 9 and Yampa segment 1 which had the Flat Tops Wilderness Area added to their descriptions and Roaring Fork segment 1 which had the Holy Cross, Collegiate Peaks and Raggeds Wilderness Areas added to its description.

F. Temporary Modifications

There were several segments which had temporary modifications that were reviewed and decisions made as to delete them or to extend them, either as is or with modification of the numeric limits.

Upper Colorado segment 6c - Mainstem of un-named tributary to Willow Creek from the Willow Creek Reservoir Rd to the confluence Willow Creek.

This segment had 5-year temporary modification for un-ionized ammonia that will expire in 12/30/2000, but under the terms of a stipulation entered into at the 1995 rulemaking the temporary modification is "subject to review at approximately a three-year interval into the modification". The Commission determined that after review of information submitted by the Division and Three Lakes Water and Sanitation District that the present expiration date provided sufficient time for Three Lakes to develop and implement its plan for meeting the unionized ammonia standard in this segment.

Upper Colorado segment 8 - Mainstem of the Williams Fork River.

The Commission reviewed the need for the existing temporary modifications to the manganese and iron water supply standards and determined that their removal would not pose a significant hardship to Climax's ability to meet its permit limits and manage the water in its facility provided that a point of compliance is adopted. As noted in the Basis and Purpose for the October 1997 rulemaking, Climax, with the participation of Grand County and the Northwest Colorado Council of Governments, identified a well as a potential point of compliance. Climax monitored the iron and manganese levels in a well at the Aspen Canyon Ranch. The data from March 1998 through February 1999 showed that the existing water quality was well below the water supply standards for iron and manganese. In view of the above, the temporary modifications for iron and manganese are deleted and a point of compliance at the Aspen Canyon Ranch well is adopted.

Blue River segment 2 - Mainstem of the Blue River from the confluence with French Gulch to a point one mile above the confluence with Swan River.

The temporary modifications were reviewed and revised to reflect data collected from the segment in 1996-98. It was determined that an expiration date of 12/31/2002 would provide sufficient time for the French Gulch Opportunity Group (FROG) to determine the appropriate steps to address the source of the high metals in this segment which derive from French Gulch (Blue River segment 11) and complete a use attainability analysis on segment 2 which should determine the proper classifications and standards for the segment.

Blue River segment 6 - Snake River

Appendix F

Henderson Geochemical Evaluation and Sampling Plan

Henderson Mine and Mill
Geochemical Evaluation and Sampling Plan

Introduction

The Henderson Mine and Mill (Henderson) is currently in the process of revising Technical Revision 05 (TR-05) to formally establish a ground water protection program under its Reclamation Permit Number M-77-342. As part of this process, Henderson is completing a geochemical evaluation to identify analytes associated with site operations that should be periodically monitored and subject to numeric limits. This Geochemical Evaluation and Sampling Plan (Plan) summarizes the proposed sampling plan and parameters to be tested.

Henderson has performed a significant amount of surface and ground water quality monitoring for a variety of parameters including cadmium, copper, lead, zinc, iron, manganese, mercury, silver, pH, and temperature. This Sampling Plan will include these and other parameters established by the State Water Quality Control Commission. The intent is to identify those parameters that have a reasonable potential of being transported from mining materials to surface and ground water systems. The complete list of parameters to be analyzed is included in Attachment 3.

Determination of Sampling Locations

Three sampling points have been selected for this project, two at the Mine and one at the Mill. Maps of the respective areas identifying the sampling points are included as the following attachments.

- Attachment 1 – Displays the entire mine area and the two sampling locations.
- Attachment 1a – Identifies the first sampling location at the Mine (Location #1), which is at the northeast end of the mine site, just down-gradient of the Emrick and Hill industrial area. This area appears to contain materials displaying elevated levels of mineralization. This area is considered a worst-case scenario sampling location for identifying material with contamination potential.
- Attachment 1b – Identifies the second sampling location at the Mine (Location #2), which is located generally in the central part of the mine site, north of the surface impoundments. We believe this location will provide samples that are more representative of general site geology than Location #1.
- Attachment 2 – Mill Site Map – Displays the entire mill area and the single sampling location.

- Attachment 2a – Identifies the single sampling location at the Mill (Location #3), which is located near the tailing pump station, at the confluence of the 1 and 3 dam seep return canals and flows from the tailing area wellfield. Samples taken from this location will provide good representation of leached materials being transported from the tailing impoundments to ground and surface water systems.

Sampling Plan

Mine

Frequency:	One-time
Sampling Method:	Composite Soil Grab. The sampling areas will be gridded into nine equally spaced locations. Soil samples of equivalent volume will be collected from each of the nine locations to a depth of 1-foot, at each of the two sampling locations. The nine samples (at each location) will be composited together to form a single homogenous sample to provide a representative sample of the area being evaluated.
Sample Location:	Samples will be taken from two locations: Location #1 and Location #2. These sampling locations are specified in Attachments 1a and 1b.
Sampling QC:	As a standard quality control practice, all sample containers and sampling equipment will be thoroughly cleaned and rinsed in accordance with 40 CFR, Part 403, Appendix E. This precludes the use of any equipment that may contain trace amounts of pollutant. Each sample is labeled prior to, or at the time of, sampling on a self-adhesive label with waterproof ink. As a minimum, the sample number, name of collector, date and time of collection, and sample preservative are included on the label.
Parameters to be Tested:	Parameters specified in Regulation 41 (Tables 1 through 4) and Regulation 31 (Tables I through III) that could potentially exist at the Mine. A list of these parameters to be tested is provided in Attachment 3. A list of parameters from these regulatory sections that are deemed to be inapplicable, and thus won't be analyzed is also included.

Analytical Method:	The Synthetic Precipitation Leaching Procedure (SPLP, EPA SW-846 Method 1312) will be used where appropriate. The SPLP procedure is useful for determining whether a potentially contaminated material, left in situ, will leach toxic substances when exposed to normal weathering. Certain non-metal parameters may be analyzed by other suitable methods.
Photographic:	Photographs of each sampling location will be taken and preserved as part of the sampling event.
GIS:	GIS data will be collected for each sampling location.

Mill

Frequency:	One-time
Sampling Method:	Aqueous Grab. A single dip grab sample will be collected directly into pre-cleaned laboratory bottles.
Sample Location:	Sample will be taken from Location #3. The sampling location is specified in Attachments 2a.
Sampling QC:	As a standard quality control practice, all sample containers and sampling equipment will be thoroughly cleaned and rinsed in accordance with 40 CFR, Part 403, Appendix E. This precludes the use of any equipment that may contain trace amounts of pollutant. Each sample is labeled prior to, or at the time of, sampling on a self-adhesive label with waterproof ink. As a minimum, the sample number, name of collector, date and time of collection, and sample preservative are included on the label.
Parameters to be Tested:	Parameters specified in Regulation 41 (Tables 1 through 4) and Regulation 31 (Tables I through III) that could potentially exist at the Mine. A list of these parameters to be tested is provided in Attachment 3. A list of parameters from these regulatory sections that are deemed to be inapplicable, and thus won't be analyzed is also included.
Analytical Method:	The appropriate 40 CFR 136 method for each individual analyte will be used to determine contaminant potential. The SPLP procedure will not be used as the sample will have already naturally leached through the tailing impoundments

	at 1-Dam and 3-Dam.
Photographic:	Photographs of each sampling location will be taken and preserved as part of the sampling event.
GIS:	GIS data will be collected for each sampling location.

Attachment 1 – Mine Site Map

Attachment 1a – Location #1

Attachment 1b – Location #2

Attachment 2 – Mill Site Map

Attachment 2a – Location #3

Attachment 3
Parameters to be Analyzed

Parameters specified in 5 CCR 1002 Regulation 41 (Tables 1 through 4) and Regulation 31 (Tables I through III) that **will be analyzed**

- Aluminum (Dissolved)
- Antimony (Dissolved)
- Arsenic (Dissolved)
- Barium (Dissolved)
- Beryllium (Dissolved)
- Boron (Dissolved)
- Cadmium (Dissolved)
- Chromium (Dissolved)
- Cobalt (Dissolved)
- Copper (Dissolved)
- Iron (Dissolved)
- Lead (Dissolved)
- Manganese (Dissolved)
- Mercury (Dissolved)
- Molybdenum (Dissolved)
- Nickel (Dissolved)
- Selenium (Dissolved)
- Silver (Dissolved)
- Thallium (Dissolved)
- Uranium (Dissolved)
- Vanadium (Dissolved)
- Zinc (Dissolved)

- Ammonia (As N) Total
- Beta and Photon Emitters
- Chloride (Dissolved)
- Chlorophenol
- Cyanide (Free)
- Fluoride (Dissolved)
- Gross Alpha Particle Activity
- Lithium (Dissolved)
- Nitrate (As N) (Dissolved)
- Nitrite (AS N) (Dissolved)
- Nitrate/Nitrite, Total (Dissolved)
- pH
- Phenol
- Sulfate (Dissolved)
- Sulfide as H2S
- Temperature

Parameters that **will not be analyzed** due to there being no potential for them to exist in Mine and Mill soils/tailings

- Asbestos
- Color
- Dissolved Oxygen
- Ecoli
- Foaming Agents
- Odor
- TDS/TSS
- Total Residual Chlorine

Appendix G

Henderson Geochemical Evaluation Results

Analysis for SPLP soil sample taken at east end of mine stockpile										
Site Name	Sample Date	Analytical Method	Analyte		Units	Results	MDL	Media	RL	Note
LOCATION #1	6/14/2010	SM4500NH3 D	Nitrogen, Ammonia	Total	mg/l	<0.1	0.1	Soil	0.1	U
LOCATION #1	6/14/2010	E420.1	Phenols	Total	ug/l	<50	50	Soil	50	U
LOCATION #1	6/14/2010	E300	Fluoride	Total	mg/kg	10.4	2.2	Soil	2.2	
LOCATION #1	6/14/2010	E300	Chloride	Total	mg/kg	<5.5	5.5	Soil	5.5	U
LOCATION #1	6/14/2010	E300	Nitrogen, Nitrite	Total	mg/kg	<0.67	0.67	Soil	0.67	U
LOCATION #1	6/14/2010	E300	Nitrogen, Nitrate	Total	mg/kg	<0.49	0.49	Soil	0.49	U
LOCATION #1	6/14/2010	E300	Sulfate	Total	mg/kg	587	5.5	Soil	5.5	
LOCATION #1	6/14/2010	SM4500NO3	Nitrogen, Nitrate + Nitrite	Total	mg/kg	<1.2	1.2	Soil	1.2	U
LOCATION #1	6/14/2010	SW9045C	pH	Total	pH Units	3.47		Soil		
LOCATION #1	6/14/2010	SW7470A	Mercury	Total	mg/l	<0.0001	0.0001	Soil	0.0001	U
LOCATION #1	6/14/2010	SW6010B	Aluminum	Total	mg/l	0.84	0.1	Soil	0.1	
LOCATION #1	6/14/2010	SW6010B	Antimony	Total	mg/l	<0.03	0.03	Soil	0.03	U
LOCATION #1	6/14/2010	SW6010B	Arsenic	Total	mg/l	<0.025	0.025	Soil	0.025	U
LOCATION #1	6/14/2010	SW6010B	Barium	Total	mg/l	<1	1	Soil	1	U
LOCATION #1	6/14/2010	SW6010B	Beryllium	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #1	6/14/2010	SW6010B	Boron	Total	mg/l	0.19	0.05	Soil	0.05	
LOCATION #1	6/14/2010	SW6010B	Cadmium	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #1	6/14/2010	SW6010B	Chromium	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #1	6/14/2010	SW6010B	Cobalt	Total	mg/l	<0.005	0.005	Soil	0.005	U
LOCATION #1	6/14/2010	SW6010B	Copper	Total	mg/l	0.024	0.005	Soil	0.005	
LOCATION #1	6/14/2010	SW6010B	Iron	Total	mg/l	0.098	0.07	Soil	0.07	
LOCATION #1	6/14/2010	SW6010B	Lead	Total	mg/l	<0.05	0.05	Soil	0.05	U
LOCATION #1	6/14/2010	SW6010B	Lithium	Total	mg/l	0.006	0.002	Soil	0.002	
LOCATION #1	6/14/2010	SW6010B	Magnesium	Total	mg/l	0.27	0.2	Soil	0.2	
LOCATION #1	6/14/2010	SW6010B	Manganese	Total	mg/l	1.6	0.005	Soil	0.005	
LOCATION #1	6/14/2010	SW6010B	Molybdenum	Total	mg/l	<0.005	0.005	Soil	0.005	U
LOCATION #1	6/14/2010	SW6010B	Nickel	Total	mg/l	<0.03	0.03	Soil	0.03	U
LOCATION #1	6/14/2010	SW6010B	Selenium	Total	mg/l	<0.05	0.05	Soil	0.05	U
LOCATION #1	6/14/2010	SW6010B	Silver	Total	mg/l	<0.03	0.03	Soil	0.03	U
LOCATION #1	6/14/2010	SW6010B	Thallium	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #1	6/14/2010	SW6010B	Uranium	Total	mg/l	<0.05	0.05	Soil	0.05	U
LOCATION #1	6/14/2010	SW6010B	Vanadium	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #1	6/14/2010	SW6010B	Zinc	Total	mg/l	0.67	0.03	Soil	0.03	
LOCATION #1	6/14/2010	SW8270C	Benzoic Acid	Total	mg/l	<0.02	0.02	Soil	0.05	U
LOCATION #1	6/14/2010	SW8270C	2-Chlorophenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	4-Chloro-3-methyl phenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	2,4-Dichlorophenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	2,4-Dimethylphenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	2,4-Dinitrophenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	4,6-Dinitro-o-cresol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	2-Methylphenol	Total	mg/l	<0.025	0.025	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	3&4-Methylphenol	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #1	6/14/2010	SW8270C	2-Nitrophenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	4-Nitrophenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Pentachlorophenol	Total	mg/l	<0.01	0.01	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Phenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	2,4,5-Trichlorophenol	Total	mg/l	<0.025	0.025	Soil	0.05	U
LOCATION #1	6/14/2010	SW8270C	2,4,6-Trichlorophenol	Total	mg/l	<0.01	0.01	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Acenaphthene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Acenaphthylene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Anthracene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Benzo(a)anthracene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Benzo(a)pyrene	Total	mg/l	<0.015	0.015	Soil	0.025	U

Analysis for SPLP soil sample taken at east end of mine stockpile										
Site Name	Sample Date	Analytical Method	Analyte		Units	Results	MDL	Media	RL	Note
LOCATION #1	6/14/2010	SW8270C	Benzo(b)fluoranthene	Total	mg/l	<1		Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Benzo(g,h,i)perylene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Benzo(k)fluoranthene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	4-Bromophenyl phenyl ether	Total	mg/l	<0.045	0.045	Soil	0.1	U
LOCATION #1	6/14/2010	SW8270C	Butyl benzyl phthalate	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Benzyl Alcohol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	2-Chloronaphthalene	Total	mg/l	<1		Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	4-Chloroaniline	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Carbazole	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Chrysene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	bis(2-Chloroethoxy)methane	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	bis(2-Chloroethyl)ether	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	bis(2-Chloroisopropyl)ether	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	4-Chlorophenyl phenyl ether	Total	mg/l	<0.015	0.015	Soil	0.05	U
LOCATION #1	6/14/2010	SW8270C	1,2-Dichlorobenzene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	1,3-Dichlorobenzene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	1,4-Dichlorobenzene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	2,4-Dinitrotoluene	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #1	6/14/2010	SW8270C	2,6-Dinitrotoluene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	3,3-Dichlorobenzidine	Total	mg/l	<0.02	0.02	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Dibenzo(a,h)anthracene	Total	mg/l	<0.02	0.02	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Dibenzofuran	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Di-n-butyl phthalate	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Di-n-octyl phthalate	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Diethyl phthalate	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Dimethyl phthalate	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	bis(2-Ethylhexyl)phthalate	Total	mg/l	<0.015	0.015	Soil	0.05	U
LOCATION #1	6/14/2010	SW8270C	Fluoranthene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Fluorene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Hexachlorobenzene	Total	mg/l	<0.01	0.01	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Hexachlorobutadiene	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #1	6/14/2010	SW8270C	Hexachlorocyclopentadiene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Hexachloroethane	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #1	6/14/2010	SW8270C	Indeno(1,2,3-cd)pyrene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Isophorone	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	2-Methylnaphthalene	Total	mg/l	<0.009	0.009	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	2-Nitroaniline	Total	mg/l	<0.05	0.05	Soil	0.1	U
LOCATION #1	6/14/2010	SW8270C	3-Nitroaniline	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	4-Nitroaniline	Total	mg/l	<0.02	0.02	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Naphthalene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Nitrobenzene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	N-Nitroso-di-n-propylamine	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	N-Nitrosodiphenylamine	Total	mg/l	<0.02	0.02	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Phenanthrene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	Pyrene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	1,2,4-Trichlorobenzene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #1	6/14/2010	SW8270C	2-Fluorophenol	Total	%REC	68		Soil		
LOCATION #1	6/14/2010	SW8270C	Phenol-d5	Total	%REC	76		Soil		
LOCATION #1	6/14/2010	SW8270C	2,4,6-Tribromophenol	Total	%REC	75		Soil		
LOCATION #1	6/14/2010	SW8270C	Nitrobenzene-d5	Total	%REC	63		Soil		
LOCATION #1	6/14/2010	SW8270C	2-Fluorobiphenyl	Total	%REC	63		Soil		
LOCATION #1	6/14/2010	SW8270C	Terphenyl-d14	Total	%REC	70		Soil		
LOCATION #1	6/14/2010	SM7110B	Gross Alpha	Total	pCi/l	130		Soil	2.1	
LOCATION #1	6/14/2010	SM7110B	Gross Beta	Total	pCi/l	53		Soil	2.1	

Analysis for SPLP soil sample taken at west end of mine stockpile										
Site Name	Sample Date	Analytical Method	Analyte		Units	Results	MDL	Media	RL	Note
LOCATION #2	6/14/2010	SM4500NH3 D	Nitrogen, Ammonia	Total	mg/l	<0.1	0.1	Soil	0.1	U
LOCATION #2	6/14/2010	E420.1	Phenols	Total	ug/l	<50	50	Soil	50	U
LOCATION #2	6/14/2010	E300	Fluoride	Total	mg/kg	13.5	2.2	Soil	2.2	
LOCATION #2	6/14/2010	E300	Chloride	Total	mg/kg	<5.4	5.4	Soil	5.4	U
LOCATION #2	6/14/2010	E300	Nitrogen, Nitrite	Total	mg/kg	<0.66	0.66	Soil	0.66	U
LOCATION #2	6/14/2010	E300	Nitrogen, Nitrate	Total	mg/kg	<0.49	0.49	Soil	0.49	U
LOCATION #2	6/14/2010	E300	Sulfate	Total	mg/kg	141	5.4	Soil	5.4	
LOCATION #2	6/14/2010	SM4500NO3	Nitrogen, Nitrate + Nitrite	Total	mg/kg	<1.2	1.2	Soil	1.2	U
LOCATION #2	6/14/2010	SW9045C	pH	Total	pH Units	5.01		Soil		
LOCATION #2	6/14/2010	SW7470A	Mercury	Total	mg/l	<0.0001	0.0001	Soil	0.0001	U
LOCATION #2	6/14/2010	SW6010B	Aluminum	Total	mg/l	1.3	0.1	Soil	0.1	
LOCATION #2	6/14/2010	SW6010B	Antimony	Total	mg/l	<0.03	0.03	Soil	0.03	U
LOCATION #2	6/14/2010	SW6010B	Arsenic	Total	mg/l	<0.025	0.025	Soil	0.025	U
LOCATION #2	6/14/2010	SW6010B	Barium	Total	mg/l	<1	1	Soil	1	U
LOCATION #2	6/14/2010	SW6010B	Beryllium	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #2	6/14/2010	SW6010B	Boron	Total	mg/l	0.23	0.05	Soil	0.05	
LOCATION #2	6/14/2010	SW6010B	Cadmium	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #2	6/14/2010	SW6010B	Chromium	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #2	6/14/2010	SW6010B	Cobalt	Total	mg/l	<0.005	0.005	Soil	0.005	U
LOCATION #2	6/14/2010	SW6010B	Copper	Total	mg/l	0.026	0.005	Soil	0.005	
LOCATION #2	6/14/2010	SW6010B	Iron	Total	mg/l	<0.07	0.07	Soil	0.07	U
LOCATION #2	6/14/2010	SW6010B	Lead	Total	mg/l	<0.05	0.05	Soil	0.05	U
LOCATION #2	6/14/2010	SW6010B	Lithium	Total	mg/l	0.004	0.002	Soil	0.002	
LOCATION #2	6/14/2010	SW6010B	Magnesium	Total	mg/l	0.5	0.2	Soil	0.2	
LOCATION #2	6/14/2010	SW6010B	Manganese	Total	mg/l	1.7	0.005	Soil	0.005	
LOCATION #2	6/14/2010	SW6010B	Molybdenum	Total	mg/l	<0.005	0.005	Soil	0.005	U
LOCATION #2	6/14/2010	SW6010B	Nickel	Total	mg/l	<0.03	0.03	Soil	0.03	U
LOCATION #2	6/14/2010	SW6010B	Selenium	Total	mg/l	<0.05	0.05	Soil	0.05	U
LOCATION #2	6/14/2010	SW6010B	Silver	Total	mg/l	<0.03	0.03	Soil	0.03	U
LOCATION #2	6/14/2010	SW6010B	Thallium	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #2	6/14/2010	SW6010B	Uranium	Total	mg/l	<0.05	0.05	Soil	0.05	U
LOCATION #2	6/14/2010	SW6010B	Vanadium	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #2	6/14/2010	SW6010B	Zinc	Total	mg/l	0.78	0.03	Soil	0.03	
LOCATION #2	6/14/2010	SW8270C	Benzoic Acid	Total	mg/l	<0.02	0.02	Soil	0.05	U
LOCATION #2	6/14/2010	SW8270C	2-Chlorophenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	4-Chloro-3-methyl phenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	2,4-Dichlorophenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	2,4-Dimethylphenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	2,4-Dinitrophenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	4,6-Dinitro-o-cresol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	2-Methylphenol	Total	mg/l	<0.025	0.025	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	3&4-Methylphenol	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #2	6/14/2010	SW8270C	2-Nitrophenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	4-Nitrophenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Pentachlorophenol	Total	mg/l	<0.01	0.01	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Phenol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	2,4,5-Trichlorophenol	Total	mg/l	<0.025	0.025	Soil	0.05	U
LOCATION #2	6/14/2010	SW8270C	2,4,6-Trichlorophenol	Total	mg/l	<0.01	0.01	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Acenaphthene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Acenaphthylene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Anthracene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Benzo(a)anthracene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Benzo(a)pyrene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Benzo(b)fluoranthene	Total	mg/l	<1		Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Benzo(g,h,i)perylene	Total	mg/l	<0.015	0.015	Soil	0.025	U

Analysis for SPLP soil sample taken at west end of mine stockpile										
Site Name	Sample Date	Analytical Method	Analyte		Units	Results	MDL	Media	RL	Note
LOCATION #2	6/14/2010	SW8270C	Benzo(k)fluoranthene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	4-Bromophenyl phenyl ether	Total	mg/l	<0.045	0.045	Soil	0.1	U
LOCATION #2	6/14/2010	SW8270C	Butyl benzyl phthalate	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Benzyl Alcohol	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	2-Chloronaphthalene	Total	mg/l	<1		Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	4-Chloroaniline	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Carbazole	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Chrysene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	bis(2-Chloroethoxy)methane	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	bis(2-Chloroethyl)ether	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	bis(2-Chloroisopropyl)ether	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	4-Chlorophenyl phenyl ether	Total	mg/l	<0.015	0.015	Soil	0.05	U
LOCATION #2	6/14/2010	SW8270C	1,2-Dichlorobenzene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	1,3-Dichlorobenzene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	1,4-Dichlorobenzene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	2,4-Dinitrotoluene	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #2	6/14/2010	SW8270C	2,6-Dinitrotoluene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	3,3-Dichlorobenzidine	Total	mg/l	<0.02	0.02	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Dibenzo(a,h)anthracene	Total	mg/l	<0.02	0.02	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Dibenzofuran	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Di-n-butyl phthalate	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Di-n-octyl phthalate	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Diethyl phthalate	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Dimethyl phthalate	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	bis(2-Ethylhexyl)phthalate	Total	mg/l	<0.015	0.015	Soil	0.05	U
LOCATION #2	6/14/2010	SW8270C	Fluoranthene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Fluorene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Hexachlorobenzene	Total	mg/l	<0.01	0.01	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Hexachlorobutadiene	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #2	6/14/2010	SW8270C	Hexachlorocyclopentadiene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Hexachloroethane	Total	mg/l	<0.01	0.01	Soil	0.01	U
LOCATION #2	6/14/2010	SW8270C	Indeno(1,2,3-cd)pyrene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Isophorone	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	2-Methylnaphthalene	Total	mg/l	<0.009	0.009	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	2-Nitroaniline	Total	mg/l	<0.05	0.05	Soil	0.1	U
LOCATION #2	6/14/2010	SW8270C	3-Nitroaniline	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	4-Nitroaniline	Total	mg/l	<0.02	0.02	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Naphthalene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Nitrobenzene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	N-Nitroso-di-n-propylamine	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	N-Nitrosodiphenylamine	Total	mg/l	<0.02	0.02	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Phenanthrene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	Pyrene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	1,2,4-Trichlorobenzene	Total	mg/l	<0.015	0.015	Soil	0.025	U
LOCATION #2	6/14/2010	SW8270C	2-Fluorophenol	Total	%REC	55		Soil		
LOCATION #2	6/14/2010	SW8270C	Phenol-d5	Total	%REC	62		Soil		
LOCATION #2	6/14/2010	SW8270C	2,4,6-Tribromophenol	Total	%REC	78		Soil		
LOCATION #2	6/14/2010	SW8270C	Nitrobenzene-d5	Total	%REC	52		Soil		
LOCATION #2	6/14/2010	SW8270C	2-Fluorobiphenyl	Total	%REC	55		Soil		
LOCATION #2	6/14/2010	SW8270C	Terphenyl-d14	Total	%REC	82		Soil		
LOCATION #2	6/14/2010	SM7110B	Gross Alpha	Total	pCi/l	180		Soil	1.2	
LOCATION #2	6/14/2010	SM7110B	Gross Beta	Total	pCi/l	78		Soil	1.9	

Analysis for water sample taken from Henderson Mill Tailings seep water										
Site Name	Sample Date	Analytical Method	Analyte		Units	Results	MDL	Media	RL	Note
LOCATION #3	6/15/2010	SM4500NH3 D	Nitrogen, Ammonia	Total	mg/l	0.6	0.1	Water	0.1	
LOCATION #3	6/15/2010	SM4500CN E	Cyanide, Total	Total	mg/l	<0.005	0.005	Water	0.005	U
LOCATION #3	6/15/2010	SM4500 S2 H	Hydrogen Sulfide	Total	mg/l	<0.5	0.5	Water	0.5	U
LOCATION #3	6/15/2010	E300	Fluoride	Total	mg/l	36.3	1	Water	1	
LOCATION #3	6/15/2010	E300	Chloride	Total	mg/l	322	10	Water	10	
LOCATION #3	6/15/2010	E300	Nitrogen, Nitrite	Total	mg/l	<0.31	0.31	Water	0.31	U
LOCATION #3	6/15/2010	E300	Nitrogen, Nitrate	Total	mg/l	<0.23	0.23	Water	0.23	U
LOCATION #3	6/15/2010	E300	Sulfate	Total	mg/l	3140	100	Water	100	
LOCATION #3	6/15/2010	E420.1	Phenols	Total	ug/l	124	50	Water	50	
LOCATION #3	6/15/2010	SW8270C	Benzoic Acid	Total	ug/l	<21	21	Water	25	U
LOCATION #3	6/15/2010	SW8270C	2-Chlorophenol	Total	ug/l	<6	6	Water	7.5	U
LOCATION #3	6/15/2010	SW8270C	4-Chloro-3-methyl phenol	Total	ug/l	<13	13	Water	25	U
LOCATION #3	6/15/2010	SW8270C	2,4-Dichlorophenol	Total	ug/l	<8.5	8.5	Water	10	U
LOCATION #3	6/15/2010	SW8270C	2,4-Dimethylphenol	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	2,4-Dinitrophenol	Total	ug/l	<6	6	Water	25	U
LOCATION #3	6/15/2010	SW8270C	4,6-Dinitro-o-cresol	Total	ug/l	<5	5	Water	10	U
LOCATION #3	6/15/2010	SW8270C	2-Methylphenol	Total	ug/l	<13	13	Water	25	U
LOCATION #3	6/15/2010	SW8270C	4-Methylphenol	Total	ug/l	<9	9	Water	10	U
LOCATION #3	6/15/2010	SW8270C	2-Nitrophenol	Total	ug/l	<10	10	Water	25	U
LOCATION #3	6/15/2010	SW8270C	4-Nitrophenol	Total	ug/l	<5.5	5.5	Water	5.5	U
LOCATION #3	6/15/2010	SW8270C	Pentachlorophenol	Total	ug/l	<6.5	6.5	Water	25	U
LOCATION #3	6/15/2010	SW8270C	Phenol	Total	ug/l	<11	11	Water	25	U
LOCATION #3	6/15/2010	SW8270C	2,4,5-Trichlorophenol	Total	ug/l	<6.5	6.5	Water	7.5	U
LOCATION #3	6/15/2010	SW8270C	2,4,6-Trichlorophenol	Total	ug/l	<8.5	8.5	Water	10	U
LOCATION #3	6/15/2010	SW8270C	Acenaphthene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	Acenaphthylene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	Anthracene	Total	ug/l	<6.5	6.5	Water	6.5	U
LOCATION #3	6/15/2010	SW8270C	Benzo(a)anthracene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	Benzo(a)pyrene	Total	ug/l	<4.5	4.5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	Benzo(b)fluoranthene	Total	ug/l	<7	7	Water	7.5	U
LOCATION #3	6/15/2010	SW8270C	Benzo(g,h,i)perylene	Total	ug/l	<10	10	Water	10	U
LOCATION #3	6/15/2010	SW8270C	Benzo(k)fluoranthene	Total	ug/l	<5	5	Water	7.5	U
LOCATION #3	6/15/2010	SW8270C	4-Bromophenyl phenyl ether	Total	ug/l	<7.5	7.5	Water	25	U
LOCATION #3	6/15/2010	SW8270C	Butyl benzyl phthalate	Total	ug/l	<5.5	5.5	Water	5.5	U
LOCATION #3	6/15/2010	SW8270C	Benzyl Alcohol	Total	ug/l	<10	10	Water	25	U
LOCATION #3	6/15/2010	SW8270C	2-Chloronaphthalene	Total	ug/l	<9	9	Water	25	U
LOCATION #3	6/15/2010	SW8270C	4-Chloroaniline	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	Chrysene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	bis(2-Chloroethoxy)methane	Total	ug/l	<11	11	Water	25	U
LOCATION #3	6/15/2010	SW8270C	bis(2-Chloroethyl)ether	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	bis(2-Chloroisopropyl)ether	Total	ug/l	<13	13	Water	25	U
LOCATION #3	6/15/2010	SW8270C	4-Chlorophenyl phenyl ether	Total	ug/l	<13	13	Water	25	U
LOCATION #3	6/15/2010	SW8270C	1,2-Dichlorobenzene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	1,3-Dichlorobenzene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	1,4-Dichlorobenzene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	2,4-Dinitrotoluene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	2,6-Dinitrotoluene	Total	ug/l	<9	9	Water	25	U
LOCATION #3	6/15/2010	SW8270C	3,3-Dichlorobenzidine	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	Dibenzo(a,h)anthracene	Total	ug/l	<8	8	Water	10	U
LOCATION #3	6/15/2010	SW8270C	Dibenzofuran	Total	ug/l	<9	9	Water	25	U
LOCATION #3	6/15/2010	SW8270C	Di-n-butyl phthalate	Total	ug/l	<6.5	6.5	Water	6.5	U

Analysis for water sample taken from Henderson Mill Tailings seep water										
Site Name	Sample Date	Analytical Method	Analyte		Units	Results	MDL	Media	RL	Note
LOCATION #3	6/15/2010	SW8270C	Di-n-octyl phthalate	Total	ug/l	<9	9	Water	9	U
LOCATION #3	6/15/2010	SW8270C	Diethyl phthalate	Total	ug/l	<10	10	Water	25	U
LOCATION #3	6/15/2010	SW8270C	Dimethyl phthalate	Total	ug/l	<10	10	Water	25	U
LOCATION #3	6/15/2010	SW8270C	bis(2-Ethylhexyl)phthalate	Total	ug/l	<7.5	7.5	Water	7.5	U
LOCATION #3	6/15/2010	SW8270C	Fluoranthene	Total	ug/l	<6	6	Water	6	U
LOCATION #3	6/15/2010	SW8270C	Fluorene	Total	ug/l	<7	7	Water	7	U
LOCATION #3	6/15/2010	SW8270C	Hexachlorobenzene	Total	ug/l	<10	10	Water	25	U
LOCATION #3	6/15/2010	SW8270C	Hexachlorobutadiene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	Hexachlorocyclopentadiene	Total	ug/l	<9	9	Water	25	U
LOCATION #3	6/15/2010	SW8270C	Hexachloroethane	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	Indeno(1,2,3-cd)pyrene	Total	ug/l	<8	8	Water	10	U
LOCATION #3	6/15/2010	SW8270C	Isophorone	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	2-Methylnaphthalene	Total	ug/l	<9	9	Water	25	U
LOCATION #3	6/15/2010	SW8270C	2-Nitroaniline	Total	ug/l	<11	11	Water	25	U
LOCATION #3	6/15/2010	SW8270C	3-Nitroaniline	Total	ug/l	<9	9	Water	25	U
LOCATION #3	6/15/2010	SW8270C	4-Nitroaniline	Total	ug/l	<7.5	7.5	Water	25	U
LOCATION #3	6/15/2010	SW8270C	Naphthalene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	Nitrobenzene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	N-Nitroso-di-n-propylamine	Total	ug/l	<8	8	Water	10	U
LOCATION #3	6/15/2010	SW8270C	N-Nitrosodiphenylamine	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	Phenanthrene	Total	ug/l	<10	10	Water	25	U
LOCATION #3	6/15/2010	SW8270C	Pyrene	Total	ug/l	<5	5	Water	5	U
LOCATION #3	6/15/2010	SW8270C	1,2,4-Trichlorobenzene	Total	ug/l	<9	9	Water	25	U
LOCATION #3	6/15/2010	SW8270C	2-Fluorophenol	Total	%REC	56		Water		
LOCATION #3	6/15/2010	SW8270C	Phenol-d5	Total	%REC	67		Water		
LOCATION #3	6/15/2010	SW8270C	2,4,6-Tribromophenol	Total	%REC	82		Water		
LOCATION #3	6/15/2010	SW8270C	Nitrobenzene-d5	Total	%REC	54		Water		
LOCATION #3	6/15/2010	SW8270C	2-Fluorobiphenyl	Total	%REC	59		Water		
LOCATION #3	6/15/2010	SW8270C	Terphenyl-d14	Total	%REC	73		Water		
LOCATION #3	6/15/2010	E200.7	Aluminum	Diss	ug/l	23600	100	Water	100	
LOCATION #3	6/15/2010	E200.7	Antimony	Diss	ug/l	<30	30	Water	30	U
LOCATION #3	6/15/2010	E200.7	Arsenic	Diss	ug/l	53.4	25	Water	25	
LOCATION #3	6/15/2010	E200.7	Barium	Diss	ug/l	20.4	10	Water	10	
LOCATION #3	6/15/2010	E200.7	Beryllium	Diss	ug/l	<10	10	Water	10	U
LOCATION #3	6/15/2010	E200.7	Boron	Diss	ug/l	62.5	50	Water	50	
LOCATION #3	6/15/2010	E200.7	Cadmium	Diss	ug/l	<10	10	Water	10	U
LOCATION #3	6/15/2010	E200.7	Chromium	Diss	ug/l	<200	200	Water	200	U
LOCATION #3	6/15/2010	E200.7	Cobalt	Diss	ug/l	<100	100	Water	100	U
LOCATION #3	6/15/2010	E200.7	Copper	Diss	ug/l	<500	500	Water	500	U
LOCATION #3	6/15/2010	E200.7	Iron	Diss	ug/l	164000	70	Water	70	
LOCATION #3	6/15/2010	E200.7	Lead	Diss	ug/l	<50	50	Water	50	U
LOCATION #3	6/15/2010	E200.7	Lithium	Diss	ug/l	231	2	Water	2	
LOCATION #3	6/15/2010	E200.7	Magnesium	Diss	ug/l	27200	200	Water	200	
LOCATION #3	6/15/2010	E200.7	Manganese	Diss	ug/l	180000	100	Water	100	
LOCATION #3	6/15/2010	E200.7	Molybdenum	Diss	ug/l	<10	10	Water	10	U
LOCATION #3	6/15/2010	E200.7	Nickel	Diss	ug/l	49.5	30	Water	30	
LOCATION #3	6/15/2010	E200.7	Selenium	Diss	ug/l	58.6	50	Water	50	
LOCATION #3	6/15/2010	E200.7	Silver	Diss	ug/l	30	30	Water	30	
LOCATION #3	6/15/2010	E200.7	Thallium	Diss	ug/l	<200	200	Water	200	U
LOCATION #3	6/15/2010	E200.7	Uranium	Diss	ug/l	113	50	Water	50	
LOCATION #3	6/15/2010	E200.7	Vanadium	Diss	ug/l	<200	200	Water	200	U

Analysis for water sample taken from Henderson Mill Tailings seep water										
Site Name	Sample Date	Analytical Method	Analyte		Units	Results	MDL	Media	RL	Note
LOCATION #3	6/15/2010	E200.7	Zinc	Diss	ug/l	8990	30	Water	30	
LOCATION #3	6/15/2010	E245.1	Mercury	Diss	ug/l	<0.1	0.1	Water	0.1	U
LOCATION #3	6/14/2010	SM7110B	Gross Alpha	Total	pCi/l	100		Soil	4.5	
LOCATION #3	6/14/2010	SM7110B	Gross Beta	Total	pCi/l	185		Soil	4.5	

Appendix H

Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese

GATEWAY ENTERPRISES

Technical Consulting Report

February 28, 2012

Report To: Climax Molybdenum Company – Henderson Mine and Mill

Subject: **Establishing Background Threshold Values (BTVs) for Manganese**

Prepared by: John G. Huntington, Ph.D.
Technical Director and Consultant
Gateway Enterprises

Background and Summary

The purpose of this report is to describe a technical approach recommended to determine background threshold values (BTVs) for manganese at the Climax Molybdenum Company - Henderson Mine and Mill (Henderson) facility. The facility consists of two separate areas, the mine and the mill. The mine is on the east side of the continental divide and the mill is on the west side.

According to the CDPHE regulations for groundwater, available information obtained since January 31, 1994 can be used to determine the level of existing ambient groundwater quality (1). Such data was provided to us by Aquionix on behalf of Henderson and we were asked to develop a set of BTVs using it.

The primary guidance and tool that we have used for this purpose is provided by EPA in the USEPA ProUCL 4.1.01 statistical package. This is a tool developed for this purpose by Lockheed Martin under contract with EPA (2). This tool consists of a software package and extensive technical documentation describing how to properly develop BTVs.

In addition to this we have used a number of other statistical references (3,4,5,6,7) as well as our own professional chemical and scientific judgment. In this document we have attempted to describe such judgments and the rationale associated with them.

In very brief summary we find that the data associated with these wells do not follow a normal distribution, but are fairly close to log-normally distributed. This is common for environmental data (3) and has been shown by a number of workers to be expected based on theoretical considerations (4). However, this type of distribution can also result from outliers, biased sampling, or mixed sources (5). These potential problems are also described in the EPA documents supporting proUCL (6). The ProUCL tool also calculates statistics based on normal and gamma distributions, which generally produce similar results. However, due to the observed distribution characteristics we have relied on the log-normal and non-parametric calculations to develop our recommendations. All of these calculations are available in the supporting documents associated with this report (available on request).

We have generated two basic types of statistical limits in this work:

1. 95% upper confidence limits (UCL) for the population mean. This is the limit which should be used to evaluate the ongoing site mean. If the mean drifts above the UCL, this may be evidence of developing contamination at the site.
2. 95% upper prediction limits (UPL). This parameter is the limit against which individual future measurements, as opposed to the site mean, should be compared. The developers of proUCL recommend the use of this parameter as a site BTV. The UPL is thus considered the BTV for the site, and if any individual measurement falls above this level it could mean that the site is showing evidence of contamination.

For the mine site there is one well, MNGW-1. We have proposed a UCL and UPL for this well based on the calculations described in this document.

For the mill site we have considered well MLGW-7. We have proposed a UCL and UPL to cover MLGW-7 based on the calculations provided in this document.

Preliminary Data Treatment

The first step in developing site limits is to evaluate the general characteristics of the data, and to determine if there are data points that should be removed as outliers, by means of statistical evaluation or a consideration of other factors. We have considered both statistical outlier calculations and have reviewed the laboratory data in cases where outliers seem possible. We have made evaluations of outliers based on both considerations.

Figure 1 represents a Q-Q plot for well MNGW-1 assuming a normal distribution. The Q-Q plot is essentially the plot of the actual distribution of data against the distribution expected from a normal distribution, and if the data follow a normal distribution a straight line should be observed. A larger and more detailed chart is available in the associated Excel files for this project (available on request). Red data points are the non-detected results observed. With or without non-detects, the data clearly fail to follow a normal distribution.

When the four data points that visually appear to be outliers are removed from the data set, the chart shown in Figure 2 is produced. This chart still clearly does not indicate a normal distribution for the data. Figure 3 shows that even when the 5 additional points at the top of the chart are removed; the data still fail to follow a normal distribution. No amount of data adjustment can produce a data set with a normal distribution.

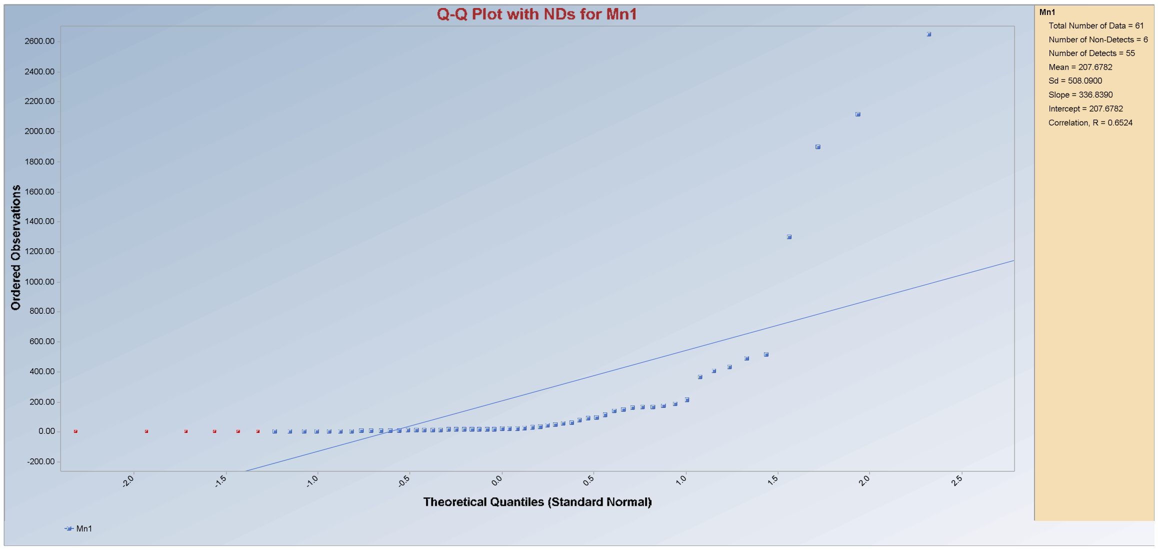


Figure 1. Q-Q Plot for Manganese in Well MNGW-1.

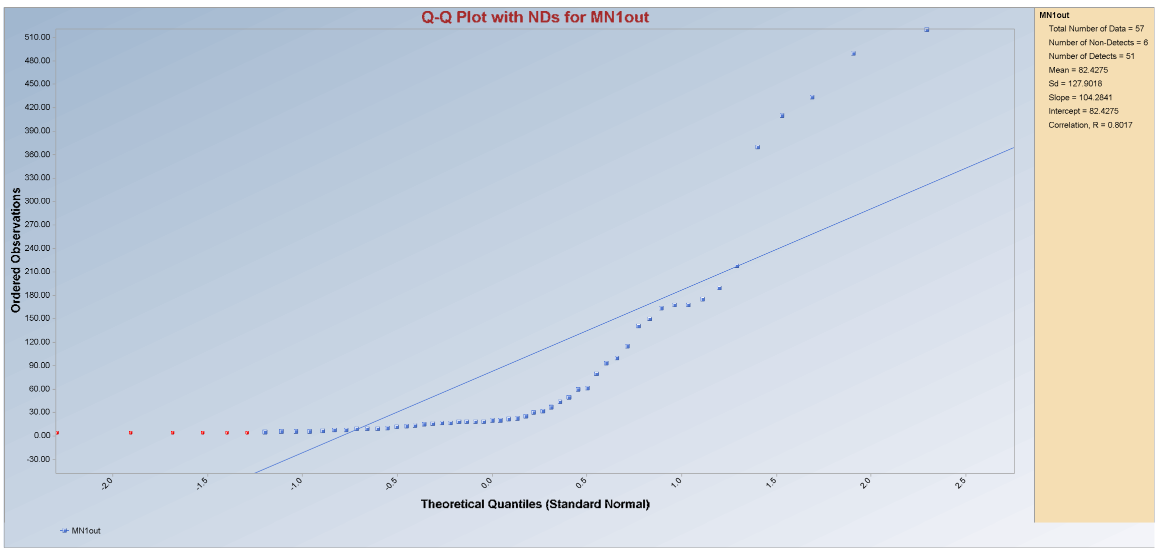


Figure 2. Q-Q Plot for Manganese in Well MNGW-1 After Removal of Four Outliers.

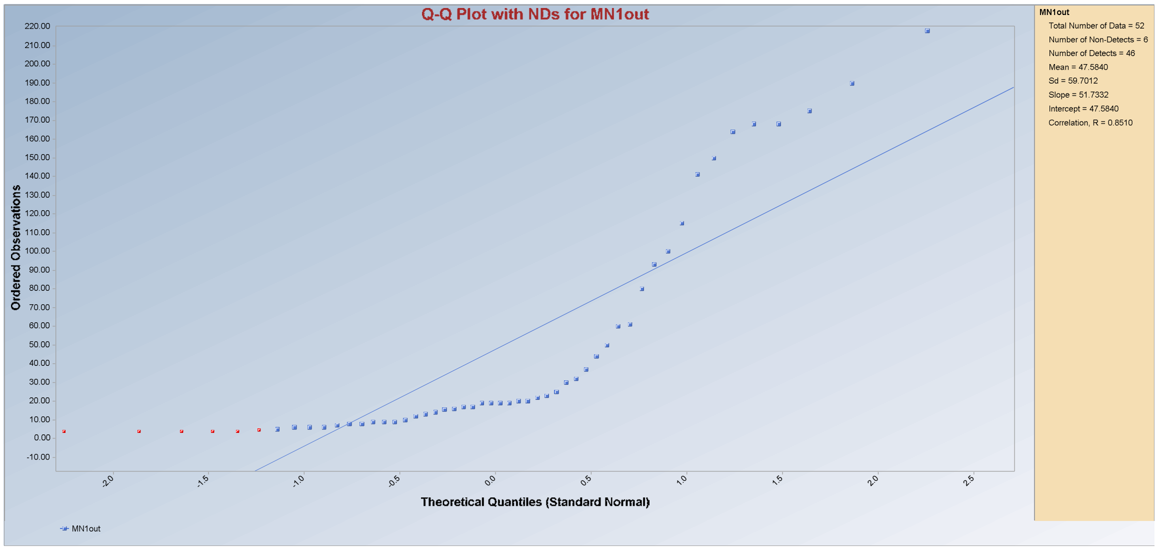


Figure 3. Q-Q Plot for Manganese in Well MNGW-1 After Removal of 9 Outliers.

In contrast, Figure 4 shows the Q-Q plot for this data set assuming a lognormal distribution, with no data points removed.

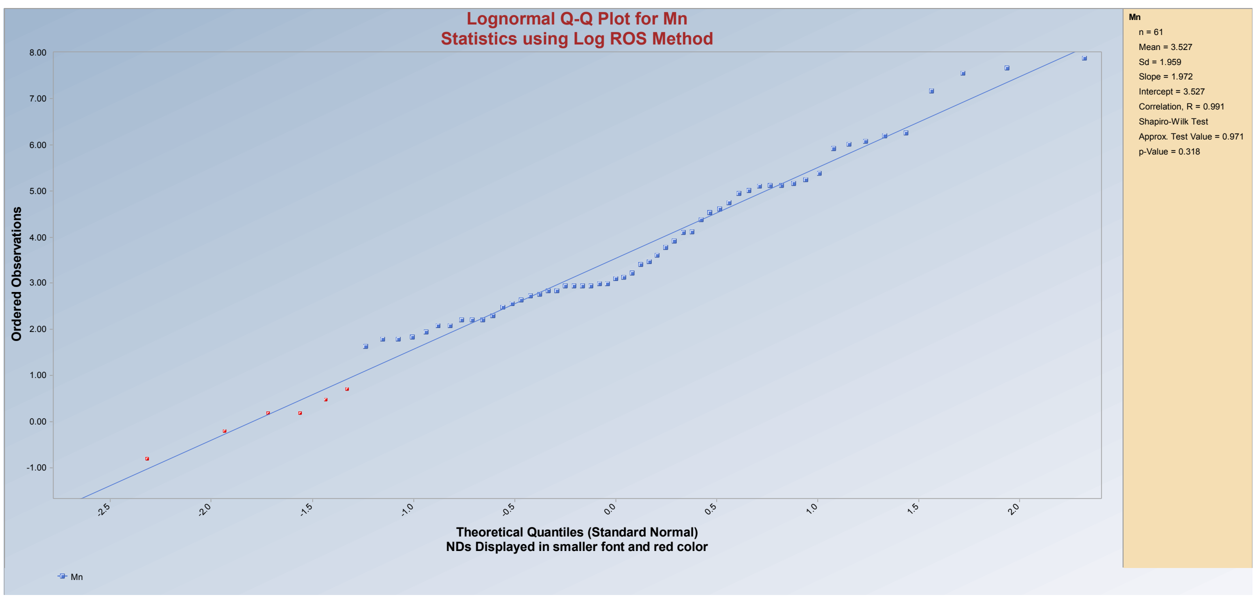


Figure 4. Q-Q Plot of Log-Transformed Manganese Results, MNGW-1, No Outliers Removed.

This plot shows that the data approximate a lognormal distribution with an r value of 0.971. Thus the lognormal distribution produces a much better fit for the behavior of Mn in this well. As has been shown by several workers, this is a result which is expected on theoretical grounds (3,4).

If the data approximate a lognormal distribution then outlier tests must be conducted on log-transformed data in order to conclude that removal of outliers is justified. The standard EPA-recommended outlier tests (The Grubbs test, the Dixon test, and the Rosner test) all assume that the data being tested follow a normal distribution. Thus testing the data for outliers using these tests on non-transformed data will generate an excessive number of outliers, since the distribution is far from normal. This is observed when the Rosner test (essentially the Gibbs tests modified to account for multiple outliers) is applied to the data set without transformation. The Rosner test can produce as many as 9 outliers, and when so applied the data set generated after removal of these outliers still does not approximate a normal distribution, and a log-normal distribution is still applicable.

On the grounds that the initial data set contains 4 data points that are flagged as outliers by the Rosner test, and that these correspond to the obviously different data points in Figure 1, we have calculated statistics based on the full data set as well as the data set with these 4 outliers removed.

Applying the Rosner test to MNGW-1 data after log transformation results in the conclusion that no outliers are statistically likely. Since the data are approximately log-normal, this suggests that the full data set should be used.

Similar calculatons for MLGW-7 show that it also approximates a log-normal distribution. For MLGW-7, three outliers were originally indicated statstically, very high-level results for samples collected in 2008, 2009, and 2010.

We requested and received the laboratory data for MLGW-7 for these sampling dates. For the sampling date of 3/31/2008, the laboratory results did not match those in the database. The high results for this sample were incorrect and were replaced with correct results, which are more in line with historical results for MLGW-7. The other high level points, however, were entered correctly per the laboratory reports.

We attempted to evaluate the laboratory data considering other results for MLGW-7. There was sufficient information to obtain a total anion result for the wells, but not all of the common cations were analyzed, so a total cation result could not be calculated. However, assuming that all the cations for Well MLGW-7 are relatively similar to previous samplings, the estimated ion balance is low for cations. Using the laboratory manganese result brings the total cation and total anions into near balance. Therefore, we have no reason to suspect that the analytical results are incorrect for the two high level results in 2009 and 2010.

Naturally-occuring dissolved manganese can show significant fluctuations in groundwater depending on groundwater oxygen levels. The manganese reduction occurs at relatively high dissolved oxygen level (higher than iron, for example). Relatively small oxygen fluctuations could cause significant increases in manganese levels.

Consistent with EPA recommendations, we have calculated all of the statistics discussed in this report based on data sets both with and without outliers. These are provided for review. In the case of well MNGW-1, although the log-normal data does not allow rejection of any outliers, if the assumption is made that outliers are one cause of the lognormal behavior, then four of the data points can be rejected by the Rosner test as outliers. We have included statistics calculated on the basis of that data set in addition to the full data set.

Seasonality

The apparent outliers discussed above may actually be due to large fluctuations that occur in the well due to natural variations. It has been shown that manganese is particularly susceptible to seasonal variations in groundwaters and in surface waters (8, 9, 10).

When the data sets are segregated into October-March and April-September groups, the wells show evidence of seasonal variation. That is, the October-March groups contain most of the higher levels detected and when a hypothesis test (either Wilcoxon-Mann-Whitney or t-test) is applied, the October-March data are statistically higher than the April – September data in wells MNGW-1 (99% level) and MLGW-7 (99% level). The highest data points are present in the October-March data groups.

While not conclusive, this strongly suggests that the high-level points in the data sets may not be outliers due to some sampling or analysis issue, but in fact are more likely to be representative of natural fluctuations of the manganese levels in these wells.

Therefore for well MNGW-1, it is reasonable to conclude, based on both the statistical outlier tests and the observation of seasonality, that the entire data set should be used in developing UCLs and UPLs. Although we show UCLs and UPLS with and without the “outliers” we recommend the use of those obtained with the high level data points included.

For well MLGW-7 the decision is less clear because the log-normal outlier tests allow the removal of some of the data points as outliers. Nonetheless, the data are consistent with a similar scenario and we believe that there should not be removal of outliers (particularly in well MLGW-7) because of the unique chemical behavior of manganese.

Calculation of UCL

Table 1 provides the general statistics calculated for each well by proUCL.

Table 1. General Statistics for the Wells

Calculated Statistic	MNGW-1 No Outliers	MNGW-1 4 Outliers	MLGW-7 No Outliers	MLGW-7 2 Outliers
Count of Detects	56	52	105	103
Count of Non-Detects	10	10	19	19
Mean	228	92	1211	86
Median	20.5	20	23	22
Standard Deviation	274	131	8118	296

These results are obtained including the non-detected results, with values assigned for calculation by proUCL. The number of non-detects is small for these data sets and the method used for handling them, whether ½ PQL or the other methods available in proUCL, makes little difference in the outcome.

Table 2 provides the UCL calculations based on a log-normal distribution. EPA does not recommend using the ½ PQL method, which has historically been the most common. For the calculated results, the proUCL tool provides results for both the ½ PQL and several other methods (depending on the applicable distribution). It also provides a more stringent test to determine if the distribution is normal, log-normal, gamma, or follows no specific distribution at the 95% level. In most cases, no distribution meets the 95% (p=5%) criterion, but the calculations show that at a lower confidence level a log-normal distribution applies. This is shown by the fact that the Lilliefors critical value is very close to the 5% Lilliefors test statistic. For a normal calculation the critical value and the test statistic are very different (see Table 4).

Table 2. UCL statistics based on log-normal distribution

Calculated Statistic	MNGW-1 No Outliers	MNGW-1 4 Outliers	MLGW-7 no Outliers	MLGW-7 2 Outliers
Lilliefors Test Statistic	0.126	0.12	0.163	0.113
5% Lilliefors Critical Value	0.118	0.124	0.0865	0.0873
95% H-Stat (DL/2) UCL	313	135	149	70
Log ROS 95% t UCL	295	105	2139	115
95% Percentile Bootstrap UCL	303	106	2050	117
95% BCA Bootstrap UCL	326	109	3380	133
95% H UCL	*393*	149	*176*	74

Table 3 provides the various non-parametric (no distribution form is assumed) statistical estimates of the UCL for the wells. The results of this approach are similar to those of the log-normal distribution.

Table 3. UCL statistics based on non-parametric calculations

Calculated Statistic	MNGW-1 No Outliers	MNGW-1 4 Outliers	MLGW-7 no Outliers	MLGW-7 2 Outliers
95% KM (t) UCL	295	105	2140	115
95% KM (z) UCL	294	104	2132	114
95% KM (jackknife) UCL	295	105	2139	115
95% KM (bootstrap t) UCL	357	114	35722	242
95% KM (BCA) UCL	312	107	2419	120
95% KM (Percentile Bootstrap) UCL	302	107	2018	117
95% KM (Chebyshev) UCL	**572**	**147**	**5223**	**182**

Table 4 provides the available results when a normal distribution is assumed. The considerable difference between the 5% Lilliefors critical value and the Lilliefors test statistic demonstrates that the assumption of normality does not apply.

Table 4. UCL Statistics based on Normal Distribution

Calculated Statistic	MNGW-1 No Outliers	MNGW-1 4 Outliers	MLGW-7 no Outliers	MLGW-7 2 Outliers
Lilliefors Test Statistic	0.35	0.258	0.499	0.388
5% Lilliefors Critical Value	0.118	0.124	0.0865	0.0873
95% DL/2 (t) UCL	295	111	2139	115

The UCL, as stated before, provides a limit to compare with the site **mean**, not with individual measured results. The site mean should not fall above this limit. The 95% KM (Chebyshev) UCL is bolded in Table 3 because this is the statistic which is suggested for use by the proUCL software.

Calculation of UPL

The calculation of the UPL for the log-normal distribution is provided in Table 5. Again the Lilliefors test statistic is consistent with a log-normal distribution for a 10% critical value, but not for a 5% critical value. Thus the distribution is reasonably close to log-normal in all cases.

Table 5. UPL Based on Log-Normal Distribution

Calculated Statistic	MNGW-1 No Outliers	MNGW-1 4 Outliers	MLGW-7 no Outliers	MLGW-7 2 Outliers
Lilliefors Test Statistic	0.126	0.12	0.163	0.113
5% Lilliefors Critical Value	0.118	0.123	0.0865	0.0873
DL/2 Method 95% UPL (t)	698	296	377	194
Log ROS Method 95% UPL (t)	*793*	361	*418*	204

Table 6 presents the UPL calculation assuming no specific distribution (non-parametric calculation).

Table 6. UPL Based on Non-Parametric Statistics

Calculated Statistic	MNGW-1 No Outliers	MNGW-1 4 Outliers	MLGW-7 no Outliers	MLGW-7 2 Outliers
95% KM Chebyshev UPL	**2330**	**618**	**33600**	**1270**
95% KM UPL (t)	1010	285	13400	527

Table 7 provides the UPL calculations assuming a normal distribution, which is clearly not consistent with the high value of the Lilliefors Test Statistic when compared to the critical value for p = 5%.

Table 7. UPL Based on Normal Distribution

Calculated Statistic	MNGW-1 No Outliers	MNGW-1 4 Outliers	MLGW-7 no Outliers	MLGW-7 2 Outliers
Lilliefors Test Statistic	0.35	0.252	0.499	0.388
5% Lilliefors Critical Value	0.118	0.123	0.0865	0.0873
DL/2 Method 95% UPL (t)	1020	287	13500	529
MLE Method 95% UPL (t)	1140	332	14100	574

The 95% KM Chebyshev UPL is bolded in Table 6, because it is analogous in computation to the software-recommended UCL. The software does not provide a specific recommendation for the UPL.

Charts of Historical Data

Figure 6 shows the historical data for MNGW-1 with the UCL, UPL, and site average computed from the full data set. A 24-month moving average is also shown to indicate the degree to which the mean changes with time. Figure 7 shows a similar plot with the 4 "outliers" removed from the data set. The values of the UCL and UPL on the chart are those provided in the Recommendations section. Figure 8 provides the plot for MLGW-7, in which the two outliers are removed. When the outliers remain the plot becomes difficult to show because the two outliers are so much higher than the rest of the data.

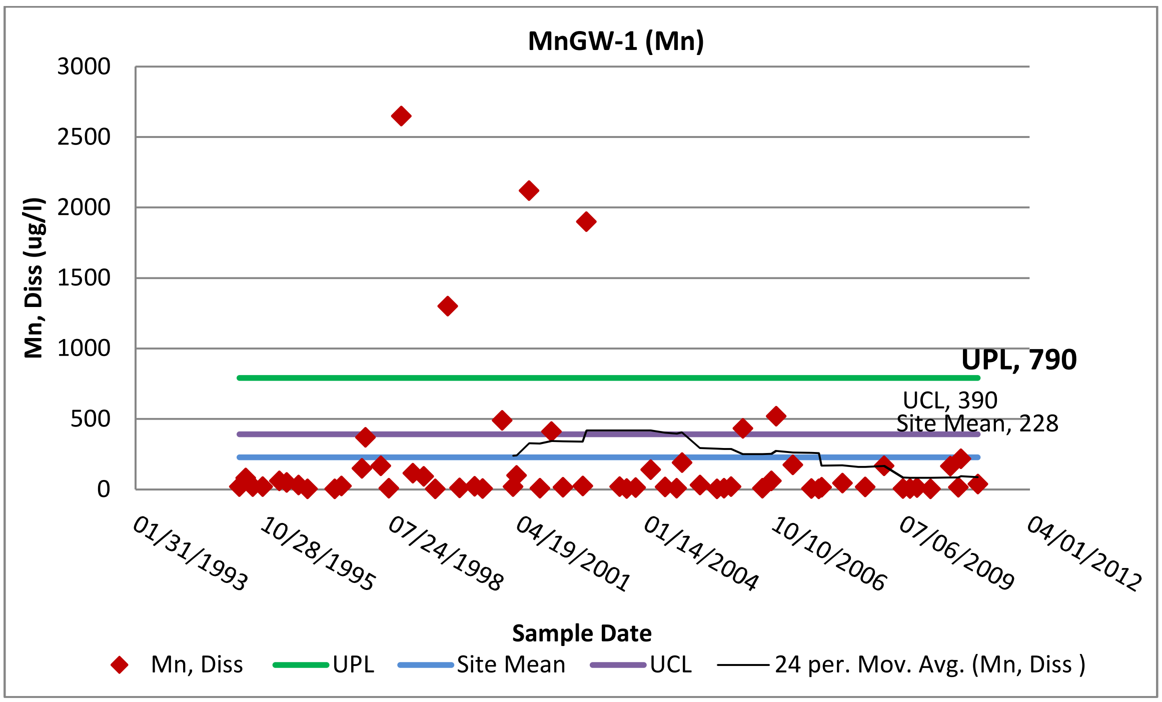


Figure 6. Well MNGW-1, Full Data Set with UPL and UCL. *The Values of the UPL and UCL are those recommended as a result of this study (see the Recommendations Section).*

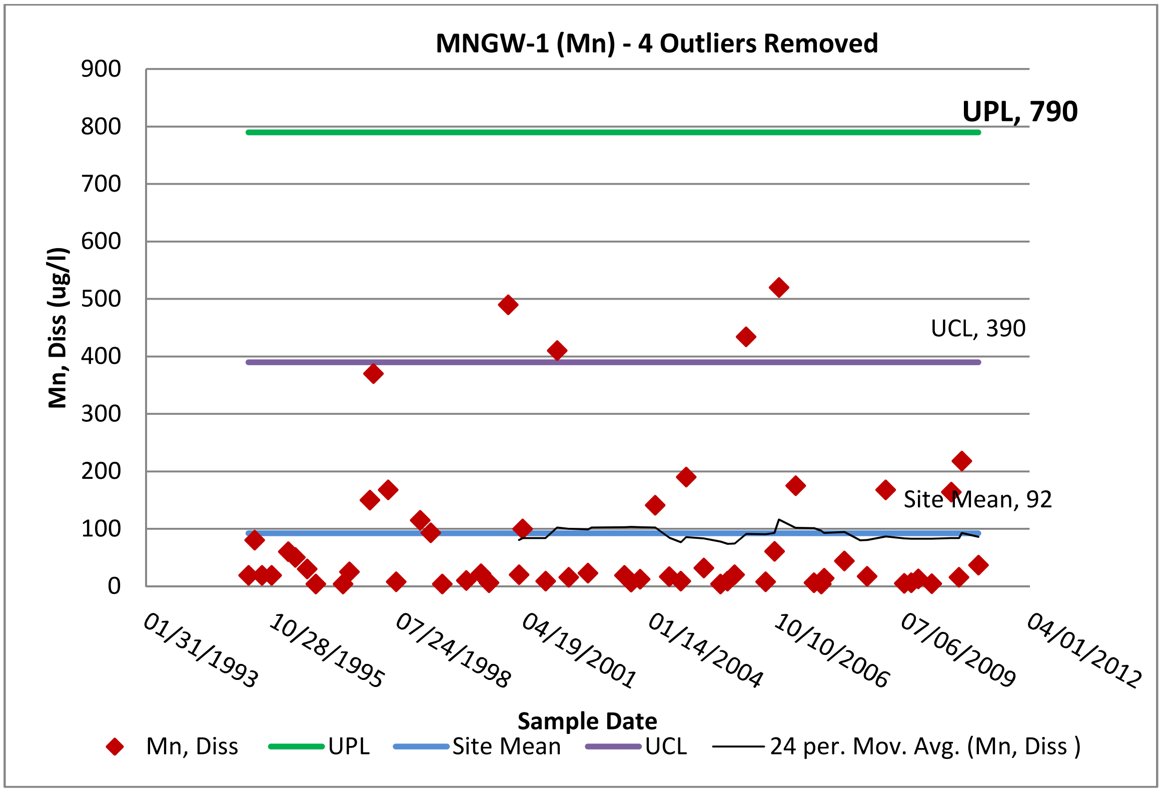


Figure 7. Well MNGW-1, 4 Outliers Removed, with Associated UPL and UCL. *The Values of the UPL and UCL are those recommended as a result of this study (see the Recommendations Section).*

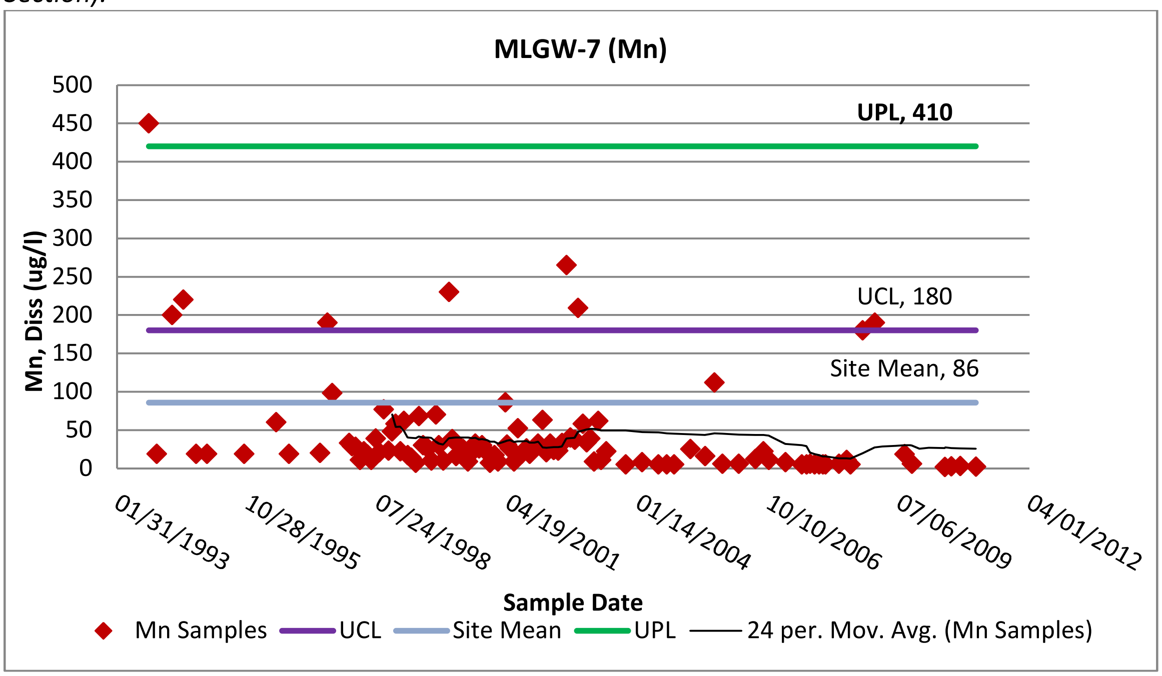


Figure 8. Well MLGW-7, two outliers removed, UPL and UCL shown. *The Values of the UPL and UCL are those recommended as a result of this study (see the Recommendations Section).*

Recommendations
As is evident from the tables, the different statistical methods produce different estimates of the UCL and the UPL in these wells. The classical EPA methods are the H-stats, based on Land's H-statistic, recommended historically for UCL determinations. The results for this statistic are not as profoundly impacted by a few high-level results as are some of the other approaches. This can be seen by comparing the H-Stat values for the UCL in Table 2 (Lognormal distribution) for well MLGW-7 having "outliers" removed and retained. MLGW-7 is a case of a well having a few very high results and a large number of data points at lower levels and/or non-detects.

All of the data sets come close to log-normality, but do not all meet the p=5% criterion and are therefore approximately log-normal. MNGW-1 does meet the p=5% criterion when outliers are removed.

The software provides a recommendation for a UCL based on non-parametric statistics. This is the UCL based on the Chebyshev inequality (a fundamental equation in statistics). This is a frequently-used UCL method, and is known to give conservative values for the UCL. The method is sensitive to "outliers" as can be seen in Table 3. Although the developers of proUCL recommend its use, they also caution that choices should be tempered by professional judgment. The same considerations apply for UPL estimates.

The dissolved manganese in these wells shows considerable variability with no discernible trends (checked by proUCL and by regression analysis). As discussed, evaluation of available laboratory data for high-level results supports the validity of the results. Thus the apparent "outliers" appear to be due to real manganese results in the samples, not due to sampling or analytical bias. Manganese is known to vary over wide ranges in the natural environment, and limits set for surface waters can be fairly high due to this (8).

We believe that although the sporadic high-level manganese levels in these wells make statistical analysis more difficult, they are likely to be actual reflections of real manganese variation in the wells and cannot be simply dismissed as outliers.

Based on the discussion presented here, we recommend the following limits for manganese. These are based on the statistical results and also include technical judgments about what is reasonable based on historical results and the known chemistry of manganese. Thus we have not chosen in all cases the software "recommended" values because we believe they may be too high to be sufficiently protective of the environment.

For the Mine site, represented by well MNGW-1:

- An upper control limit (UCL) of 390 ug/L (0.39 mg/L). This is the limit against which the site mean is to be compared. The background data suggest that it is not likely that this limit will be exceeded in the absence of a contamination event. We have chosen the H-stat result highlighted in Table 2, rounded to 2 significant figures. This choice is made because it provides a reasonable value and includes some consideration of the higher-level results observed in this well. It is also appropriate because the distribution of the data is very close to log-normal.

- An upper prediction limit (UPL) of 790 ug/L (0.79 mg/L). This is the limit against which individual measurements will be compared. The background data suggest that this limit may be occasionally exceeded, but if it is, additional measurements will not likely result in the limit being exceeded unless there is a contamination event. This result is chosen for similar reasons to the choice made for the UCL and is the highlighted value in shown in Table 5.

For the Mill site, well MLGW-7:

- An upper control limit of 180ug/L (0.18 mg/L). This is the limit against which the site mean is to be compared. This result is based on the log-normal H-Stat results for MLGW-7 with no "outliers" removed, rounded to 2 significant figures. This is also highlighted in Table 2. Based on the historical record, it is very likely that individual measurements will exceed this limit, but the site mean is expected to remain below it.

- An upper prediction limit (UPL) of 420 ug/L (0.42 mg/L). This is the limit against which individual measurements will be compared. The historical record suggests that it is somewhat more likely than 5% that individual measurements will exceed this limit, but subsequent samples are expected to fall back below the level.

The result is based on the log-normal result for MLGW-7 without removal of outliers, and is highlighted in Table 5. The value is rounded to 2 significant figures. Although this value may be relatively low for this well, it is still based on an analysis that does not require the unjustified removal of outliers and is consistent with the recommendations for MNGW-1.

References:

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7. "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites," Office of Emergency and Remedial Response, USEPA, OSWER 9285.6-10, December 2002.
8. Colorado Department of Public Health and Environment, Water Quality Control Division, "Total Maximum Daily Load Assessment, North Clear Creek, Gilpin County, Colorado, May 2008 – DRAFT.

9. Dag Hongve, “Cycling of Iron, Manganese, and Phosphate in a Meromictic Lake,” Limnol. Oceonogr., 43(4), 1997, 635-647.
10. W.H. Dickinson and R.W. Pick, “Manganese-Dependent Corrosion in the Electric Utility Industry”, Paper 02444 from Corrosion 2002 Annual Conference and Exhibition, Denver CO.

Appendix I

Monitoring Frequency Statistical Evaluation

Appendix I – Monitoring Frequency Statistical Evaluation

Shown below are the details of the calculations for each parameter and well.

MANGANESE:

Statistic - Manganese, MLGW7	**Full Data Set**	**Q1 Removed**	**Q2 Removed**	**Q3 Removed**	**Q4 Removed**
Total Detects	103	77	77	76	79
Total Non-Detects	18	17	15	14	11
Maximum Detected	2210	2040	2210	2210	2210
Minimum Detected	1.7	1.7	2.2	1.7	1.7
Detected Mean	86	73	106	91	75
Detected Median	22	23	26	21	22
Detected SD	296	238	340	341	254
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

Statistic - Manganese, MNGW-1	**Full Data Set**	**Q1 Removed**	**Q2 Removed**	**Q3 Removed**	**Q4 Removed**
Total Detects	56	40	47	38	43
Total Non-Detects	10	10	8	5	5
Maximum Detected	2650	2650	2650	2650	2120
Minimum Detected	4.7	5.1	4.7	4.7	4.7
Detected Mean	228	267	260	270	121
Detected Median	34	22.5	32	87	25
Detected SD	526	614	570	542	329
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

IRON:

Statistic - Iron, MLGW-7	Full Data Set	Q1 Removed	Q2 Removed	Q3 Removed	Q4 Removed
Total Detects	7	6	6	6	3
Total Non-Detects	12	9	9	9	9
Maximum Detected	292	292	292	292	120
Minimum Detected	20	20	20	20	20
Detected Mean	111	109.5	126.2	126.2	53.3
Detected Median	20	20	70	70	20
Detected SD	126.7	138.7	131.6	131.6	57.7
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

Statistic - Iron, MNGW-1	Full Data Set	Q1 Removed	Q2 Removed	Q3 Removed	Q4 Removed
Total Detects	30	20	27	20	23
Total Non-Detects	37	31	29	23	28
Maximum Detected	524	301	524	524	524
Minimum Detected	10	10	10	10	10
Detected Mean	116.8	90.8	122	139.6	113.9
Detected Median	61.6	61.6	70	124	50
Detected SD	130.1	78.3	135.5	148.2	140.6
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

ZINC:

Statistic - Zinc, MLGW-7	**Full Data Set**	**Q1 Removed**	**Q2 Removed**	**Q3 Removed**	**Q4 Removed**
Total Detects	12	9	8	10	9
Total Non-Detects	5	4	5	2	4
Maximum Detected	50	50	50	30	50
Minimum Detected	4.9	4.9	4.9	10	4.9
Detected Mean	25.4	26.1	25.6	25	24.9
Detected Median	30	30	30	30	30
Detected SD	11.6	12.2	14	7	13.3
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

Statistic - Zinc, MNGW-1	**Full Data Set**	**Q1 Removed**	**Q2 Removed**	**Q3 Removed**	**Q4 Removed**
Total Detects	53	38	44	37	40
Total Non-Detects	14	13	12	6	11
Maximum Detected	650	650	650	650	399
Minimum Detected	7.2	7.2	7.2	10	7.2
Detected Mean	60	64.7	61.6	69.6	44.9
Detected Median	20	20	20	24.4	20
Detected SD	114.8	129.2	123.2	121.9	78.2
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

SULFATE:

Statistic - Sulfate, MLGW7	Full Data Set	Q1 Removed	Q2 Removed	Q3 Removed	Q4 Removed
Total Detects	47	37	35	35	34
Total Non-Detects	0	0	0	0	0
Maximum Detected	320	258	320	320	320
Minimum Detected	29	29	30	29	29
Detected Mean	132.9	119.2	128.7	142.2	142.5
Detected Median	133	120	120	134	139.5
Detected SD	80.5	67.7	83.2	85.6	83.7
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

Insufficient data for Well MNGW-1

TDS:

Statistic - TDS, MLGW7	Full Data Set	Q1 Removed	Q2 Removed	Q3 Removed	Q4 Removed
Total Detects	31	24	24	24	21
Total Non-Detects	0	0	0	0	0
Maximum Detected	681	562	681	681	681
Minimum Detected	121	121	121	121	128
Detected Mean	336.4	324.5	325	344.7	353.5
Detected Median	328	330	311	328	350
Detected SD	133.4	115.7	134.7	145.5	136.9
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

Statistic - TDS, MNGW1	Full Data Set	Q1 Removed	Q2 Removed	Q3 Removed	Q4 Removed
Total Detects	65	50	54	41	50
Total Non-Detects	0	0	0	0	0
Maximum Detected	988	910	988	988	988
Minimum Detected	50	50	50	100	50
Detected Mean	264.3	210	229.4	354.6	282.4
Detected Median	156	130	136.5	308	171
Detected SD	226	203.6	200.7	242.2	236.8
Hypothesis Test, alpha=0.05		Equal	Equal	> Full set	Equal

pH:

Statistic - pH, MLGW7	Full Data Set	Q1 Removed	Q2 Removed	Q3 Removed	Q4 Removed
Total Detects	114	87	85	85	85
Total Non-Detects	0	0	0	0	0
Maximum Detected	8.2	8.2	8.2	7.9	8.2
Minimum Detected	5.9	5.9	6	5.9	5.9
Detected Mean	6.6	6.6	6.6	6.9	6.6
Detected Median	6.5	6.5	6.5	6.5	6.5
Detected SD	0.46	0.47	0.48	0.41	0.48
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

Statistic - pH, MNGW1	Full Data Set	Q1 Removed	Q2 Removed	Q3 Removed	Q4 Removed
Total Detects	61	46	51	41	45
Total Non-Detects	0	0	0	0	0
Maximum Detected	8	8	8	8	7.9
Minimum Detected	6	6	6	6	6
Detected Mean	7	7	6.9	6.9	6.9
Detected Median	6.9	6.9	6.9	7	6.9
Detected SD	0.42	0.42	0.43	0.41	0.41
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

MOLYBDENUM:

Statistic - Mo, MLGW-7	**Full Data Set**	**Q1 Removed**	**Q2 Removed**	**Q3 Removed**	**Q4 Removed**
Total Detects	9	8	8	6	5
Total Non-Detects	13	9	9	11	10
Maximum Detected	100	100	100	20	100
Minimum Detected	0.18	0.19	0.18	0.18	0.48
Detected Mean	14.7	16.5	16.5	3.6	22.1
Detected Median	0.43	0.46	0.46	0.33	0.33
Detected SD	32.7	34.5	34.5	8	43.7
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

Statistic - Mo, MNGW-1	**Full Data Set**	**Q1 Removed**	**Q2 Removed**	**Q3 Removed**	**Q4 Removed**
Total Detects	20	15	18	11	16
Total Non-Detects	47	36	38	32	35
Maximum Detected	40	40	20	40	40
Minimum Detected	0.14	0.17	0.14	0.14	0.14
Detected Mean	5.6	6.3	3.5	7.5	6.1
Detected Median	1.2	0.53	0.44	2	1.1
Detected SD	9.7	10.9	5.6	11.8	10.7
Hypothesis Test, alpha=0.05		Equal	Equal	Equal	Equal

Appendix J

5-Quarter Water Quality Data and Baseline Parameters Report

Climax Molybdenum
A Freeport-McMoRan Company

COLORADO OPERATIONS
Henderson Mine and Mill
1746 County Road 202
Empire, CO 80438
Phone (303) 569-3221

May 28, 2014

Via Email and FedEx Tracking #: 770038482916

Mr. Peter Hays
Division of Reclamation, Mining and Safety
1313 Sherman St., Rm. 215
Denver, CO 80203

Re: 5-Quarter Water Quality Data and Baseline Parameters Report, Permit No. M-1977-342

Dear Mr. Hays:

Climax Molybdenum Company, Henderson Operations (Henderson) is providing the enclosed 5-Quarter Water Quality Data and Baseline Parameters Report for new groundwater wells at the Henderson Mill to meet the requirements of the Henderson Operations Groundwater Management Plan. Also included as Appendix A and Appendix C to this Report is an assessment of point of compliance locations and numeric protection limits at the Henderson Mill.

If you have any questions regarding this submittal, please feel free to contact me at (720) 942-3255.

Sincerely,

Miguel Hamarat

Miguel Hamarat
Chief Environmental Engineer
Climax Molybdenum Company
Henderson Operations

cc (via email):
- B. Romig, Climax
- S. Deely, Freeport-McMoRan
- N. Hall, Freeport-McMoRan
- L. Decker, Gallagher & Kennedy

5-Quarter Water Quality Data and Baseline Parameters Report

Climax Molybdenum Company
Henderson Operations
P.O. Box 68
Empire, CO 80438

May 2014

Prepared By:

Aquionix

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Appendices

1.0 Introduction and Background

The Henderson Operations Groundwater Management Plan (GWMP), submitted as Technical Revision 16 (TR-16) to the Henderson Mine and Mill Reclamation Permit M-1977-342 was approved on July 25, 2012. The GWMP provided that Henderson would conduct further groundwater studies at the Henderson Mill to determine the appropriateness of current point of compliance (POC) locations as well as the potential for establishing new POC locations below 1-Dam and in the Potato Gulch drainage. Additionally, the GWMP provided that Henderson would collect and submit the results of baseline parameters and Numeric Protection Level (NPL) assessments for new POC locations. This report has been prepared to provide groundwater study results as well as the results of the baseline parameters and NPL assessments for new POC locations.

2.0 Groundwater Studies

An initial Groundwater Monitoring Point of Compliance (POC) Technical Memorandum (AJAX and Clear Creek Associates, 2013) was prepared and submitted to the DRMS in May 2013. The Memorandum presented several preliminary recommendations, including completion of additional monitoring to provide data to support final determinations on potential POC locations, particularly below 3-Dam. A subsequent Groundwater Monitoring Point of Compliance Update Memorandum (AJAX and Clear Creek Associates, 2014a) has been prepared and is being submitted with this report (Appendix A). Collectively, the memorandums recommend that POC locations be established at MLGW-15 and MLGW-17. These POC locations are in addition to existing GWMP approved POC locations MLGW-7 and MLGW-ACR.

3.0 Baseline Parameters and NPL Assessments

The purpose of this section is to provide the results of baseline parameters monitoring and related NPL assessments for existing POC location MLGW-ACR and the new proposed POC locations MLGW-15 and MLGW-17. Figures 1 – 3 of Appendix A illustrate the location and geographic setting of the Henderson Mill, including POC locations.

3.1 MLGW-ACR

3.1.1 Monitoring Summary

MLGW-ACR was established in the GWMP as the POC for water supply related parameters since it represents the nearest location of actual potable water use to the Henderson Mill facility (see Section 3.2.6.1 of the GWMP for additional information). However, when the GWMP was approved, there was insufficient data to establish NPLs. Therefore, as required by the GWMP, baseline monitoring was performed at MLGW-ACR over a period of five (5) calendar quarters from the 4th quarter of 2012 through the 4th quarter of 2013 for the parameters listed in GWMP Tables 4-1 and 4-3.

3.1.2 Baseline Parameters Data Assessment

MLGW-ACR baseline monitoring data is summarized in Table A – MLGW-ACR Monitoring Data. Results were compared against the domestic water supply standards specified in Table 1 and Table 2 (refer to Appendix B) of the Colorado Water Quality Control Commission Basic Standards for Groundwater (CBSG). All results were below the standards with the exception of iron and manganese, both secondary aesthetic standards. A graph summarizing iron and manganese concentrations is presented in Figure 1. Iron exceeded the CBSG Table 2 standard of 300 ug/L in two out of the five monitoring events on 12/20/2012 and 2/5/2013 with measured concentrations of 428 ug/L and 340 ug/L, respectively. Manganese exceeded the CBSG Table 2 standard of 50 ug/L in two out of the five monitoring events on 12/20/2012 and 2/5/2013 with measured concentrations of 225 ug/L and 72.5 ug/L respectively. These elevated iron and manganese concentrations do not appear to be in any way related to mining activities, rather, they may be due to the condition of the steel casing in the well and potential presence of iron reducing bacteria. Henderson intends to conduct further research to explore this possibility. As mentioned, no other baseline monitoring parameter results exceeded applicable CBSG standards nor were there any other apparent trends that were a cause for concern.

The baseline water quality assessment did not result in the identification of any additional parameters that warranted consideration for inclusion in the established indicator parameter list for future monitoring at MLGW-ACR. The original set of indicator parameters summarized in Section 4.1 of the GWMP, including consideration for trace elemental cations, anionic species, oxyanions and field data, appears to continue to be an appropriate approach for this well. As stated in Section 4.2 of the GWMP, upon completion of baseline monitoring at MLGW-ACR, only those indicator parameters that also appear in CBSG Tables 1 and 2 (Domestic Water Supply) will be monitored on an ongoing basis: iron, manganese, selenium, zinc, pH and sulfate.

3.1.3 NPL Assessment

Consistent with Section 5.1 of the GWMP, Henderson proposes that NPLs for MLGW-ACR be established using the most stringent domestic water supply use standards specified in CBSG Tables 1 and 2 (refer to Appendix B) for dissolved selenium, zinc and sulfate. The NPL range for pH was developed using ambient data as discussed in Section 3.4 below. Consistent with the Technical Consulting Report Establishing Background Threshold Values (BTVs) - Henderson Mill (Gateway Enterprises, 2014), included as Appendix C, Henderson proposes that NPLs for dissolved iron and dissolved manganese be developed after an investigation to determine the source of elevated Fe and Mn in the well, including the condition of the steel casing and potential presence of bacterial activity, has been completed and an adequate quantity of data are collected to generate statistically meaningful limits for these parameters. With regard to manganese, data will be reviewed to determine whether the existing ambient NPL developed for dissolved manganese in Establishing Background Threshold Values (BTV) for Manganese (Gateway Enterprises, 2012), included as Appendix H to the GWMP, will sufficiently bracket conditions at MLGW-ACR. The development of the NPLs will be consistent with established methodologies for developing background threshold values. Proposed NPLs for MLGW-ACR are summarized in Table 3-1 below.

Table 3-1: MLGW-ACR Numeric Protection Limits

Analytical Parameter	***NPL (mg/L)***	***NPL Basis (see notes)***
Iron, dissolved	NA (report)*	NA
Manganese, dissolved	NA (report)*	NA
Selenium, dissolved	0.05	Table 1, CBSG
Zinc, dissolved	5	Table 2, CBSG
pH, s.u.	5.9 – 8.5	Ambient
Sulfate	250	Table 2, CBSG

Notes:
Table 1, CBSG: Domestic Water Supply – Human Health Standards
Table 2, CBSG: Domestic Water Supply – Drinking Water Standards
* NPLs will be developed after an investigation to determine the source of elevated Fe and Mn in the well, including the condition of the steel casing and potential presence of bacterial activity, has been completed and an adequate quantity of data are collected to generate statistically meaningful limits for these parameters.
Ambient: pH - See Appendix C

3.2 MLGW-15

3.2.1 Monitoring Summary

As required by the GWMP, baseline monitoring was performed at MLGW-15 over a period of five (5) calendar quarters from the 4th quarter of 2012 through the 4th quarter of 2013 for the parameters listed in GWMP Tables 4-1 and 4-2.

3.2.2 Baseline Parameters Data Assessment

MLGW-15 monitoring data is summarized in Table B – MLGW-15 Monitoring Data. All results were observed to be below the agricultural standards specified in Table 3 (refer to Appendix B) of the CBSG. All five pH values were at or near the lower end of the CBSG Table 3 range of 6.5 – 8.5 standard units; specifically values ranged from 6.5 to 6.8 standard units. A graph summarizing pH values at MLGW-15 is presented in Figure 2. As mentioned, no other baseline monitoring parameter results exceeded applicable CBSG standards nor were there any other apparent trends that were a cause for concern.

The baseline water quality assessment did not result in the identification of any additional parameters that warranted consideration for inclusion in the established indicator parameter list for future monitoring at MLGW-15. The rationale used in selecting the original set of indicator parameters summarized in Section 4.1 of the GWMP, including consideration for trace elemental cations, anionic species, oxyanions and field data, appears to continue to be an appropriate approach for this well. As such, Henderson proposes to establish long term monitoring for the seven indicator parameters listed in GWMP Table 4-1: iron, manganese, selenium, zinc, conductivity, pH and sulfate.

3.2.3 NPL Assessment

Consistent with Section 5.1 of the GWMP, Henderson proposes that NPLs for MLGW-15 be established using the agricultural use standards specified in CBSG Table 3 (refer to Appendix B) for dissolved iron, dissolved selenium and dissolved zinc. Data for conductivity and sulfate will be "report" only, as NPLs are not applicable for these parameters. The NPL range for pH was developed using ambient data as discussed in Section 3.4 below. The NPL for dissolved manganese was developed in accordance with Establishing Background Threshold Values (BTV) for Manganese (Gateway Enterprises, 2012), included as Appendix H to the GWMP. Proposed NPLs for MLGW-15 are summarized in Table 3-2 below.

Table 3-2: MLGW-15 Numeric Protection Limits

Analytical Parameter	*NPL (mg/L)*	*NPL Basis (see notes)*
Iron, dissolved	5	Table 3, CBSG
Manganese, dissolved	0.79	Ambient
Selenium, dissolved	0.02	Table 3, CBSG
Zinc, dissolved	2	Table 3, CBSG
Conductivity, umhos/cm	NA (report)	NA
pH, s.u.	5.9 – 8.5	Ambient
Sulfate, mg/L	NA (report)	NA

Notes:
Table 3, CBSG: Agricultural Use Standards
Ambient: Dissolved manganese – refer to Establishing Background Threshold Values (BTV) for Manganese (Gateway Enterprises, 2012); pH - see Appendix C

3.3 MLGW-17

3.3.1 Monitoring Summary

As required by the GWMP, baseline monitoring was performed at MLGW-17 over a period of five (5) calendar quarters from the 4th quarter of 2012 through the 4th quarter of 2013 for the parameters listed in GWMP Tables 4-1 and 4-2.

3.3.2 Baseline Parameters Data Assessment

MLGW-17 monitoring data is summarized in Table C – MLGW-17 Monitoring Data. All results were observed to be below the agricultural standards specified in Table 3 (refer to Appendix B) of the CBSG with the exception of pH. pH deviated from the CBSG Table 3 range of 6.5 – 8.5 standard units on 6/14/2013 with a measured value of 6.4 standard units. Additionally, a value of 6.6 was measured on both 2/26/2013 and 8/14/2013, only slightly above the 6.5 minimum. A graph summarizing pH values at MLGW-17 is presented in Figure 2. As mentioned, no other baseline monitoring parameter results exceeded applicable CBSG standards nor were there any other apparent trends that were a cause for concern.

The baseline water quality assessment did not result in the identification of any additional parameters that warranted consideration for inclusion in the established indicator parameter list for future monitoring at MLGW-15. The rationale used in selecting the original set of indicator parameters summarized in Section 4.1 of the GWMP, including consideration for trace elemental cations, anionic species, oxyanions and field data, appears to continue to be an appropriate approach for this well. As such, Henderson proposes to establish long term monitoring for the seven indicator parameters listed in GWMP Table 4-1: iron, manganese, selenium, zinc, conductivity, pH and sulfate.

3.3.3 NPL Assessment

Consistent with Section 5.1 of the GWMP, Henderson proposes that NPLs for MLGW-17 be established using the agricultural use standards specified in CBSG Table 3 (refer to Appendix B) for dissolved iron, dissolved selenium and dissolved zinc. Data for conductivity and sulfate will be “report” only, as NPLs are not applicable for these parameters. The NPL range for pH was developed using ambient data as discussed in Section 3.4 below. The NPL for dissolved manganese was developed in accordance with Establishing Background Threshold Values (BTV) for Manganese (Gateway Enterprises, 2012), included as Appendix H to the GWMP. Proposed NPLs for MLGW-17 are summarized in Table 3-3 below.

Table 3-3: MLGW-17 Numeric Protection Limits

Analytical Parameter	*NPL (mg/L)*	*NPL Basis (see notes)*
Iron, dissolved	5	Table 3, CBSG
Manganese, dissolved	0.79	Ambient
Selenium, dissolved	0.02	Table 3, CBSG
Zinc, dissolved	2	Table 3, CBSG
Conductivity, umhos/cm	NA (report)	NA
pH, s.u.	5.9 – 8.5	Ambient
Sulfate, mg/L	NA (report)	NA

Notes:
Table 3, CBSG: Agricultural Use Standards
Ambient: Dissolved manganese – refer to Establishing Background Threshold Values (BTV) for Manganese (Gateway Enterprises, 2012); pH - see Appendix C

3.4 Establishment of Ambient pH NPLs at Mill POCs

Henderson recently completed and submitted to the DRMS the results of a Groundwater Quality Assessment for MLGW-7 (AJAX and Clear Creek Associates, 2014b) in response to measured pH values that fell below the established NPL range of 6.5 – 8.5. The report concluded that the pH measurements at MLGW-7 and other locations do not appear to be indicative of seepage impacts and are more likely attributable to natural fluctuations. It was recommended that Henderson work to establish pH NPLs at MLGW-7 and other POC wells that appropriately bracket naturally occurring conditions. Consistent with this recommendation, Henderson has developed and is proposing a NPL range for pH of 5.9 – 8.5 standard units at all Mill POC locations using ambient data consistent with established methodologies for developing background threshold values (BTVs). This assessment is presented in Appendix C - Establishing Background Threshold Values (BTV) - Henderson Mill (Gateway Enterprises, 2014).

4.0 Monitoring Frequencies

Consistent with monitoring frequencies summarized in GWMP Table 6-2, POC wells will be monitored at the frequency summarized in Table 4-1:

Table 4-1: Monitoring Frequency

Monitoring Location	*Frequency*	*Type*
MLGW-15	3x/year*	Groundwater
MLGW-ACR	3x/year*	Groundwater
MLGW-17	3x/year*	Groundwater

Notes:
* 3x/year – samples shall be collected during spring run-off (Apr-May), summer months (July-Aug) and low flow (Sep-Dec).

5.0 Conclusion

Henderson has completed additional groundwater studies at the Mill and has determined that two additional locations, MLGW-15 and MLGW-17, are appropriate as long-term POC monitoring locations. Additionally, Henderson has completed baseline parameters monitoring and related NPL assessments for existing POC location MLGW-ACR and the new proposed POC locations MLGW-15 and MLGW-17. A parameter list and NPLs have been developed for these locations.

Upon DRMS approval, Henderson will begin monitoring at these locations and proposes to insert the parameter lists, NPLs and sampling frequency for each location into Section 5.1.2 and Section 6.2 of the GWMP in order to consolidate the information in a single location and simplify overall administration of the GWMP. Upon concurrence from the DRMS, Henderson will submit appropriate revisions to the GWMP.

References

AJAX and Clear Creek Associates, 2013; Groundwater Monitoring Point of Compliance (POC) Technical Memorandum, Henderson Mill, May, 2013.

AJAX and Clear Creek Associates, 2014a; Groundwater Monitoring Point of Compliance (POC) Update Memorandum, Henderson Mill, April, 2014.

AJAX and Clear Creek Associates, 2014b; Groundwater Quality Assessment for MLGW-7 Technical Memorandum, March, 2014.

Climax Molybdenum Company Henderson Operations, 2012; Technical Revision (TR-16) to Permit M-1977-342 Groundwater Management Plan, April, 2012.

Gateway Enterprises, 2012; Establishing Background Threshold Values (BTV) for Manganese, Henderson Mill, February, 2012.

Gateway Enterprises, 2014; Establishing Background Threshold Values (BTV) - Henderson Mill, April, 2014.

Figures

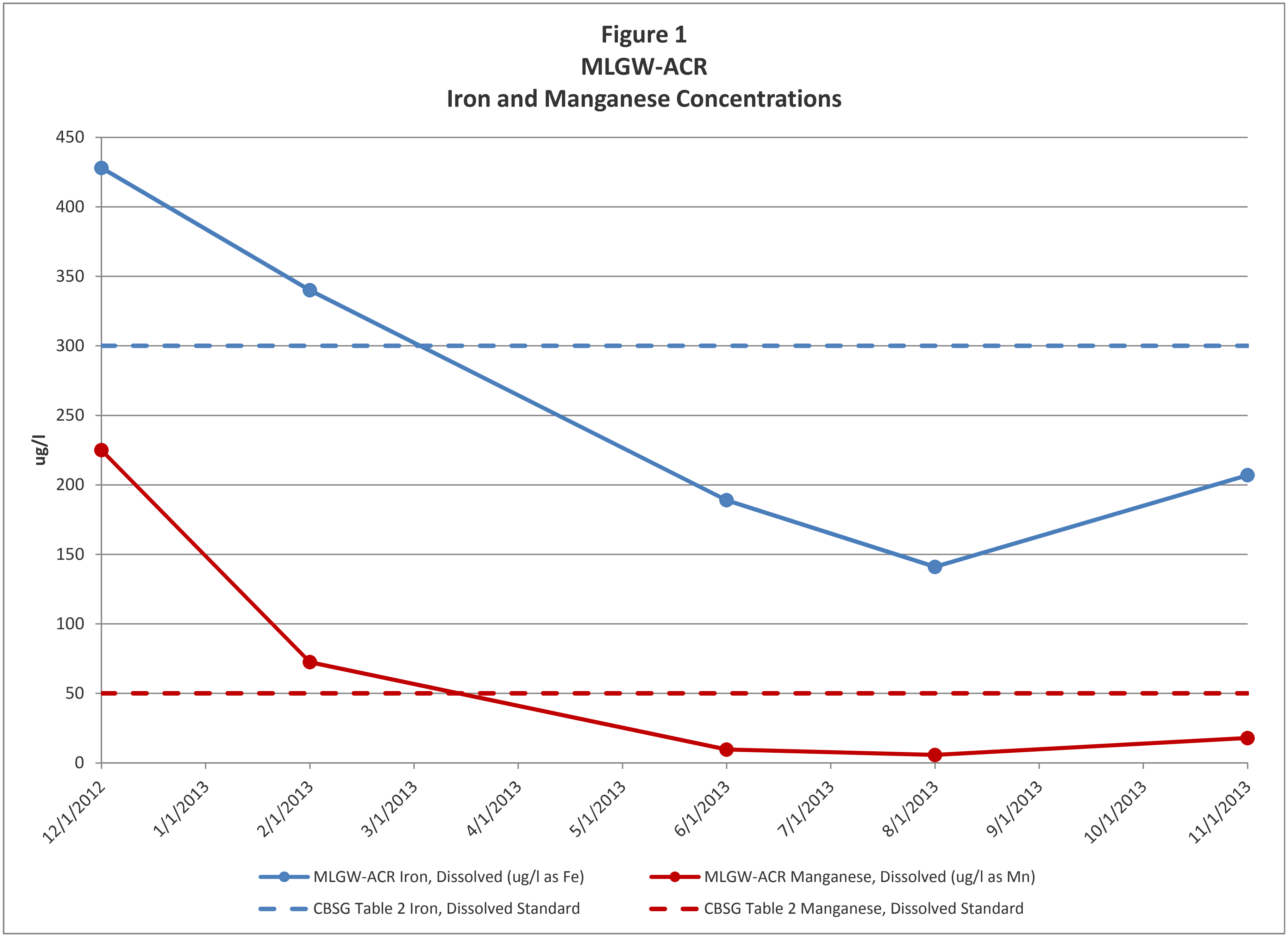
Figure 1
MLGW-ACR
Iron and Manganese Concentrations
450
400
350
300
250
200
150
100
50
0
ug/l
12/1/2012
1/1/2013
2/1/2013
3/1/2013
4/1/2013
5/1/2013
6/1/2013
7/1/2013
8/1/2013
9/1/2013
10/1/2013
11/1/2013
MLGW-ACR Iron, Dissolved (ug/l as Fe)
MLGW-ACR Manganese, Dissolved (ug/l as Mn)
CBSG Table 2 Iron, Dissolved Standard
CBSG Table 2 Manganese, Dissolved Standard

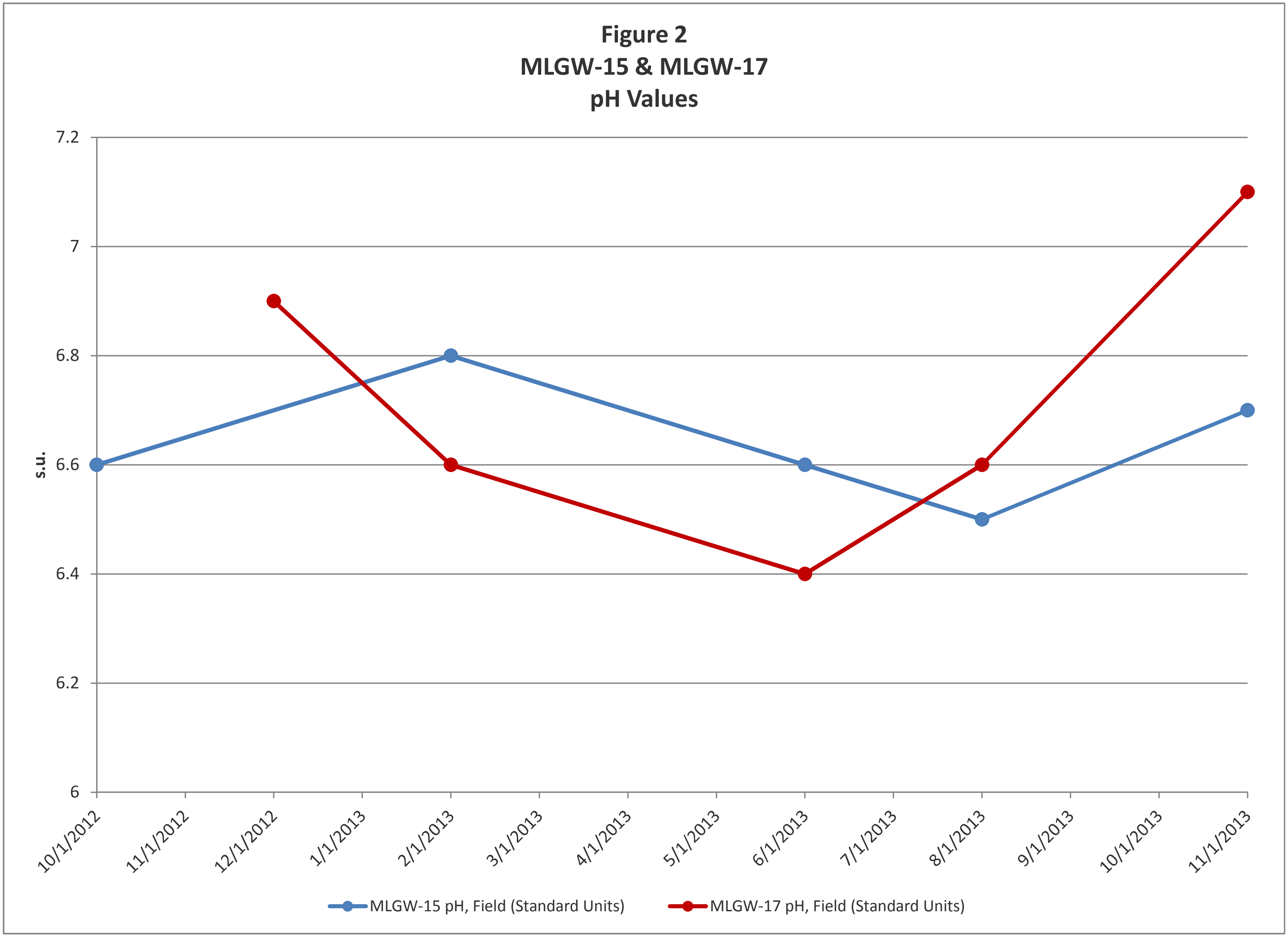

Figure 2
MLGW-15 & MLGW-17
pH Values
7.2
7
6.8
6.6
6.4
6.2
6
s.u.
10/1/2012
11/1/2012
12/1/2012
1/1/2013
2/1/2013
3/1/2013
4/1/2013
5/1/2013
6/1/2013
7/1/2013
8/1/2013
9/1/2013
10/1/2013
11/1/2013
MLGW-15 pH, Field (Standard Units)
MLGW-17 pH, Field (Standard Units)

Tables

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Table A
Baseline Parameter Data
MLGW-ACR Monitoring Data
Henderson Mill

Parameter	TVS[1]	12/20/2012	2/5/2013	6/4/2013	8/14/2013	11/19/2013
Antimony, Dissolved (µg/L as Sb)	6	<0.04	<0.04	<0.022	<0.022	<0.022
Arsenic, Dissolved (µg/L as As)	10	<0.2	<0.2	<0.088	<0.088	<0.088
Barium, Dissolved (µg/L as Ba)	2000	10.2	13.2	38.8	42.5	25.1
Beryllium, Dissolved (µg/L as Be)	4	<0.26	<0.26	<0.14	<0.14	<0.14
Cadmium, Dissolved (µg/L as Cd)	5	<0.16	<0.16	0.09	<0.084	<0.084
Chromium, Dissolved (µg/L as Cr)	100	<0.3	0.71	0.41	<0.11	<0.11
Flouride (mg/L)	4	<0.5	0.14	0.17	0.23	0.29
Iron, Dissolved (ug/L as Fe)	300	428	340	189	141	207
Lead, Dissolved (µg/L as Pb)	50	<0.028	0.83	0.023	0.02	0.034
Manganese, Dissolved (µg/L as Mn)	50	225	72.5	9.6	5.7	17.9
Mercury, Dissolved (µg/L as Hg)	2	<0.014	<0.014	<0.009	<0.0098	<0.009
Molydenum, Dissolved (µg/L as Mo)	210	0.54	0.41	0.29	0.3	0.57
Nickel, Dissolved (µg/L as Ni)	100	2.1	1.6	1.6	1.1	2.6
Nitrogen, Combined Nitrite Nitrate (mg/l)	10	<0.12	NR[3]	NR[3]	1.2	0.78
Nitrogen, Nitrate (mg/L)	10	<0.1	<0.024	<0.74	1.20	0.8
Selenium, Dissolved (µg/L as Se)	50	<0.58	<0.58	<0.42	<0.42	<0.42
Sulfate (mg/L)	250	27.2	36.5	91.8	89.6	84.1
Thallium, Dissolved (µg/L as Tl)	2	<0.08	<0.08	<0.01	<0.01	<0.01
Uranium, Dissolved (µg/L as U)	16.8	0.2	0.24	1.1	1.3	1
Zinc, Dissolved (µg/L as Zn)	5000	6.2	24.6	4.2	5.4	<1.9
Gross Alpha Particle, Total (pCi/L)	15	4.5	1.7	2.5	4.7	4.3
Chlorophenol, Total (ug/L)	0.2	NR[2]	<0.48	<0.53	<0.53	<0.53
Chloride (mg/L)	250	11.7	14.1	18.9	23.6	20.9
Copper, Total (ug/L as Cu)	1000	36.8	26.9	7.5	8	1.3
Corrosivity (as pH)	Noncorrosive	7.52	7.45	6.71	-1.3 (as Langlier Index)	-0.9 (as Lanlier Index)
Phenol, Total (mg/L)	0.3	NR[2]	<0.00072	<0.00071	<0.00071	<0.00071
pH (Standard Units)	6.5 - 8.5	6.9	6.8	7.14	6.7	7.2
Specific Conductivity (µS/cm)	No TVS	391.7	459.5	409.4	429.2	423.9

Notes:
CDPHE = Colorado Department of Public Health and Environment
NR = not reported
TVS = Table Value Standard
WQCC = Water Quality Control Commision
< = not detected at concentrations exceeding the laboratory reporting limit
mg/L = milligrams per liter
pCi/L = pico Curies per liter
µg/L = micrograms per liter
µS/cm = micro Siemens per centimeter

Comments:
[1]TVS reported from Table 1 & 2 of the CDPHE WQCC Regulation # 41, The Basic Standards for Ground Water.
[2]Not reported due to laboratory MDL issue.
[3]Not reported due to laboratory error.

Table B
Baseline Parameter Data
MLGW-15 Monitoring Data
Henderson Mill

Parameter	TVS[1]	10/18/2012	2/5/2013	6/4/2013	8/14/2013	11/19/2013
Aluminum, Dissolved (µg/L as Al)	5000	23.8	2.8	<30	15.5	3.71
Arsenic, Dissolved (µg/L as As)	100	0.421	0.544	<1	1.36	<0.15
Beryllium, Dissolved (µg/L as Be)	100	<0.15	<0.15	<1	0.214	<0.15
Boron, Dissolved (µg/L as B)	750	<50	<500	<50	<250	8.05
Cadmium, Dissolved (µg/L as Cd)	10	<0.1	<0.1	<1	<1	<0.1
Chromium, Dissolved (µg/L as Cr)	100	2.68	3.94	<5	0.911	0.629
Cobalt, Dissolved (µg/L as Co)	50	1.06	0.915	<5	0.701	0.548
Copper, Dissolved (µg/L as Cu)	200	1.56	2.68	<5	0.781	0.741
Flouride (mg/L)	2.0	<2	<1	1.59	<0.4	0.247
Iron, Dissolved (µg/L as Fe)	5000	<50	<500	<30	<250	6.13
Lead, Dissolved (µg/L as Pb)	100	<0.2	<0.2	<1	<20	0.636
Lithium, Dissolved (µg/L as Li)	2500	<100	<1000	<100	<500	7.23
Manganese, Dissolved (µg/L as Mn)	200	39.1	6.46	2	2.69	20.2
Mercury, Dissolved (µg/L as Hg)	10	<0.1	<0.2	<0.20	<0.2	<0.0002
Nickel, Dissolved (µg/L as Ni)	200	9.51	12.9	<5	6.26	1.04
Nitrogen, Combined Nitrite Nitrate (mg/l)	100	<0.2	0.224	<0.4	0.229	0.217
Nitrogen, Nitrite (mg/L)	10	<2	<0.1	<0.4	<0.4	<0.2
Selenium, Dissolved (µg/L as Se)	20	1.02	1.51	1	1.14	<0.5
Sulfate (mg/L)	No TVS	543	527	592	631	656
Vanadium, Dissolved (µg/L as V)	100	<10	<100	<10	<50	<5
Zinc, Dissolved (µg/L as Zn)	2000	3.65	2.7	<10	3.61	<2.5
pH (Standard Units)	6.5 - 8.5	6.6	6.8	6.6	6.5	6.7
Specific Conductivity (µS/cm)	No TVS	NR[2]	1489	1508	1529	1642

Notes:

CDPHE = Colorado Department of Public Health and Environment

NR = not reported

TVS = Table Value Standard

WQCC = Water Quality Control Commision

< = not detected at concentrations exceeding the laboratory reporting limit

mg/L = milligrams per liter

µg/L = micrograms per liter

µS/cm = micro Siemens per centimeter

Comments:

[1]TVS reported from Table 3 of the CDPHE WQCC Regulation # 41, The Basic Standards for Ground Water.

[2]Not reported due to field parameter issue.

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Table C
Baseline Parameter Data
MLGW-17 Monitoring Data
Henderson Mill

Parameter	TVS[1]	12/13/2012	2/26/2013	6/14/2013[2]	8/14/2013	11/20/2013
Aluminum, Dissolved (µg/L as Al)	5000	2.66	1.22	<1,000	<1	2.25
Arsenic, Dissolved (µg/L as As)	100	<0.15	<0.15	<150	<0.15	<0.15
Beryllium, Dissolved (µg/L as Be)	100	<0.15	<0.15	<150	<0.15	<0.15
Boron, Dissolved (µg/L as B)	750	<50	<50	<2000	<250	3.38
Cadmium, Dissolved (µg/L as Cd)	10	<0.1	<0.1	<100	<0.1	<0.1
Chromium, Dissolved (µg/L as Cr)	100	<0.5	0.543	<500	<0.5	<0.5
Cobalt, Dissolved (µg/L as Co)	50	<0.5	<0.5	<500	<0.5	<0.5
Copper, Dissolved (µg/L as Cu)	200	<0.25	0.255	<250	<0.25	<0.25
Flouride (mg/L)	2.0	0.169	0.213	0.184	0.261	0.26
Iron, Dissolved (µg/L as Fe)	5000	<50	<50	<30	<250	2.9
Lead, Dissolved (µg/L as Pb)	100	<0.2	<0.2	<200	<0.2	0.232
Lithium, Dissolved (µg/L as Li)	2500	<100	<100	<100	<500	<5
Manganese, Dissolved (µg/L as Mn)	200	15.7	2.08	<250	4.75	1.96
Mercury, Dissolved (µg/L as Hg)	10	<0.0001	<0.2	<0.2	<0.2	<0.0002
Nickel, Dissolved (µg/L as Ni)	200	2.26	1.79	<250	1.08	<0.25
Nitrogen, Combined Nitrite Nitrate (mg/l)	100	<0.1	<0.2	<0.2	0.212	<0.2
Nitrogen, Nitrite (mg/L)	10	<0.1	<0.1	<0.1	<0.1	<0.2
Selenium, Dissolved (µg/L as Se)	20	<0.5	<0.5	<500	<0.5	<0.5
Sulfate (mg/L)	No TVS	41.4	36.4	33.6	31.9	33.1
Vanadium, Dissolved (µg/L as V)	100	<10	<10	<5000	<50	<5
Zinc, Dissolved (µg/L as Zn)	2000	<2.5	<2.5	<2500	<2.5	<2.5
pH (Standard Units)	6.5 - 8.5	6.9	6.6	6.4	6.6	7.1
Specific Conductivity (µS/cm)	No TVS	241.7	240.1	230.4	224.3	217.8

Notes:

CDPHE = Colorado Department of Public Health and Environment

TVS = Table Value Standard

WQCC = Water Quality Control Commision

< = not detected at concentrations exceeding the laboratory reporting limit

mg/L = milligrams per liter

µg/L = micrograms per liter

µS/cm = micro Siemens per centimeter

Comments:

[1]TVS reported from Table 3 of the CDPHE WQCC Regulation # 41, The Basic Standards for Ground Water.

[2]Analytical reporting limits of metals are elevated due to laboratory dilution in response to high concentrations of metals in group run.

Appendices

Appendix A
Groundwater Monitoring Point of Compliance (POC) Update Memorandum

Prepared for:

Climax Molybdenum Company – Henderson Operations

1746 County Road 202

Empire, Colorado 80438

GROUNDWATER MONITORING POINT OF COMPLIANCE (POC) UPDATE MEMORANDUM

HENDERSON MILL

Grand County, Colorado

MAY 2014

Prepared by:

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Evergreen, CO 80439

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Scottsdale, AZ 85251

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TABLES

FIGURES

1.0 INTRODUCTION

This Memorandum has been prepared for Climax Molybdenum Company's Henderson Mill Operation (Henderson) to further assess appropriate locations for point of compliance (POC) groundwater monitor wells downgradient of Henderson Mill's Tailing Storage Facility (TSF), specifically 1-Dam and 3-Dam, which are located within the Ute Creek Basin of the Williams Fork River Valley, south of Parshall, in Grand County, Colorado. Figure 1 presents a regional map showing the location and geographic setting of the Henderson Mill and TSF area. Monitoring and reporting requirements are pursuant to the Division of Reclamation, Mining, and Safety (DRMS)-approved Henderson Groundwater Management Plan (GWMP), formally submitted as Technical Revision 16 (TR-16) to the Henderson Mine and Mill Reclamation Permit No. M-1977-342 (Climax Molybdenum Company, 2012).

1.1 BACKGROUND AND OBJECTIVES

The groundwater quality downgradient of 1-Dam has historically been monitored at well MLGW-7. As described in the GWMP, Henderson recognized the need to evaluate and potentially establish new POC wells: (1) near the property line east of 1-Dam (near MLGW-7 - see Figure 2), (2) in the Potato Gulch drainage (near MLGW-10 – see Figure 1), and (3) east of 3-Dam (see Figure 3) to provide adequate lateral coverage in areas downgradient of the TSF. Henderson further recognized the potential merits of establishing nested wells, to assess potential deeper groundwater conditions. In May 2013, these POC locations were evaluated and recommendations were provided in the POC Memorandum (AJAX and Clear Creek, 2013) submitted to DRMS. This POC Update Memorandum evaluates the previous recommendations based on additional groundwater quality data (five quarters of baseline data) and monthly groundwater elevation data collected since the previous evaluation. Updated recommendations are presented herein based on our review of these data.

2.0 SUMMARY OF GEOLOGY AND HYDROGEOLOGY

2.1 SITE GEOLOGY

The Henderson Mill and TSF are located within the Ute Creek Basin of the Williams Fork River valley. The Ute Creek Basin drains through a gap in the bedrock ridge at Ute Park, just west of the confluence of Ute Creek and the Williams Fork River. The TSF is within a shallow sloping portion of the basin near its downstream outlet.

Shallow geology beneath and downgradient of the TSF, including portions of 1-Dam and 3-Dam, is characterized by Quaternary glacial drift (moraine and till deposits undivided), glacial outwash, and alluvium (Qd). Pre-quaternary geologic units in the vicinity of the TSF include the Tertiary Troublesome Formation (Tt) and Precambrian bedrock (Xg). A more detailed description of the geology is provided in the POC Memorandum (AJAX and Clear Creek, 2013).

2.2 SITE HYDROGEOLOGY

Hydrostratigraphic units are bodies of rocks or sediments that are hydraulically continuous, mappable, and can be described as distinct hydrologic systems. Water-bearing Quaternary sediments, including glacial drift, glacial outwash, and recent alluvial deposits, occur in the lower Ute Creek Basin and Williams Fork River valley and comprise an aquifer system east of 1-Dam. The depth to groundwater within the aquifer is shallow, typically 10 to 30 feet below ground surface (bgs). Aquifer thickness varies depending on the thickness of Qd. In the vicinity of 1-Dam, the aquifer thickness ranges up to 160 feet. From a hydrologic standpoint, the glacial and alluvial sediments in the vicinity of 1-Dam comprise a single shallow aquifer system. Groundwater in the shallow aquifer flows beneath the dam east-northeast, towards the Williams Fork River. As discussed in the POC Memorandum (AJAX and Clear Creek, 2013), both the Tt and Xg were observed to be non-water bearing east of 1-Dam. At 3-Dam, there is not a continuous aquifer system from which to directly interpret the direction of groundwater flow. Only one of the five monitor wells consistently yields groundwater. Consideration of the geology and watershed boundary suggests that only a small amount of groundwater flows through the glacial deposits in this area.

3.0 1-DAM POC WELL EVALUATION

3.1 EAST OF 1-DAM

Groundwater in this area is monitored by a shallow/deep well pair (Figure 2). MLGW-7 is constructed in the glacial drift and outwash deposits (Qd) and is representative of shallow groundwater conditions downgradient of 1-Dam operations. Henderson installed MLGW-15, a deeper Qd well paired with MLGW-7 in 2012. Monitor well MLGW-15 was drilled through Qd sediments to a total depth of 184 feet bgs and was underlain by non-water bearing Precambrian bedrock (Xg). Groundwater elevation data collected since October 2012 have indicated downward vertical gradients of approximately 0.03 ft/ft. This deeper Qd well was proposed to DRMS as a second POC monitor well paired with MLGW-7 (AJAX and Clear Creek, 2013).

Analytical and water level data for MLGW-7 and MLGW-15 have been collected in 2012 and 2013 and are being reported to DRMS in the Annual Water Monitoring Reports and 5-Quarter Water Quality Data and Baseline Parameters Report (Climax Molybdenum Company, 2014). These data continue to support the recommendation of the POC Memorandum that MLGW-7 and MLGW-15 be established as POC locations for the area east of 1-Dam.

3.2 POTATO GULCH

The north end of 1-Dam coincides with the edge of the Ute Creek watershed hydrologic divide. A ridge of Xg separates the area north of 1-Dam from the Williams Fork River and the shallow aquifer east of 1-Dam. The geology north of 1-Dam is characterized by surficial, thin, glacial deposits overlying the generally non-water bearing Tt and Xg. Groundwater flow is intermittent in wells constructed in the area (MLGW-2, MLGW-3, and MLGW-10/Potato Gulch) and is interpreted to be separate from the Quaternary sediments aquifer east of 1-Dam (water elevations 200 feet higher north of 1-Dam than east of 1-Dam). Continued 2013 internal monitoring of water levels in these northern wells continues to support that groundwater flow and seepage transport north of 1-Dam is limited due to the low permeability of the Tt and Xg. As a result, there continues to be no basis for establishing a POC monitor well in this area.

4.0 3-DAM POC WELL EVALUATION

3-Dam is located approximately 1,500 feet south of 1-Dam (Figure 1). The 3-Dam structure was constructed within two narrow gaps in a bedrock ridge that separates the Ute Creek subbasin on the west from the Williams Fork Valley on the east with ends of the tailing dam abutting bedrock consisting of Precambrian gneiss and migmatite (see Figure 4). Below the dam, glacial till and outwash deposits (Qd) overly the Precambrian bedrock. A southwest to northeast hydrogeologic cross-section through 3-Dam is presented in Figure 5.

At 3-Dam, the seepage collection system relies primarily on two seepage trenches and control dikes located below the dam and a seepage interceptor system south of County Road 3. Flows from the seepage collection system below 3-Dam are conveyed to the Ute Park pump station where they are returned to the tailing pond. The new seepage collection system began operating in May 2012.

In 2012, Henderson conducted a hydrogeologic field investigation in the area east of 3-Dam. The investigation relied on the drilling, logging, and monitoring of five (5) new monitor wells (see Figure 3). The purpose of the investigation was to study the occurrence, flow, and groundwater quality and to evaluate potential POC locations in the area east of 3-Dam. Results of this investigation were presented in the POC Memorandum (AJAX and Clear Creek, 2013).

The initial sampling in fourth quarter 2012 of the new monitor wells showed that three of the five monitor wells were dry. The initial observations did not indicate the existence of a laterally extensive aquifer system east of 3-Dam; and therefore no POC well was justified. However, it was noted that seasonal variations could form a transient aquifer system not indicated in the initial sampling results. Therefore, it was recommended in the POC Memorandum (AJAX and Clear Creek, 2013) that the establishment of potential POC monitor wells (MLGW-17/MLGW-20) at 3-Dam be reconsidered following the completion of five quarterly monitoring events. The purpose of this section is to present the analysis of the data from water level monitoring and five quarterly sampling events conducted at 3-Dam since December 2012 and summarize the findings related to the potential establishment of a POC monitor well east of 3-Dam.

4.1 3-DAM MONITORING NETWORK

The 3-Dam groundwater monitoring network consists of five monitor wells (MLGW-16 through MLGW-20) that were installed and developed in the Fall of 2012 (see Figure 3). A hydrogeologic cross-section through selected monitor wells is presented in Figure 5. The monitor wells are constructed to depths ranging from 25 to 135 feet bgs. Each well was constructed with 20-foot screened intervals. Monitor wells MLGW-16, MLGW-17, and MLGW-19 are screened near the base of the glacial drift and outwash sediments (Qd), just above the bedrock contact. Monitor well MLGW-20 was constructed adjacent to MLGW-17, but is screened at an intermediate depth (lithologic logs included in the POC Memorandum [AJAX and Clear Creek, 2013]. Monitor well MLGW-18 is also screened at intermediate depths within the Qd sediments. Only two of the wells, MLGW-17 and MLGW-18, had measureable water during the initial December 2012 water level monitoring event. The other three wells were dry.

4.2 WATER LEVEL MONITORING

Periodic internal water level monitoring has been conducted at 3-Dam since the wells were installed in 2012. Water levels recorded during these monitoring events are presented in Table 1 and results are summarized below. Depth-to-water hydrographs for 3-Dam monitor wells are presented in Figures 6 and 7. Groundwater elevation hydrographs for 3-Dam monitor wells are presented in Figures 8 and 9.

Water level results show that seasonal responses occur in the Qd sediments east of 3-Dam (Figures 6 to 9). The seasonal response ranges from a gradual rise observed in MLGW-17 to an abrupt appearance of water in MLGW-19 and MLGW-20. Monitor well MLGW-18 varies significantly, likely in response to direct precipitation/recharge events. Gradual water level decreases are observed in MLGW-17, MLGW-19, and MLGW-20 during the Fall and Winter months. With the exception of one measurement (July 2013), when 0.20 feet of water was recorded at the bottom of the well, MLGW-16 has been dry since installation.

The water level measurements collected from 3-Dam monitor wells support the following conclusions:

- Continuous groundwater is observed at only one monitoring location east of 3-Dam (MLGW-17). Groundwater at this location occurs in a 20 to 30 foot zone near the base of Qd sediments.
- At all other locations, groundwater occurs within Qd sediments intermittently, primarily in response to late Spring/early Summer snowmelt events. Water at these locations is not interpreted to represent a laterally extensive aquifer system. Rather the appearance of water at these locations is intermittent and is interpreted to represent pulses of water infiltrating the shallow Qd sediments during Spring and Summer months.
- Since no laterally extensive aquifer system is indicated it is not possible to measure hydraulic gradients and calculate groundwater flow direction. Our interpretation is that flow direction is primarily controlled by the slope of the Qd/bedrock contact, which is northeasterly based on drill logs of the completed monitor wells. Measured groundwater elevations at the shallower MLGW-20 are consistently higher than elevations at the deeper MLGW-17, suggesting a perched aquifer at MLGW-20 and downward flow gradients.

4.3 WATER QUALITY SAMPLING

Quarterly groundwater sampling events were completed for MLGW-17 and MLGW-20 beginning in December 2012. Five water chemistry samples were collected from MLGW-17 and three samples were collected from MLGW-20 when sufficient water was recorded in the monitor well (after May 2013). Time-series charts for indicator parameters chloride, sulfate, manganese, and pH are presented in Figure 10 to Figure 13 and water quality data is presented in Table 2. The following is a summary of analytical results from water chemistry samples collected from MLGW-17 and MLGW-20:

- Concentrations in wells MLGW-17 and MLGW-20 are below the numeric protection limits (NPLs) as set forth in the DRMS-approved GWMP.

- Concentrations of sulfate ranged from 31.9 mg/L to 41.9 mg/L in MLGW-17 and 24.3 mg/L to 75.6 mg/L in MLGW-20. Concentrations of manganese ranged from 0.002 mg/L to 0.005 mg/L in MLGW-17 and 0.004 mg/L to 0.011 mg/L in MLGW-20. Field pH measurements ranged from 6.4 to 7.2 in MLGW-17 and 5.5 to 6.0 in MLGW-20.
- Concentrations of seepage indicator parameters are within the range of interpreted background (natural) conditions for the Qd aquifer at the Henderson Mill site and indicate groundwater at MLGW-17 and MLGW-20 is not currently impacted by seepage from 3-Dam. Internal monitoring at Henderson has shown that seepage impacted groundwater typically has the following parameter concentrations: sulfate > 1000 mg/L, pH < 4, dissolved manganese > 50 mg/L. As noted above, concentrations of these three indicator parameters in MLGW-17 and MLGW-20 are well below the levels indicative of seepage impacts.
- Results suggest natural (background) groundwater at these locations is slightly acidic, which is interpreted to reflect the influence of infiltrating surface water, which has a pH usually below 5.5 (Langmuir, 1997). The meteoric response would be more apparent in shallow wells (e.g., MLGW-20) resulting in lower pH values and potentially higher natural concentrations of sulfate and total dissolved solids.

4.4 3-DAM POC FINDINGS AND RECOMMENDATIONS

The results of quarterly groundwater monitoring at 3-Dam support the original interpretation that a laterally extensive aquifer system does not exist at 3-Dam. Of the five monitor wells installed, only one (MLGW-17) has had measureable groundwater during all monitoring events. All other wells have been observed to go dry. Hydrographs and water level elevation data suggest water infiltrates the glacial sediments during late Spring/early Summer snowmelt and following storm events. This transient water is interpreted to flow vertically until it reaches the bedrock contact (water in MGLW-20 migrates downward to MLGW-17). At that point, the water is interpreted to migrate along the bedrock contact following the slope of the contact northeastward toward the center of the Williams Fork River valley. More continuous saturation of the glacial deposits occurs where the sediments are deepest, which corresponds to the area of MLGW-17. The ultimate fate of water in these deeper sections is unclear. The water level elevation at MLGW-17 is over 70 feet lower than the Williams Fork River at its nearest point, so a through-flowing aquifer system to the Williams Fork River is not supported. Water may reside in shallow depressions in the bedrock surface for extended periods of time or it may continue to follow the sloping bedrock contact toward the north, where the glacial sediments are even deeper. When groundwater has been observed in MLGW-20, it appears to be the result of transient and temporary perched water conditions. The abrupt appearance of groundwater in the spring and early summer is consistent with a localized meteoric recharge and not a distal source.

Seepage affects from 3-Dam are not indicated by water chemistry results from monitor wells MLGW-17 and MLGW-20. Both wells show low or non-detect concentrations of seepage indicator parameters. The maximum concentrations of sulfate in MLGW-17 and MLGW-20 are 33.5 and 75.6 mg/L are interpreted to be within the range of background natural concentrations for the Qd aquifer at the site, and are well below concentrations measured in seepage or seepage-impacted groundwater (>1,000 mg/L). Manganese and other dissolved metal concentrations do not indicate seepage impacts in these monitor wells.

Based on these results, AJAX and Clear Creek recommend that monitor well MLGW-17 be established as a POC monitor well for 3-Dam. Of the five wells installed, MLGW-17 is the only well that regularly has groundwater and is located within the interpreted groundwater flowpath east of 3-Dam. Groundwater in MLGW-20, located adjacent to MLGW-17, is interpreted to be localized and transient, with perched water occurring in the well only in response to late spring/early summer snowmelt. Based on geology and water level observations in other nearby monitor wells, groundwater in MLGW-20 is not interpreted to follow a laterally extensive flowpath leading from the 3-Dam facility. Therefore, MLGW-20 is not considered a representative monitoring location for 3-Dam. Downward vertical gradients are indicated from MLGW-20 toward the deeper MLGW-17, further supporting the selection of MLGW-17 as a more representative 3-Dam monitoring location.

5.0 SUMMARY AND RECOMMENDATIONS

The results of recent investigations and groundwater monitoring were used to develop the following POC recommendations for the areas east of 1-Dam, in the Potato Gulch drainage, and east of 3-Dam.

- Groundwater elevation and water quality data from MLGW-15 continue to support that both MLGW-7 and MLGW-15 be considered POC locations for the area east of 1-Dam. Monitor well MLGW-15 should be included in the triannual POC monitoring program along with MLGW-7 and sampled for the list of indicator parameters as specified in the GWMP.
- Based on existing geologic and hydrologic information, including the existence of a bedrock ridge northeast of 1-Dam and the intermittent occurrence of groundwater in existing monitor wells, there continues to be no basis for establishing a POC well north of 1-Dam or in the Potato Gulch drainage.
- The results of quarterly groundwater monitoring at 3-Dam support the original interpretation that a laterally extensive aquifer system does not exist at 3-Dam. Of the five monitor wells installed, only one (MLGW-17) has had measureable groundwater during all monitoring events and is located within the interpreted groundwater flowpath east of 3-Dam. All other wells have at times been dry. Based on these results, AJAX and Clear Creek recommend that monitor well MLGW-17 be established as a POC monitor well for 3-Dam.
- As discussed in Section 4.0, pH measurements in MLGW-17 have ranged as low as 6.4 s.u.. This level is lower than the NPL established for other Henderson Mill POC locations in the GWMP. Since water quality results indicate MLGW-17 is not affected by seepage, the lower pH measurements are interpreted to represent background conditions. Therefore, it is recommended that a modified pH range be adopted as an NPL for MLGW-17 and other POC wells as discussed in in the Groundwater Quality Assessment for MLGW-7 Technical Memorandum (AJAX and Clear Creek, 2014).

6.0 REFERENCES

AJAX and Clear Creek Associates, 2013. Groundwater Monitoring Point of Compliance (POC) Technical Memorandum, Henderson Mill. May 2013.

AJAX and Clear Creek Associates, 2014. Groundwater Quality Assessment for MLGW-7 Technical Memorandum. March 2014.

Climax Molybdenum Company Henderson Operations, 2012. Technical Revision (TR-16) to Permit M-1977-342 Groundwater Management Plan, April, 2012.

Climax Molybdenum Company Henderson Operations and Aquionix, 2014. 5-Quarter Water Quality Data and Baseline Parameters Report. April 2014.Langmuir, D., 1997. Aqueous Environmental Geochemistry, Prentice-Hall, Inc., 600 p.

Langmuir, D., 1997. Aqueous Environmental Geochemistry, Prentice-Hall, Inc., 600 p.

TABLES

Table 1
3-Dam Water Level Summary

Depth To Water

Well	Total Depth (ft TOC)	12/13/2012	1/30/2013	2/26/2013	3/27/2013	4/23/2013	5/15/2013	06/18/13	07/10/13	08/07/13	09/10/13	10/02/13	11/06/13	12/10/13
MLGW-16	127.30	DRY	DRY	DRY	DRY	DRY	DRY	DRY	127.08	DRY	DRY	DRY	DRY	DRY
MLGW-17	137.65	111.80	116.02	116.11	116.19	116.24	114.98	112.70	112.42	112.92	113.70	114.03	114.45	114.75
MLGW-18	27.30	16.32	26.70	DRY	27.02	16.33	9.05	14.77	16.28	17.90	26.70	15.74	16.65	22.25
MLGW-19	47.46	NA	NA	NA	NA	NA	41.09	43.07	43.43	44.02	44.91	44.29	45.25	45.50
MLGW-20	57.42	NA	NA	NA	NA	NA	29.01	33.79	37.48	46.59	52.19	50.50	53.10	55.00

Groundwater Elevation

Well	Measuring Point (ft AMSL)	12/13/2012	1/30/2013	2/26/2013	3/27/2013	4/23/2013	5/15/2013	06/18/13	07/10/13	08/07/13	09/10/13	10/02/13	11/06/13	12/10/13
MLGW-16	8714.121	DRY	DRY	DRY	DRY	DRY	DRY	DRY	8587.04	DRY	DRY	DRY	DRY	DRY
MLGW-17	8684.274	8572.47	8568.25	8568.16	8568.08	8568.03	8569.29	8571.57	8571.85	8571.35	8570.57	8570.24	8569.82	8569.52
MLGW-18	8698.958	8682.64	8672.26	DRY	8671.94	8682.63	8689.91	8684.19	8682.68	8681.06	8672.26	8683.22	8682.31	8676.71
MLGW-19	8715.135	NA	NA	NA	NA	NA	8674.05	8672.07	8671.71	8671.12	8670.23	8670.85	8669.89	8669.64
MLGW-20	8683.909	NA	NA	NA	NA	NA	8654.90	8650.12	8646.43	8637.32	8631.72	8633.41	8630.81	8628.91

Notes:
All water level measurements in feet from top of casing.
NA = Wells were not monitored as part of this project on this date

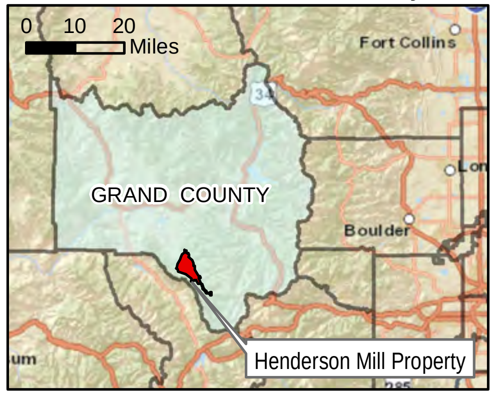
Table 2 MLGW-17 and MLGW-20 Analytical Data Summary								
Sample Date	12/13/2012	02/26/2013	06/14/2013	08/14/2013	11/20/2013	06/04/2013	08/14/2013	11/20/2013
Site Number	MLGW-17	MLGW-17	MLGW-17	MLGW-17	MLGW-17	MLGW-20	MLGW-20	MLGW-20
Aluminum, Dissolved (ug/l as Al)	2.66	1.22	<1000	<1	2.25	<30	306	285
Arsenic, Dissolved (ug/l as As)	<0.15	<0.15	<150	<0.15	<0.15	<1	<0.15	<0.15
Beryllium, Dissolved (ug/l as Be)	<0.15	<0.15	<150	<0.15	<0.15	<1	<0.15	<15
Boron, Dissolved (ug/l as B)	<50	<50	<2000	<250	3.38	<50	<250	8.36
Cadmium, Dissolved (ug/l as Cd)	<0.1	<0.1	<100	<0.1	<0.1	<1	<0.1	<0.1
Chloride (mg/l)	8.28	7.24	7.79	7.69	7.52	22	24.4	35.8
Chromium, Dissolved (ug/l as Cr)	<0.5	0.543	<500	<0.5	<0.5	<5	<0.5	1.06
Cobalt, Dissolved (ug/l as Co)	<0.5	<0.5	<500	<0.5	<0.5	<5	<0.5	<0.5
Copper, Dissolved (ug/l as Cu)	<0.25	0.255	<250	<0.25	<0.25	<5	0.53	1.39
Conductivity, Specific, Field (uS/cm)	241.7	240.1	230.4	224.3	217.8	197.2	308.9	334.3
Fluoride (mg/l)	0.169	0.213	0.184	0.261	0.26	0.306	1.58	2.47
Iron, Dissolved (ug/l as Fe)	<50	<50	<30	<250	2.9	<30	<250	43.9
Lead, Dissolved (ug/l as Pb)	<0.2	<0.2	<200	<0.2	0.232	<1	<0.2	0.24
Lithium, Dissolved (ug/ as Li)	<100	<100	<100	<500	<5	<100	<500	<5
Manganese, Dissolved (ug/l as Mn)	15.7	2.08	<250	4.75	1.96	4	8	11.2
Mercury, Dissolved (ug/l as Hg)	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel, Dissolved (ug/l as Ni)	2.26	1.79	<250	1.08	<0.25	<5	1.44	2.37
Nitrogen, Nitrite (mg/l)	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.2	<0.4
Nitrogen, Combined Nitrite Nitrate (mg/l)	<0.1	<0.2	0.219	0.212	<0.2	1.7	1.77	1.24
pH, Field (Standard Units)	6.9	6.6	6.4	6.6	7.1	6.0	5.5	5.8
Selenium, Dissolved (ug/l as Se)	<0.5	<0.5	<500	<0.5	<0.5	<1	<0.5	<0.5
Sulfate, Total (mg/l as SO4)	41.4	36.4	33.6	31.9	33.1	24.6	75.3	75.6
Temperature, Field (Degrees Centigrade)	6.8	5.4	7.4	7.3	6.6	6.2	9.5	5.2
Vanadium, Dissolved (ug/l as V)	<10	<10	<5000	<50	<5	<10	<50	<5
Zinc, Dissolved (ug/l as Zn)	<2.5	<2.5	<2500	<2.5	<2.5	<10	<2.5	6.39

FIGURES

Legend

- POC Monitor Well
- Groundwater Monitor Well
- Abandoned GW Monitor Well
- Wellfield Line Well
- Surface Water Monitoring Loc.
- Ultimate Canal
- Canal
- Dike
- Ditch
- Intermittent Surface Water
- Perennial Surface Water
- Pipeline
- Road
  dashed where unimproved
- Property Boundary
- Affected Lands (2010)
- County Line

Henderson Mill, Grand County, CO



SCALE

0 0.5 1 Miles

NOTES:
Imagery from NAIP Natural Color Imagery for Colorado 2013

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Figure 1
Regional Map
Henderson Mill, CO

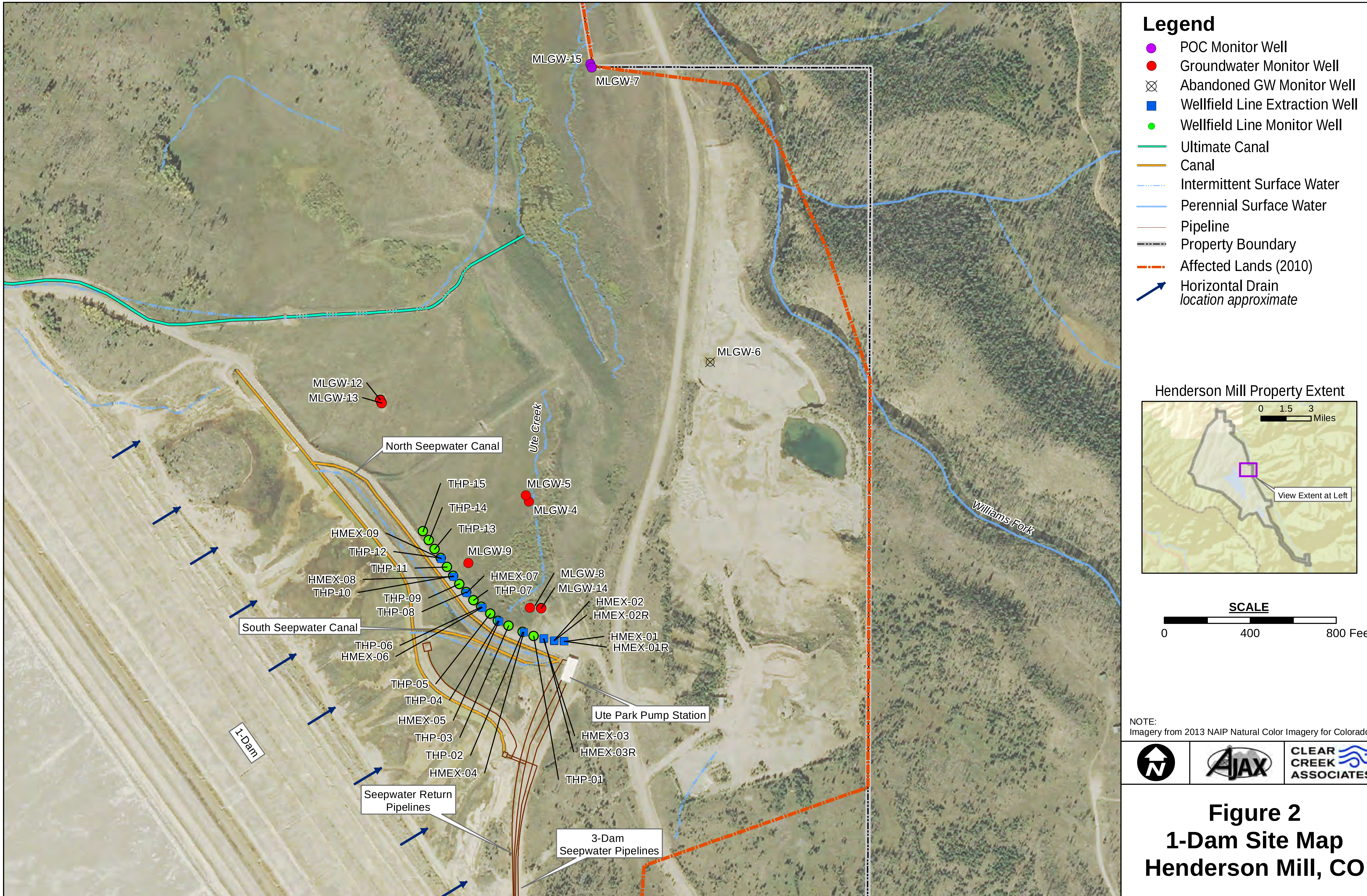
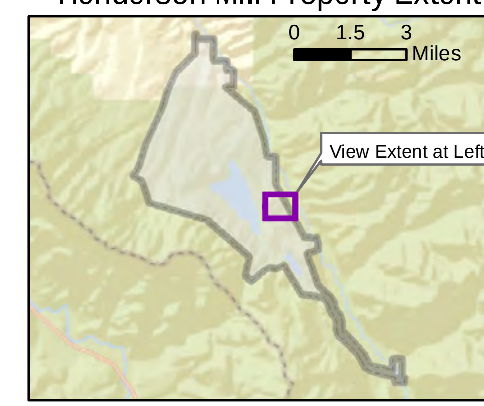


Figure 2
1-Dam Site Map
Henderson Mill, CO

Legend

- Proposed POC Monitor Well
- 2012 Groundwater Monitor Well
- Pre-Existing GW Monitor Well
- Abandoned Monitor Well
- Canal
- Dike
- Intermittent Surface Water
- Perennial Surface Water
- Property Boundary
- Affected Lands (2010)

Henderson Mill Property Extent



1 inch: 320 feet

0 320 640 Feet

NOTE:
Imagery from 2013 NAIP Natural Color Imagery for Colorado

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Figure 3
3-Dam Monitor Well Location Map
Henderson Mill, CO

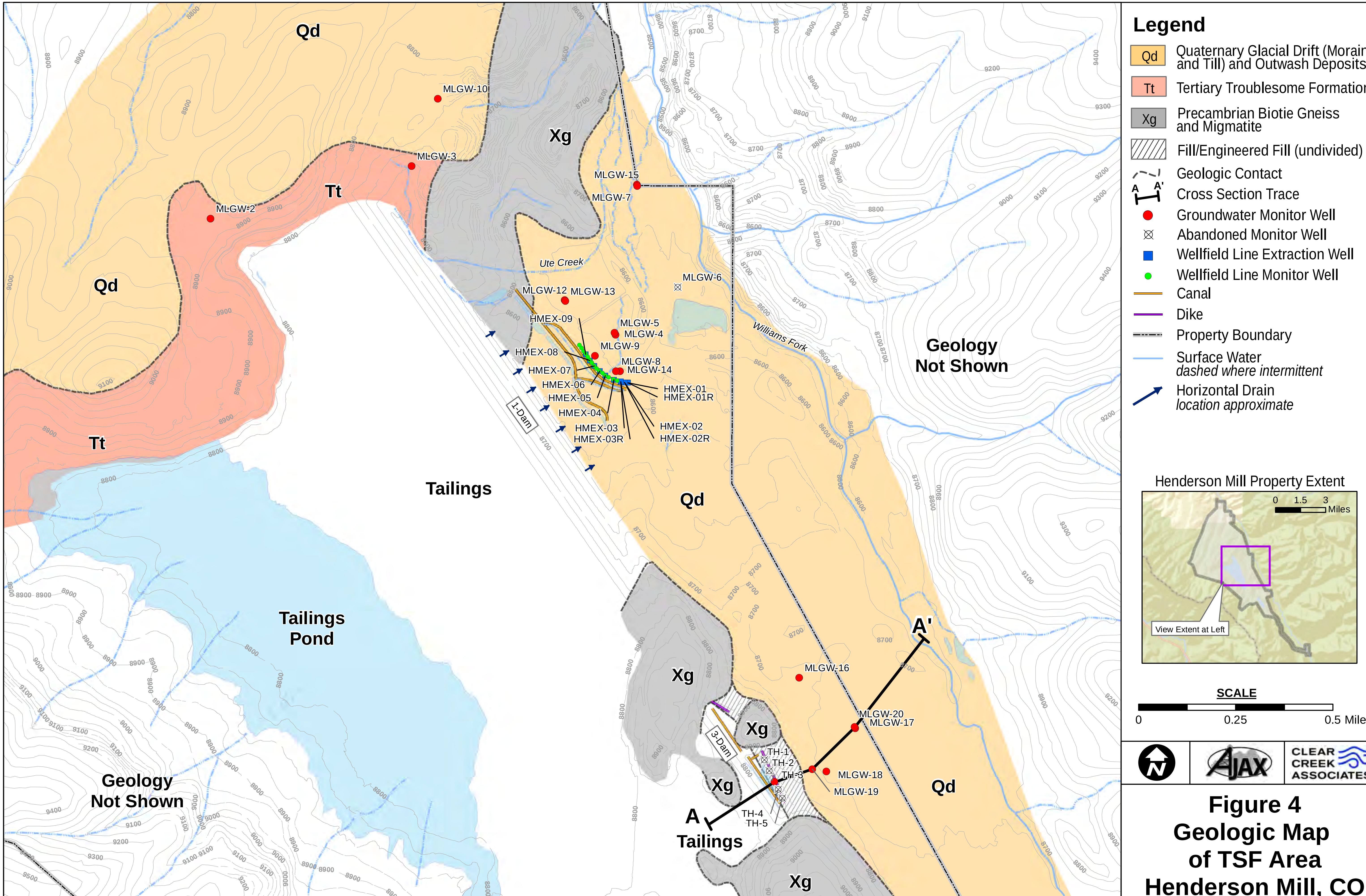

Figure 4
Geologic Map of TSF Area
Henderson Mill, CO

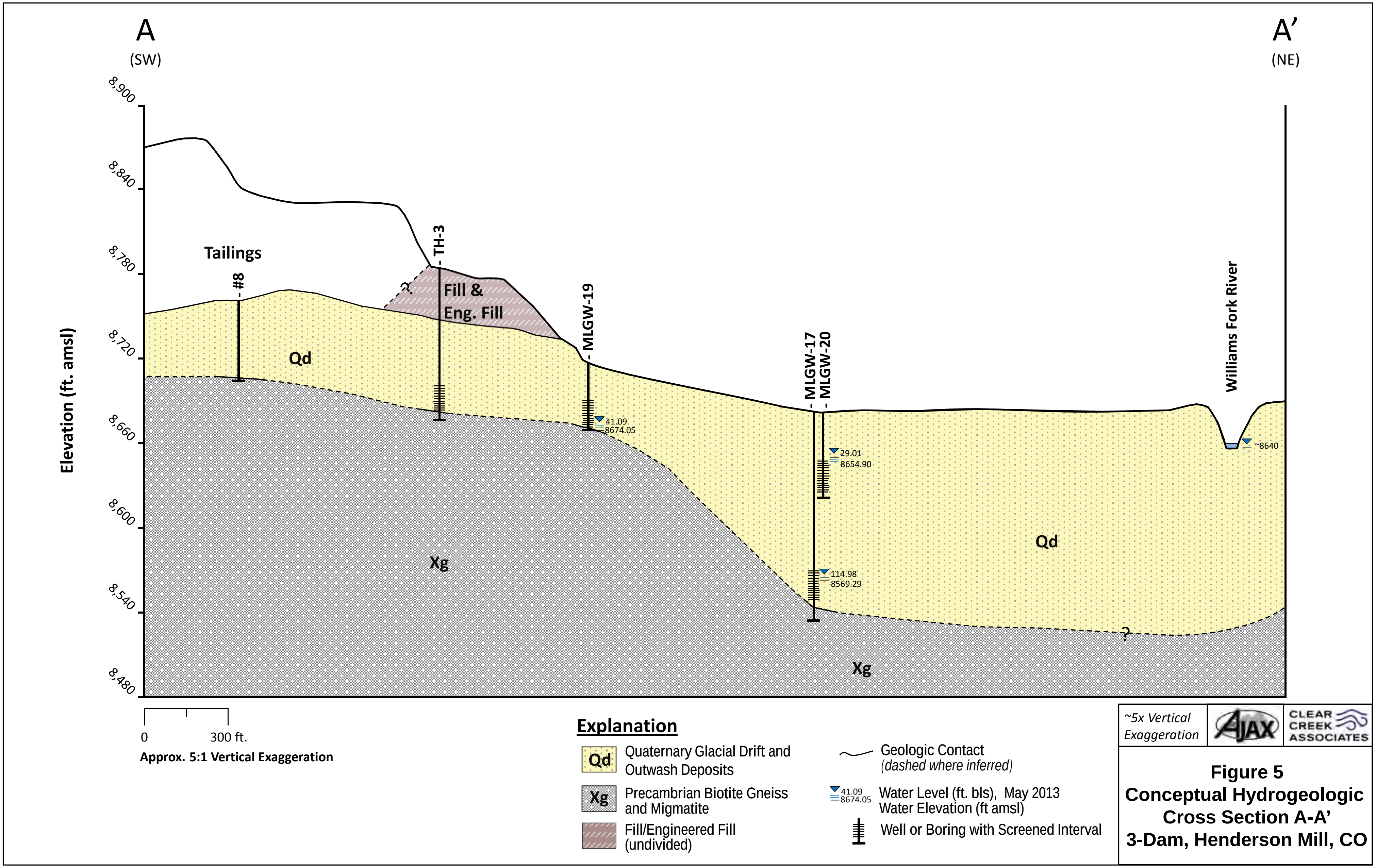

Figure 5
Conceptual Hydrogeologic Cross Section A-A'
3-Dam, Henderson Mill, CO

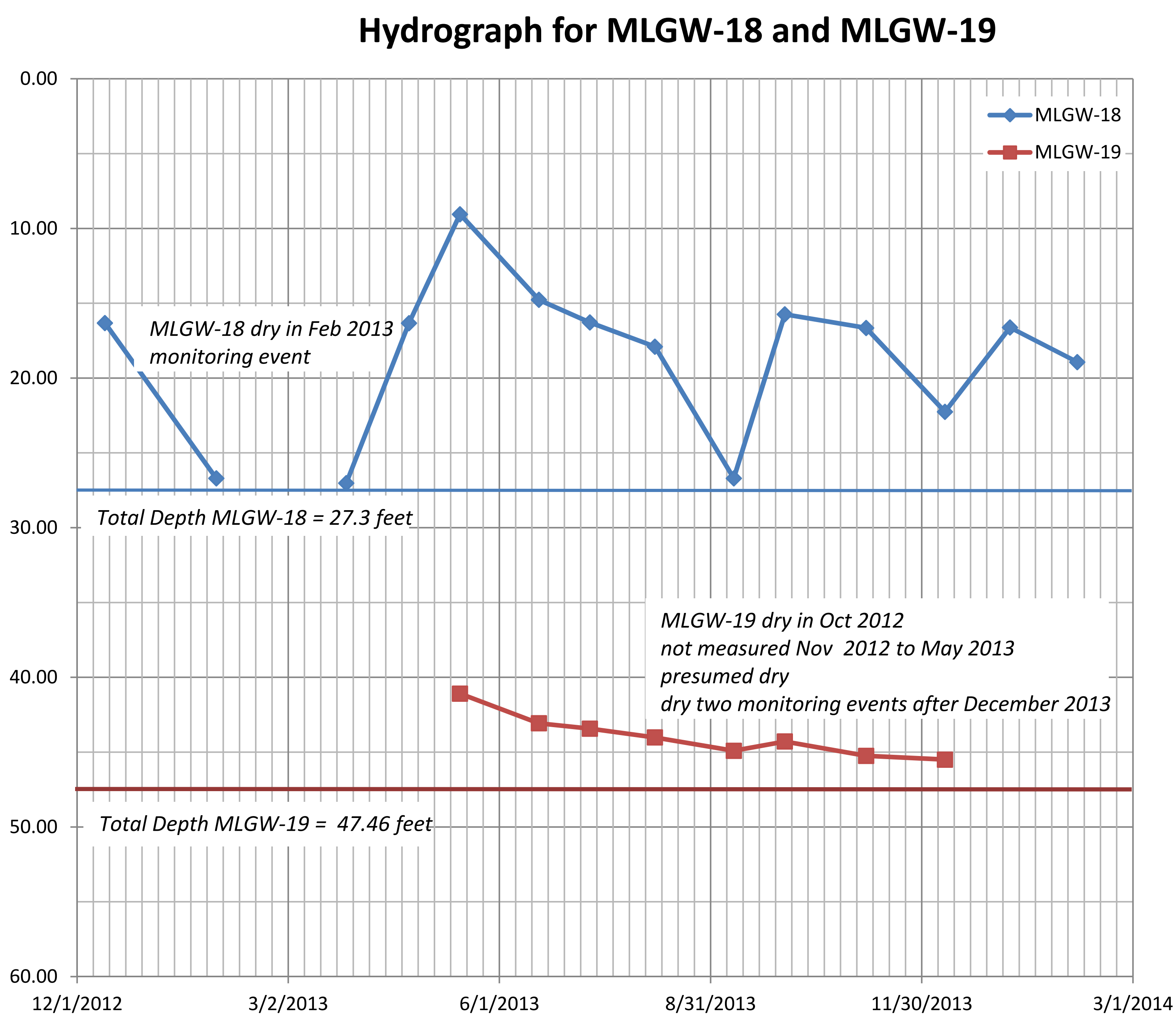

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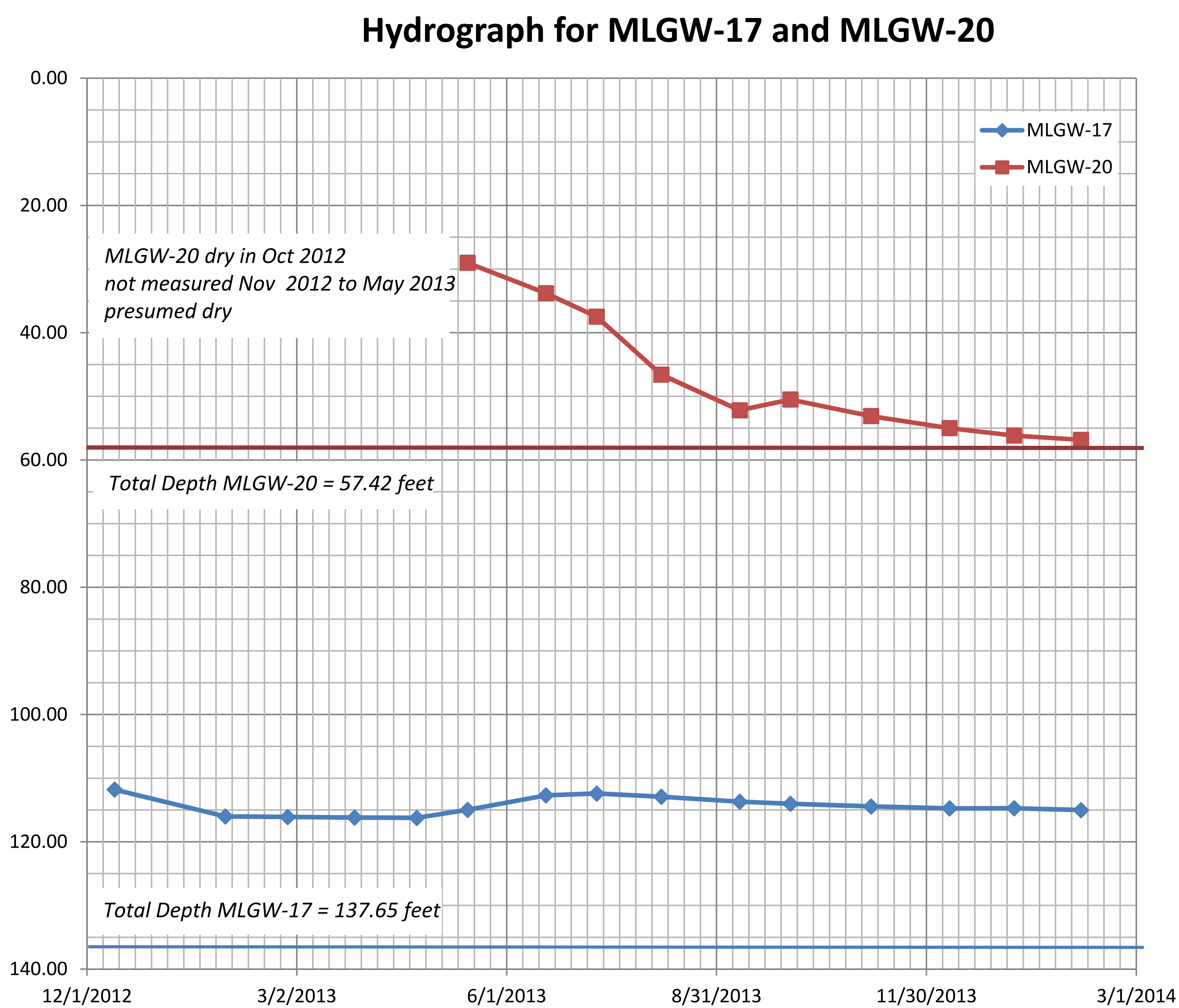
FIGURE 6
MGLW-18 AND MLGW-19
DEPTH TO WATER



AJAX CLEAR CREEK ASSOCIATES

FIGURE 7
MGLW-17 AND
MLGW-20
DEPTH TO WATER

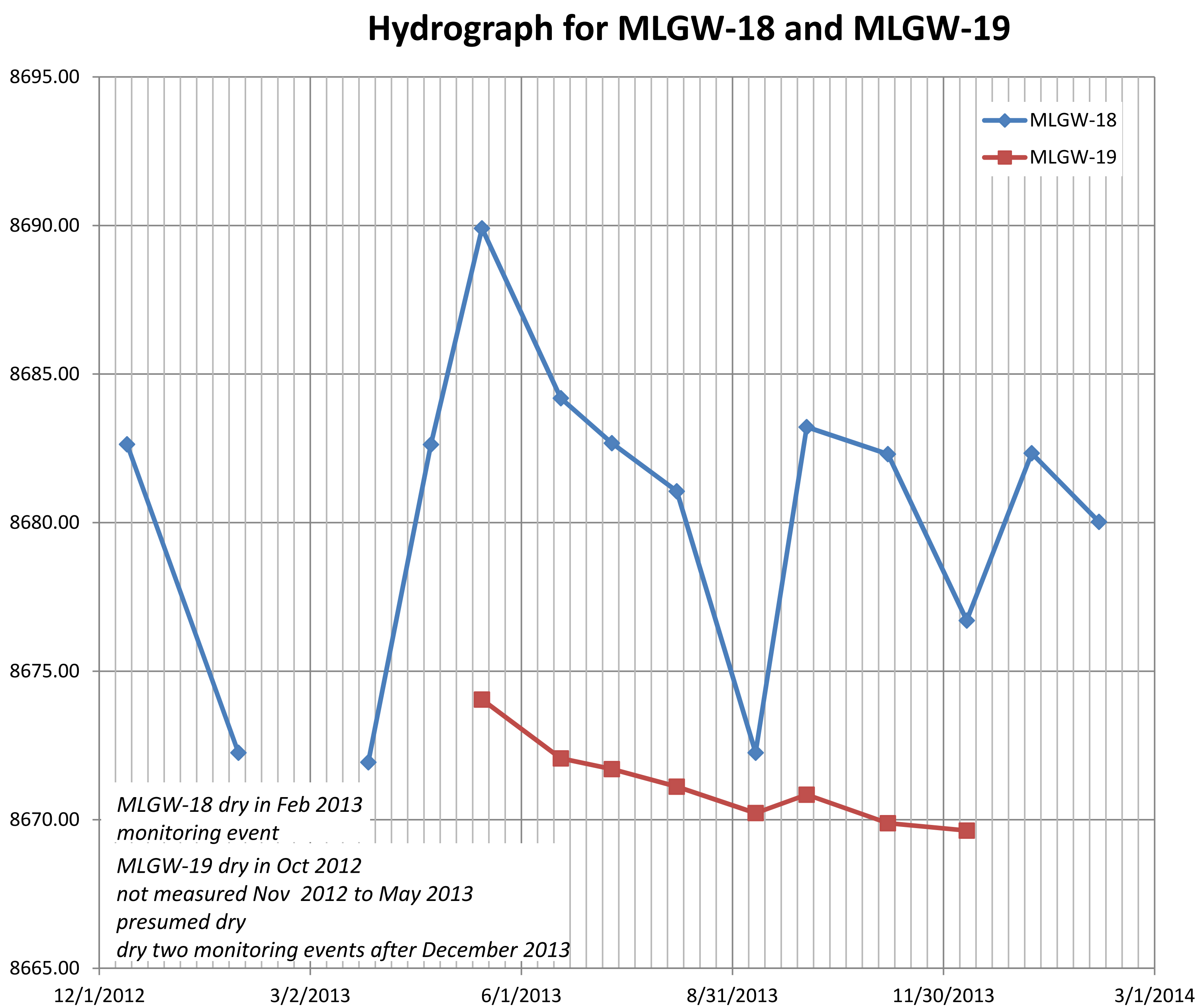


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FIGURE 8
MGLW-18 AND
MLGW-19
GROUNDWATER
ELEVATION

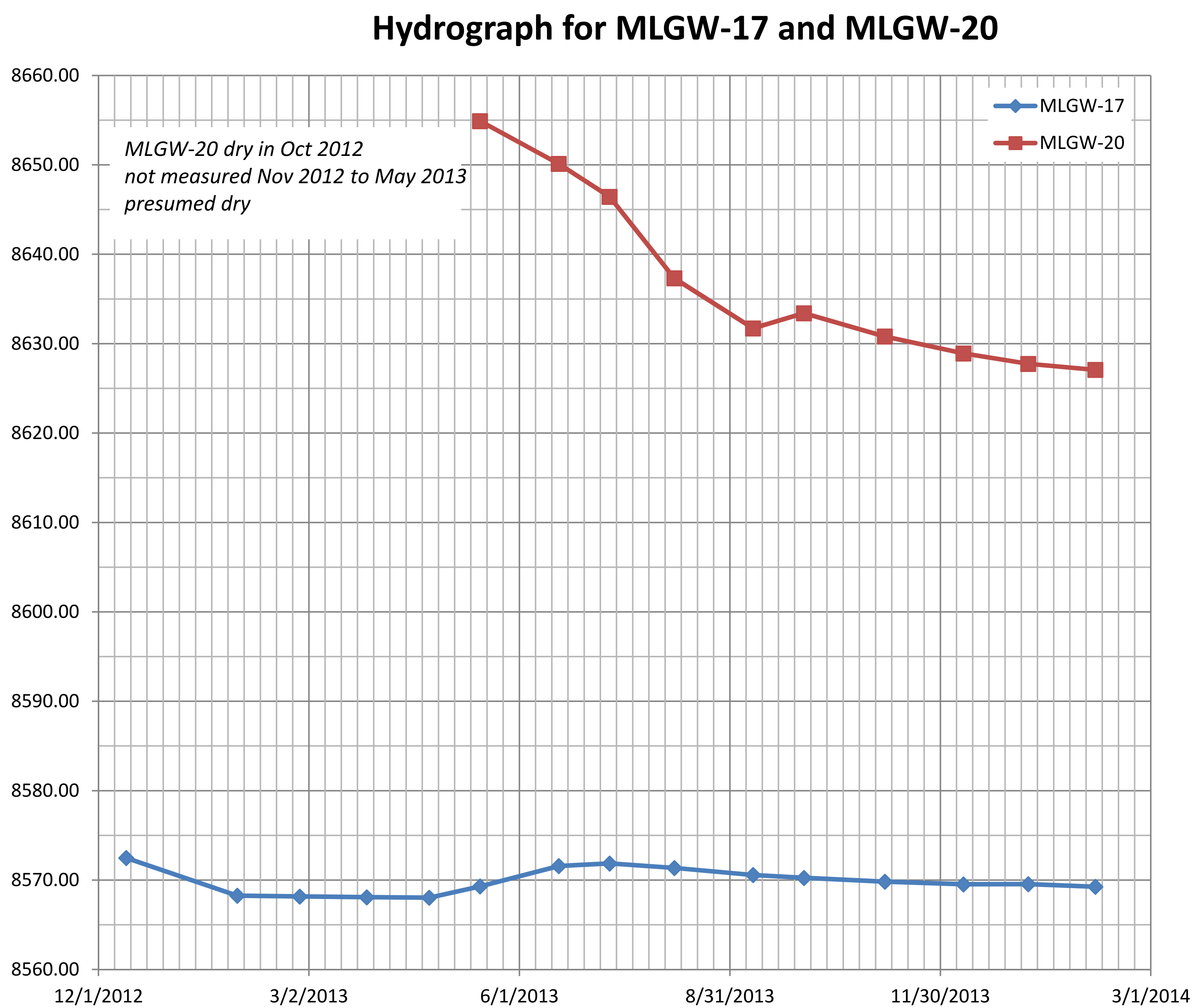

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FIGURE 9
MGLW-17 AND MLGW-20 GROUNDWATER ELEVATION

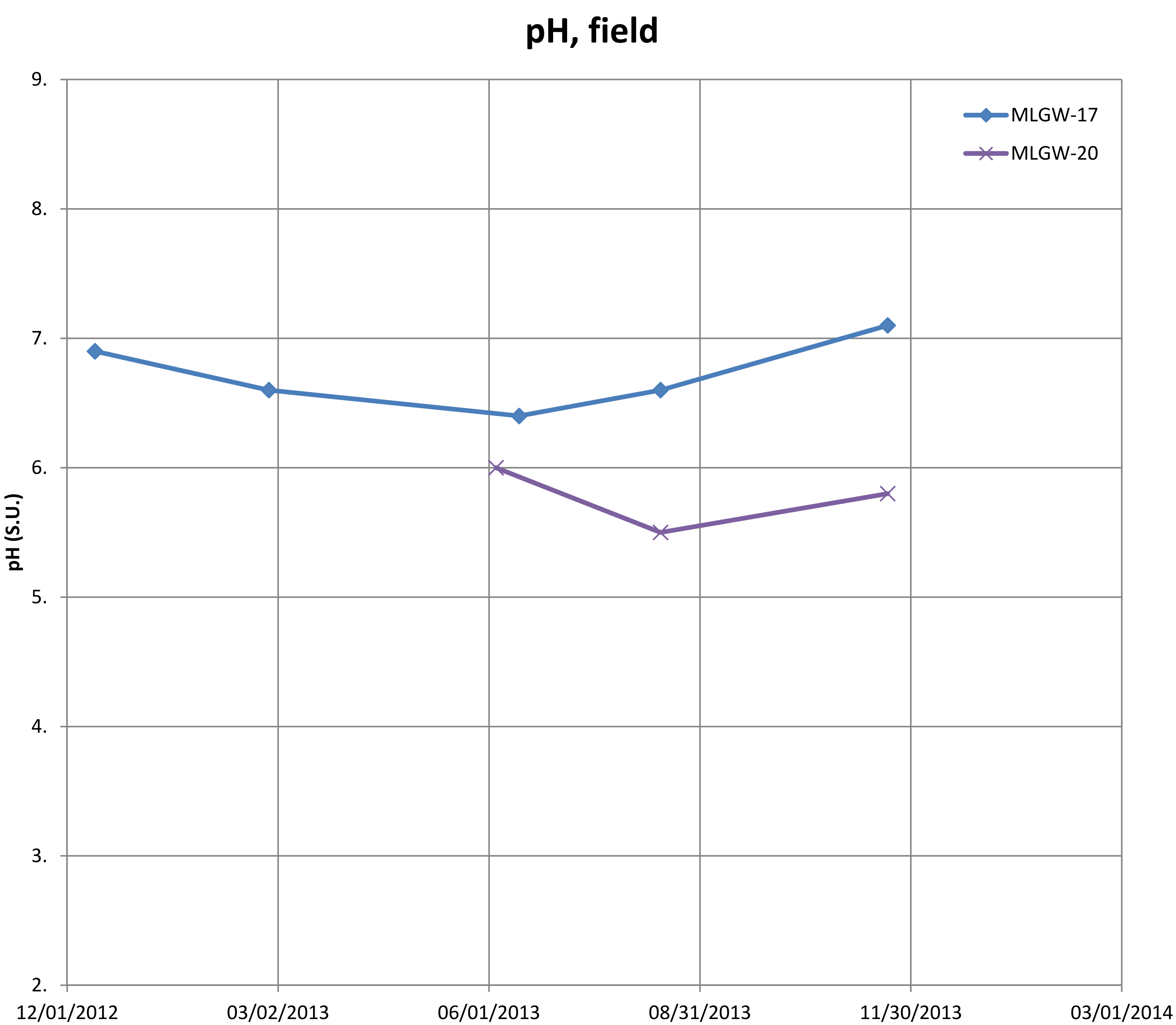

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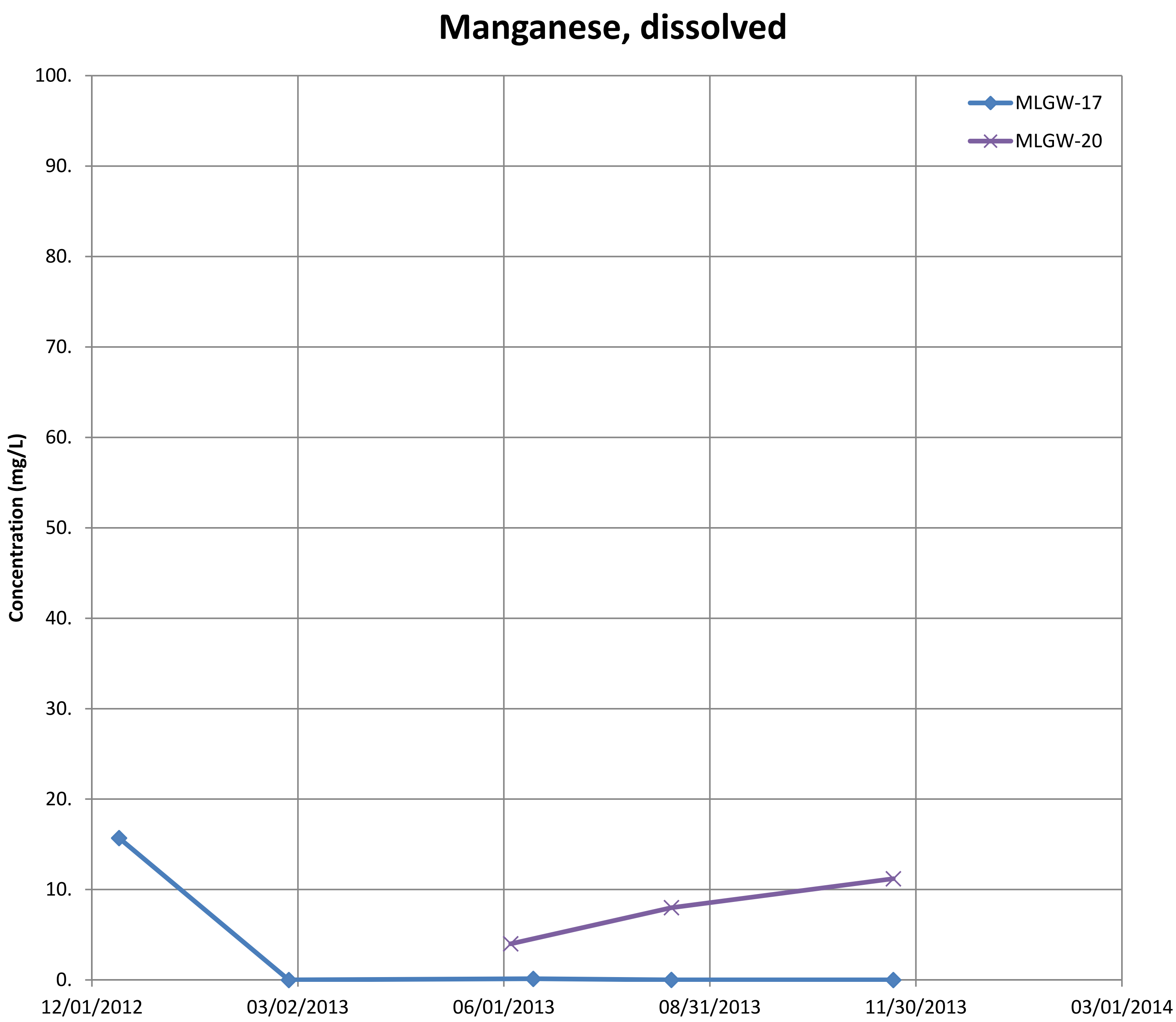
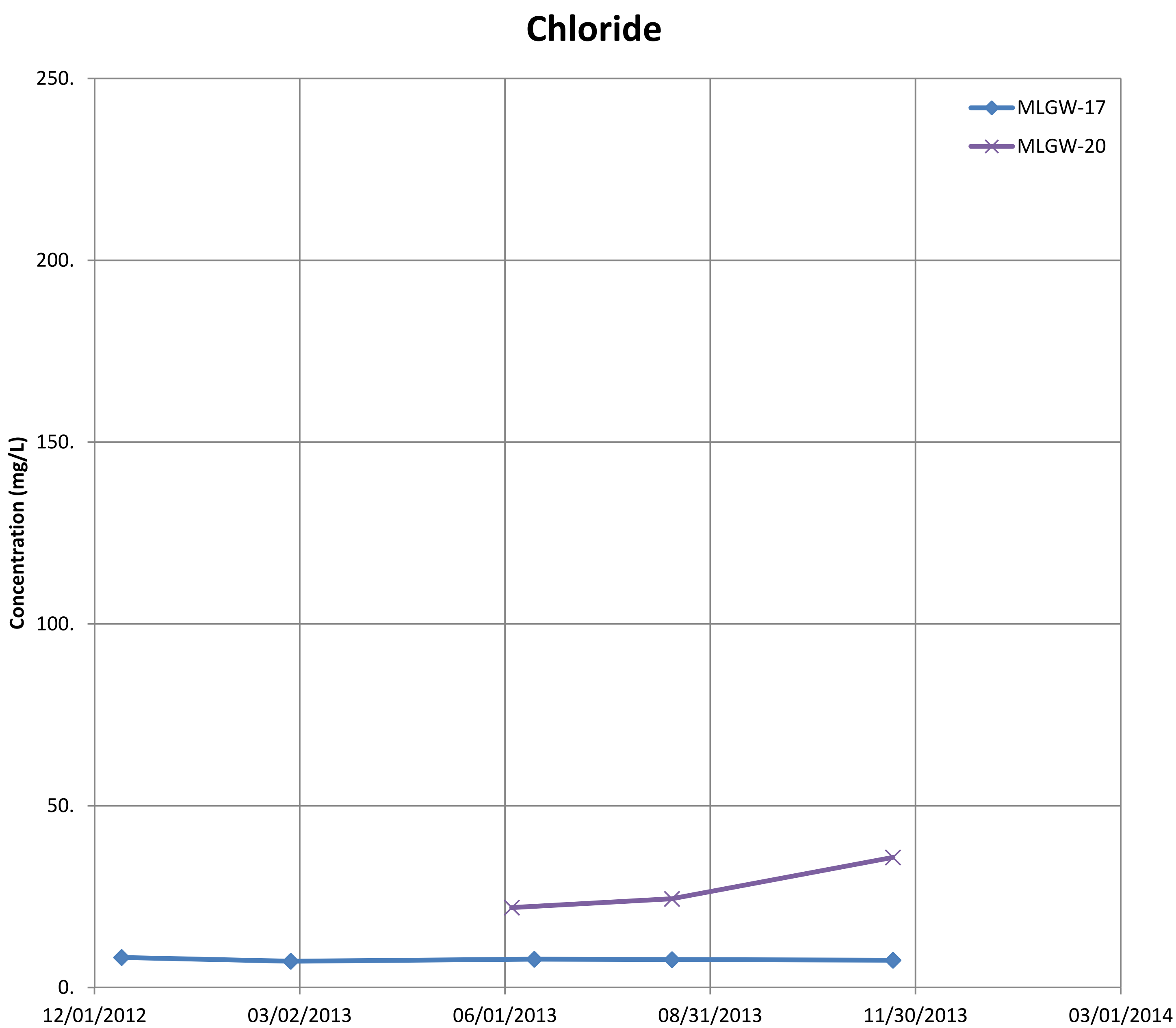
FIGURE 10
MLGW-17 AND
MLGW-20
pH



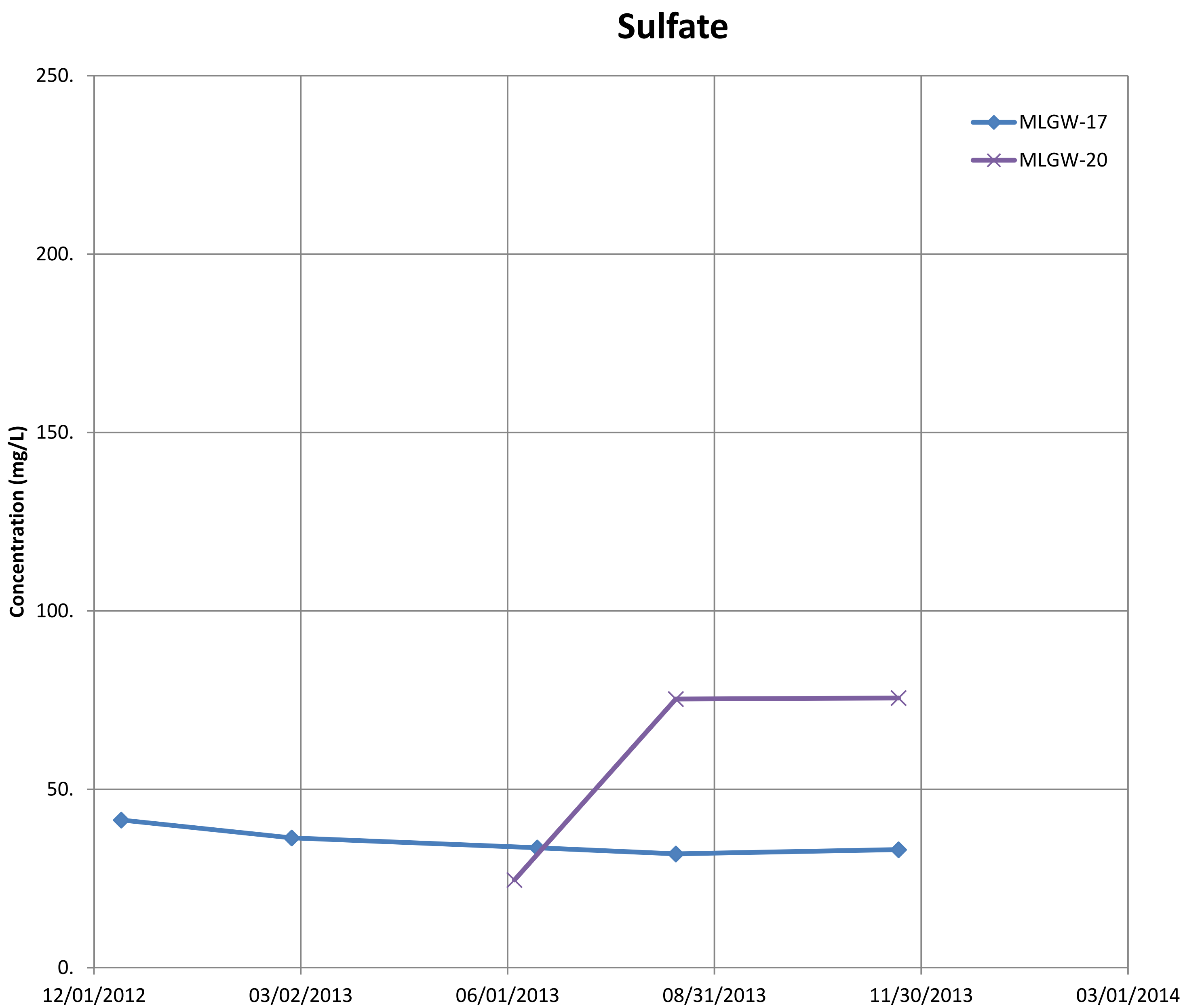
CLEAR CREEK ASSOCIATES

FIGURE 11
MLGW-17 AND
MLGW-20
MANGANESE



CLEAR CREEK ASSOCIATES

FIGURE 12
MLGW-17 AND
MLGW-20
CHLORIDE



AJAX CLEAR CREEK ASSOCIATES

FIGURE 13
MLGW-17 AND
MLGW-20
SULFATE

Appendix B
Colorado Water Quality Control Commission Basic Standards for Groundwater, Tables 1-4

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

WATER QUALITY CONTROL COMMISSION

5 CCR 1002-41

REGULATION NO. 41

THE BASIC STANDARDS FOR GROUND WATER

AMENDED: September 11, 2012

EFFECTIVE: January 31, 2013

G. When the Commission has established statewide standards or classification(s) and standards for ground water in a specified area, those classifications and standards shall be used with respect to the regulation and subsequent enforcement of specific activities by the Commission, the Administration and other State agencies, consistent with applicable law.

H. When the Commission has not established classification(s) and standards for ground water in a specified area, the Commission recommends the classifications and standards set forth in these regulations as guidance for use by other State agencies in the implementation of ground water protection responsibilities, on a case-by-case basis, consistent with applicable law. This shall not be construed as a delegation by the Commission of its authority to classify ground water and promulgate water quality standards.

I. Existing discharges of pollutants to ground water shall be deemed "activities" as defined in section 41.3(1), and are not exempt from regulation, unless specific statutory or regulatory provisions require otherwise.

41.8 SEVERABILITY

The provisions of these regulations are severable, and if any provisions or the application of the provisions to any circumstances is held invalid, the application of such provision to other circumstances, and the remainder of these regulations, shall not be affected thereby.

TABLE 1
Domestic Water Supply – Human Health Standards

Parameter	Standard[1]
Biological	
Total Coliforms (30 day average)	2.2[a]org/100 ml
Total Coliforms (max in 30 days)	23org/100 ml
Inorganic	
Antimony (Sb)[d, M]	0.006mg/l
Asbestos[M]	7,000,000fibers/Liter
Arsenic (As)[d, M]	0.01mg/l
Barium (Ba)[d, M]	2.0mg/l
Beryllium (Be)[d, M]	0.004mg/l
Cadmium (Cd)[d, M]	0.005mg/l
Chromium (Cr)[c, d, M]	0.1mg/l
Cyanide [Free] (CN)[M]	0.2mg/l
Fluoride (F)[d, M]	4.0mg/l
Lead (Pb)[d]	0.05mg/l
Mercury (inorganic) (Hg)[d,M]	0.002mg/l
Molybdenum (Mo)[d]	0.21 mg/l
Nickel (Ni)[d]	0.1mg/l
Nitrate (NO3)[d, M]	10.0mg/l as N
Nitrite (NO2)[d, M]	1.0mg/l as N
Total Nitrate+Nitrite (NO_2+NO_3-N)[d, f]	10.0mg/l as N
Selenium (Se)[d, M]	0.05mg/l
Silver (Ag)[d]	0.05mg/l

Thallium (Tl)[d, M]	0.002mg/l
Uranium (U)[d, 2]	0.0168 to 0.03[M]mg/l
Radiological[b, d]	
Gross Alpha Particle Activity[i, M]	15 pCi/l
Beta and Photon Emitters[e]	4 mrem/year

TABLE 2
Domestic Water Supply – Drinking Water Standards

Parameter	Standard
Chlorophenol	0.0002 mg/l
Chloride (Cl)[d]	250 mg/l
Color	15 color units
Copper (Cu)[d]	1 mg/l
Corrosivity	Noncorrosive
Foaming Agents	0.5 mg/l
Iron (Fe)[d]	0.3 mg/l
Manganese (Mn)[d]	0.05 mg/l
Odor	3 threshold odor numbers
pH	6.5 - 8.5
Phenol	0.3 mg/l
Sulfate (SO_4)[d]	250 mg/l
Zinc (Zn)[d]	5 mg/l

Table 3
Agricultural Standards

Parameter	Standard
Aluminum (Al)[d, f]	5 mg/l
Arsenic (As)[d]	0.1 mg/l
Beryllium (Be)[d]	0.1 mg/l
Boron (B)[d, g]	0.75 mg/l
Cadmium (Cd)[d]	0.01 mg/l
Chromium (Cr)[d]	0.1 mg/l
Cobalt (Co)[d]	0.05 mg/l
Copper (Cu)[d]	0.2 mg/l
Fluoride (F)[d]	2 mg/l
Iron (Fe)[d]	5 mg/l
Lead (Pb)[d, f]	0.1 mg/l
Lithium (Li)[d, h]	2.5 mg/l
Manganese (Mn)[d, j]	0.2 mg/l
Mercury (Hg)[d, f]	0.01 mg/l
Nickel (Ni)[d]	0.2 mg/l

Table 3

Agricultural Standards

Nitrite $(NO_2\text{-}N)^{d,f}$	10 mg/l as N
Nitrite & Nitrate$(NO_2+NO_3\text{-}N)^{d,f}$	100 mg/l as N
Selenium $(Se)^{d}$	0.02 mg/l
Vanadium $(V)^{d}$	0.1 mg/l
Zinc $(Zn)^{d}$	2 mg/l
pH	6.5 - 8.5

TABLE 4

TDS Water Quality Standards

Background TDS Value (mg/l)	Maximum Allowable TDS Concentrations
0 - 500	400 mg/l or 1.25 times the background level, whichever is least restrictive
501 - 10,000	1.25 times the background value
10,001 or greater	No limit

[1] Chronic or 30-day standard based on information contained in EPA's Integrated Risk Information System (IRIS) using a 10^{-6} incremental risk factor.

[2] Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. The Commission intends that control requirements for this chemical be implemented to attain a level of ambient water quality that is at least equal to the first number in the range except as follows:

- Where ground water quality exceeds the first number in the range due to a release of contaminants that occurred prior to September 15, 2012, (regardless of the date of discovery or subsequent migration of such contaminants) clean-up levels for the entire contaminant plume shall be no more restrictive than the second number in the range or the ground water quality resulting from such release, whichever is more protective.
- Wherever the Commission has adopted alternative, site-specific standards for the chemical, the site-specific standards shall apply instead of these statewide standards.

The Commission does not intend the adoption of this range of standards to result in changes to clean-up requirements previously established by an implementing agency, unless such change is mandated by the implementing agency pursuant to its independent statutory authority.

[a]. When the Membrane Filter Technique is used for analysis, the average of all samples taken within thirty days must be less than 1 organism per 100 milliliters of sample. When the Multiple Tube Fermentation Method is used for analysis, the limit is less than 2.2 org/100 ml.

[b]If the identity and concentration of each radionuclide in a mixture are known, the limiting value would be derived as follows: Determine, for each radionuclide in the mixture, the ratio between the quantity present in the mixture and the limit specified. The sum of such ratios for all radionuclides in the mixture shall not exceed "1" (i.e. unity). A radionuclide may be considered as not present in a mixture if the ratio of the concentration to the limit does not exceed 1/10 and the sum of such ratios for all radionuclides considered as not present in the mixture does not exceed 1/4.

[c]The chromium standard is based on the total concentration of both trivalent and hexavalent forms of dissolved chromium.

[d]Measured as dissolved concentration. The sample water shall be filtered through a 0.45 micron membrane filter prior to preservation. The total concentration (not filtered) may be required on a case-by-case basis if deemed necessary to characterize the pollution caused by the activity.

[e]If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 mrem per year. Except for Tritium and Strontium 90 the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents shall be calculated on the basis of a 2 liter per day drinking water intake using the 168-hour data listed in "Maximum Permissible Body Burden and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69, as amended, August 1963, US Department of Commerce.

[f]These more stringent levels are necessary to protect livestock watering. Levels for parameters without this footnote are set to protect irrigated crops at the same level. Where a party can demonstrate that a livestock watering use of ground water is not reasonably expected, the applicable standard for lead is 5.0 mg/l.

[g]This level is set to protect the following plants in ascending order of sensitivity: Pecan, Black Walnut, Persian (English) Walnut, Jerusalem Artichoke, Navy Bean, American Elm, Plum, Pear, Apple, Grape (Sultanina and Malaga), Kadota Fig, Persimmon, Cherry, Peach, Apricot, Thornless Blackberry, Orange, Avocado, Grapefruit, Lemon. Where a party can demonstrate that a crop watering use of ground water is not reasonably expected, the applicable standard for boron is 5.0 mg/l.

[h]This level protects all crops, except citrus which do not grow in Colorado and therefore a more stringent level of protection is not required.

[i]The Gross Alpha Activity standard excludes alpha activity due to Radon and Uranium.

[j] This standard is only appropriate where irrigation water is applied to soils with pH values lower than 6.0.

[M]Drinking water MCL.

41.9 Reserved.

41.10 Reserved.

41.11 Reserved.

41.12 STATEMENT OF BASIS AND PURPOSE

Statement of Basis and Purpose for adopting the Regulations entitled: "The Basic Standards for Ground Waters". In accordance with 24-4-103(4), CRS (1982 and 1985 Supp.), the Commission adopts this Statement of Basis and Purpose.

PURPOSE

"The Basic Standards for Ground Waters" establishes a system of classifications (classes) for determining the appropriate degree of protection (standards) necessary to maintain beneficial uses of ground waters. These standards and classes are intended to complement regulations 3.1.0, "The Basic Standards and Methodologies" which are primarily applicable to surface waters. Together, regulations 3.1.0 and 3.11.0 protect all state waters as defined in Section 25-8-203, CRS (1982). Separate regulations for surface and ground waters are appropriate, because the surface water classification system is not easily adopted to ground waters.

These regulations are the first step in developing a comprehensive, statewide ground water protection program. The complete program will include control regulations which will enforce the water quality standards. These additional regulations may include amending the current CDPS permit regulations and adopting activity-specific control regulations.

It is not the intent of the Commission to control existing or future uses of ground water (i.e., domestic, agricultural, or industrial uses). The intent is to protect ground water quality from uncontrolled degradation and thereby protect existing and future uses of ground water.

It is not the intent of the Commission or the Division by virtue of adoption of these regulations or subsequent control regulations, to duplicate ground water regulations adopted by other state or federal programs. When an activity that impacts ground water appears to be unregulated or inadequately regulated with respect to those impacts, the Division will conduct a thorough review of any applicable authorities prior to proposing a control regulation.

NEED FOR REGULATIONS

Ground water is the primary water source for seventy-five percent of the public water supply systems of the state (defined in the Colorado Primary Drinking Water Regulations).

There are approximately 825,000 people in Colorado that rely either wholly or partially on ground water. Ground water use to support new urban areas is increasing as surface water supplies become more difficult to obtain in some metropolitan areas. Agriculture also relies heavily on ground water for the

Appendix C
Establishing Background Threshold Values (BTV) – Henderson Mill

GATEWAY ENTERPRISES

Technical Consulting Report

May 5, 2014

Report To: Climax Molybdenum Company – Henderson Mine and Mill

Subject: **Establishing Background Threshold Values (BTVs) – Henderson Mill**

Prepared by: John G. Huntington, Ph.D.
Technical Director and Consultant
Gateway Enterprises

Background and Summary

The purpose of this report is to recommend a technical approach to determine background threshold values (BTVs) for pH at the Climax Molybdenum Company - Henderson Mill (Henderson) facility.

pH data were provided to us by Aquionix on behalf of Henderson for the wells discussed in this report, including MLGW-7, MLGW-6, MLGW-17, MLGW-15, and MLGW-ACR. The data are from historical groundwater monitoring at the site. We have used these data to calculate BTVs (also called numeric protection levels, or NPLs) for pH using EPA guidance.

The primary guidance and tool that we have used for this purpose is provided by EPA in the USEPA ProUCL 5.0.00 statistical package. This is a statistical tool developed purpose by Lockheed Martin under contract with EPA (2). Version 5.0.00 is updated as of 2013 and includes a few additional statistics not in version 4.1.01, which we used in 2012 to produce a BTV for manganese (13). These two versions are very similar and both perform the same tasks. They include extensive technical documentation describing how to properly develop BTVs and perform other statistical functions consistent with the preferences of EPA scientists. In addition to this tool, Lockheed-Martin also developed another tool, Scout 2008 (12), which has similar capability but also includes the ability to develop lower control limits, which are needed for pH.

In addition to this, we have used a number of other statistical references (3,4,5,6,7) as well as our own professional chemical and scientific judgment.

We find that the pH data associated with these wells do not follow a normal distribution for pH. This is common for environmental data (3) and has been shown in several studies to be expected based on theoretical considerations (4). However, non-normal distributions can also result from outliers, biased sampling, or mixed sources (5). These potential problems are also described in the EPA documents supporting ProUCL (6,11). The ProUCL tool also calculates statistics based on normal and gamma distributions, which generally produce similar results. It also calculates non-parametric statistics, which are not dependent on the form of the distribution.

We have generated two basic types of statistical limits in this work:

1. 95% upper prediction limits (UPL). This parameter is the limit against which individual future measurements, as opposed to the site mean, should be compared. The developers of ProUCL recommend the use of this parameter as a site BTV. The UPL is thus considered the BTV for the site, and if any individual measurement falls above this level it could mean that the site is showing evidence of contamination or a major change in the groundwater chemistry.
2. 95% lower prediction limits (LPL). This is the limit on the low side analogous to the UPL in item 1 above. A single value falling below this LPL could indicate that the parameter may be showing a change that could indicate a shift in the groundwater chemistry.

To develop the fundamental statistics we have used results from MLGW-7, MLGW-6, MLGW-15, MLGW-17, and MLGW-ACR. In principle, these wells should have very similar behavior and should fall within the same UPL and LPL windows. If this can be demonstrated, then it is reasonable to use the same pH numeric protection limits (NPLs) for the wells in this valley.

Preliminary Data Treatment - pH

We began with the pH data for MLGW-7 and MLGW-6 since these two wells have data available since 1995, and therefore provide a sufficient number of data points to be statistically reliable.

The first step in developing site limits is to evaluate the general characteristics of the data, and to determine if there are data points that should be removed as outliers, by means of statistical evaluation or a consideration of other factors. We have considered both statistical outlier calculations and have reviewed the laboratory data in cases where outliers seem possible. We have made evaluations of outliers based on both considerations.

The pH data do not fit a normal distribution, a lognormal distribution, or a gamma distribution for either MLGW-7 or MLGW-6. As an example of this, Figure 1 shows the histogram chart for the pH values in MLGW-7, superimposed over what would be expected from a normal distribution. It is clear from this chart that there is a significant skewness value, indicating that the distribution is asymmetric.

Since the pH is the negative logarithm of the hydrogen ion concentration, it is not clear that log or gamma distributions would be expected to be significantly better fits than normal distribution since the data have already been log-transformed. It is reasonable to conclude from the distribution that there is a natural tendency for the water to have a pH in a range below 7, but that the buffering capacity of the dissolved solids tends to prevent it falling to levels much below 6. Thus the buffering characteristics of the water may tend to cause the distribution to be asymmetric. Using ProUCL we can show that the pH data for both wells do not fit any of the distributions used in this EPA tool. This is different from the metals data, in which we demonstrated that the data tend to be lognormal for MLGW-7 (12).

Application of Rosner's outlier test to the data flags two pH values of 8.2 as outliers at the 95% level. These can be seen on the normal Q-Q plot in Figure 2, and appear to be outliers visually as well as statistically.

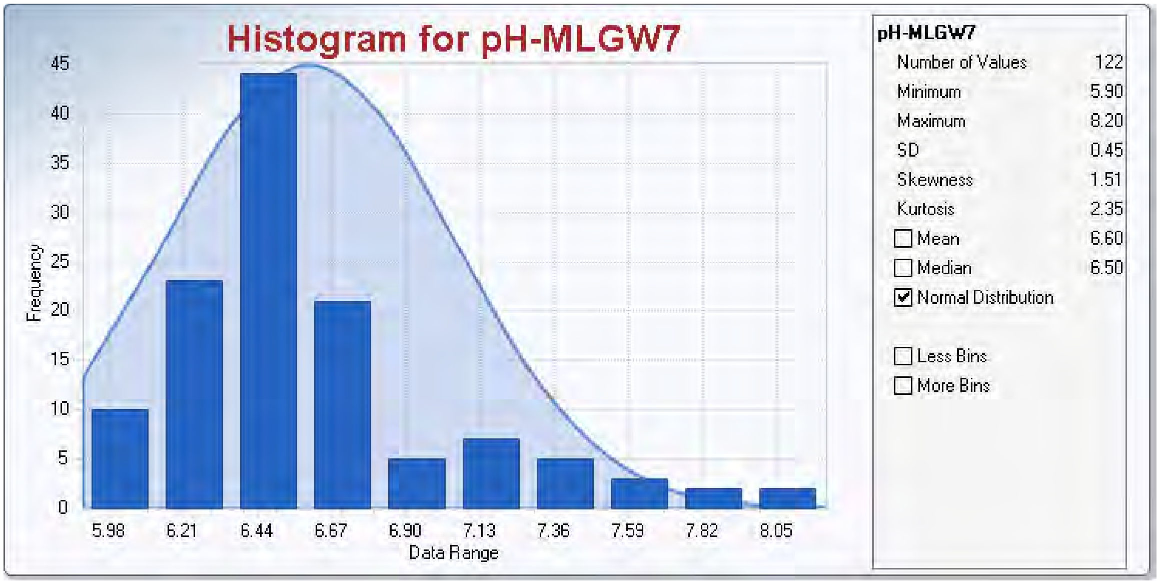


Figure 1. Histogram Plot for pH in Well MLGW-7.

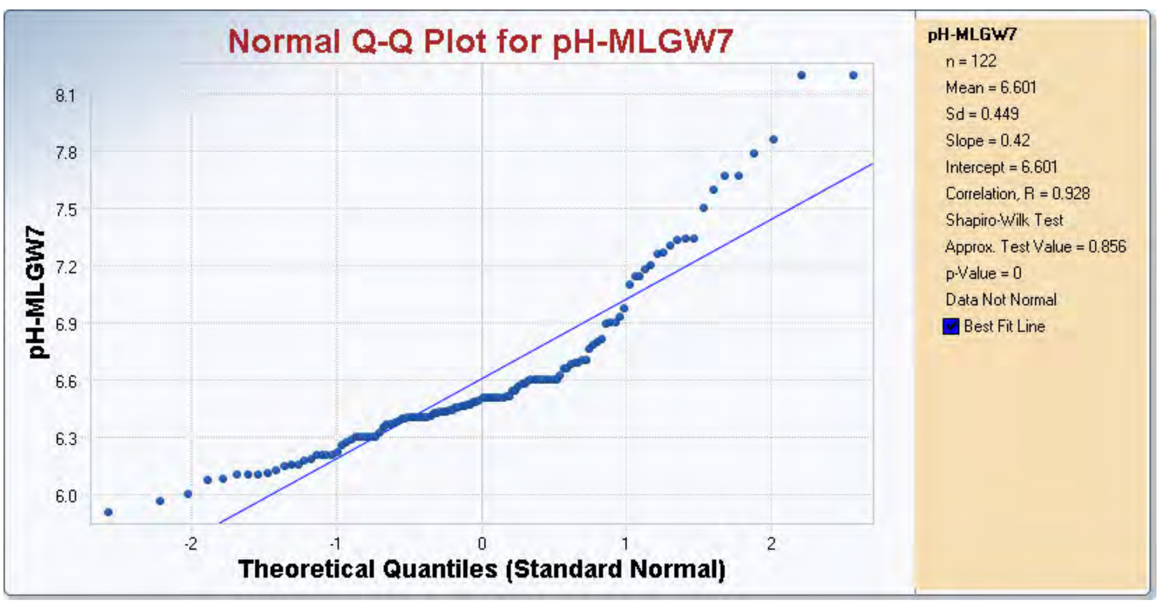


Figure 2. Q-Q Plot for pH in Well MLGW-7.

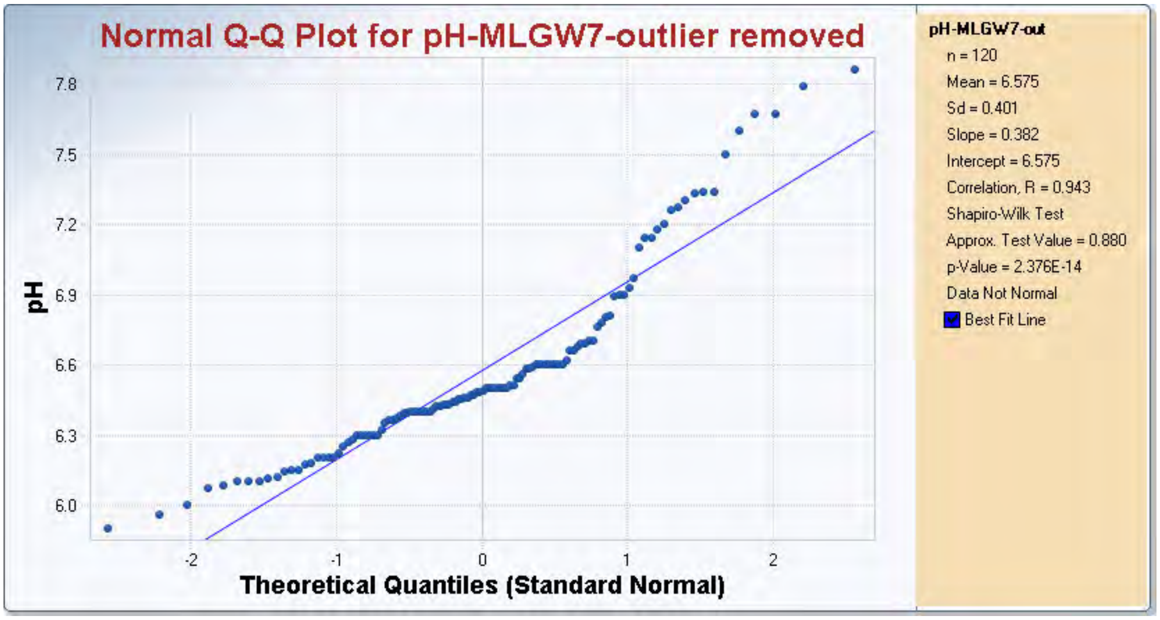


Figure 3. Q-Q Plot for pH in Well MLGW-7 after Removal of 2 Outliers.

Figure 3 illustrates the fact that the removal of the two apparent outliers does not materially improve the fit to a normal distribution. This is also true of the lognormal and gamma distributions. In the absence of evidence that these results are actually biased, there appears to be no compelling reason to consider removal of outliers from the data set. Outlier tests are difficult to apply to data where a distribution type is not clearly present, and may produce erroneous results. Therefore we worked with the full data set for pH in well MLGW-7.

For well MLGW-6, the outlier test produced a single clear outlier, namely a value of 4.4 measured in September of 1998. We did not remove this from the data set because of the above considerations and the fact that the robust calculations (see below) are effective at mitigating the impacts of outliers.

Background threshold values (BTVs) are estimated per EPA (6, 11) using the prediction interval or the tolerance interval statistics. Briefly, the “prediction interval” is a prediction of the interval in which the next sample data point will be expected to fall. The “tolerance interval” is the range in which there is a known probability (usually 95%) that a known percentage of the data points (also usually 95%) will fall. These are similar concepts, but not identical.

The background threshold values for pH must incorporate both a high value and a low value, whereas for toxic metals or other compounds of interest only an upper bound is required. Indeed, since such data are normally censored due to the application of detection limits, lower bounds would not be meaningful. For pH, lower bounds are meaningful because there is no censoring of the data.

Consequently the ProUCL software does not provide a computation for the lower bound. This has been provided for by EPA in a different tool, Scout 2008 (11), which does many of the same statistical calculations as ProUCL but also calculates lower bounds. Thus Scout will produce upper tolerance limits (UTLs) but also computes lower tolerance limits (LTLs). It also produces upper prediction limits (UPLs) and lower prediction limits (LTLs).

We have used this tool to generate values for these limits with the entire pH data set. These are provided in Tables 1 and 3, using classical statistical estimator procedures.

In addition to these, Scout has the capability of generating prediction and tolerance intervals using what is known as “robust” statistical methods. These are methods that are more resistant to issues that arise when data does not follow a discernable distribution or when it has outliers that skew the results. Table 2 and 4 show the results obtained using these tools. Robust techniques are usually confined to uncensored data, which is the case with pH.

Table 1. Prediction and Tolerance Intervals for pH in Well MLGW-7.

Calculated Statistic	MLGW-7 LTL	MLGW-7 UTL	MLGW-7 LPL	MLGW-7 UPL
Normal Distribution	5.77	7.43	5.71	7.49
Lognormal distribution	5.84	7.429	5.788	7.497
Gamma distribution	5.82	7.429	5.77	7.495
Non-Parametric (BCA Bootstrap)	6.1	7.78	6.061	7.855
AVERAGE of above	**5.9**	**7.5**	**5.8**	**7.6**

Table 2. Robust Prediction and Tolerance Intervals for pH in Well MLGW-7

Robust Method	LTL	UTL	LPL	UPL
PROP	6.046	6.867	6.019	6.894
Huber	5.86	7.292	5.807	7.345
Tukey Biweight	5.838	7.097	5.798	7.137
Lax Kafadar Biweight	5.91	7.04	5.874	7.076
MVT	5.967	7.006	5.927	7.046
AVERAGE of above	**5.9**	**7.1**	**5.9**	**7.1**

Table 3. Prediction and Tolerance Intervals for pH in Well MLGW-6.

Calculated Statistic	MLGW-6 LTL	MLGW-6 UTL	MLGW-6 LPL	MLGW-6 UPL
Normal Distribution	5.763	7.407	5.704	7.465
Lognormal distribution	5.783	7.464	5.73	7.532
Gamma distribution	5.78	7.44	5.726	7.512
Non-Parametric (BCA Bootstrap)	5.998	7.563	5.989	7.758
AVERAGE of above	**5.8**	**7.4**	**5.7**	**7.5**

Table 4. Robust Prediction and Tolerance Intervals for pH in Well MLGW-6.

Robust Method	LTL	UTL	LPL	UPL
PROP	5.98	7.137	5.94	7.177
Huber	5.913	7.249	5.866	7.296
Tukey Biweight	5.879	7.174	5.84	7.213
Lax Kafadar Biweight	5.906	7.176	5.866	7.216
MVT	6.004	7.031	5.967	7.069
AVERAGE of above	**5.9**	**7.2**	**5.9**	**7.2**

Without going into the details of the various methods used, it is notable that the different approaches produce very similar results for the LTL and LPL, and very similar results for MLGW-6 and MLGW-7. These values range between approximately 5.8 and 6.0 for both the LTL and the LPL. Where the robust methods produce a significant difference is for the UTL and UPL, which is lower than the value obtained using the "classical" statistical calculations. The "classical" approach produces UPL and UTL values between 7.5-7.9, whereas the "robust" calculations produce levels just above a pH of 7 for the UTL and UPL.

Development of a single set of BTVs for pH

The fact that the two wells produce very similar tolerance and prediction intervals is a good argument that a single set should suffice for both. However, to be more confident in this conclusion, we did conduct a null hypothesis test using ProUCL. This test compares the two data sets, with the null hypothesis that the mean of the two wells is the same. If the hypothesis is rejected then the two data sets are statistically different, if not they are indistinguishable from a statistical standpoint.

The t-test compares both the means for equality and conducts an F-test to compare variances. In both comparisons the conclusion is that the null hypothesis cannot be rejected and the two means are equal, and the variances are equal.

Since the t-test is a parametric test, we also applied the non-parametric Wilcoxon-Mann-Whitney test, which is non-parametric and also compares means. The conclusion based on this test is the same, namely that the two means are equal.

The detailed output of these calculations is provided in Excel files associated with this report.

Given the demonstrated equivalence of MLGW-6 and MLGW-7, we have used the cominbed data to develop upper and lower BTVs for pH that is proposed for the entire set of Mill POCs. These are provided in Tables 5 and 6, with details in the accompanying Excel files.

Table 5. Prediction and Tolerance Intervals for pH in Combined Data Set

Calculated Statistic	LTL	UTL	LPL	UPL
Normal Distribution	5.799	7.387	5.715	7.472
Lognormal distribution	5.84	7.41	5.767	7.506

Calculated Statistic	LTL	UTL	LPL	UPL
Gamma distribution	5.832	7.403	5.756	7.494
Non-Parametric (BCA Bootstrap)	6.0	7.754	6.0	7.791
AVERAGE of above	**5.9**	**7.5**	**5.8**	**7.5**

Table 6. Robust Prediction and Tolerance Intervals for pH in Combined Data Set.

Robust Method	LTL	UTL	LPL	UPL
PROP	6.021	7.008	5.97	7.059
Huber	5.913	7.243	5.842	7.313
Tukey Biweight	5.878	7.124	5.817	7.185
Lax Kafadar Biweight	5.933	7.083	5.877	7.14
MVT	6.007	6.995	5.954	7.048
AVERAGE of above	**6.0**	**7.1**	**5.9**	**7.1**

Recommended BTVs for Mill POCs

Based on the preceeding evaluations and calculations we recommend the following BTVs for pH in the Mill POCs.

Lower BTV = 5.9
Upper BTV= 8.5 (existing groundwater standard)

The lower limit is consistent with all the different methods. A single pH measurement below the lower limit could indicate that the water chemistry of the well has undergone a change and therefore needs additional evaluation. Based on the data obtained throughout this entire time period, there does not appear to be any reason to change the existing groundwater standard for the upper limit.

MLGW-15 and MLGW-17

These two wells each have had 5 samples collected at this point. A review of the data collected suggests that pH ranges are similar to those collected at MLGW-7 and MLGW-6.
Five data points are not a sufficient number to establish BTVs, according to EPA, ProUCL and Scout. However, we can obtain an initial indication if they are likely to fall into a similar statistical set as the general case we have evaluated.

The Scout software package will produce prediction and tolerance intervals using 5 data points but with a warning tht the data set is not large enough for reliability. Using this feature, we have calculated sets of these intervals for wells MLGW-15 and MLGW-17. These are shown in Tables 7 – 10.

Table 7. Prediction and Tolerance Intervals for pH in Well MLGW-15.

Calculated Statistic	LTL	UTL	LPL	UPL
Normal Distribution	6.151	7.125	6.293	6.987
Lognormal distribution	6.168	7.146	6.302	6.994
Gamma distribution	6.164	7.142	6.3	6.992
Non-Parametric (BCA Bootstrap)	6.513	6.785	6.415	6.8
AVERAGE of above	**6.2**	**7.0**	**6.3**	**6.9**

Table 8. Robust Prediction and Tolerance Intervals for pH in Well MLGW-15.

Robust Method	LTL	UTL	LPL	UPL
PROP	6.151	7.129	6.293	6.987
Huber	6.151	7.129	6.293	6.987
Tukey Biweight	6.135	7.141	6.268	7.008
Lax Kafadar Biweight	6.148	7.125	6.268	7.005
MVT	6.156	7.124	6.293	6.987
AVERAGE of above	**6.1**	**7.1**	**6.3**	**7.0**

Table 9. Prediction and Tolerance Intervals for pH in Well MLGW-17.

Calculated Statistic	LTL	UTL	LPL	UPL
Normal Distribution	5.529	7.911	5.876	7.564
Lognormal distribution	6.168	7.146	5.927	7.609
Gamma distribution	6.164	7.142	5.915	7.597
Non-Parametric (BCA Bootstrap)	6.513	6.785	6.23	7.1
AVERAGE of above	**6.1**	**7.3**	**6.0**	**7.5**

Table 10. Robust Prediction and Tolerance Intervals for pH in Well MLGW-17.

Robust Method	LTL	UTL	LPL	UPL
PROP	5.529	7.911	5.876	7.564
Huber	5.529	7.911	5.876	7.564
Tukey Biweight	5.458	7.965	5.773	7.65
Lax Kafadar Biweight	5.45	7.972	5.766	7.656
MVT	5.543	7.897	5.876	7.564
AVERAGE of above	**5.5**	**7.9**	**5.8**	**7.6**

MLGW-17 generally produces prediction intervals consistent with the proposed site BTV. Well MLGW-15 appears to be accomodated at this stage by somewhat narrower windows, but this is likely to be due to the reduced number of data points.

The proposed site BTV of 5.9 for the lower pH limit discussed above is appropriate for both of these wells. As additional data points are accumulated the option to revisit the statistics can be considered.

Well MLGW-ACR Data

pH data
Well MLGW-ACR was sampled when MLGW-15 and MLGW-17 were sampled and there are consequently 5 relatively recent data points available, collected from 2012-2013.

We also reviewed data showing 19 sampling results for pH from 1998 through 1999, and an additional 3 data points collected annually from 2000-2002.

When we used this set of data to calculate a BTV using the above methods, the result was very similar to that obtained for the MLGW-6 and MLGW-7. This is shown in Tables 11-12.

There is a gap in the pH data from 2002 to 2012, so a BTV based on the observations on this well alone might not be appropriate. However, over this entire period (1999-2013) there is no statistically significant indication of a trend in the pH, indicating that the behavior has probably not materially changed. A null hypothesis comparison between the 1999-2002 data and the 2012-2013 data indicates a significant likelihood that the mean pH during the earlier period is less than the mean pH of the more recent samplings, but this is likely a statistical consequence of the small number of data points available in the 2012-2013 period compared to the 1999-2002 period.

Based on these considerations, the sitewide BTV for pH proposed from the analysis of MLGW-6 and MLGW-7 should be statistically applicable in this well.

Table 11. Prediction and Tolerance Intervals for pH in Well MLGW-ACR.

Calculated Statistic	LTL	UTL	LPL	UPL
Normal Distribution	5.884	7.195	5.911	7.168
Lognormal distribution	5.916	7.214	5.941	7.184
Gamma distribution	5.909	7.209	5.934	7.18
Non-Parametric (BCA Bootstrap)	6.168	7.158	6.07	7.2
AVERAGE of above	**6.0**	**7.2**	**6.0**	**7.2**

Table 12. Robust Prediction and Tolerance Intervals for pH in MLGW-ACR.

Robust Method	LTL	UTL	LPL	UPL
PROP	5.893	7.178	5.92	7.152
Huber	5.886	7.192	5.913	7.164
Tukey Biweight	5.849	7.2	5.882	7.166
Lax Kafadar Biweight	5.822	7.213	5.86	7.175
MVT	5.948	7.03	5.966	7.012
AVERAGE of above	**5.9**	**7.2**	**5.9**	**7.1**

Iron and manganese data

Well MLGW-ACR was sampled when MLGW-15 and MLGW-17 were sampled and there are consequently 5 relatively recent data points available, collected from 2012-2013. We also reviewed data showing 19 sampling results for iron and manganese from 1998 through 1999, and an additional 2 data points collected annually from 2000-2001.

Iron and manganese were both very low or non-detect during the 1998-2001 time period. No data are available for this well between 2001 and 2012, but after 2012 detections of both iron and manganese have been observed.

The well has a steel casing, and it may be that the recent higher levels of iron and manganese are due to increasing degradation of the casing, perhaps because of bacterial activity. If so, the result may not represent the groundwater chemistry but rather the condition of the well itself.

Because there is a gap in the data for iron and manganese in MLGW-ACR between 2001 and 2012, there is no way to determine what may have been occuring in this intervening period, or to indicate the timing of the apparent trend from low or non-detected levels to the higher levels observed since 2012.

Before applying a standard to this well, we believe that the cause of the iron and manganese concentration increase should be further investigated. Therefore we propose to monitor and report data from the well until the investigation can be completed.

With regard to manganese, data collected will be reviewed to determine whether the existing ambient NPL developed for dissolved manganese in accordance with our earlier work Establishing Background Threshold Values (BTV) for Manganese (Gateway Enterprises, 2012) will sufficiently bracket conditions at MLGW-ACR.

References:

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5. USEPA Technology Support Center Issue, "The LogNormal Distribution in Environmental Applications," Ashok K. Singh, Anita Singh, and Max Engelhardt, EPA 600/S-97/006, December 1997.
6. ProUCL Version 4.1.00 Technical Guide, USEPA, EPA/600/R-07/041 May 2010.
7. "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites," Office of Emergency and Remedial Response, USEPA, OSWER 9285.6-10, December 2002.
8. Colorado Department of Public Health and Environment, Water Quality Control Division, "Total Maximum Daily Load Assessment, North Clear Creek, Gilpin County, Colorado, May 2008 – DRAFT.
9. Dag Hongve, "Cycling of Iron, Manganese, and Phosphate in a Meromictic Lake," Limnol. Oceonogr., 43(4), 1997, 635-647.
10. W.H. Dickinson and R.W. Pick, "Manganese-Dependent Corrosion in the Electric Utility Industry", Paper 02444 from Corrosion 2002 Annual Conference and Exhibition, Denver CO.
11. ProUCL 5.0.00 Technical Guide, EPA/600/R-07/041, Sept. 2013
12. http://www.epa.gov/esd/databases/scout/abstract.htm
13. Report from Gateway Enterprises to Climax Molybdenum Company, Feb. 28, 2012.

	Prediction Intervals/Limts (PLs) for Datasets Without Non-Detects	
User Selected Options		
Date/Time of Computation	4/16/2014 8:25:58 AM	
From File	C:\Working\Working Folder 4-1-2014\Henderson UPL calcs\pH.xls	
Full Precision	OFF	
Number of Future K Values	1	
Confidence Coefficient	0.95	
ph-MLGW15		
Number of Valid Observations	5	
Number of Distinct Observations	4	
Raw Statistics		
Mean	6.64	
Minimum	6.5	
5% Percentile	6.5	
10% Percentile	6.5	
1st Quartile	6.525	
Median	6.6	
3rd Quartile	6.675	
90% Percentile	6.75	
95% Percentile	6.775	
Maximum	6.8	
Standard Deviation	0.114	
MAD / 0.6745	0.148	
IQR / 1.35	0.148	
Normal Statistics		
1% Percentile (z)	6.375	
5% Percentile (z)	6.452	
10% Percentile (z)	6.494	
1st Quartile (z)	6.563	
Median (z)	6.64	
3rd Quartile (z)	6.717	
90% Percentile (z)	6.786	
95% Percentile (z)	6.828	
99% Percentile (z)	6.905	
Normal Prediction Intervals		
Prediction	Lower Limit	Upper Limit
Student's t	6.293	6.987
For Next 1	6.293	6.987
Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!		
It is suggested to collect at least 8 to 10 observations using these statistical methods!		
If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.		
Gamma Statistics		
k hat	4250	
Theta hat	0.00156	
nu hat	42504	
k star	1700	
Theta star	0.00391	
MLE of Mean	6.64	
MLE of Standard Deviation	0.161	
nu star	17003	
95% Percentile of Chisquare (2k)	3537	
Approximate Gamma Prediction Intervals		
Prediction	Lower Limit	Upper Limit
Gamma Wilson Hilferty	6.299	6.992
Gamma Hawkins Wixley	6.3	6.992

	A	B	C	D	E	F	G	H	I	J	K	L
67	Gamma Wilson Hilferty For Next 1			6.299	6.992							
68	Gamma Hawkins Wixley For Next 1			6.3	6.992							
69												
70	**Log-Transformed Statistics**											
71	Mean of Log-Transformed Data				1.893							
72	Standard Deviation of Log-Transformed Data				0.0171							
73												
74	**Log-Transformed Prediction Intervals**											
75	Prediction			Lower Limit	Upper Limit							
76	Log			6.302	6.994							
77	For Next 1			6.302	6.994							
78												
79	**Nonparametric Prediction Intervals**											
80	Chebyshev			Lower Limit	Upper Limit							
81	Chebyshev			6.081	7.199							
82	Prediction			Lower Limit	Upper Limit							
83	Nonparametric			6.415	6.8							
84												
85	**ph_MLGW17**											
86												
87	Number of Valid Observations				5							
88	Number of Distinct Observations				4							
89												
90	**Raw Statistics**											
91	Mean				6.72							
92	Minimum				6.4							
93	5% Percentile				6.4							
94	10% Percentile				6.4							
95	1st Quartile				6.45							
96	Median				6.6							
97	3rd Quartile				6.825							
98	90% Percentile				7							
99	95% Percentile				7.05							
100	Maximum				7.1							
101	Standard Deviation				0.277							
102	MAD / 0.6745				0.297							
103	IQR / 1.35				0.37							
104												
105	**Normal Statistics**											
106												
107	1% Percentile (z)				6.074							
108	5% Percentile (z)				6.264							
109	10% Percentile (z)				6.364							
110	1st Quartile (z)				6.533							
111	Median (z)				6.72							
112	3rd Quartile (z)				6.907							
113	90% Percentile (z)				7.076							
114	95% Percentile (z)				7.176							
115	99% Percentile (z)				7.366							
116												
117	**Normal Prediction Intervals**											
118	Prediction			Lower Limit	Upper Limit							
119	Student's t			5.876	7.564							
120	For Next 1			5.876	7.564							
121												
122	**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
123												
124	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
125	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
126												
127												
128	**Gamma Statistics**											
129	k hat				738.2							
130	Theta hat				0.0091							
131	nu hat				7382							
132	k star				295.4							

	A	B	C	D	E	F	G	H	I	J	K	L
133				Theta star	0.0227							
134				MLE of Mean	6.72							
135				MLE of Standard Deviation	0.391							
136				nu star	2954							
137				95% Percentile of Chisquare (2k)	648.5							
138												
139			Approximate Gamma Prediction Intervals									
140			Prediction	Lower Limit	Upper Limit							
141			Gamma Wilson Hilferty	5.911	7.593							
142			Gamma Hawkins Wixley	5.915	7.597							
143			Gamma Wilson Hilferty For Next 1	5.911	7.593							
144			Gamma Hawkins Wixley For Next 1	5.915	7.597							
145												
146			Log-Transformed Statistics									
147				Mean of Log-Transformed Data	1.904							
148				Standard Deviation of Log-Transformed Data	0.0411							
149												
150			Log-Transformed Prediction Intervals									
151			Prediction	Lower Limit	Upper Limit							
152			Log	5.927	7.609							
153			For Next 1	5.927	7.609							
154												
155			Nonparametric Prediction Intervals									
156			Chebyshev	Lower Limit	Upper Limit							
157			Chebyshev	5.361	8.079							
158			Prediction	Lower Limit	Upper Limit							
159			Nonparametric	6.23	7.1							
160												

Robust Tolerance Intervals/Limits (TLs)

Date/Time of Computation	4/15/2014 12:04:47 PM
User Selected Options	
From File	C:\Working\Working Folder 4-1-2014\Henderson UPL calcs\pH.xls
Full Precision	OFF
Confidence Coefficient	0.95
Coverage	0.9
PROP Method	Influence Function Alpha of 0.025 with MDs following Beta Distribution.
	PROP TLs derived using 10 Iterations and initial estimates of median/1.48MAD.
Huber Method	Influence Function Alpha of 0.025 with MDs following Beta Distribution.
	Huber TLs derived using 10 Iterations and initial estimates of median/1.48MAD.
Tukey Biweight Method	Location Tuning Constant of 4 and a Scale Tuning Constant of 6
	Tukey Biweight TLs derived using a Maximum of 10 Iterations and initial estimates of median/1.48MAD.
Lax/Kafadar Biweight Method	Location Tuning Constant of 4 and a Scale Tuning Constant of 6
	Lax/Kafadar TLs derived using a Maximum of 10 Iterations and initial estimates of median/1.48MAD.
MVT Method	Triming Percentage of 10%
	MVT TLs derived using 10 Iterations and initial estimates of median/1.48MAD.

K2 represents the two-sided cutoff for tolerance intervals and is computed based upon Wsum Values following the procedure described in Hahn and Meeker (1991)

ph-MLGW6

	Number Obs.	Mean	Median	Standard Deviation	MAD/ 0.6745	k2	LTL	UTL
Classical	113	6.585	6.53	0.443	0.282	1.858	5.763	7.407

Method	Initial Location	Initial Scale	Final Mean	Final Stdv	Wsum	k2	LTL	UTL
PROP	6.53	0.282	6.558	0.31	107.7	1.864	5.98	7.137
Huber	6.53	0.282	6.581	0.359	111	1.86	5.913	7.249
Tukey Biweight	6.53	0.282	6.527	0.344	92.85	1.884	5.879	7.174
Lax Kafadar Biweight	6.53	0.282	6.541	0.338	97.33	1.878	5.906	7.176
MVT	6.53	0.282	6.518	0.276	102	1.858	6.004	7.031

Prediction Intervals/Limts (PLs) for Datasets Without Non-Detects

User Selected Options	
Date/Time of Computation	4/15/2014 10:56:27 AM
From File	C:\Working\Working Folder 4-1-2014\Henderson UPL calcs\pH.xls
Full Precision	OFF
Number of Future K Values	1
Confidence Coefficient	0.95

pH-combined6_7

Number of Valid Observations	235
Number of Distinct Observations	103

Raw Statistics

Mean	6.593
Minimum	4.43
5% Percentile	6.095
10% Percentile	6.155
1st Quartile	6.335
Median	6.5
3rd Quartile	6.71
90% Percentile	7.2
95% Percentile	7.38
Maximum	8.2
Standard Deviation	0.445
MAD / 0.6745	0.297
IQR / 1.35	0.274

Normal Statistics

1% Percentile (z)	5.559
5% Percentile (z)	5.862
10% Percentile (z)	6.023
1st Quartile (z)	6.293
Median (z)	6.593
3rd Quartile (z)	6.893
90% Percentile (z)	7.163
95% Percentile (z)	7.325
99% Percentile (z)	7.628

Normal Prediction Intervals

Prediction	Lower Limit	Upper Limit
Student's t	5.715	7.472
For Next 1	5.715	7.472

Gamma Statistics

k hat	224.8
Theta hat	0.0293
nu hat	105673
k star	222
Theta star	0.0297
MLE of Mean	6.593
MLE of Standard Deviation	0.443
nu star	104326
95% Percentile of Chisquare (2k)	494.1

Approximate Gamma Prediction Intervals

Prediction	Lower Limit	Upper Limit
Gamma Wilson Hilferty	5.752	7.491
Gamma Hawkins Wixley	5.756	7.494
Gamma Wilson Hilferty For Next 1	5.752	7.491
Gamma Hawkins Wixley For Next 1	5.756	7.494

Log-Transformed Statistics

Mean of Log-Transformed Data	1.884
Standard Deviation of Log-Transformed Data	0.0667

	A	B	C	D	E	F	G	H	I	J	K	L
67												
68		Log-Transformed Prediction Intervals										
69			Prediction	Lower Limit	Upper Limit							
70			Log	5.767	7.505							
71			For Next 1	5.767	7.505							
72												
73		Nonparametric Prediction Intervals										
74			Chebyshev	Lower Limit	Upper Limit							
75			Chebyshev	4.6	8.587							
76			Prediction	Lower Limit	Upper Limit							
77			Nonparametric	6	7.791							
78												

	A–C	D	E
1		Prediction Intervals/Limts (PLs) for Datasets Without Non-Detects	
2	User Selected Options		
3	Date/Time of Computation	5/5/2014 9:31:24 AM	
4	From File	C:\Working\Working Folder 4-1-2014\Aquionix\Henderson UPL calcs\Old data for MLGW-ACR\pHdata.xls	
5	Full Precision	OFF	
6	Number of Future K Values	1	
7	Confidence Coefficient	0.95	
8			
9	ph_MLGW-ACR		
10			
11	Number of Valid Observations		27
12	Number of Distinct Observations		24
13			
14	Raw Statistics		
15	Mean		6.539
16	Minimum		6.1
17	5% Percentile		6.135
18	10% Percentile		6.214
19	1st Quartile		6.24
20	Median		6.55
21	3rd Quartile		6.685
22	90% Percentile		6.942
23	95% Percentile		7.105
24	Maximum		7.2
25	Standard Deviation		0.3
26	MAD / 0.6745		0.371
27	IQR / 1.35		0.341
28			
29	Normal Statistics		
30			
31	1% Percentile (z)		5.841
32	5% Percentile (z)		6.046
33	10% Percentile (z)		6.155
34	1st Quartile (z)		6.337
35	Median (z)		6.539
36	3rd Quartile (z)		6.742
37	90% Percentile (z)		6.924
38	95% Percentile (z)		7.033
39	99% Percentile (z)		7.237
40			
41	Normal Prediction Intervals		
42	Prediction	Lower Limit	Upper Limit
43	Student's t	5.911	7.168
44	For Next 1	5.911	7.168
45			
46	Gamma Statistics		
47	k hat		500.4
48	Theta hat		0.0131
49	nu hat		27023
50	k star		444.9
51	Theta star		0.0147
52	MLE of Mean		6.539
53	MLE of Standard Deviation		0.31
54	nu star		24022
55	95% Percentile of Chisquare (2k)		960.2
56			
57	Approximate Gamma Prediction Intervals		
58	Prediction	Lower Limit	Upper Limit
59	Gamma Wilson Hilferty	5.931	7.178
60	Gamma Hawkins Wixley	5.934	7.18
61	Gamma Wilson Hilferty For Next 1	5.931	7.178
62	Gamma Hawkins Wixley For Next 1	5.934	7.18
63			
64	Log-Transformed Statistics		
65	Mean of Log-Transformed Data		1.877
66	Standard Deviation of Log-Transformed Data		0.0454

	A	B	C	D	E	F	G	H	I	J	K	L
67												
68		Log-Transformed Prediction Intervals										
69			Prediction	Lower Limit	Upper Limit							
70			Log	5.941	7.184							
71			For Next 1	5.941	7.184							
72												
73		Nonparametric Prediction Intervals										
74			Chebyshev	Lower Limit	Upper Limit							
75			Chebyshev	5.172	7.906							
76			Prediction	Lower Limit	Upper Limit							
77			Nonparametric	6.07	7.2							
78												

	Tolerance Intervals/Limits (TLs) for Datasets Without Non-Detects	
Date/Time of Computation	5/5/2014 9:32:38 AM	
User Selected Options		
From File	C:\Working\Working Folder 4-1-2014\Aquionix\Henderson UPL calcs\Old data for MLGW-ACR\pHdata.xls	
Full Precision	OFF	
Number of Bootstrap Operations	2000	
Coverage	0.9	
Confidence Coefficient	0.95	
ph_MLGW-ACR		
Number of Valid Observations	27	
Number of Distinct Observations	24	
Raw Statistics		
Mean	6.539	
Minimum	6.1	
5% Percentile	6.135	
10% Percentile	6.214	
1st Quartile	6.24	
Median	6.55	
3rd Quartile	6.685	
90% Percentile	6.942	
95% Percentile	7.105	
Maximum	7.2	
Standard Deviation	0.3	
MAD / 0.6745	0.371	
IQR / 1.35	0.341	
Normal Statistics		
1% Percentile (z)	5.841	
5% Percentile (z)	6.046	
10% Percentile (z)	6.155	
1st Quartile (z)	6.337	
Median (z)	6.539	
3rd Quartile (z)	6.742	
90% Percentile (z)	6.924	
95% Percentile (z)	7.033	
99% Percentile (z)	7.237	
K2	2.184	
Normal Tolerance Intervals		
Tolerance	Lower Limit	Upper Limit
Normal	5.884	7.195
Gamma Statistics		
k hat	500.4	
Theta hat	0.0131	
nu hat	27023	
k star	444.9	
Theta star	0.0147	
MLE of Mean	6.539	
MLE of Standard Deviation	0.31	
nu star	24022	
95% Percentile of Chisquare (2k)	960.2	
Approximate Gamma Tolerance Intervals		
Tolerance	Lower Limit	Upper Limit
Gamma Wilson Hilferty	5.906	7.207
Gamma Hawkins Wixley	5.909	7.209
Log-Transformed Statistics		
Mean of Log-Transformed Data	1.877	
Standard Deviation of Log-Transformed Data	0.0454	
Log-Transformed Tolerance Intervals		

	A	B	C	D	E	F	G	H	I	J	K	L
67			Tolerance	Lower Limit	Upper Limit							
68			Lognormal	5.916	7.214							
69												
70		**Nonparametric Tolerance Intervals**										
71			Tolerance	Lower Limit	Upper Limit							
72			% Bootstrap	6.686	7.158							
73			BCA Bootstrap	6.68	7.158							
74			% TL	6.168	7.158							
75												

Robust Prediction Intervals/Limits (PLs)

Date/Time of Computation	5/5/2014 9:34:52 AM
User Selected Options	
From File	C:\Working\Working Folder 4-1-2014\Aquionix\Henderson UPL calcs\Old data for MLGW-ACR\pHdata.xls
Full Precision	OFF
Confidence Coefficient	0.95
Number of future K values	1
PROP Method	Influence Function Alpha of 0.025 with MDs following Beta Distribution.
	PROP PLs derived using 10 Iterations and initial estimates of median/1.48MAD.
Huber Method	Influence Function Alpha of 0.025 with MDs following Beta Distribution.
	Huber PLs derived using 10 Iterations and initial estimates of median/1.48MAD.
Tukey Biweight Method	Location Tuning Constant of 4 and a Scale Tuning Constant of 6
	Tukey Biweight PLs derived using a Maximum of 10 Iterations and initial estimates of median/1.48MAD.
Lax/Kafadar Biweight Method	Location Tuning Constant of 4 and a Scale Tuning Constant of 6
	Lax/Kafadar PLs derived using a Maximum of 10 Iterations and initial estimates of median/1.48MAD.
MVT Method	Triming Percentage of 10%
	MVT PLs derived using 10 Iterations and initial estimates of median/1.48MAD.

ph_MLGW-ACR

	Number Obs.	Mean	Median	Standard Deviation	MAD/ 0.6745	SE Mean	Critical t	Next 1 LPL	Next 1 UPL
Classical	27	6.539	6.55	0.3	0.371	0.0578	2.056	5.911	7.168

Method	Initial Mean	Initial Stdv	Final Mean	Final Stdv	Wsum	SEM	Critical t	LPL	UPL
PROP	6.55	0.371	6.536	0.294	26.86	0.0568	2.056	5.92	7.152
Huber	6.55	0.371	6.539	0.299	26.97	0.0576	2.056	5.913	7.164
Tukey Biweight	6.55	0.371	6.524	0.305	24.98	0.061	2.064	5.882	7.166
Lax Kafadar Biweight	6.55	0.371	6.517	0.312	24.2	0.0634	2.068	5.86	7.175
MVT	6.55	0.371	6.489	0.248	25	0.0497	2.064	5.966	7.012

	Robust Tolerance Intervals/Limits (TLs)
Date/Time of Computation	5/5/2014 9:35:42 AM
User Selected Options	
From File	C:\Working\Working Folder 4-1-2014\Aquionix\Henderson UPL calcs\Old data for MLGW-ACR\pHdata.xls
Full Precision	OFF
Confidence Coefficient	0.95
Coverage	0.9
PROP Method	Influence Function Alpha of 0.025 with MDs following Beta Distribution.
	PROP TLs derived using 10 Iterations and initial estimates of median/1.48MAD.
Huber Method	Influence Function Alpha of 0.025 with MDs following Beta Distribution.
	Huber TLs derived using 10 Iterations and initial estimates of median/1.48MAD.
Tukey Biweight Method	Location Tuning Constant of 4 and a Scale Tuning Constant of 6
	Tukey Biweight TLs derived using a Maximum of 10 Iterations and initial estimates of median/1.48MAD.
Lax/Kafadar Biweight Method	Location Tuning Constant of 4 and a Scale Tuning Constant of 6
	Lax/Kafadar TLs derived using a Maximum of 10 Iterations and initial estimates of median/1.48MAD.
MVT Method	Triming Percentage of 10%
	MVT TLs derived using 10 Iterations and initial estimates of median/1.48MAD.

K2 represents the two-sided cutoff for tolerance intervals and is computed based upon Wsum Values following the procedure described in Hahn and Meeker (1991)

ph_MLGW-ACR

	Number Obs.	Mean	Median	Standard Deviation	MAD/ 0.6745	k2	LTL	UTL
Classical	27	6.539	6.55	0.3	0.371	2.184	5.884	7.195

Method	Initial Location	Initial Scale	Final Mean	Final Stdv	Wsum	k2	LTL	UTL
PROP	6.55	0.371	6.536	0.294	26.86	2.184	5.893	7.178
Huber	6.55	0.371	6.539	0.299	26.97	2.184	5.886	7.192
Tukey Biweight	6.55	0.371	6.524	0.305	24.98	2.215	5.849	7.2
Lax Kafadar Biweight	6.55	0.371	6.517	0.312	24.2	2.232	5.822	7.213
MVT	6.55	0.371	6.489	0.248	25	2.178	5.948	7.03

Appendix K

Assessment of Proposed Point of Compliance (POC) Well – MLGW-37, Technical Memorandum

Climax Molybdenum Company – Henderson Operations

1746 County Road 202

Empire, Colorado 80438

ASSESSMENT OF PROPOSED POINT OF COMPLIANCE (POC) WELL – MLGW-37 TECHNICAL MEMORANDUM HENDERSON MILL

Grand County, Colorado

December 2024

Prepared by:

AJAX

28828 Cedar Circle

Evergreen, CO 80439

CLEAR CREEK ASSOCIATES

8777 North Gainey Center Drive, Suite 250

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1.0 INTRODUCTION

In 2023, Henderson Operations initiated a task to site, design, and install a new well to potentially replace the previously established Point of Compliance well located at Aspen Canyon Ranch (ACR). This Technical Memorandum presents the results of a technical assessment of recently installed well MLGW-37 as a potential point of compliance (POC) for domestic water supply standards.

The Henderson Mill and Tailing Storage Facility (TSF) are located within the Ute Creek Basin of the Williams Fork River Valley, south of Parshall, in Grand County, Colorado. Figure 1 presents a regional map showing the location and geographic setting of the Henderson Mill, TSF area, and the location of MLGW-37.

1.1 BACKGROUND

The Aspen Canyon Ranch (ACR) well (MLGW-ACR) was previously established as Henderson Mill's POC for domestic water supply standards (Henderson, 2012). However, the ACR property was recently sold to a new owner, and Henderson has not been able to gain access to perform required sampling at MLGW-ACR. Further, as discussed in prior Henderson annual water quality reports and other communications, MLGW-ACR is constructed of unperforated, mild steel casing that is believed to cause corrosion and stagnation within the well casing resulting in elevated and non-representative iron and manganese levels (AJAX and Clear Creek Associates, 2015). As such, MLGW-37 was sited, designed, and constructed to potentially replace MLGW-ACR as the POC for domestic water supply standards. As discussed in this technical memorandum, MLGW-37 is a newly constructed well located on Henderson property, located and designed to alleviate both access issues and issues associated with MLGW-ACR's unconventional well design.

2.0 POC WELL ASSESSMENT

2.1 SITE SELECTION

Henderson completed a siting evaluation that reviewed potential replacement locations within the Williams Fork River Valley downgradient of the TSF. This process identified a parcel of Henderson-owned property leased to Eric Pickering (Pickering Ranch), as a potential location for a new well. Pickering Ranch is located approximately two miles north of the Henderson Mill TSF. Pickering Ranch is identified on Figure 2. This location was selected for the following reasons:

- The property is owned by Henderson, which addresses the access issues that have influenced monitoring activities at the ACR location.
- The location is within the Williams Fork River Valley downgradient of the Henderson Mill TSF and upgradient of the ACR property.

Additionally, while the geology of the location had not been investigated previously, the topography indicated that much of the property was underlain by alluvial/glacial deposits that comprise the domestic water supply aquifer system in the William's Fork River Valley.

Henderson selected a site in the eastern part of the property for the drilling and installation of a new well. The location is shown on Figure 2.

2.2 WELL INSTALLATION

Drilling and well construction operations were conducted by Boart-Longyear Drilling Services of Glendale, Arizona. Boart-Longyear used an LS600T sonic drilling rig for drilling and construction activities. A Clear Creek geologist logged the sonic core from the borehole and provided oversight during drilling, logging, construction, and development activities. Henderson drilled the well under a notice of intent (4000431-MH), which is presented in Appendix A, and has filed a monitoring well permit application. Drilling and construction activities were completed on November 2, 2023.

Boart-Longyear drilled the borehole by advancing 7-inch sonic core tooling, followed by 8-inch drill casing, to 100 feet below land surface (ft bls).

A Clear Creek geologist logged and photographed the sonic core. Logging information included color, rock type, mineralogy, grain size, degree of cementation, clast composition, and reaction to hydrochloric acid. The lithologic log for MLGW-37 is presented in Appendix B. The lithology of MLGW-37 consists of:

- 0 to 7 feet – Topsoil.
- 7 to 92 feet – Quaternary alluvial and glacial drift sediments (Qd) - poorly sorted cobbles, gravel, and sand mixed with silt and clay. Below 29 ft bgs sediments consisted of poorly sorted to clayey cobbles and gravel with sand.
- 92 to 100 feet – Precambrian schist (Xg) - clayey, weathered, and slightly friable schist to 93 ft bgs and more competent, dry schist below to the final depth of 100 ft bgs.

Saturated Qd sediments were encountered at 43 ft bls. The thickness of the saturated Qd sediments in MLGW-37 was approximately 50 feet.

AJAX and Clear Creek developed the final well design based on the lithology and groundwater conditions observed during drilling. The design incorporated industry-standard elements for monitoring groundwater conditions and ensuring the highest quality of water quality samples. This included:

- Four-inch Schedule 80 polyvinyl chloride (PVC) casing, instead of steel, which is susceptible to corrosion and related chemical effects.
- Well screen (0.040 slots) and #8 to #12 mesh size silica-sand filter pack, which enables development and water production from a more representative portion of the aquifer than the open-bottom design used in the MLGW-ACR well.
- Annular seals of hydrated bentonite chips and cement grout that extend from the top of the silica-sand filter pack to ground surface, which prevent contamination of the filter pack and screened interval from surface water.

Boart-Longyear completed the well installation in accordance with the final design. The well was constructed using the casing-pullback approach, which involves installing the well casing and annular materials within the drill casing, which is removed during installation of the annular materials. An As-built diagram of the completed well is presented in Figure 3.

Following installation, Boart-Longyear developed the well by swabbing and bailing, followed by pumping using a temporary submersible pump until field parameters including sand content, pH, specific conductance, and temperature stabilized. Development activities were completed on November 16, 2023.

3.0 ASSESSMENT SUMMARY

The following assessment findings support establishing MLGW-37 as a new POC for domestic water quality standards for the Henderson Mill property and replacing the previously established ACR well:

- The Pickering Ranch property is owned by Henderson, which alleviates the access issues associated with the ACR property.
- The MLGW-37 well was designed, constructed, and developed using industry-standard and accepted methods for groundwater monitoring. Additionally, unlike MLGW-ACR, all activities were observed and documented by an on-site geologist.
- MLGW-37 is screened within the Qd aquifer and is located downgradient of the Henderson Mill TSF.

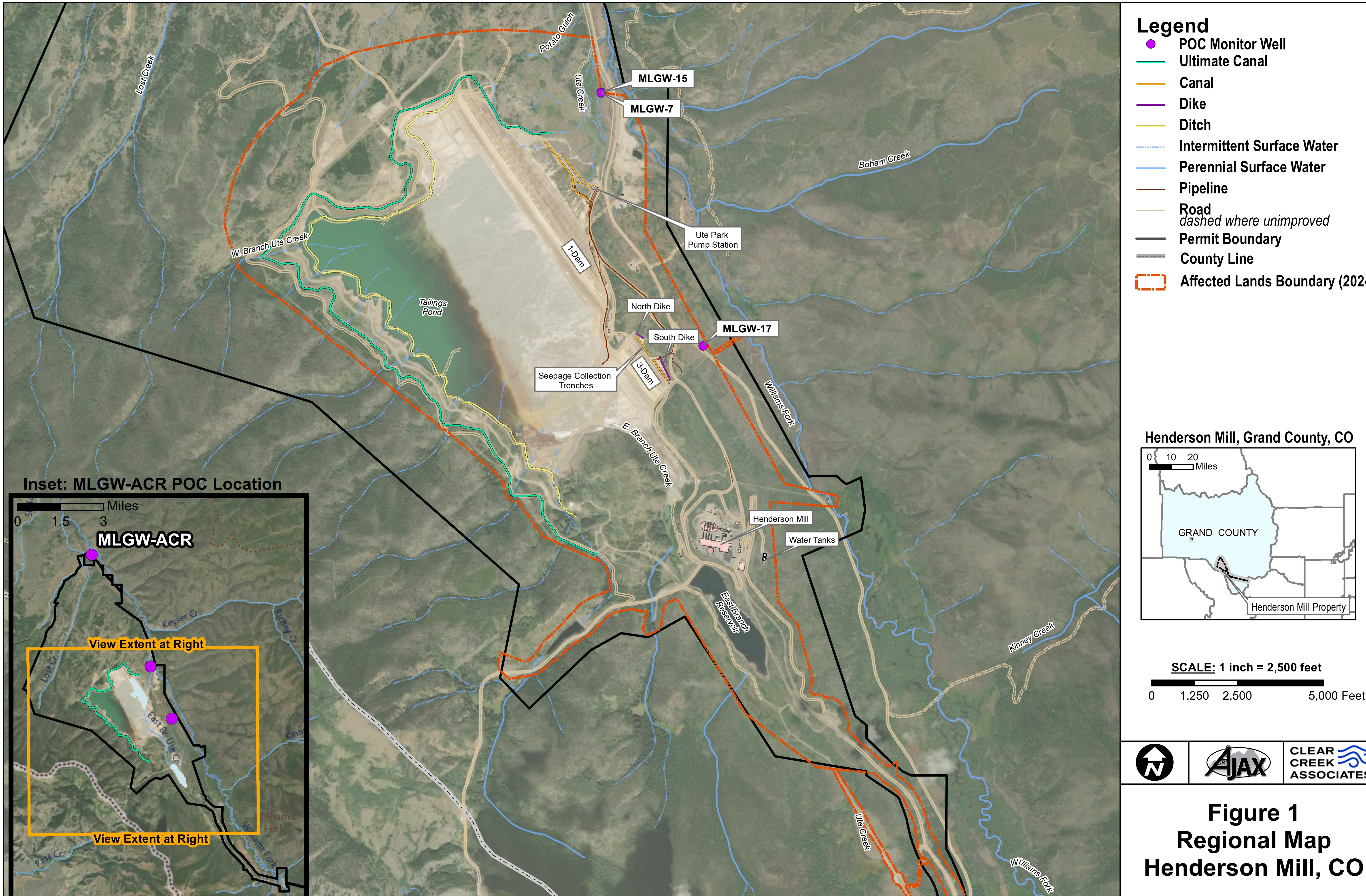
Based on the construction of MLGW-37, and the screened interval within the saturated Qd sediments, the water quality samples collected from MLGW-37 will be representative of aquifer conditions at nearby domestic water supply wells.

4.0 REFERENCES

Climax Molybdenum Company Henderson Operations, 2012. Technical Revision (TR-16) to Permit M-1977-342 Groundwater Management Plan. April 2012.

AJAX and Clear Creek Associates, 2015. Groundwater Quality Memorandum for Point of Compliance (POC) Well – MLGW-ACR Henderson Mill. September 2015.

FIGURES



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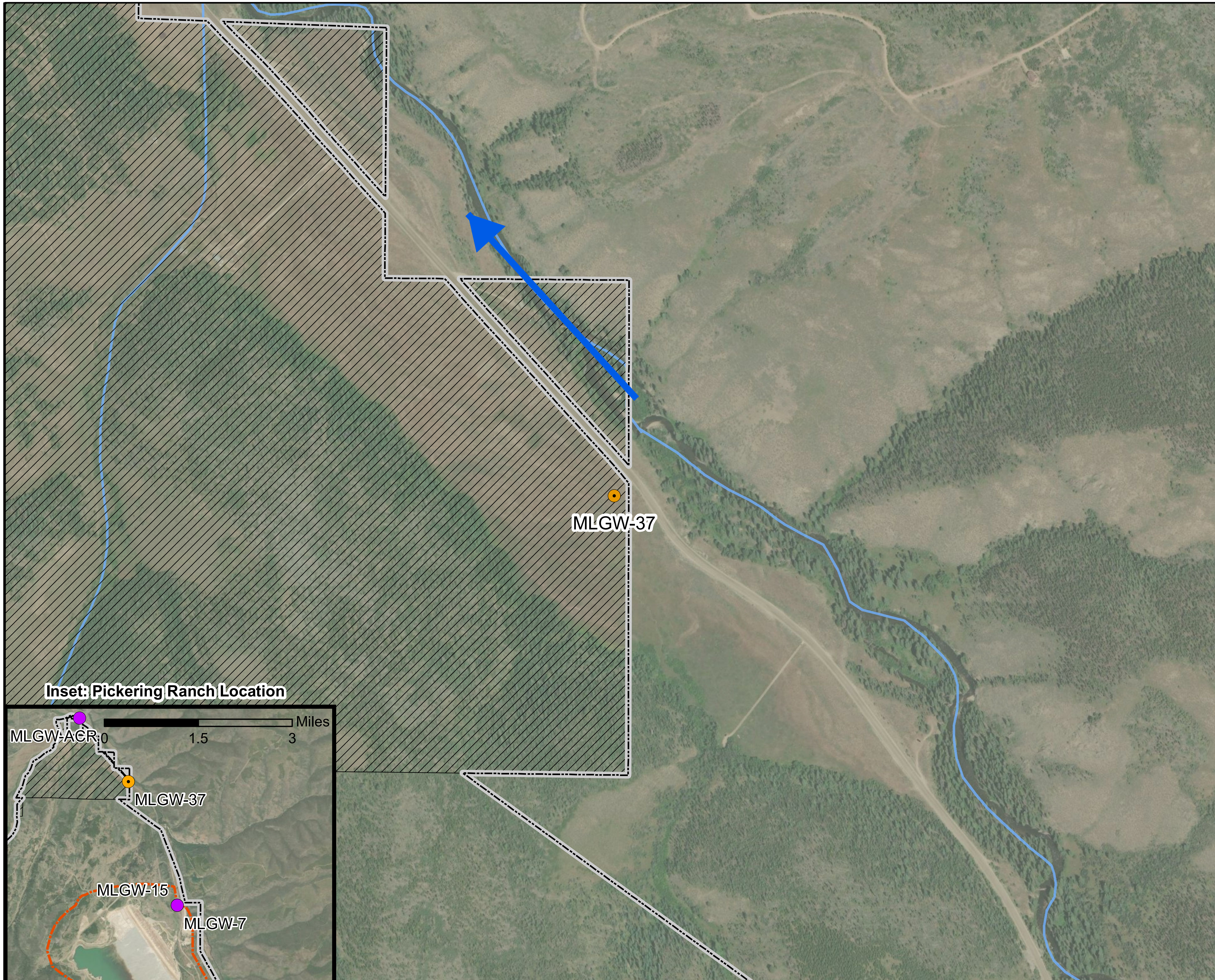


Legend

- POC Monitor Well
- 2023 Monitor Well
- Perennial Surface Water
- Permit Boundary
- Pickering Ranch Parcel
- Affected Lands Boundary (2024)
- Groundwater Flow Direction

SCALE: 1 inch: 500 feet

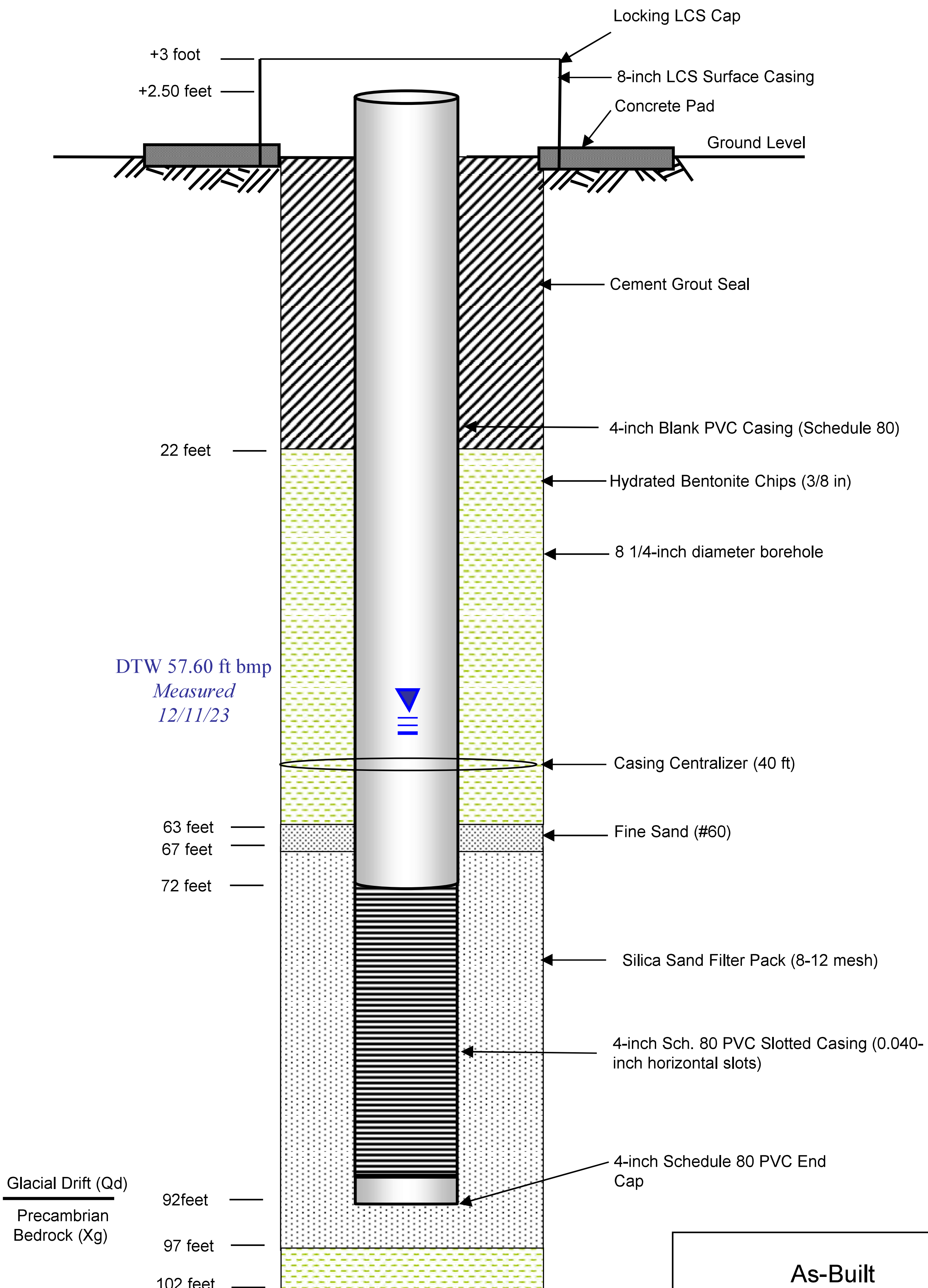
0 500 1,000 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri

AJAX
CLEAR CREEK ASSOCIATES

Figure 2
MLGW-37 Location
Henderson Mill, CO

Document Path: P:\Freeport McMoRan\Henderson\Data and Maps\Figure2_TM_MLGW-37_Location.mxd



NOT TO SCALE

Notes: LCS = Low carbon steel DTW = Depth to water
PVC = Polyvinyl chloride ft bmp = Feet below measuring point
Constructed on November 2, 2023

As-Built
MLGW-37

APPENDIX A

MLGW-37 Permit

COLORADO
Division of Water Resources
Department of Natural Resources

ACKNOWLEDGEMENT NUMBER 4000431-MH
RECEIPT NUMBER 04000431

HOLE/WELL OWNER(S)

CLIMAX MOLYBDENUM CO. HENDERSON

HOLE/WELL CONSTRUCTOR

BOART LONGYEAR COMPANY (MICHAEL VAN AACKEN)

CONTACT/CONSULTANT(S)

LEAH WOLF MARTIN

Proposed Hole/Well Information

Number of holes/wells:	1
Maximum Depth:	200 FT
Aquifer:	ALLUVIAL
Aquifer Type:	Type 3 (Alluvial)

APPROVED HOLE/WELL LOCATION

Water Division: 5 Water District: 51
Designated Basin: N/A
Management District: N/A
County: GRAND

Section 34 Township 1.0 S Range 78.0 W Sixth P.M.

Purpose of holes/wells: Monitoring and observation hole
Anticipated Construction Start Date: 10/23/2023

Acknowledgment From State Engineer's Office

ACKNOWLEDGEMENT OF THIS NOTICE DOES NOT CONFER A WATER RIGHT

CONDITIONS OF ACKNOWLEDGEMENT

1) In accordance with Rule 6.3 of the Water Well Construction Rules (2 CCR 402-2), a Notice of Intent was provided to the State Engineer at least 72 hours prior to construction of monitoring & observation hole(s).

2) Construction of the monitoring and observation hole(s) must be completed within 90 days of the date the Notice of Intent was submitted to the State Engineer. Testing and/or pumping shall not exceed a total of 200 hours unless prior written approval is obtained from the State Engineer. Water diverted during testing must not be used for beneficial purposes. The owner of the monitoring and observation hole(s) is responsible for obtaining permit(s) and complying with all rules and regulations pertaining to the discharge of fluids produced during testing.

3) All work must comply with the Water Well Construction Rules, 2 CCR 402-2. Well Construction and Yield Estimate Reports (GWS-31) must be completed for each monitoring and observation hole drilled. The licensed contractor or authorized individual must submit the completed forms to DwrPermitsOnline@state.co.us within 60 days of monitoring and observation hole completion. Aquifer testing information must be submitted on Well Yield Test Report (GWS-39). Forms are available at: https://dwr.state.co.us/eforms

4) Unless a well permit is obtained or variance approved, the monitoring and observation hole(s) must be plugged and sealed within eighteen (18) months after construction. An Abandonment Report (GWS-09) must be submitted within 60 days of plugging & sealing to confirm the monitoring and observation hole is no longer in existence. The MH acknowledgement number, owner's structure name, and owner's name and address must be provided on all well permit application(s), well construction, and abandonment reports. Forms are available at: https://dwr.state.co.us/eforms

5) A MONITORING AND OBSERVATION HOLE CANNOT BE CONVERTED TO A PRODUCTION WATER WELL, except for purposes of remediation (recovery), or as a permanent dewatering system, if constructed in accordance with the Water Well Construction Rules and policies of the State Engineer.

6) A copy of the acknowledgement (or the notice, if not acknowledged within 3 days of submittal) must be available at the drilling site.

7) This acknowledgement of notice does not indicate that well permit(s) can be approved.

8) If monitoring and observation holes will not be constructed under this notice within 90 days, please indicate "No holes constructed" in an email with the MH acknowledgement number and send to: DwrPermitsOnline@state.co.us

Alex Teitz

Issued By: ALEX TEITZ

Date Notice received by DWR: 10/17/2023
Notice Expiration Date: 1/15/2024

APPENDIX B

MLGW-37 Lithologic Log

LITHOLOGIC LOG

Project/Client Name Monitor Well Install - Henderson Mill	Location (NAD 83 GPS Latitude Longitude) 39.910117, -106.106967	GS Elev (ft amsl) 8371.506	TOC Elev (ft amsl) 8373.59
Drilling Co. Boart Longyear – Joseph Katona	Location (Local Coordinates, Northing, Easting) 210782.667, 1830808.91	Date Started 11/2/23 ; 0800	Date Finished 11/2/23 ; 1230
Lithology Described By CCA – Graham Kilduff	Drilling Equipment LS600T	Drilling Method SONIC	
Total Depth 100 feet	Drilling Fluid None		
Bit Diameter 7-inch core barrel	Conductor Casing (type; diameter; depth) Steel; 8-inch drill casing		
Comments			
* Clasification System (for soils only)	**Unified Soil Classification System (ASTM)**		

Description	Depth (feet)	USCS	Drill Rate	Comments
0-2' (10/70/20) <u>Poorly Sorted SAND with GRAVEL and SILT</u>; Dark brown (10 YR 3/3); Fines are nonplastic silts. Sands are fine to coarse and poorly sorted. Gravels are up to 25 mm.	0 1 2	SW-SM	40	
2-7' (T/60/40) <u>Poorly Sorted SAND with GRAVEL</u>; Brown (10 YR 3/3); Fines are nonplastic silts. Sands are fine to coarse and poorly sorted. Gravels are up to 25 mm.	3 4 5 6 7	SW	40	
7-10' (T/40/60) <u>Poorly Sorted GRAVEL with SAND</u>; Brown (10 YR 4/3); Same as above with more gravels and size up to 100+ mm. Cobble at 10 ft	8 9 10	GW		
10-17' (T/20/80) <u>Poorly Sorted GRAVEL with SAND</u>; Brownish yellow (10 YR 5/6); Trace clay fines outweighed by larger clasts. Sands are fine to coarse, subangular to rounded, and poorly sorted. Gravels are up to 120+ mm, subangular to rounded with larger cobbles being more rounded, and composed of gneiss/schist.	11 12	GW	62	

LITHOLOGIC LOG

Description	Depth (feet)	USCS	Drill Rate	Comments
10-17' (T/20/80) Poorly Sorted GRAVEL with SAND; Brownish yellow (10 YR 5/6); Trace clay fines outweighed by larger clasts. Sands are fine to coarse, subangular to rounded, and poorly sorted. Gravels are up to 120+ mm, subangular to rounded with larger cobbles being more rounded, and composed of gneiss/schist.	12			
	13		62	
	14	GW		
	15			
	16			
17-29' (T/10/90) Poorly Sorted GRAVEL with SAND; Brownish yellow (10 YR 5/6); Same as above with an increase in clay content, but an increase in gravels up to 7 inches outweighs the clay. Cobble at 27 ft bls	17			Clay patches appear moist
	18			
	19			
	20	GW		
	21		62	
	22			
	23			
	24			
	25			
	26	GW		
27' Cobble	27		62	
	28			

LITHOLOGIC LOG

Description	Depth (feet)	USCS	Drill Rate	Comments
29-34' (T/30/70) <u>Poorly Sorted GRAVEL with SAND</u>; Brownish yellow (10 YR 5/6); Trace fines of clay and silt. Sands are fine to coarse, subangular to rounded, well sorted, and yellowish brown in color. Gravels are up to 100+ mm with occasional larger gravels/cobbles and are subrounded to rounded with larger clasts being more rounded.	29 30 31 32 33	GW	62	Sediment moist at 29 ft bls
34-43' (10/20/70) <u>Poorly Sorted GRAVEL with SAND and CLAY</u>; Brownish yellow (10 YR 5/6); Fines are low plasticity clay that appears in sandy lean clay coating larger clasts. Sands are fine to coarse, subangular to rounded, and poorly sorted. Gravels are up to 110+ mm, subrounded to rounded with larger clasts being more rounded, and composed of granite and gneiss/schist.	34 35 36 37 38 39 40	GW-GC	50	Lot of chatter and slower drilling rate
	41 42	GW-GC	50	
43-55' (T/20/80) <u>Poorly Sorted GRAVEL with SAND</u>; Yellowish brown (10 YR 5/4); Fines are low plasticity clay that appears in sandy lean clay coating larger clasts. Sands are fine to coarse, subangular to rounded, and poorly sorted. Gravels are up to 110+ mm, subrounded to rounded with larger clasts being more rounded, and composed of granite and gneiss/schist.	43 44 45	GW		Cuttings saturated at 43 ft bls

LITHOLOGIC LOG

Description	Depth (feet)	USCS	Drill Rate	Comments
43-55’ (T/20/80) Poorly Sorted GRAVEL with SAND; Yellowish brown (10 YR 5/4); Trace clay fines outweighed by larger clasts. Sands are fine to coarse, predominantly medium to coarse, moderately sorted, subrounded to rounded, and stained yellowish in color. Gravels are up to 100+ mm, subrounded to rounded, composed of granite and gneiss/schist. 1 ft lense of 20/20/60 clayey gravel at 46 to 47 ft. Cobbles at 49 and 53 ft bls.	46 47 48 49 50 51 52 53 54	GW GW	50	
55-57’ (10/T/90) Yellowish brown (10 YR 5/4); Clayey cobbles greater than 7 inches.	55 56	GW-GC		
57-70’ (20/10/70) CLAYEY GRAVEL with SAND; Yellowish brown (10 YR 5/4); Fines are low plasticity to high plasticity sandy lean clays that are mixed with fine sand and appear red brown or gray in color. Sands are fine to coarse, subrounded to rounded, and poorly sorted. Gravels are up to 120+ mm and are subrounded to rounded.	57 58 59 60 61 62	GC	45	

LITHOLOGIC LOG

Description	Depth (feet)	USCS	Drill Rate	Comments
57-70' (20/10/70) CLAYEY GRAVEL with SAND; Yellowish brown (10 YR 5/4); Fines are low plasticity to high plasticity sandy lean clays that are mixed with fine sand and appear red brown or gray in color. Sands are fine to coarse, subrounded to rounded, and poorly sorted. Gravels are up to 120+ mm and are subrounded to rounded.	63 64 65 66 67 68 69	GC	45	
70-92' (10/10/70) Poorly Sorted GRAVEL with SAND and CLAY; Yellowish brown (10 YR 5/4); Low plasticity clay fines nearly outweighed by larger clasts. Sands are fine to coarse, subangular to rounded, and poorly to moderately sorted. Gravels are up to 110 mm with cobbles >7 inches at 79 and 86 ft. Some 1 to 2 ft lenses of clayey gravel (20/10/70) throughout the interval with small (<5 cm) lenses of clay.	70 71 72 73 74 75 76	GW-GC		Water parameters with casing at 70 ft: Cond: 600 uS/cm
	77 78 79	GW-GC	45	

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LITHOLOGIC LOG

Description	Depth (feet)	USCS	Drill Rate	Comments
70-92' (20/10/70) Poorly Sorted GRAVEL with SAND and CLAY; Yellowish brown (10 YR 5/4); Low plasticity clay fines nearly outweighed by larger clasts. Sands are fine to coarse, subangular to rounded, and poorly to moderately sorted. Gravels are up to 110 mm with cobbles >7 inches at 79 and 86 ft. Some 1 to 2 ft lenses of clayey gravel (20/10/70) throughout the interval with small (<5 cm) lenses of clay.	80			
	81		45	
	82	GW-GC		
	83			
	84			
	85			
	86			
	87			
	88		45	
	89			
	90	GW-GC		
	91			
92-93' Weathered SCHIST BEDROCK; Dark gray (10 YR 4/1); Slightly friable, clayey schist.	92			Contact with weather bedrock (Xg) at 92 ft bls.
93-100' SCHIST BEDROCK; Dark gray (10 YR 4/1); More competent dry schist bedrock that is largely pulverized to gray dust with 100 mm angular clasts.	93		40	Bedrock (Xg) dry at 93 ft bls.
	94			
	95			
	96			

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LITHOLOGIC LOG

Description	Depth (feet)	USCS	Drill Rate	Comments
SCHIST BEDROCK; Dark gray (10 YR 4/1); More competent dry schist bedrock that is largely pulverized to gray dust with 100 mm angular clasts.	97			
	98		40	
	99			
TOTAL DEPTH: 100 feet	100			
	101			
	102			
	103			
	104			
	105			
	106			
	107			
	108			
	109			
	110			
	111			
	112			
	113			

Appendix L

Establishing Background Threshold Values for MNGW-1, Technical Memorandum

Climax Molybdenum Company – Henderson Operations

1746 County Road 202

Empire, Colorado 80438

ESTABLISHING BACKGROUND THRESHOLD VALUES FOR MNGW-1 TECHNICAL MEMORANDUM HENDERSON MINE

Grand County, Colorado

April 2024

Prepared by:

ARTESIAN HYDROCONSULTING LLC

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FIGURES

APPENDICES

1.0 INTRODUCTION

The purpose of this memorandum is to outline a statistical approach to determine the calculation of background threshold values (BTVs) for pH at the Henderson Mine (Mine) facility. These calculated BTVs inform the site-specific numeric protection level (NPL) and/or site-specific indicator value Henderson intends to use for pH in their Groundwater Management Plan (GWMP).

1.1 BACKGROUND

Historical groundwater quality data have previously been used in 2012 and 2014 to establish site-specific NPLs for manganese and pH at the Henderson Mine and Mill facilities [Aquionix and Climax 2012, Aquionix 2014]. However, the current NPLs for pH at the Mine are adopted from Table 3 of the Colorado Basic Standards for Groundwater set forth by the water Quality Control Commission (WQCC) (5 CCR 1002-41). The Mine point of compliance (POC) well, MNGW-1, is believed to be influenced by the naturally low pH water of No Name Gulch (NNG). This has led to pH values at MNGW-1 below the current NPL of 6.5 standard units (S.U.). To better represent the background conditions at the Mine, site-specific threshold values can be estimated from historical groundwater quality data.

The United States Environmental Protection Agency (EPA) provides guidance and tools for this purpose in the ProUCL 5.2.0 (ProUCL) and Scout 2008 1.00.01 (Scout) statistical packages. These are statistical tools developed by Lockheed Martin and Neptune and Company Inc. under contract with the EPA (EPA, 2022). The ProUCL software includes methods for computations of the upper limits of statistical intervals, including confidence, tolerance, and prediction intervals. ProUCL also offers a variety of tests to validate and define the statistics of a background dataset. The Scout software includes many of the same statistical computations as ProUCL, but also estimates the lower bounds of statistical intervals.

ProUCL guidance recommends using defensible, site-specific background data to calculate background threshold values. BTVs are estimated parameters of the background population that represent a do-not-exceed value. An exceedance of the upper threshold may be considered as not coming from the background population and can indicate a change to the system (EPA, 2022). Because pH data are uncensored, meaning every data point has a value, there exists a lower threshold value in a pH dataset.

In this memorandum, ProUCL was used to evaluate the background dataset of pH at MNGW-1 and Scout was used to generate the statistical limits defined below:

1. 95% Lower prediction limit (LPL). The lower boundary of a prediction interval for an individual future observation. The next value will be above this limit with 95% confidence.
2. 95% Lower tolerance limit (LTL). The lower boundary of a confidence interval that the population of values are expected to be above. 95% of the sample population can be expected to be above this limit with 95% confidence.
3. 95% Upper prediction limit (UPL). The upper boundary of a prediction interval that is analogous to the LPL.
4. 95% Upper tolerance limit (UTL). The upper boundary of a confidence interval that is analogous to the LTL.

Scout computes the full range of these statistical intervals. Although the scope of this memorandum is only the lower threshold value for pH, calculated UPLs and UTLs were included for completeness. Henderson intends for the upper NPL for pH at MNGW-1 to remain based on WQCC standards.

2.0 ESTABLISHING THRESHOLD VALUES

2.1 EVALUATION OF BACKGROUND DATA

Henderson utilized pH data for MNGW-1 that extends from 1995 through 2024. This dataset captures the entire period of record at MNGW-1, which allows for the statistical analysis to consider variations in pH over time. A thorough evaluation of these data is necessary before it can be used to establish BTVs for the Mine. ProUCL provides tools to analyze the statistics of a dataset and assess its fit to known statistical models, known as distributions. The results of this analysis are included in Appendix A of this memorandum.

ProUCL was used to evaluate the goodness of fit (GOF) of MNGW-1 pH data to three standard distributions: normal, lognormal, and gamma. ProUCL 5.2 includes updated critical values for some of the test statistics used to determine normality and lognormality. Based on results of the GOF tests, the data do not follow any discernible distribution at a significant level. The data are nonparametric in that they do not rely on defined parameters, such as a mean or standard deviation, to describe their distribution. In addition to these formal tests, informal visual inspections of the data distribution can provide useful information.

Figure 1 shows the normal quantile-quantile (Q-Q) plot for the pH dataset. A Q-Q plot is a graphical method to test for approximate normality and visualize outliers of a dataset. The plot shows the scatter of the data compared to a theoretical normal distribution. Data that plots in a linear pattern, with a correlation of 0.95 or greater, may suggest approximate normality (EPA, 2022). The background pH data has a correlation to the normal model of 0.97.

Figure 2 is a histogram of the dataset against an outline of a normal distribution. The data visually follow an approximate normal distribution that is slightly skewed to the right. ProUCL generated a skewness coefficient of 0.9, which indicates that the skew is to the right, positive, and it is not significantly skewed, the absolute value is less than one (EPA, 2009b).

It is a reasonable explanation that the right-skewed distribution is due to buffering of potentially lower pH values by dissolved solids in the system. Although the data showed a degree of skewness, the lognormal or gamma distributions were not expected to be a more appropriate fit.

A log-transformation of data with a significantly skewed distribution can create a variable that has better statistical properties than the original. Hydrogen ion concentrations of natural systems typically follow a lognormal, or right-skewed, distribution. Since pH is the negative logarithm of hydrogen ion concentration, it generally follows a more normal distribution with reduced variability (Kuna, 2017 and More, 2024). pH on its own is a valid measurement system with a scale that may be more appropriate for data analysis than the original concentration units (Helsel et al., 2020).

Following this reasoning, any transformation of the pH dataset was deemed unnecessary and excessive.

Application of Rosner's outlier test to the data flagged one data point with a value of 8.02 as a suspected outlier. However, the test determined this was not a potential outlier at a 1% significance level. Figure 3 shows the normal Q-Q plot of the dataset without the suspected outlier. Removal of this value did not materially improve the correlation coefficient, so it was included in the computation of statistical intervals.

2.2 COMPUTING STATISTICAL LIMITS

The ProUCL software was developed in part to calculate a do-not-exceed value for left censored data, that is data not known below a certain value. While constituents like metals are censored due to detection limits, pH is uncensored with a known value for every measurement. Therefore, a meaningful lower threshold value exists for a pH dataset. The Scout software is able to produce both the upper and lower bounds of statistical intervals for uncensored datasets. Tolerance and prediction intervals estimate limits for which the population and next individual value will fall between, respectively. These are typically estimated to a 95% confidence level. Scout provides a classical and a robust package of statistical methods to generate the 95% tolerance limits and the 95% prediction limits.

The classical methods calculate the value of these limits around parameters assuming a normal, lognormal, and gamma distribution. In addition, Scout includes a simple nonparametric method in its classical methods that is not associated with a discernable statistical model. The calculated statistics for the classical methods are provided in Table 1. The limits for lognormal, gamma, and non-parametric distributions are included in Table 1 for completeness.

Table 1. Prediction and Tolerance Limits for pH in MNGW-1

Classical Method	LTL	UTL	LPL	UPL
Normal Distribution	5.67	7.25	5.58	7.34
Lognormal Distribution	5.72	7.27	5.64	7.36
Gamma Distribution	5.71	7.26	5.63	7.36
Non-Parametric (BCA Bootstrap)	5.80	7.48	5.80	7.52

Scout offers a robust package of statistical methods to compute tolerance and prediction intervals for nonparametric distributions. These methods use the same parameters as the classical methods but are iterative and more resistant to the influence of skewness and outliers in a dataset [EPA 2009a]. Discussion of the details of these robust methods was not part of the scope of this memorandum. The calculated statistics from the robust methods are provided in Table 2.

Table 2. Robust Prediction and Tolerance Limits for pH in MNGW-1

Robust Method	LTL	UTL	LPL	UPL
PROP	5.76	7.08	5.69	7.16
Huber	5.71	7.19	5.63	7.27
Tukey Biweight	5.63	7.12	5.55	7.19
Lax Kafadar Biweight	5.65	7.17	5.56	7.25
MVT	5.80	6.95	5.73	7.01
Average	**5.7**	**7.1**	**5.6**	**7.2**

The output files of both the classical and robust methods are included in Appendix B of this memorandum.

2.3 BACKGROUND THRESHOLD VALUES

A BTV can be established from the 95% lower prediction limit (LPL). Future observations at a site can be compared to the LPL as an indicator of influence beyond background conditions. At the Mine, a pH value below the LPL, or threshold value, may be an indicator of further depletion of alkalinity in the system.

The normal LPL computed with Scout's classical package was 5.58 S.U. It is reasonable to assume the normal LPL represents the lower background threshold value because the dataset approximated to a normal distribution. This assumption is further validated as the average of the LPLs computed by the robust methods is 5.6 S.U. The robust methods Scout offers provide more appropriate estimation of statistical intervals for datasets that do not strictly fit standard distribution models. The prior evaluation of the data ruled out the need to transform data to calculate parameters for a lognormal or gamma distribution. Given this, it is appropriate to assume a lower threshold value for pH at MNGW-1 to be 5.6 S.U.

3.0 SUMMARY AND RECOMMENDATION

Historical groundwater quality data were used to evaluate background conditions of pH at the Henderson Mine facility. An analysis using ProUCL suggested the pH data from POC well MNGW-1 can be approximated to have a normal distribution. Transformations and rejection of outliers were determined to be excessive or unnecessary. The Scout software used this background pH dataset to generate 95% tolerance and prediction intervals for the background population. The lower bounds of these intervals can be considered as guidance for establishing a threshold value for future monitoring at MNGW-1.

The Scout software generated an LPL for pH of 5.6 S.U., assuming the dataset followed a normal distribution. This value is recommended as the lower threshold value and site-specific NPL for the Mine POC MNGW-1. The upper NPL will continue to be based on the WQCC Table Value Standard of 8.5.

4.0 REFERENCES

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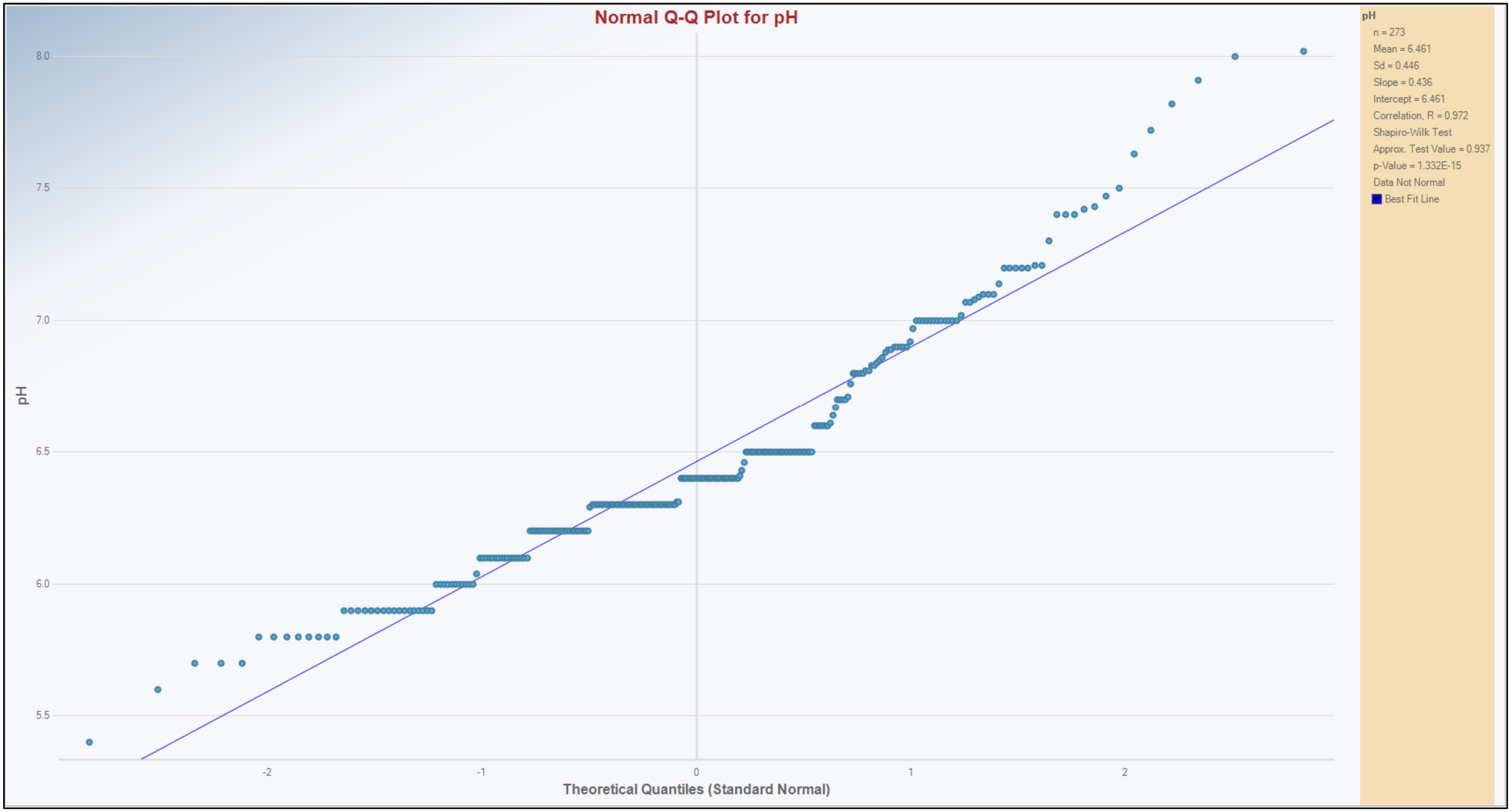
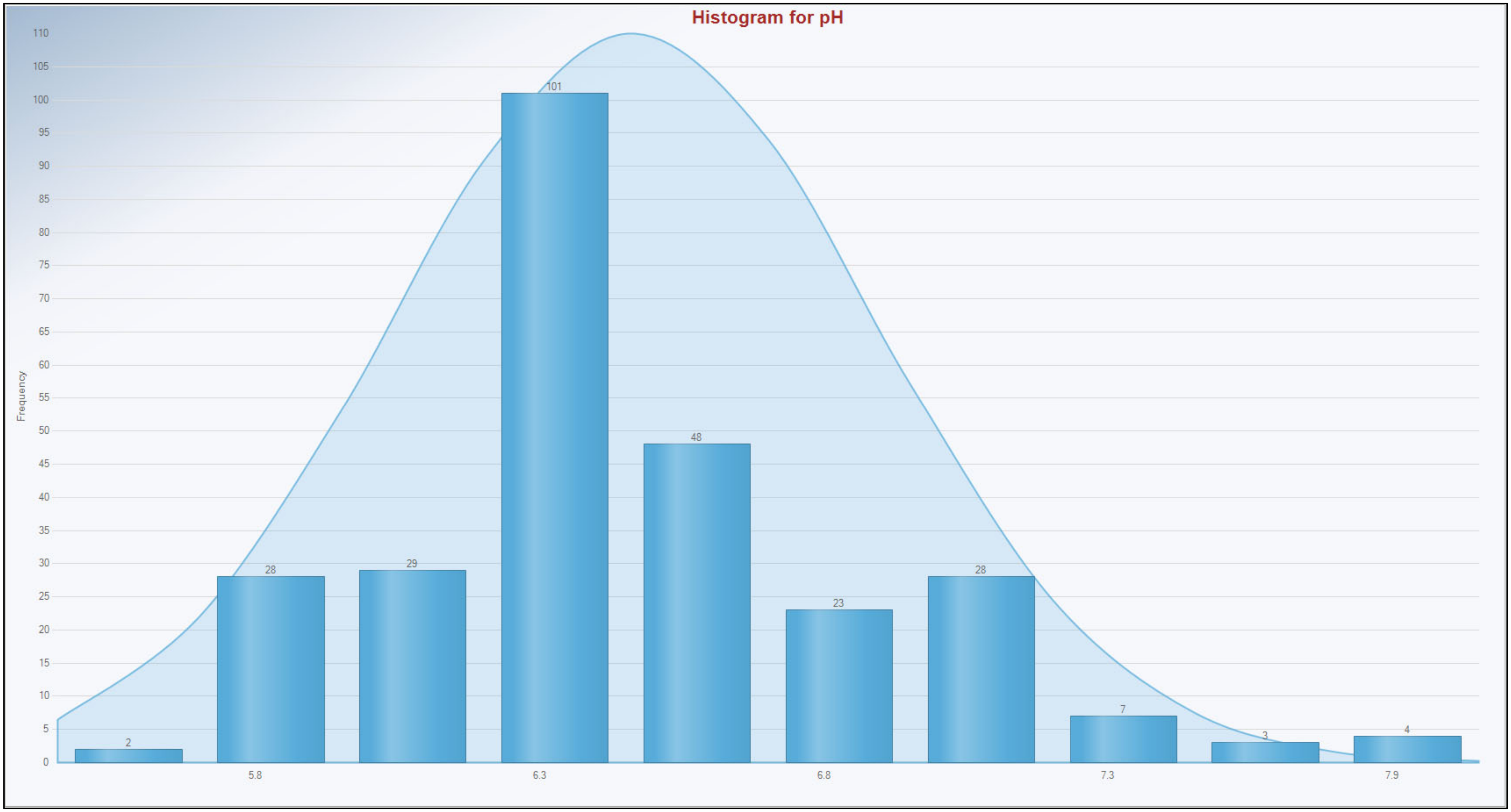
More K.S., Wolkersdorfer C., 2024. The pH paradox. Science of the Total Environment Vol. 946. October 2024.

FIGURES



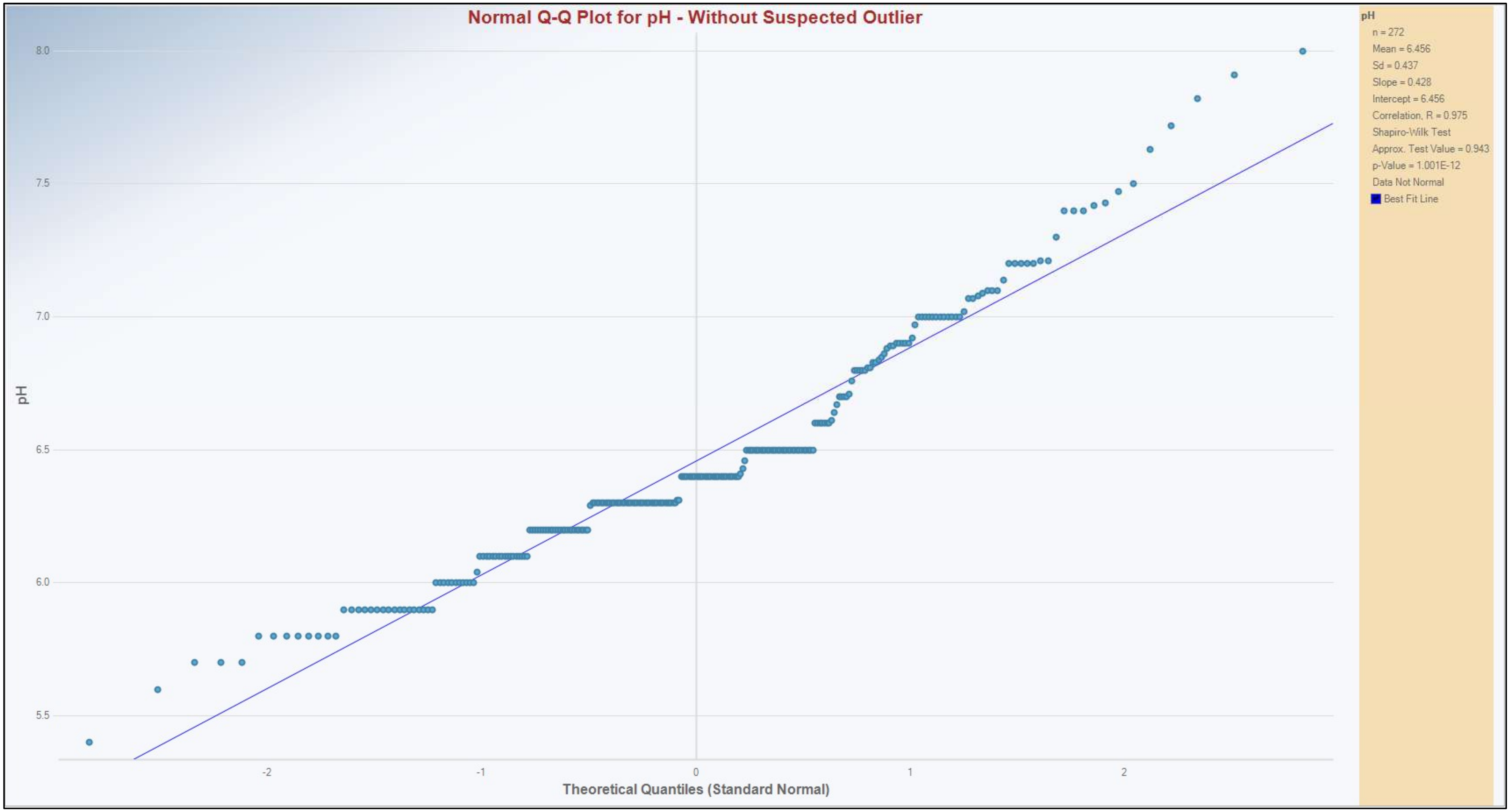
CLEAR CREEK ASSOCIATES

FIGURE 1
Q-Q Plot for pH



CLEAR CREEK ASSOCIATES

FIGURE 2
Histogram for pH



CLEAR CREEK ASSOCIATES

FIGURE 3
Q-Q Plot for pH Without Suspected Outlier

APPENDIX A

ProUCL Outputs

	General Statistics on Uncensored Full Data
Date/Time of Computation	ProUCL 5.2 4/4/2025 2:10:59 PM
User Selected Options	
From File	MNGW-1 pH POR input.xls
Full Precision	OFF

From File: MNGW-1 pH POR input.xls

General Statistics for Uncensored Dataset

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Geo-Mean	SD	SEM	MAD/0.675	Skewness	CV
pH	273	0	5.4	8.02	6.461	6.446	0.446	0.027	0.297	0.876	0.0691

Percentiles for Uncensored Dataset

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
pH	273	0	5.9	6.1	6.2	6.4	6.7	6.836	7.07	7.246	7.845

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 4/4/2025 2:12:07 PM
From File	MNGW-1 pH POR input.xls
Full Precision	OFF
Confidence Coefficient	0.95

pH

Raw Statistics

Number of Valid Observations	273
Number of Distinct Observations	56
Minimum	5.4
Maximum	8.02
Mean of Raw Data	6.461
Standard Deviation of Raw Data	0.446
Khat	217.4
Theta hat	0.0297
Kstar	215
Theta star	0.0301
Mean of Log Transformed Data	1.864
Standard Deviation of Log Transformed Data	0.0675

Normal GOF Test Results

Correlation Coefficient R	0.972
Approximate Shapiro Wilk Test Statistic	0.937
Approximate Shapiro Wilk P Value	1.332E-15
Lilliefors Test Statistic	0.172
Lilliefors Critical (0.05) Value	0.054

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.978
A-D Test Statistic	4.34
A-D Critical (0.05) Value	0.752
K-S Test Statistic	0.163
K-S Critical(0.05) Value	0.0551

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.981
Approximate Shapiro Wilk Test Statistic	0.953
Approximate Shapiro Wilk P Value	1.5100E-8
Lilliefors Test Statistic	0.158
Lilliefors Critical (0.05) Value	0.054

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.2 4/4/2025 2:36:40 PM
From File	MNGW-1 pH POR input.xls
Full Precision	OFF

Rosner's Outlier Test for pH

Mean	**6.461**
Standard Deviation	**0.446**
Number of data	273
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6.461	0.445	8.02	30	3.499	3.693	4.063

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

APPENDIX B

Scout 2008 Outputs

Prediction Intervals/Limts (PLs) for Datasets Without Non-Detects

User Selected Options	
Date/Time of Computation	4/4/2025 2:41:01 PM
From File	P:\Freeport McMoRan\Henderson\3. Mine - NNG Folder\2024 Mine WQ Update\NPL Stats\MNGW-1 pH POR in
Full Precision	OFF
Number of Future K Values	1
Confidence Coefficient	0.95

pH

Number of Valid Observations	273
Number of Distinct Observations	56

Raw Statistics

Mean	6.461
Minimum	5.4
5% Percentile	5.865
10% Percentile	5.9
1st Quartile	6.2
Median	6.4
3rd Quartile	6.7
90% Percentile	7.07
95% Percentile	7.242
Maximum	8.02
Standard Deviation	0.446
MAD / 0.6745	0.297
IQR / 1.35	0.37

Normal Statistics

1% Percentile (z)	5.423
5% Percentile (z)	5.727
10% Percentile (z)	5.889
1st Quartile (z)	6.16
Median (z)	6.461
3rd Quartile (z)	6.762
90% Percentile (z)	7.033
95% Percentile (z)	7.195
99% Percentile (z)	7.5

Normal Prediction Intervals

Prediction	Lower Limit	Upper Limit
Student's t	5.581	7.342
For Next 1	5.581	7.342

Gamma Statistics

k hat	217.4
Theta hat	0.0297
nu hat	118681
k star	215
Theta star	0.0301
MLE of Mean	6.461

	A	B	C	D	E	F	G	H	I	J	K	L
53	MLE of Standard Deviation				0.441							
54	nu star				117378							
55	95% Percentile of Chisquare (2k)				479.3							
56												
57	**Approximate Gamma Prediction Intervals**											
58	Prediction			Lower Limit	Upper Limit							
59	Gamma Wilson Hilferty			5.624	7.356							
60	Gamma Hawkins Wixley			5.629	7.358							
61	Gamma Wilson Hilferty For Next 1			5.624	7.356							
62	Gamma Hawkins Wixley For Next 1			5.629	7.358							
63												
64	**Log-Transformed Statistics**											
65	Mean of Log-Transformed Data				1.864							
66	Standard Deviation of Log-Transformed Data				0.0675							
67												
68	**Log-Transformed Prediction Intervals**											
69	Prediction			Lower Limit	Upper Limit							
70	Log			5.643	7.364							
71	For Next 1			5.643	7.364							
72												
73	**Nonparametric Prediction Intervals**											
74	Chebyshev			Lower Limit	Upper Limit							
75	Chebyshev			4.462	8.461							
76	Prediction			Lower Limit	Upper Limit							
77	Nonparametric			5.8	7.52							
78												

	Tolerance Intervals/Limits (TLs) for Datasets Without Non-Detects
Date/Time of Computation	4/4/2025 2:40:30 PM
User Selected Options	
From File	P:\Freeport McMoRan\Henderson\3. Mine - NNG Folder\2024 Mine WQ Update\NPL Stats\MNGW-1 pH POR in
Full Precision	OFF
Number of Bootstrap Operations	2000
Coverage	0.9
Confidence Coefficient	0.95

pH

Number of Valid Observations	273
Number of Distinct Observations	56

Raw Statistics

Mean	6.461
Minimum	5.4
5% Percentile	5.865
10% Percentile	5.9
1st Quartile	6.2
Median	6.4
3rd Quartile	6.7
90% Percentile	7.07
95% Percentile	7.242
Maximum	8.02
Standard Deviation	0.446
MAD / 0.6745	0.297
IQR / 1.35	0.37

Normal Statistics

1% Percentile (z)	5.423
5% Percentile (z)	5.727
10% Percentile (z)	5.889
1st Quartile (z)	6.16
Median (z)	6.461
3rd Quartile (z)	6.762
90% Percentile (z)	7.033
95% Percentile (z)	7.195
99% Percentile (z)	7.5
K2	1.774

Normal Tolerance Intervals

Tolerance	Lower Limit	Upper Limit
Normal	5.67	7.253

Gamma Statistics

k hat	217.4
Theta hat	0.0297
nu hat	118681
k star	215
Theta star	0.0301
MLE of Mean	6.461

	A	B	C	D	E	F	G	H	I	J	K	L
53				MLE of Standard Deviation	0.441							
54				nu star	117378							
55				95% Percentile of Chisquare (2k)	479.3							
56												
57		Approximate Gamma Tolerance Intervals										
58			Tolerance	Lower Limit	Upper Limit							
59			Gamma Wilson Hilferty	5.704	7.261							
60			Gamma Hawkins Wixley	5.708	7.262							
61												
62		Log-Transformed Statistics										
63				Mean of Log-Transformed Data	1.864							
64				Standard Deviation of Log-Transformed Data	0.0675							
65												
66		Log-Transformed Tolerance Intervals										
67			Tolerance	Lower Limit	Upper Limit							
68			Lognormal	5.719	7.266							
69												
70		Nonparametric Tolerance Intervals										
71			Tolerance	Lower Limit	Upper Limit							
72			% Bootstrap	7	7.2							
73			BCA Bootstrap	7	7.2							
74			% TL	5.8	7.475							
75												

	A	B	C	D	E	F	G	H	I	J	K	L
1				Robust Prediction Intervals/Limits (PLs)								
2			Date/Time of Computation	4/4/2025 2:42:53 PM								
3			User Selected Options									
4			From File	P:\Freeport McMoRan\Henderson\3. Mine - NNG Folder\2024 Mine WQ Update\NPL Stats\MNGW-1 pH POR in								
5			Full Precision	OFF								
6			Confidence Coefficient	0.95								
7			Number of future K values	1								
8			PROP Method	Influence Function Alpha of 0.025 with MDs following Beta Distribution.								
9				PROP PLs derived using 10 Iterations and initial estimates of median/1.48MAD.								
10			Huber Method	Influence Function Alpha of 0.025 with MDs following Beta Distribution.								
11				Huber PLs derived using 10 Iterations and initial estimates of median/1.48MAD.								
12			Tukey Biweight Method	Location Tuning Constant of 4 and a Scale Tuning Constant of 6								
13				Tukey Biweight PLs derived using a Maximum of 10 Iterations and initial estimates of median/1.48MAD.								
14			Lax/Kafadar Biweight Method	Location Tuning Constant of 4 and a Scale Tuning Constant of 6								
15				Lax/Kafadar PLs derived using a Maximum of 10 Iterations and initial estimates of median/1.48MAD.								
16			MVT Method	Triming Percentage of 10%								
17				MVT PLs derived using 10 Iterations and initial estimates of median/1.48MAD.								
18												
19	pH											
20			Number			Standard	MAD/			Next 1	Next 1	
21			Obs.	Mean	Median	Deviation	0.6745	SE Mean	Critical t	LPL	UPL	
22		Classical	273	6.461	6.4	0.446	0.297	0.027	1.969	5.581	7.342	
23												
24			Initial	Initial	Final	Final						
25	Method		Mean	Stdv	Mean	Stdv	Wsum	SEM	Critical t	LPL	UPL	
26		PROP	6.4	0.297	6.422	0.372	263.6	0.0229	1.969	5.687	7.157	
27		Huber	6.4	0.297	6.45	0.416	270.4	0.0253	1.969	5.629	7.27	
28		Tukey Biweight	6.4	0.297	6.372	0.415	217.1	0.0282	1.971	5.552	7.193	
29		Lax Kafadar Biweight	6.4	0.297	6.409	0.428	241.1	0.0276	1.97	5.564	7.254	
30		MVT	6.4	0.297	6.373	0.325	246	0.0207	1.97	5.731	7.014	
31												

Robust Tolerance Intervals/Limits (TLs)

Date/Time of Computation	4/4/2025 2:42:00 PM
User Selected Options	
From File	P:\Freeport McMoRan\Henderson\3. Mine - NNG Folder\2024 Mine WQ Update\NPL Stats\MNGW-1 pH POR in
Full Precision	OFF
Confidence Coefficient	0.95
Coverage	0.9
PROP Method	Influence Function Alpha of 0.025 with MDs following Beta Distribution.
	PROP TLs derived using 10 Iterations and initial estimates of median/1.48MAD.
Huber Method	Influence Function Alpha of 0.025 with MDs following Beta Distribution.
	Huber TLs derived using 10 Iterations and initial estimates of median/1.48MAD.
Tukey Biweight Method	Location Tuning Constant of 4 and a Scale Tuning Constant of 6
	Tukey Biweight TLs derived using a Maximum of 10 Iterations and initial estimates of median/1.48MAD.
Lax/Kafadar Biweight Method	Location Tuning Constant of 4 and a Scale Tuning Constant of 6
	Lax/Kafadar TLs derived using a Maximum of 10 Iterations and initial estimates of median/1.48MAD.
MVT Method	Triming Percentage of 10%
	MVT TLs derived using 10 Iterations and initial estimates of median/1.48MAD.

K2 represents the two-sided cutoff for tolerance intervals and is computed based upon Wsum Values following the procedure described in Hahn and Meeker (1991)

pH

	Number Obs.	Mean	Median	Standard Deviation	MAD/ 0.6745	k2	LTL	UTL
Classical	273	6.461	6.4	0.446	0.297	1.774	5.67	7.253

Method	Initial Location	Initial Scale	Final Mean	Final Stdv	Wsum	k2	LTL	UTL
PROP	6.4	0.297	6.422	0.372	263.6	1.776	5.761	7.084
Huber	6.4	0.297	6.45	0.416	270.4	1.774	5.711	7.188
Tukey Biweight	6.4	0.297	6.372	0.415	217.1	1.791	5.629	7.116
Lax Kafadar Biweight	6.4	0.297	6.409	0.428	241.1	1.783	5.646	7.173
MVT	6.4	0.297	6.373	0.325	246	1.774	5.796	6.949

ATTACHMENT 2

Groundwater Management Plan (“Red-Lined” version)

CLIMAX MOLYBDENUM COMPANY
HENDERSON OPERATIONS

Technical Revision 37 (TR-37) to Permit M-77-342
Groundwater Management Plan

April 2025

Submitted To:

Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, Colorado 80203

Prepared by:

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List of Acronyms and Abbreviations

CBSG – Colorado Water Quality Control Commission Basic Standards for Groundwater (5 CCR 1002-41)

CDPHE – Colorado Department of Public Health and Environment

CDPS – Colorado Discharge Permit System

CRS – Colorado Revised Statute

DMO – Designated Mining Operation

EBR – East Branch Reservoir

EPF – Environmental Protection Facility

DRMS – Division of Reclamation, Mining and Safety

EPP – Environmental Protection Plan

mg/L – milligrams per liter

MOA – Memorandum of Agreement

NPL – Numeric Protection Level

POC – Point of Compliance

SPCC/MCP – Spill Prevention Control and Countermeasures / Materials Containment Plan

s.u. – standard units

SWMP – Stormwater Management Plan

TR – Total Recoverable

TR – Technical Revision

µg/L – microgram per liter

µS/cm – microsiemens per centimeter

WQCC – Water Quality Control Commission

WQCD – Water Quality Control Division

1.0 Purpose of Permitting Action

Climax Molybdenum Company - Henderson Operations (Henderson) is submitting this document concerning the protection of groundwater quality pursuant to Rule 3.1.7(5) of the Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal, and Designated Mining Operations (the "Rules"). This section states as follows:

> *(5) Any Operator, on a voluntary basis, may submit information concerning the protection of the quality of groundwater affected by the operation to the Office. The Operator may submit such information and a plan for monitoring, where appropriate, including monitoring at points of compliance, for the Office's consideration. The information submitted must satisfy the requirements of Paragraphs 3.1.7(6) and (7). Such voluntary submission by an Operator shall be considered a Technical Revision provided the submittal satisfies Section 1.8, or NOI modification.*

This permitting action provides an update to the plan for groundwater monitoring at the Henderson Mine and Mill. This document constitutes the Henderson Groundwater Management Plan (GWMP) and is being formally submitted as Technical Revision 37 (TR-37) to the Henderson Mine and Mill Reclamation Permit No. M-1977-342, as required. This TR supersedes TR-16 and TR-05 that were previously submitted to the Division of Reclamation, Mining and Safety (DRMS).

TR-37 establishes the program by which the Henderson Mine and Mill will demonstrate compliance with applicable groundwater quality requirements and, by reference, Colorado Water Quality Control Commission (WQCC) standards. As such, this Technical Revision establishes permit conditions~~, including numeric protection levels (NPL)~~ protective of groundwater. Once approved, this technical revision will become part of the existing permit.

Both the Henderson Mine and the Henderson Mill are represented in this Technical Revision. Figure 1 illustrates the general locations of the Henderson Mine and Mill and Figures 2 and 3 illustrate major site features and drainage basins. Specific conditions at each location are addressed individually throughout this document.

2.0 Site Descriptions

2.1 Henderson Mine

The Henderson Mine is located in Clear Creek County west of Empire, Colorado. The Henderson Mine is situated on the northern flanks of Red Mountain located in the Dailey-Jones Pass mining district along the eastern edge of the Continental Divide. Figure 1 provides an overview of Henderson operations.

The Henderson ore body was discovered in the early 1960's. Shortly thereafter mine development began and continues today. The main ore haulage from the underground mine is a 9.6 mile tunnel to the Henderson Mill site located on the western side of the Continental Divide in the Williams Fork Valley.

Currently, formally non-tributary developed water from rock fracture interception coupled with water intercepted by the Henderson glory hole is pumped from the mine workings to the surface where it is treated and discharged under the authority of the Colorado Discharge Permit Systems (CDPS) Wastewater Discharge Permit No. CO-0041467. Surface treatment consists of a high density sludge water treatment process. This process treats incoming water via lime neutralization, precipitation, settling and pH adjustment. Clarifier underflow is recycled to seed incoming untreated water. The balance of the sludge is pumped to two dewatering beds on an alternating basis. Dried sludge is collected and disposed of off-site in accordance with applicable solid waste regulations.

Stormwater at the Henderson Mine is discharged under the authority of the CDPS Stormwater General Permit COR-040000, specifically authorization number COR-040079, as well as the previously identified CDPS wastewater discharge permit. Stormwater not discharged under the wastewater discharge permit is discharged via identified stormwater outfalls and via sheet flow to the West Fork of Clear Creek. In addition, stormwater diversionary canals have been constructed on the south side of surface operations, around the west end and along the north side of the Henderson Mine property. These diversionary interceptors serve to deliver unimpacted stormwater to the West Fork of Clear Creek.

Henderson currently maintains its operations of underground workings in a dewatered condition. This GWMP assumes post mining dewatering and treatment. Henderson will obtain the necessary authorizations to address the potential impacts of mine flooding prior to ceasing dewatering.

2.2 Henderson Mill

Henderson Mill is located in the upper Williams Fork River drainage basin just north of Ute Pass in Grand County, Colorado. The mill, located on the west side of the Continental Divide, is linked by a tunnel to the Henderson Mine on the east side of the Continental Divide. The major components associated with the mill facility include the mill, process water storage reservoir, and the main tailings storage facility (TSF). Figure 1 provides an overview of Henderson operations.

Tailings storage began at the Henderson Mill site in the mid 1970's. Tailings related seep water is currently collected downgradient of the storage area in a collection channel and via the Ute Park extraction wellfield (see Section 3.2.8 for additional information). The collected seep water is then pumped back up to the TSF for re-use.

Process water associated with the Henderson Mill may be discharged under the authority of CDPS Wastewater Discharge Permit No. CO-0000230. Process water is captured and reused in the milling circuit. Additionally, the construction and operation of a new Mill water treatment plant (WTP) is planned based upon forecasted future operating conditions to provide treatment of excess process water (see Section 3.2.7 for additional information).

Stormwater at the Henderson Mill is discharged under the authority of CDPS Wastewater Discharge Permit No. CO-0000230~~Stormwater General Permit COR-040079 and may be, in some circumstances, discharged under the previously identified CDPS wastewater discharge permit~~. Stormwater not captured in the milling circuit or discharged under the wastewater discharge permit is discharged via identified stormwater outfalls and via sheet flow to the Williams Fork River. To minimize the volume of stormwater that comes into contact with the facility's industrial operations, interceptor canals have been constructed around the west and north end of the tailings pond to deliver unimpacted stormwater to the Williams Fork River. A collection system has also been constructed for drainages southwest of the Henderson Mill property that transmits unimpacted stormwater through an underground diversion pipe to the Williams Fork River.

2.3 Existing Monitoring Program

Henderson has been conducting routine groundwater quality monitoring at the Mine and Mill since 1995. Analytical data available from 1995-2012 prior to the original GWMP (TR-16) approval are provided in Appendix A for both the Mine (MNGW-1) and the Mill (MLGW-7) Point of Compliance (POC) wells (see related POC discussion in Section 3.0). Groundwater data subsequent to 2012 have been routinely submitted to the DRMS consistent with the GWMP.

In addition to groundwater monitoring, Henderson has also performed sampling as part of an established surface water monitoring plan. The plan includes monitoring locations both upgradient and downgradient of the Mine and Mill as summarized in Table 2-1.

Table 2-1: Surface Water Monitoring Locations

Site	*Upgradient Sampling Locations*	*Downgradient Sampling Locations*
Henderson Mine	CC-10 and BG-20	CC-30
Henderson Mill	WFR-20	WFR-40

Analytical data from five quarterly surface water sampling events collected immediately prior to the original GWMP (TR-16) submittal and approval are provided in Appendix B. Surface water data subsequent to 2012 have been routinely submitted to the DRMS consistent with the GWMP. Surface water quality data indicate that Mine and Mill operations are not adversely impacting water quality downstream of the sites.

Note that Henderson revised sampling location nomenclature in 2012 to improve efficiencies. Sampling locations referenced in correspondence with DRMS prior to 2012 may still be active but have been assigned a new name.

3.0 Drainage Basins and Selection of Monitoring Locations

This section provides a summary of:

- Classified stream segments;
- Existing and potential future uses of groundwater;
- Potential contamination sources;
- Geologic and hydrogeologic conditions at the Henderson Mine and Henderson Mill;
- Groundwater monitoring locations; and
- Surface water monitoring locations.

The geologic and hydrogeologic assessments presented herein are a summary of information previously provided to the DRMS. The original source of the data presented is referenced as applicable.

POC monitoring locations were selected in accordance with Rule 3.1.7(6) of the Rules and related discussions in this section.

3.1 Henderson Mine

3.1.1 Location and Description of Classified Stream Segments

Adjacent to the Henderson Mine, Segment 4 of Clear Creek runs from the source of the West Fork of Clear Creek to the confluence with Woods Creek and is classified as Aquatic Life (cold) Class 1, Recreation E, Water Supply, and Agriculture. Downstream of the Henderson Mine, Segment 5 of Clear Creek runs from the confluence with Woods Creek to the confluence with Clear Creek and is classified as Aquatic Life (cold) Class 1, Recreation E, Water Supply and Agriculture. Stream segments are noted, relative to mine operations, in Figure 3 of Appendix C.

3.1.2 Existing and Potential Future Uses of Groundwater

As discussed in Section 3.1.5, groundwater at the Henderson Mine is limited to a thin lens of ~~alluvium~~colluvium that is bounded on all sides by low permeability Precambrian Silver Plume Granite. As the groundwater approaches the lower end of the drainage, the ~~alluvium~~colluvium pinches out, and groundwater is forced to surface into the West Fork of Clear Creek. Therefore, the current and future groundwater use at the site is limited to recharge of the West Fork of Clear Creek. The site hydrogeologic conditions cannot support development of groundwater resources for any other beneficial use.

3.1.3 Potential Contamination Sources and Environmental Protection Facilities (EPFs)

Sources of potential contamination of groundwater from the Henderson Mine include infiltration of water from historical water treatment ponds and development rock piles. Potential contaminant sources and established EPFs at the Henderson Mine will be managed in accordance with Section 7.1 of the revised Environmental Protection Plan (EPP).

3.1.4 Geology

The bedrock of the area surrounding the Henderson Mine site is relatively shallow and is composed primarily of Precambrian Silver Plume Granite and Tertiary Period stock and dike granitic intrusions that are highly altered by hydrothermal activity. The intrusions are upgradient from the mine site and may produce significant naturally occurring background concentrations of dissolved metals in the groundwater. The Vasquez Fault and a related fracture zone may affect the groundwater flow, but the fate of any percolation into the fault would be recirculation into the established mine water system. The expected fate of all other potential contamination would be accumulation in the stream flow and shallow groundwater associated with the West Fork of Clear Creek (WW Wheeler and Associates, 1991).

3.1.5 Hydrogeology

Groundwater occurrence at the Henderson Mine is primarily limited to a thin, well-defined ~~lens of alluvium~~colluvial deposit which is bounded on all sides by the Precambrian Silver Plume Granite Formation. Groundwater occurrence within the Precambrian Silver Plume Granite is limited. The low permeability of the granite is evident in the mine workings where groundwater inflow has remained unchanged in the life of the Henderson operation. Additionally, because process water is pumped from the mine workings to the surface for treatment (as discussed in Section 2.1), increased exposure of sulfides to oxidation through the underground mining activities does not impact groundwater quality near the underground workings.

As shown in Figure 3 of Appendix C, groundwater flow direction within the ~~alluvium~~colluvium generally flows from the upper end of the drainage to the lower end. Upgradient of the confluence with Woods Creek, the ~~alluvium~~colluvium pinches out and groundwater is forced to surface into the West Fork of Clear Creek.

3.1.6 Groundwater Monitoring Locations

3.1.6.1 POC Groundwater Monitoring Locations

The groundwater quality for the West Fork of Clear Creek basin has historically been ~~, and will continue to be,~~ monitored at well MNGW-1, located downgradient of the Henderson Mine. MNGW-1 is constructed in the ~~alluvium~~colluvium and is representative of shallow groundwater conditions downgradient of mine operations. Completion details for the well are not available. MNGW-1 will be analyzed for the constituents listed in Table 4-1 and monitored at the frequencies summarized in Section 6.0.

Henderson Mine installed MNGW-2, a deeper Precambrian bedrock well, in 1993. This well has been dry since its completion. Henderson also conducted a hydraulic conductivity study of the Precambrian Silver Plume Granite in the Urad Valley and determined that groundwater flow is limited (WW Wheeler and Associates, 1993). As a result of these findings and consistent with Section 3.1.5, Henderson and the DRMS agreed that MNGW-1 was appropriate for characterizing groundwater at the Mine.

Henderson initiated increased frequency monitoring (monthly) for pH at MNGW-1 shortly after the establishment of the GWMP in 2012, when further evaluations were triggered consistent with the requirements of section 5.4 of the GWMP. Monthly pH monitoring at MNGW-1 continued through 2025 in addition to supplementary investigations that were conducted between 2013 and -2024 to help assess and determine low pH causes. Updates were provided to the DRMS during this time and are included as part of the permit record. Investigations included, in part, sampling along No Name Gulch which conveys water from Red Mountain around the south side of the Mine to the West Fork of Clear Creek. No Name Gulch is a natural stream that transitions at the base of the mountain, just south of the Mine facilities, to an unlined diversion ditch which routes water around the southern and eastern edge of the surface facilities.

Results of these investigations indicate that the naturally low pH water conveyed by No Name Gulch is contributing to low pH conditions observed in MNGW-1 and is likely contributing or directly causing pH values at the POC to drop below the 6.5 s.u. NPL. The naturally acidic water from No Name Gulch is believed to be the result of acid-rock drainage (ARD) conditions that existed in the system well before mine development and facility construction. This is supported by the presence of certain mineral deposits (manganocrete and ferricrete) in and adjacent to the channel which indicate the long-term existence of ARD. Further, there also appears to be a likelihood that ARD has caused some level of exhaustion of the natural alkaline buffering capacity in No Name Gulch, particularly in the materials used to create the No Name Gulch diversion ditch. Further exhaustion of these materials could lead to continued decreasing trends in pH in the future and will require adjustments to Site Specific Indicator Values. Data also indicates that decreases in pH do not specifically correlate with increases in indicator parameter concentrations. As such and based on current data, Henderson is proposing a Site Specific Indicator Value pH range of 5.6-8.5 to bracket these naturally occurring conditions. The background threshold values were established consistent with the Technical Memorandum Establishing Background Threshold Values for MNGW-1, (Appendix L). Upon approval of TR-37, Henderson will return to the standard monitoring frequencies referenced in Section 6.0, Table 6-1.

3.1.6.2 Internal Groundwater Monitoring

Internal monitoring wells include those monitoring wells not specifically defined as POC wells in this GWMP. Henderson will continue to monitor key internal monitoring wells (Figure 1) on a routine basis as a part of its overall water monitoring program. Note that sampling at key internal monitoring wells, if any, is variable. The need for monitoring is based on a variety of factors including, for example, conceptual site model development and refinement, groundwater flow models, seasonal patterns, water quality assessments, operational needs, and/or other similar projects.

3.1.7 Surface Water Monitoring Locations

3.1.7.1 CDPS Permit Monitoring

The Henderson Mine wastewater treatment system manages, in part, groundwater that is pumped from the mine workings and discharges the effluent through the permitted outfall. This surface water discharge is authorized under CDPS discharge permit No. CO-0041467. Surface water sampling at the outfall is performed in accordance with the permit and is not included in the scope of this Plan. Ongoing compliance with discharge requirements demonstrates the overall effectiveness of the collection and treatment facilities.

3.1.7.2 Clear Creek Surface Water Monitoring Locations

Henderson Mine will continue to monitor existing surface water monitoring locations: CC-10, upgradient of the Henderson Mine in the West Fork of Clear Creek; BG-20, upgradient of the Henderson Mine in Butler Gulch; and CC-30, downgradient of the Henderson Mine in the West Fork of Clear Creek. These sites will allow additional monitoring and trending of data and enable detection of potential changes in water quality from surface runoff in the vicinity of the mine facilities.

Surface water samples will be analyzed for the constituents listed in Table 4-4 and monitored at the frequencies summarized in Section 6.0. Figure 3 of Appendix C illustrates monitoring locations at the Henderson Mine.

3.2 Henderson Mill

3.2.1 Location and Description of Classified Stream Segments

Adjacent to the Henderson Mill, the Williams Fork River, from its source to the confluence with the Colorado River, is Segment 8 of the Upper Colorado River basin. This segment is classified as Aquatic Life (cold) Class 1, Recreation E, Water Supply, and Agriculture. Stream segment location is noted, relative to mill operations, in Figure 2 of Appendix C.

3.2.2 Existing and Potential Future Uses of Groundwater

Current and future groundwater uses at the Henderson Mill are limited. Groundwater within the Henderson Mill property boundary occurs primarily in the areas downstream of the TSF. Within these areas, current and future domestic and agricultural development of groundwater would not be likely given the site location and climate conditions. The current and future groundwater use at the site is limited to recharge of the Williams Fork River.

3.2.3 Potential Contamination Sources and EPFs

Sources of potential contamination of groundwater from the Henderson Mill include infiltration of process water from the TSF and the East Branch Reservoir (EBR), a process water impoundment in the East Branch of Ute Creek. Potential contaminant sources and established EPFs at the Henderson Mine will be managed in accordance with Section 7.2 of the revised EPP.

3.2.4 Site Geology

The Henderson Mill and tailings storage facilities are located in the Ute Creek Basin of the Williams Fork drainage basin. The Ute Creek Basin is bounded on the west by the Vasquez Mountain Range and bounded on the north, south and east by northwest trending Williams Fork Mountains. The Ute Creek Basin basement rocks consist of weathered and unweathered Precambrian gneiss and schist of the Idaho Springs Formation and Silver Plume Granite. In some areas of the basin, the Miocene-aged Troublesome Formation consists mostly of unconsolidated and semi-consolidated lensed clays, silts, sands, gravels and volcanic ash grading to consolidated siltstone, sandstone, conglomerate and claystone derived from the weathering of the Williams Fork Mountain Range. Pleistocene-aged glacial end-moraines, lake sediments and outwash material encroach on the Ute Creek Basin and overlie the Troublesome Formation. End-moraines are a conglomeration of boulders, cobbles, gravels, sands, silts and clays. Glacial lake sediments cover low flat sections while glacial outwash was deposited in braided stream beds. Glacial outwash consists of gravels, cobbles and sands. The Troublesome Formation is generally blanketed by a 2 to 10-foot thick layer of recent slopewash and residual soils. Alluvial material generally lies within the present stream valleys.

The Henderson Mill and adjacent facilities are constructed on the Idaho Springs Formation and Silver Plume Granite. The tailings storage area is located on the western slope of the Williams Fork River Valley and is constructed primarily on the Troublesome Formation although some areas overlay glacial and alluvial deposits.

3.2.5 Hydrogeology

Hydrogeologic conditions at the Henderson Mill were investigated by advancing seven borings into the alluvium and weathered bedrock in the fall of 1993. Of the seven borings, six borings were completed as monitoring wells (designated as GW-2 through GW-7). Based on the site geology, boring logs and observation of groundwater levels, three primary hydrostratigraphic units can be identified at the Henderson Mill site: 1) unconsolidated glacial and alluvial deposits, 2) the Troublesome Formation, and 3) the Idaho Springs Formation and Silver Plume Granite. The following sections summarize the hydraulic characteristics of each hydrostratigraphic unit. Within and downgradient of the TSF, groundwater primarily occurs within the glacial and alluvial deposits, while little groundwater flow is present in the Troublesome Formation, Idaho Springs Formation and Silver Plume Granite.

Glacial and Alluvial Materials

Field data from test pits and borings advanced prior to and after tailings deposition (Woodward-Clyde, 1983, Hydrokinetics, 1993) show that the groundwater levels within the glacial and alluvial materials are hydraulically connected. Since both the glacial and alluvial materials consist of gravels, sands and clay deposits, and are hydraulically connected, these materials are considered a single hydrostratigraphic unit.

The groundwater levels measured within the glacial and alluvial materials vary considerably across the site. When correlated to geologic data, it is evident that the variability of the groundwater levels can be attributed to multiple perched water zones present within pervious layers which overlay impervious layers. Therefore, the groundwater levels and hydraulic properties of this hydrostratigraphic unit are expected to be highly variable.

As shown in Figure 2 of Appendix C, the primary groundwater flow path is generally from southwest to northeast. Data indicates that the direction of groundwater flow is essentially northward near GW-4, and bends northeastward (towards the William Fork River) in the area of well GW-7 (Hydrokinetics, 1993).

Troublesome Formation

The Troublesome Formation has been documented to contain discontinuous sands, gravels, lensed clays, and silts underlain by semi-consolidated siltstones, sandstones, conglomerates and claystones. Data from test pits and borings within the Troublesome indicate that the presence of groundwater within this unit is highly variable. A site study conducted by Woodward-Clyde (1983) concluded that this formation is not considered to be a continuous aquifer because of the limited extent of the sand layers in the formation which would preclude significant groundwater flow.

Idaho Springs Formation and Silver Plume Granite

The weathered and unweathered Precambrian Idaho Springs Formation and Silver Plume Granite are considered to be relatively impermeable compared to the overlying glacial, alluvial and Troublesome Formation deposits. The low permeability nature of the Idaho Springs Formation and the Silver Plume Granite have been documented through packer and geophysical testing in the Precambrian bedrock. These data indicate that the Precambrian bedrock is not capable of transmitting significant quantities of groundwater as compared to the overlying glacial and alluvial deposits and show a defined decrease in hydraulic conductivity with depth.

~~As shown in Figure 2 of Appendix C, the primary groundwater flow path is generally from southwest and towards the Williams Fork River to the northeast. Data indicates that the direction of groundwater flow is essentially northward near GW-4, and bends northeastward (towards the William Fork River) in the area of well GW-7 (Hydrokinetics, 1993).~~

3.2.6 Groundwater Monitoring Locations

3.2.6.1 POC Groundwater Monitoring Locations

The groundwater quality for the Upper Colorado River drainage basin has historically been, and at the time of the original GWMP (TR-16) approval, monitored at well MLGW-7, located downgradient of the Henderson Mill. MLGW-7 is constructed in the alluvium and considered representative of shallow groundwater conditions below the Henderson Mill. The geologic well log and construction details for MLGW-7 are included in Appendix D (Hydrokinetics, 1993). MLGW-7 will be analyzed for the constituents listed in Table 4-1 and monitored at the frequencies summarized in Section 6.0.

The original GWMP (TR-16) provided that Henderson would conduct further groundwater studies at the Henderson Mill to determine the appropriateness of current POC locations as well as the potential for establishing new POC locations below 1-Dam and in the Potato Gulch drainage. The results of this study were submitted in the 2014 5-Quarter Water Quality

Data and Baseline Parameters Report (see Appendix J) and confirmed the appropriateness of the approved POC locations and recommended that new POC locations be established at MLGW-15 and MLGW-17. The report further recommended these POC locations be monitored on an ongoing basis for the indicator parameters listed in Table 4-1 and monitored at the frequencies summarized in Section 6.0. The DRMS preliminarily approved the POC locations, NPLs, and monitoring schedules in April 2015. Geologic well construction details for MLGW-15 and MLGW-17 were provided to the DRMS as part of the Groundwater Monitoring Point of Compliance (POC) Technical Memorandum (AJAX and Clear Creek Associates, 2013).

Segment 8 of the Upper Colorado River drainage basin has been classified as water supply; however, the closest actual water supply use is a substantial distance downstream of the Henderson facility. As such, and as a result of related rulemaking hearings, the Water Quality Control Commission established the Aspen Canyon Ranch well (5 CCR 1002-33, see Appendix E) as the ~~POC~~ “point of compliance” for water supply related parameters iron and manganese. Since sulfate (which is discussed here because it is included as an “indicator parameter” in Section 4.1) is only applicable because of a potential water supply classification, it follows that the POC would also be located at the Aspen Canyon Ranch well. As such, the Aspen Canyon Ranch well (MLGW-ACR) originally served as the POC for domestic water supply standards. The original GWMP (TR-16) provided that Henderson conduct baseline monitoring to establish NPLs at MLGW-ACR. The results of this study were submitted in the 2014 5-Quarter Water Quality Data and Baseline Parameters Report (see Appendix J) including proposed NPLs, with exception of dissolved iron and manganese due to the well conditions discussed below.

However, the Aspen Canyon Ranch property was ~~recently~~ sold ~~to a new owner~~in 2023, and Henderson w~~h~~as not ~~been~~ able to gain access to complete required sampling at MLGW-ACR. Further, as discussed in prior Henderson annual water quality reports and other communications, MLGW-ACR has an unconventional well design that is believed to cause elevated iron and manganese levels due to corrosion and stagnation within the well casing. As such, Henderson is proposing to ~~formally replace MLGW-ACR with~~establish well MLGW-37 as the internal POC monitoring location for domestic water supply standards under the GWMP. MLGW-37 is a newly constructed well located on Henderson property, within proximity to and in the same aquifer system as MLWG-ACR, alleviating both access issues and issues associated with MLGW-ACR’s ~~unconventional~~ well design. A Technical Memo summarizing the results of the MLGW-37 assessment as a potential POC for domestic water supply standards is included as Appendix K.

In accordance with ~~s~~Section 4.2, a baseline dataset will be collected at MLGW-37 over a period of time necessary to provide a minimum of 5 triannual sampling events. Once sampling has been completed, the baseline data will be assessed to determine a final list of domestic water supply parameters and related ~~NPL~~Limits for long-term monitoring. Henderson will present the results of this assessment to DRMS for review and approval. Upon approval, ~~NPL~~Limit and monitoring information will be updated in Sections 5.0 and 6.0, if required. In the interim, Henderson proposes to adopt ~~NPL~~Limits based on the table value standards listed in Tables 1 and 2 (Domestic Water Supply) of the Colorado Basic

Standards for Groundwater (CBSG) for the indicator parameters listed in Table 4-1 and that also appear in CBSG Tables 1 and 2.

3.2.6.2 Internal Groundwater Monitoring

Internal monitoring wells include those monitoring wells not specifically defined as POC wells in this GWMP. Henderson will continue to monitor key internal monitoring wells (Figure 2) on a routine basis as a part of its overall water monitoring program. Note that sampling at key internal monitoring wells, if any, is variable. The need for monitoring is based on a variety of factors including, for example, conceptual site model development and refinement, groundwater flow models, seasonal patterns, water quality assessments, operational needs, and/or other similar projects.

3.2.7 Surface Water Monitoring Locations

3.2.7.1 CDPS Permit Monitoring

Henderson Mill process water may be discharged under the authority of CDPS Wastewater Discharge Permit No. CO-0000230. The Mill facility has operated as a zero-discharge facility since the beginning of operations in 1976; however, under forecasted operating and climate conditions, a surplus water scenario is possible which results in water that must be stored in the TSF or EBR. The construction and operation of a new Mill WTP is planned to treat excess process water to provide operational flexibility and allow appropriate management of stored water volumes under a variety of conditions. The WTP has been designated as an EPF in the Henderson EPP approved as part of TR-34. Additional WTP design details are provided in TR-35. Future discharge and any surface water sampling conducted in accordance with the CDPS Permit is not included in the scope of this GWMP. Ongoing compliance with discharge requirements is expected to demonstrate the overall effectiveness of the collection and treatment facilities.

3.2.7.2 Williams Fork Surface Water Monitoring Locations

Henderson will continue to monitor existing surface water monitoring locations: WFR-20, upgradient of the Henderson Mill in the Williams Fork River, and WFR-40, downgradient of the Henderson Mill in the Williams Fork River. These sites will allow additional monitoring and trending of data and enable the detection of potential changes in water quality from surface runoff in the vicinity of the mill facilities.

Surface water samples will be analyzed for the constituents listed in Table 4-4 and monitored at the frequencies summarized in Section 6.0. Figure 2 of Appendix C illustrates the location of monitoring locations at the Henderson Mill.

3.2.8 Ute Park Extraction Wellfield

The Henderson Mill TSF was constructed by the upstream deposition method and is comprised of tailings material. Some of the water from the tailings pond and dam migrates through the tailings material and is captured in seepage collection canals located at the toe of the tailings dam. The canals direct the water to the Ute Creek Pump Station which pumps it back into the mill water circuit for reuse. This seep water collection and return system is identified as Mill EPF 1.5 and managed in accordance with the revised EPP.

1-Dam was constructed over the Ute Creek drainage and its alluvial channels which form a shallow groundwater unit. Based on previous characterization studies, the Ute Creek alluvial and glacial drift deposits were reported to be the primary water-bearing unit underlying and downgradient of the tailings dam. Seepage from the 1-Dam tailings facility that is not captured in the seepage collection canals reports to the underlying alluvium and is captured by an extraction wellfield. The purpose of the extraction wellfield is to effectively intercept and capture seepage affected groundwater below 1-Dam and pump it back into the Mill process water system. The extraction wellfield is currently comprised of seven extraction wells located downgradient of 1-Dam. Water from the extraction wellfield system is routed to the Ute Park Pump House and pumped back to the tailing pond for reuse in the milling circuit. The Ute Park Extraction Wellfield is identified as Mill EPF 1.6 and managed in accordance with the revised EPP.

4.0 Monitoring Parameters

Monitoring under this GWMP is intended to provide data for:

- Demonstrating that EPP requirements are being met; and
- Evaluating changes in water quality that may be related to mining and milling operations at the site.

This section describes the selection of monitoring parameters.

4.1 Indicator Parameters

A Geochemical Evaluation and Sampling Plan (see Appendix F) was submitted and approved by the DRMS in May 2010. Subsequent sampling was performed on June 14-15, 2010 at the Mine to identify those parameters that have a reasonable potential of being transported from mining materials to surface and groundwater systems. A DRMS representative was present and observed this sampling event.

Geochemical evaluation monitoring results (see Appendix G) were subsequently analyzed by Henderson and the DRMS with the goal of identifying a short list of indicator parameters that track overall water quality. An indicator parameters list was selected and approved by the DRMS and is summarized in Table 4-1.

Table 4-1: Groundwater Indicator Monitoring Parameters

***Indicator Parameters*[1]**	
Selenium	Conductivity
Iron	Sulfate
Manganese	pH
Zinc	

Footnotes:
[1] Metals measured as dissolved fraction

The following provides a brief rationale for indicator parameter selection based on related discussions and correspondence between Henderson and the DRMS:

- Iron, manganese and zinc were selected to provide a reasonable indication of how trace elemental cations are behaving;
- Sulfate was selected to provide a reasonable indication of how anionic species are behaving. Sulfate is a constituent associated with sulfide ore and is known to occur in the water fraction of the tailings. Sulfate is also a naturally occurring constituent in surface and groundwater in this area;
- Selenium was selected to provide an indication of how elements that exist in natural waters primarily as oxyanions (antimony, arsenic, molybdenum, selenium and uranium), which do not track with the metal cations, are behaving; and
- pH and conductivity provide an instantaneous snapshot of physical field data.

4.2 Baseline Parameters

Newly monitored or constructed groundwater monitoring POC locations will, in addition to those indicator parameters listed in Section 4.1, be monitored for the baseline parameters summarized in Table 4-2 or Table 4-3, as appropriate. The baseline dataset will be collected over a period of time necessary to provide a minimum of 5 triannual sampling events. Once sampling has been completed, the indicator parameter list will be reviewed against the baseline data, and parameters may be added or removed from the lists for long-term monitoring. Henderson will present the results of this assessment to DRMS for review and approval. Upon approval, these monitoring locations will be added to the tables in Section 6.0, as appropriate, for long-term monitoring. Upon completion of baseline monitoring at domestic water supply POC monitoring locations, only those indicator parameters that also appear in CBSG Tables 1 and 2 (Domestic Water Supply) will be monitored on an ongoing basis.

The baseline parameters in Table 4-2 are a compilation of those parameters listed in CBSG Table 3 Agricultural Standards, but excluding those parameters already included in the indicator parameter list in Table 4-1. The baseline parameters in Table 4-3 are a compilation of those parameters listed in CBSG Tables 1 and 2 for domestic water supply, but excluding those parameters already included in the indicator parameter list in Table 4-1 and excluding asbestos, cyanide [Free], total coliforms, odor, color and foaming agents as these constituents would not reasonably be expected to be present or necessary.

Table 4-2: Groundwater Baseline Monitoring Parameters – Agriculture (CBSG Table 3)

Groundwater Baseline Parameters[1]	
Aluminum	Fluoride
Arsenic	Lead
Beryllium	Lithium
Boron	Mercury
Cadmium	Nickel
Chromium	Nitrite (NO_2-N)
Cobalt	Nitrite & Nitrate (NO_2 + NO_3-N)
Copper	Vanadium

Footnotes:
[1] Metals, Nitrite, and Nitrite & Nitrate measured as dissolved fraction

Table 4-3: Groundwater Baseline Monitoring Parameters - Domestic Water Supply (CBSG Tables 1 and 2)

***Groundwater Baseline Parameters - Domestic Water Supply*[1]**	
Inorganic	
Antimony	Mercury (inorganic)
Arsenic	Molybdenum
Barium	Nickel
Beryllium	Nitrate (NO_3)
Cadmium	Nitrite & Nitrate ($NO_2 + NO_3$-N)
Chromium	Silver
Fluoride	Thallium
Lead	Uranium
Radiological	
Gross Alpha Particle Activity	Beta and Photon Emitters
Drinking Water	
Chlorophenol	Corrosivity
Chloride	Phenol
Copper	

Footnotes:
[1] Metals, Nitrate, Nitrite & Nitrate, Fluoride, and Chloride measured as dissolved fraction

4.3 Surface Water Monitoring Parameters

Surface water monitoring locations will be monitored for the parameters listed in Table 4-4.

Table 4-4: Surface Water Monitoring Parameters

***Surface Water Monitoring Parameters*[1]**	
Selenium	Conductivity
Iron	Sulfate
Manganese	pH
Zinc	Hardness[2]

Footnotes:
[1] Metals measured as dissolved fraction
[2] Hardness included in the surface water parameters list to allow for the calculation of table value standards

5.0 ~~NPL~~Limits, Data Analysis, Notification and Revisions to Groundwater Standards

This section presents the approach to be utilized to establish ~~NPL~~Limits and the data analysis and reporting procedures for POC wells.

5.1 NPLs (Numeric Protection Levels) for POC Wells

Colorado Revised Statute (C.R.S.) 25-8-202(7) and the December 14, 2010 Memorandum of Agreement (MOA) between the Colorado Department of Public Health and Environment (CDPHE), the Water Quality Control Commission (WQCC), and DRMS clarify that WQCC is the entity solely responsible to adopt water quality standards and classifications for state waters. The MOA provides that DRMS will establish points of compliance for discharges to groundwater and must provide reasonable assurance to the Water Quality Control Division (WQCD) and WQCC that compliance with the C.R.S. 25-8-202(7) has been obtained by using the groundwater standards and classifications established by WQCC as the basis for setting enforceable performance standards, adopting rules and regulations to establish points of compliance for discharges to state waters other than point source discharges to surface water, and other requirements as included in the MOA. The WQCC has not established classified uses for groundwater at or near Henderson Mine or Mill for which standards specific to the area have been adopted, therefore the Interim Narrative Standard under CBSG is applicable. DRMS Rule 3.1.7(2)(c), requires the use of the groundwater quality table values in the CBSG as a guide for establishing numeric protection limits or permit conditions. In situations where ambient groundwater exceeds groundwater table values, the rule requires establishing permit conditions to protect existing and reasonably potential future uses against further lowering of groundwater quality. The Interim Narrative Statewide Standard (CBSG Section 41.5(C)(6)(b)(i)) states that groundwater quality shall be maintained for each parameter at whichever of the following levels is least restrictive: existing ambient quality as of January 31, 1994, or the most stringent criteria set forth in Tables 1 through 4 of the CBSG.

Consistent with DRMS rules, ~~NPL~~Limits will be established for POC groundwater wells using the CBSG Table Value Standards as a guide with consideration given to baseline data, where available. In instances where the ambient~~existing~~ groundwater quality exceeds ~~a~~ CBSG table values, Site Specific Indicator Values are established ~~an alternate NPL is selected based on the Interim Narrative Standard~~ to protect against the further lowering of groundwater quality.

Where ambient data are to be used to establish Site Specific Indicator Values~~protection limits~~, baseline concentrations will be established using ~~baseline~~ monitoring data~~,~~ from a minimum of 5 representative triannual sampling events (or more where data is available) ~~collected subsequent to January 31, 1994~~. ~~The~~ Site Specific Indicator Values ~~NPL~~ will be ~~established~~ determined using a methodology consistent with that summarized in the Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese included in Appendix H.

The ~~NPL~~Limits are discussed below for each of the watersheds. The data analysis approach to be used in evaluating data against the ~~NPL~~Limits is described in Section 5.2.

5.1.1 Henderson Mine

The POC for Henderson Mine is MNGW-1 (see Figure 3). The monitoring well is located downgradient, near the east end of the disturbed industrial area. Table 5-1 lists the parameters to be measured, applicable ~~NPL~~Limits, and the basis for establishing the ~~NPL~~Limits.

Table 5-1: MNGW-1 Numeric Protection Limits

Analytical Parameter	***~~NP~~Limit (mg/L)***	***~~NPL~~ Basis (see footnotes)***
Iron, dissolved	5	Table 3, CBSG
Manganese, dissolved	0.79	Site Specific Indicator Value[1]~~Ambient~~
Selenium, dissolved	0.02	Table 3, CBSG
Zinc, dissolved	2	Table 3, CBSG
Conductivity, µS/cm	NA (report)	NA
pH, s.u.	~~6.5~~5.6 – 8.5	Site Specific Indicator Value[2]~~Table 3, CBSG~~
Sulfate, mg/L	NA (report)	NA

Footnotes:

Table 3, CBSG: Agricultural Use Standards

[1]~~Ambient:~~ See Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese included in Appendix H as previously approved in the GWMP TR-16

[2]See Technical Memorandum Establishing Background Threshold Values for MNGW-1 included in Appendix L

5.1.2 Henderson Mill

The POC locations for Henderson Mill, parameters to be measured, applicable ~~NP~~Limits, and the basis for establishing the ~~NP~~Limits for each POC location are summarized in the below tables.

Table 5-2: MLGW-7 Numeric Protection Limits

Analytical Parameter	***~~NP~~Limit (mg/L)***	***~~NPL~~ Basis (see footnotes)***
Iron, dissolved	5	Table 3, CBSG
Manganese, dissolved	0.42	Site Specific Indicator Value ~~Ambient~~[1]
Selenium, dissolved	0.02	Table 3, CBSG
Zinc, dissolved	2	Table 3, CBSG
Conductivity, µS/cm	NA (report)	NA

pH, s.u.	5.9 – 8.5	Site Specific Indicator Value~~Ambient~~[2]
Sulfate, mg/L	NA (report)	NA

Footnotes:
Table 3, CBSG: Agricultural Use Standards
[1]See Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese included in Appendix H as previously approved in the GWMP TR-16
[2]See 5-Quarter Water Quality Data and Baseline Parameters Report (Appendix J); Technical Consulting Report - Establishing Background Threshold Values (BTV) - Henderson Mill (Gateway Enterprises, 2014)

Table 5-3: MLGW-15 Numeric Protection Limits

Analytical Parameter	***~~NP~~Limit (mg/L)***	***~~NPL~~ Basis (see footnotes)***
Iron, dissolved	5	Table 3, CBSG
Manganese, dissolved	0.42	Site Specific Indicator Value~~Ambient~~[1]
Selenium, dissolved	0.02	Table 3, CBSG
Zinc, dissolved	2	Table 3, CBSG
Conductivity, µS/cm	NA (report)	NA
pH, s.u.	5.9 – 8.5	Site Specific Indicator Value~~Ambient~~[2]
Sulfate, mg/L	NA (report)	NA

Footnotes:
Table 3, CBSG: Agricultural Use Standards
[1]See Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese included in Appendix H as previously approved in the GWMP TR-16
[2]See 5-Quarter Water Quality Data and Baseline Parameters Report (Appendix J); Technical Consulting Report - Establishing Background Threshold Values (BTV) - Henderson Mill (Gateway Enterprises, 2014)

Table 5-4: MLGW-17 Numeric Protection Limits

Analytical Parameter	***~~NP~~Limit (mg/L)***	***~~NPL~~ Basis (see footnotes)***
Iron, dissolved	5	Table 3, CBSG
Manganese, dissolved	0.42	Site Specific Indicator Value~~Ambient~~[1]
Selenium, dissolved	0.02	Table 3, CBSG
Zinc, dissolved	2	Table 3, CBSG
Conductivity, µS/cm	NA (report)	NA
pH, s.u.	5.9 – 8.5	Site Specific Indicator Value~~Ambient~~[2]

Sulfate, mg/L	NA (report)	NA

Footnotes:
Table 3, CBSG: Agricultural Use Standards
[1]See Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese included in Appendix H as previously approved in the GWMP TR-16
[2]See 5-Quarter Water Quality Data and Baseline Parameters Report (Appendix J); Technical Consulting Report - Establishing Background Threshold Values (BTV) - Henderson Mill (Gateway Enterprises, 2014)

Table 5-5: MLGW-37 Numeric Protection Limits

Analytical Parameter	*~~NP~~Limit (mg/L)*	*~~NPL~~ Basis (see footnotes)*
Iron, dissolved	0.3[1]	Table 2, CBSG
Manganese, dissolved	0.05[1]	Table 2, CBSG
Selenium, dissolved	0.05[1]	Table 1, CBSG
Zinc, dissolved	5[1]	Table 2, CBSG
pH, s.u.	6.5-8.5[1]	Table 2, CBSG
Sulfate, dissolved	250[1]	Table 2, CBSG

Footnotes:
[1]Interim ~~NP~~Limit established during the baseline monitoring (a minimum of 5 triannual sampling events), baseline data assessment, and determination of a final list of domestic water supply parameters and related ~~NP~~Limits for long-term monitoring (see Section 3.2.6 for additional information).
Table 1, CBSG: Domestic Water Supply – Human Health Standards
Table 2, CBSG: Domestic Water Supply – Drinking Water Standards

5.2 Data Analysis

This section presents the data analysis and reporting procedures established for POC wells. The data evaluation for the POC wells involves a comparison against ~~NPL~~Limits.

For POC wells, the first step in evaluating individual event results will be a simple comparison against the ~~NPL~~Limit. If a sample result exceeds the ~~NPL~~Limit, field forms will be reviewed and the laboratory will be contacted to check for potential errors. If the initial data quality review does not reveal any errors, the DRMS will be notified and the well will be resampled within 30 days of the receipt of the analytical data. If the second analytical result does not exceed the ~~NPL~~Limit, sampling will continue at the normally scheduled frequency. If the second sample confirms the first result, additional data evaluation including outlier tests and data distribution and trend analyses will be performed, along with the additional steps presented below.

5.3 Notification and Consultation

If a result is confirmed to have exceeded an ~~NPL~~Limit and Henderson's data trend analysis does not find the result to be anomalous, or an obvious outlier, the following steps outline the procedure that will be taken:

1. Henderson will verbally notify DRMS that an exceedance has occurred within 10 days of receiving the analytical results for the second sample and in writing within 30 days. Written notification will include, at a minimum, the following information:

a. The constituent identified to be in excess of established action level or standard.

b. The location at which the exceedance was identified.

c. Analytical data, including the date the samples were collected and the concentrations at which the constituent was measured.

d. Increased monitoring measures being undertaken.

Notifications will be submitted to the following location:

Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, Colorado 80203

2. The increased-monitoring proposal will address a modified sampling frequency for the POC location. The proposal will include a schedule for reporting and follow up discussions with DRMS.

3. If the results of the additional monitoring data indicate that water quality may be affected, Henderson will notify DRMS and initiate timely discussions with DRMS on the appropriate actions to be implemented.

5.4 Additional Data Evaluation

5.4.1 Trend Evaluation

Henderson will evaluate water quality trends for the POC groundwater monitoring sites identified above on an annual basis, and report findings in accordance with Section 7.0. This trend evaluation will be performed by viewing and presenting the data graphically and evaluating any observable visual trend. Evaluation of trends can be complicated by seasonal changes in precipitation and recharge, and by delayed response to events. Therefore, the evaluation will consider short-term changes (such as seasonal effects) in determining whether a declining trend in water quality exists. In other words, if seasonal concentration peaks occur, the evaluation should be performed to determine if there are trends in the peak concentrations.

If graphical trends do not suggest declining water quality, no further action is required and monitoring will continue in accordance with Section 6.1 and 6.2, access and weather conditions permitting. However, if a trend that suggests increasing concentrations in parameters is observed, Henderson will evaluate downgradient data, consider potential sources or causes of the trend, and if necessary, develop a plan for increased monitoring frequency or further actions.

5.4.2 Outlier Identification

Outlier results can and do occur in environmental monitoring. The general practice will be to not remove outliers from the water-quality data set, but to consider them in the visual and statistical trend evaluations. However, Henderson will perform outlier testing using Rosner's outlier or other applicable test, considering the size of the available sample set and the validity of statistical tests for the circumstance, and report the results in its annual monitoring report. Test results identified as "outlier" will be maintained in the monitoring database, but may be excluded in trend or statistical analyses.

5.5 Revisions to Water Quality Standards

The ~~NPL~~Limits established in this section reflect the numeric water quality standards (5 CCR 1002-41 CBSG) in effect at the time this GWMP was submitted. In the event that the applicable water quality standards are revised, the ~~NPL~~Limits established herein will default to the revised numeric standards. However, ~~NPL~~Limits that have been established based on ambient water quality shall not be affected by changes to state water quality standards, unless such changes reflect an increase in the standard above the established limitation.

6.0 Monitoring Summary

This section summarizes the long-term monitoring locations, frequencies, sample types, parameters to be monitored for, and applicable ~~NPL~~Limits at the Henderson Mine and Mill. This section does not address baseline monitoring, which will, as summarized in Section 4.2, be conducted over a period of time necessary to provide a minimum of 5 triannual sampling events. Upon completion of baseline monitoring for newly constructed or monitored locations and determination of appropriate parameter list, these locations will be added to the below tables for long-term monitoring. Monitoring shall commence upon approval of this Technical Revision.

6.1 Henderson Mine

Table 6-1: Mine Monitoring Frequencies

Monitoring Locations	*Frequency*	*Type*	*Parameters*	*~~NPL~~Limits*
MNGW-1	3x/year*	Groundwater	Table 4-1	Table 5-1
BG-20	3x/year*	Surface Water	Table 4-4	NA
CC-10	3x/year*	Surface Water	Table 4-4	NA
CC-30	3x/year*	Surface Water	Table 4-4	NA

Notes:
3x/year – samples shall be collected during spring run-off (Apr-Jun), summer months (July-Aug) and low flow (Sep-Dec).

6.2 Henderson Mill

Table 6-2: Mill Monitoring Frequencies

Monitoring Locations	*Frequency*	*Type*	*Parameters*	*~~NPL~~Limits*
MLGW-7	3x/year*	Groundwater	Table 4-1	Table 5-2
MLGW-15	3x/year*	Groundwater	Table 4-1	Table 5-3
MLGW-17	3x/year*	Groundwater	Table 4-1	Table 5-4
MLGW-37	3x/year*	Groundwater	Table 5-5	Table 5-5
WFR-20	3x/year*	Surface Water	Table 4-4	NA
WFR-40	3x/year*	Surface Water	Table 4-4	NA

Notes:
3x/year – samples shall be collected during spring run-off (Apr-Jun), summer months (July-Aug) and low flow (Sep-Dec).

6.3 Triannual Monitoring

Due to the harsh winter weather conditions at Henderson, monitoring during the winter months has proved to be a logistical difficulty, and more importantly requires significant management to reduce safety risks. Sampling procedures during the middle of winter (normally January through March timeframe) are often complicated by deep powder snowshoe access, freezing conditions, equipment difficulties, avalanche concerns, communication requirements (radio/beacons) and increased staffing requirements (safety spotters). For these reasons, Henderson has developed a monitoring schedule that includes a sampling frequency of three (3) times per year (triannual) that limits sampling activities during these times while delivering equivalent data results when compared to the historic calendar quarter monitoring schedule. The three monitoring periods will be spring runoff (April-June), summer months (July-August) and low flow conditions in the fall/winter (Sep-Dec). The following discussion provides the basis for this determination.

Using EPA's ProUCL, a number of statistical calculations were conducted that were designed to determine what impacts a reduced frequency of monitoring would have on the anticipated results. In order to do this, the full data set for Wells MLGW-7 and MNGW-1 were compared to reduced data sets generated when first, second, third, or fourth quarter data were removed. This produces comparisons that can be used to show what the impact of reduced sampling would have been in the past, and by extension, a likely projection of what it would be in the future.

This statistical analysis was performed to develop an indication of the likely effects of reduced sampling on all parameters. To perform a statistical test of this type, an appropriate null hypothesis is first established. In this case the null hypothesis is that the mean/median of data sets with one quarter's sampling removed is statistically equal to the mean/median of the full data set. If it is equal, then there is not any statistical impact of eliminating that quarter of sampling data.

The indicator parameter set was used to perform this evaluation. The indicator analytes include manganese, zinc, iron, selenium, conductivity, sulfate, and pH. Conductivity data was not available at the time and so TDS was used as a substitute. In addition, the number of data points available for selenium was not sufficient to allow a statistically significant evaluation and so it was not included in the evaluation. In its place, molybdenum was used since it is also a metal for which oxyanions predominate in solution.

Detailed results for all these parameters are shown in Appendix I. A summary of the results for each parameter is shown in Table 6-3 for MLGW-7 and for MNGW-1.

In the case of MNGW-1, sulfate had an insufficient number of points that did not cover all quarters of sampling, so the hypothesis test could not be performed for that analyte. For MLGW-7, iron, zinc and molybdenum had coverage of all quarters but the number of points is relatively small such that the statistical evaluation becomes less certain. Otherwise, the data clearly show that the mean/median for all sets with any single quarter removed is statistically equal to the full data set.

The exception to this is total dissolved solids, which displays a higher mean/median when the third quarter of data is removed for well MNGW-1 (highlighted in Table 6-3). The degree of this effect can be seen in the appropriate data table in Appendix I.

The conclusion that can be reached from these results is that a properly-designed sampling program in which samples are taken three times per year will produce equivalent results as the quarterly (i.e., four times per year) program in place at this time. This means that any seasonal fluctuations can be accounted for using a triannual frequency of sampling, and there is no evidence of any trend that would skew the results.

Table 6-3: Results of Hypothesis Test for Indicator Parameters in MNGW-1 and MLGW-7

Well	***Parameter***	***Data Points in Full Set***	***Result of Hypothesis Test, Q1 Removed***	***Result of Hypothesis Test, Q2 Removed***	***Result of Hypothesis Test, Q3 Removed***	***Result of Hypothesis Test, Q4 Removed***
MNGW-1	Manganese	66	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Iron	67	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Zinc	67	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Sulfate*	16	NA	NA	NA	NA
	Molybdenum	67	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	TDS	65	Equal to full set	Equal to full set	**Mean > Full Set**	Equal to full set
	pH	61	Equal to full set	Equal to full set	Equal to full set	Equal to full set
MLGW-7	Manganese	121	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Iron**	19	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Zinc**	17	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Sulfate	47	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	Molybdenum**	22	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	TDS	31	Equal to full set	Equal to full set	Equal to full set	Equal to full set
	pH	114	Equal to full set	Equal to full set	Equal to full set	Equal to full set

* The number of data points is not sufficient for sulfate in well MNGW-1 to provide coverage of all quarters and the hypothesis test was not run.

**For MLGW-7, iron, zinc, and molybdenum have a relatively small number of data points and the hypothesis test may be less reliable than for the other parameters in this well.

6.4 Reduced Monitoring

Where data indicate that water quality is consistently meeting ~~NPL~~Limits established in the GWMP and that no trend of increased contamination is being observed over time, taking into account potential seasonal fluctuations, Henderson may submit a request to the DRMS for reduced monitoring until such time that monitoring under the Henderson Permit is no longer deemed necessary.

6.5 Access to Monitoring Locations and Personnel Safety

Monitoring shall not be required during periods where weather and access conditions pose a risk to personnel safety. Failure to monitor due to unsafe access conditions shall not be deemed a violation of this GWMP.

7.0 Reporting and Recordkeeping

7.1 Reporting

A copy of monitoring data gathered in accordance with the requirements contained herein will be submitted to the DRMS on an annual basis. This annual report will be submitted separately from the annual Reclamation Report, by May 31 of each year for the prior year's data. The report shall be submitted to DRMS at the following address:

Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, Colorado 80203

7.2 Recordkeeping

Henderson Mine and Henderson Mill will establish and maintain records. Records will include the following:

a. The date, type and location of sampling;
b. The individual who performed the sampling;
c. The date the analyses was performed;
d. The individual performing the analyses;
e. The analytical technique or methods; and
f. Results of analyses.

Records will be maintained for a minimum of three years and will be made available upon request of the DRMS.

8.0 Sampling and Analytical Methods

The Henderson Mine and Henderson Mill will establish, implement and maintain sampling procedures to meet the following minimum requirements:

- Generally, all ground and surface water samples shall be collected and analyzed in accordance with approved industry standards using methodologies, including quality assurance/quality control, similar to those required of major Federal and State monitoring programs and other programs of systematic monitoring or academic research;
- Surface water samples and measurements shall be representative of the nature of the monitored water body; and
- Groundwater samples will be collected and managed in accordance with the Colorado Department of Public Health and Environment's *Suggested Sampling Protocol for Groundwater Monitoring Wells*, as well as internally developed procedures.

Where possible, the analytical method selected for a parameter shall have a detection limit below the ~~NPL~~Limits established in this GWMP. Where the most sensitive analytical method has a detection limit greater than or equal to a limit established herein, "less than (the detection limit)" shall be reported and will not be considered an exceedance of the applicable ~~NPL~~Limit.

References

AJAX and Clear Creek Associates, 2013, Groundwater Monitoring Point of Compliance (POC) Technical Memorandum, Henderson Mill, May, 2013.

Hydrokinetics, 1993, Well Construction and Flow Analysis – Troublesome Formation and Alluvial Materials

W.W. Wheeler and Associates, Inc., 1991, Recommendations for Groundwater Monitoring at the Henderson Minesite Near Empire.

W.W. Wheeler and Associates, Inc., 1993, Hydraulic Conductivity of Precambrian Granite in Upper Clear Creek Area

Woodward Clyde, 1983, Henderson Tailing Area Geohydrology, Report No. 20997-9407 to Amax, Inc.

Appendix A

Existing Monitoring Program – Groundwater Data

Appendix B

Existing Monitoring Program – 5 Quarters of Surface Water Data

Appendix C

Site Diagrams

Appendix D

Geologic Well Logs and Construction Details

Appendix E

Water Quality Control Commission Rulemaking Hearing – 5 CCR 1002-33

Appendix F

Henderson Geochemical Evaluation and Sampling Plan

Appendix G

Henderson Geochemical Evaluation Results

Appendix H

Technical Consulting Report – Establishing Background Threshold Values (BTVs) for Manganese

Appendix I

Monitoring Frequency Statistical Evaluation

Appendix J

5-Quarter Water Quality Data and Baseline Parameters Report

Appendix K

Assessment of Proposed Point of Compliance (POC) Well – MLGW-37, Technical Memorandum

Appendix L

Establishing Background Threshold Values for MNGW-1, Technical Memorandum

ATTACHMENT 3

Well Permit and As-Built drawing for MNGW-5

COLORADO
Division of Water Resources
Department of Natural Resources

WELL PERMIT NUMBER 336912-
RECEIPT NUMBER 10039964

ORIGINAL PERMIT APPLICANT(S)

CLIMAX MOLYBDENUM COMPANY

APPROVED WELL LOCATION

Water Division: 1 Water District: 7
Designated Basin: N/A
Management District: N/A
County: CLEAR CREEK
Parcel Name: N/A
Physical Address: N/A

SW 1/4 SW 1/4 Section 19 Township 3.0 S Range 75.0 W Sixth P.M.

UTM COORDINATES (Meters, Zone:13, NAD83)

Easting: 428437.0 Northing: 4402581.0

PERMIT TO USE AN EXISTING WELL

ISSUANCE OF THIS PERMIT DOES NOT CONFER A WATER RIGHT

CONDITIONS OF APPROVAL

1) This well shall be used in such a way as to cause no material injury to existing water rights. The issuance of this permit does not ensure that no injury will occur to another vested water right or preclude another owner of a vested water right from seeking relief in a civil court action.

2) The construction of this well shall be in compliance with the Water Well Construction Rules 2 CCR 402-2, unless approval of a variance has been granted by the State Board of Examiners of Water Well Construction and Pump Installation Contractors in accordance with Rule 18.

3) Approved pursuant to CRS 37-92-602(3)(b)(I) for uses as described in CRS 37-92-602(1)(f). Use of this well is limited to monitoring water levels and/or water quality sampling.

4) Approved for the use of an existing well acknowledged for construction under monitoring hole notice 4000465-MH, and known as MNGW-5.

5) This well must be equipped with a locking cap or seal to prevent well contamination or possible hazards as an open well. The well must be kept capped and locked at all times except during sampling or measuring.

6) Records of water level measurements and water quality analyses shall be maintained by the well owner and submitted to the Division of Water Resources upon request.

7) Upon conclusion of the monitoring program the well owner shall plug this well in accordance with Rule 16 of the Water Well Construction Rules. A Well Abandonment Report e-Form available at: https://dwr.state.co.us/eforms must be completed and submitted to the Division of Water Resources within 60 days of plugging.

8) The owner shall mark the well in a conspicuous location with the well permit number and name of aquifer as appropriate, and shall take necessary means and precautions to preserve these markings.

9) This well must have been constructed by or under the supervision of a licensed well driller or other authorized individual according to the Water Well Construction Rules.

10) This well must be located not more than 200 feet from the location specified on this permit.

NOTE: Issuance of this permit does not guarantee that this well can be converted to a production well under a future permit. Additionally, pursuant to Rule 14.2 of the Water Well Construction Rules (2 CCR 402-2), monitoring holes constructed pursuant to a monitoring hole notice shall not be converted to a production well. (Upon obtaining a permit from the State Engineer, a monitoring hole may be converted to a monitoring well, recovery well for remediation of the aquifer, or a dewatering system for dewatering the aquifer.)

NOTICE: This permit has been approved subject to the following changes: The quarter/quarter and quarter section were determined from UTM coordinate values provided with the permit application. You are hereby notified that you have the right to appeal the issuance of this permit, by filing a written request with this office within sixty (60) days of the date of issuance, pursuant to the State Administrative Procedures Act. (See Section 24-4-104 through 106, C.R.S.)

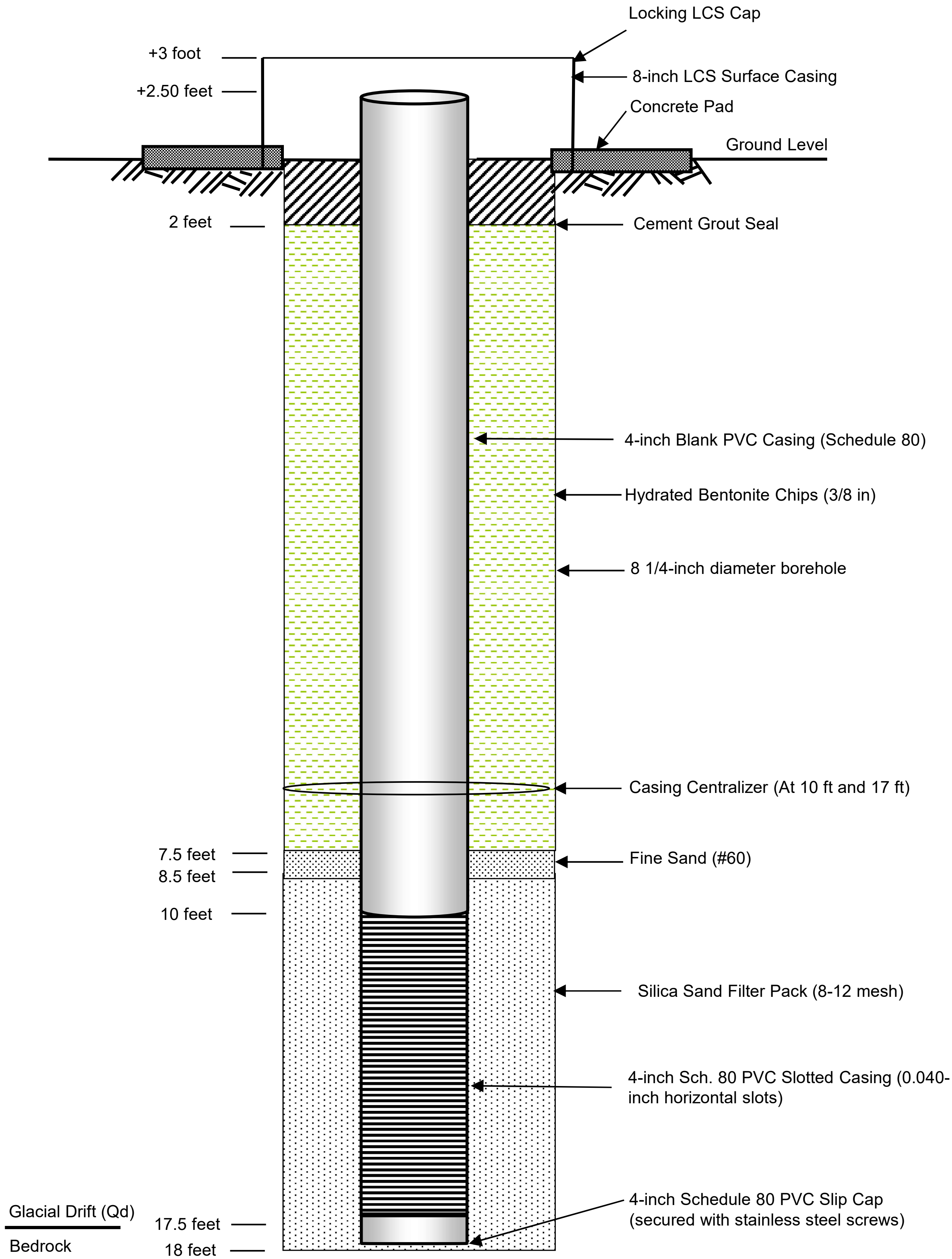
WELL PERMIT NUMBER 336912-	RECEIPT NUMBER 10039964

Geoff Davis

Issued By GEOFFREY DAVIS

Date Issued: 12/31/2024

Expiration Date: N/A



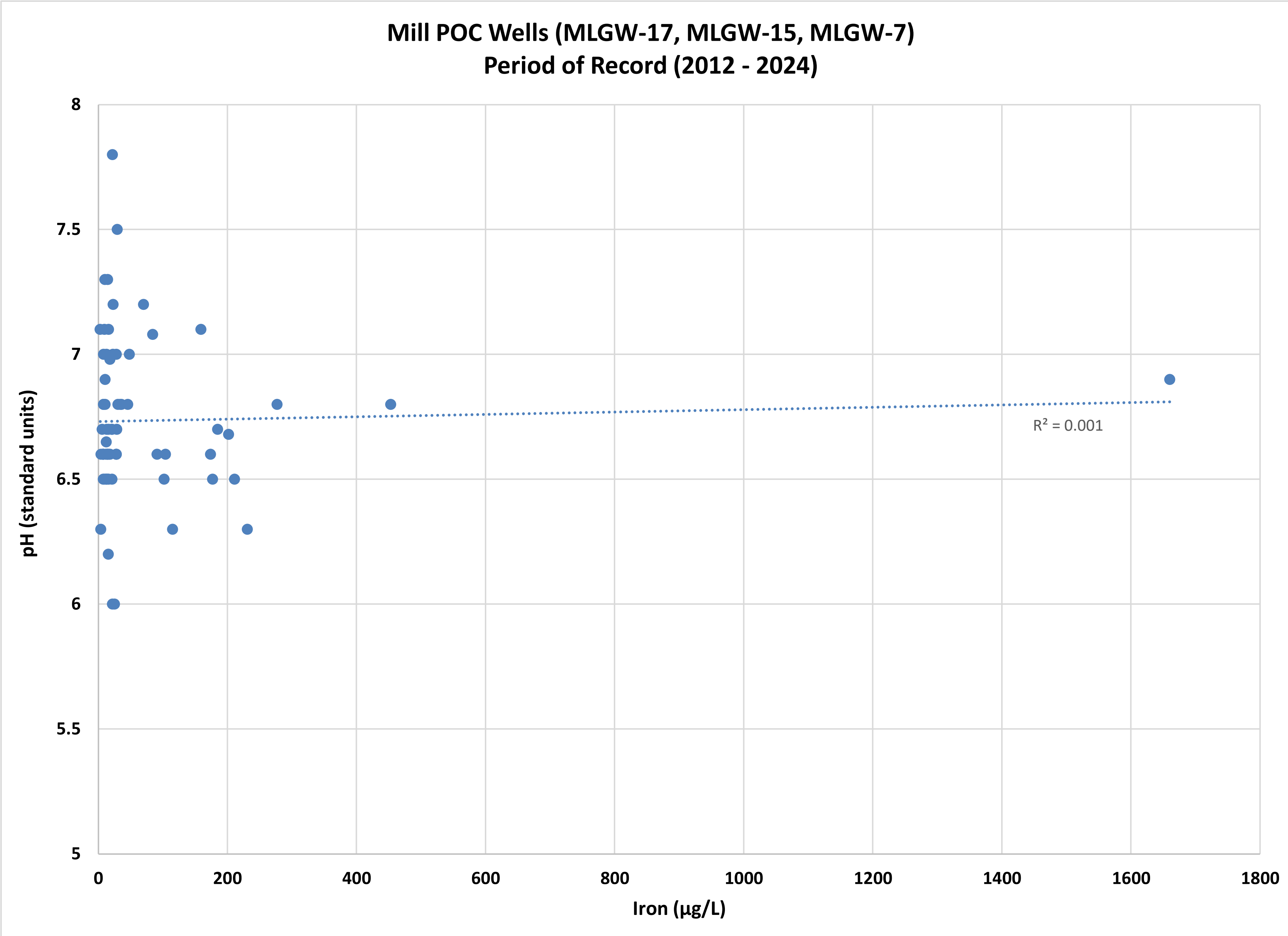
Notes: PVC = Polyvinyl chloride
LCS = low carbon steel
Constructed on November 17, 2023

NOT TO SCALE

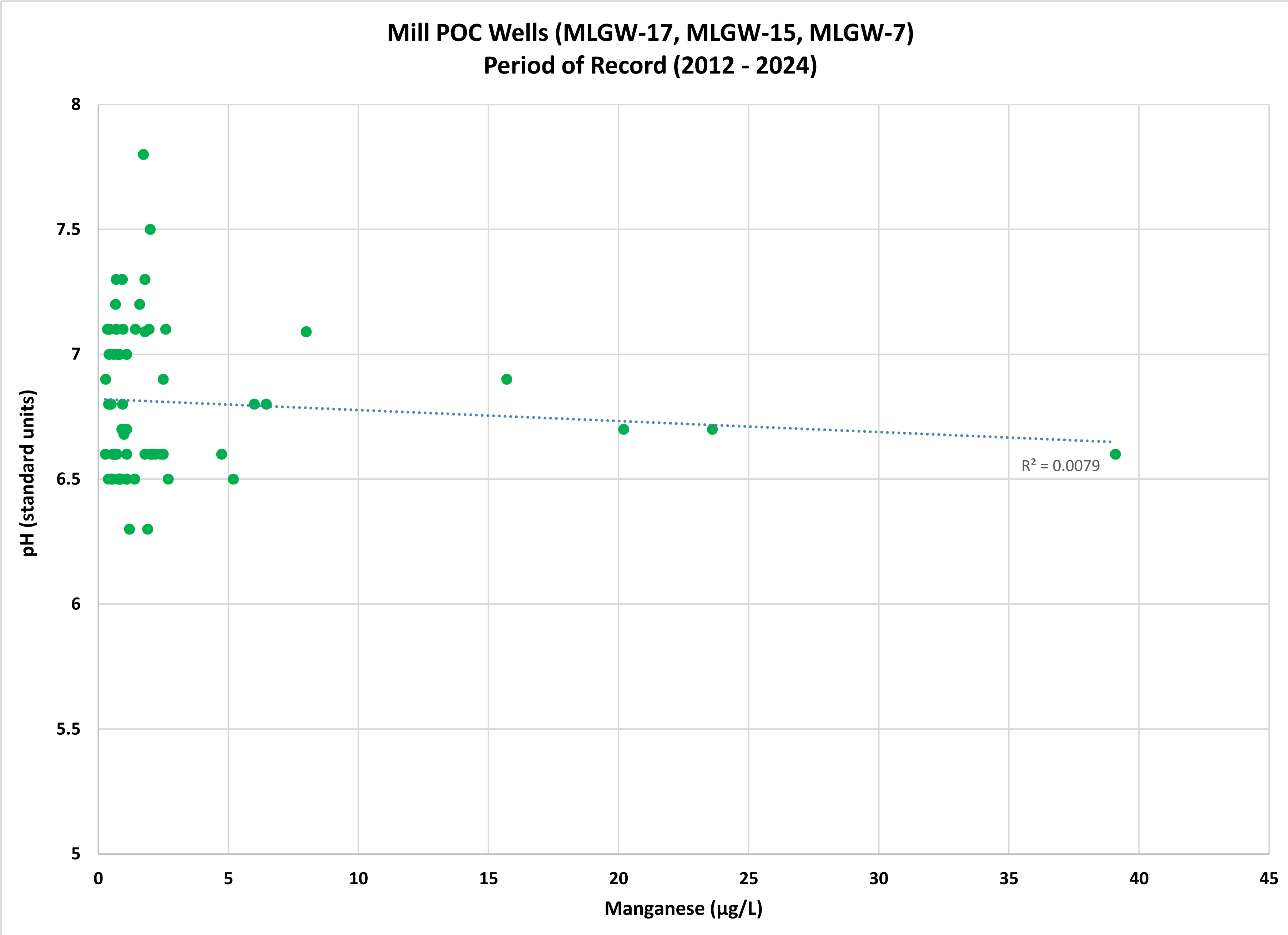
As-Built
MNGW-5

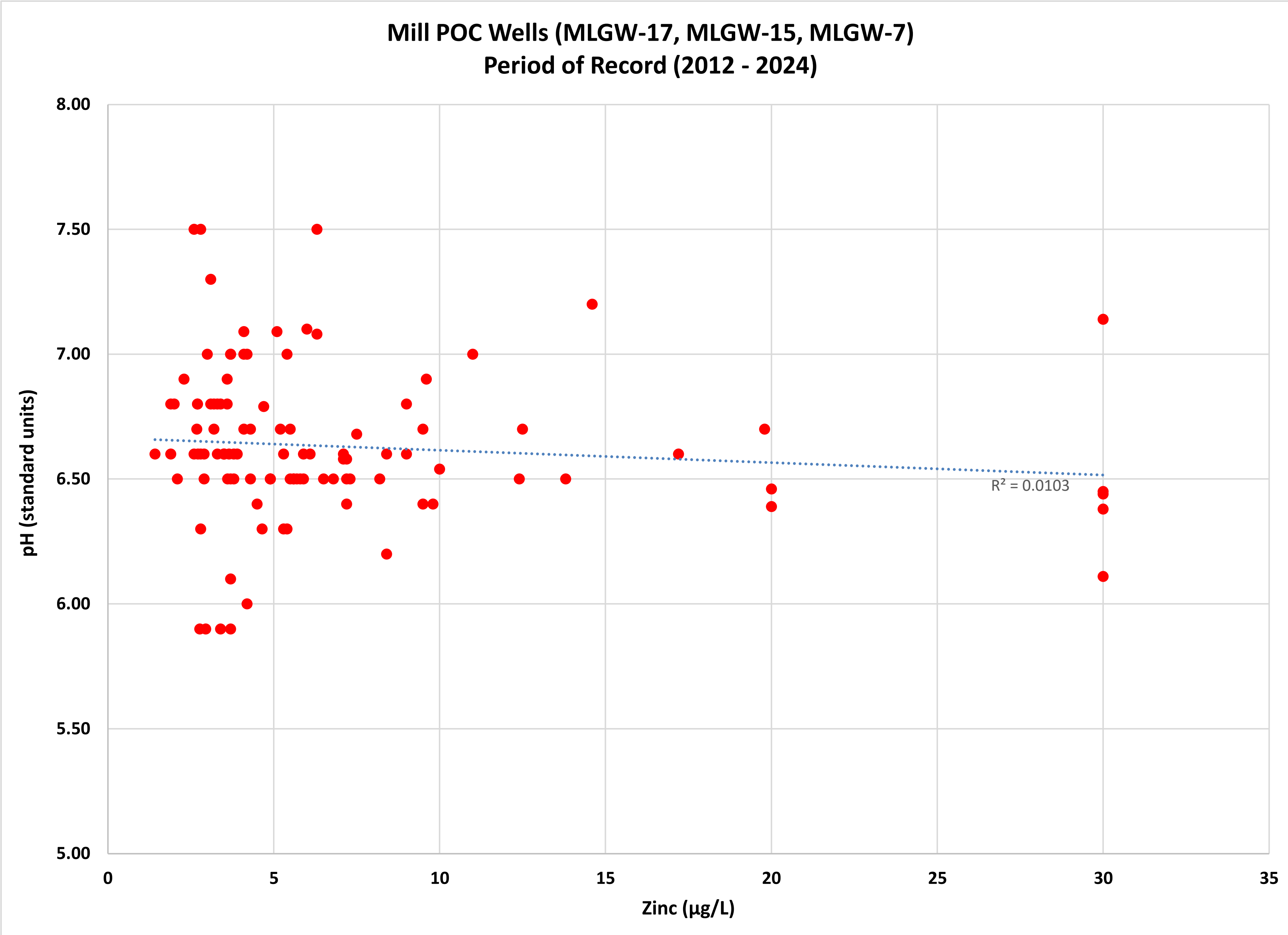
ATTACHMENT 4

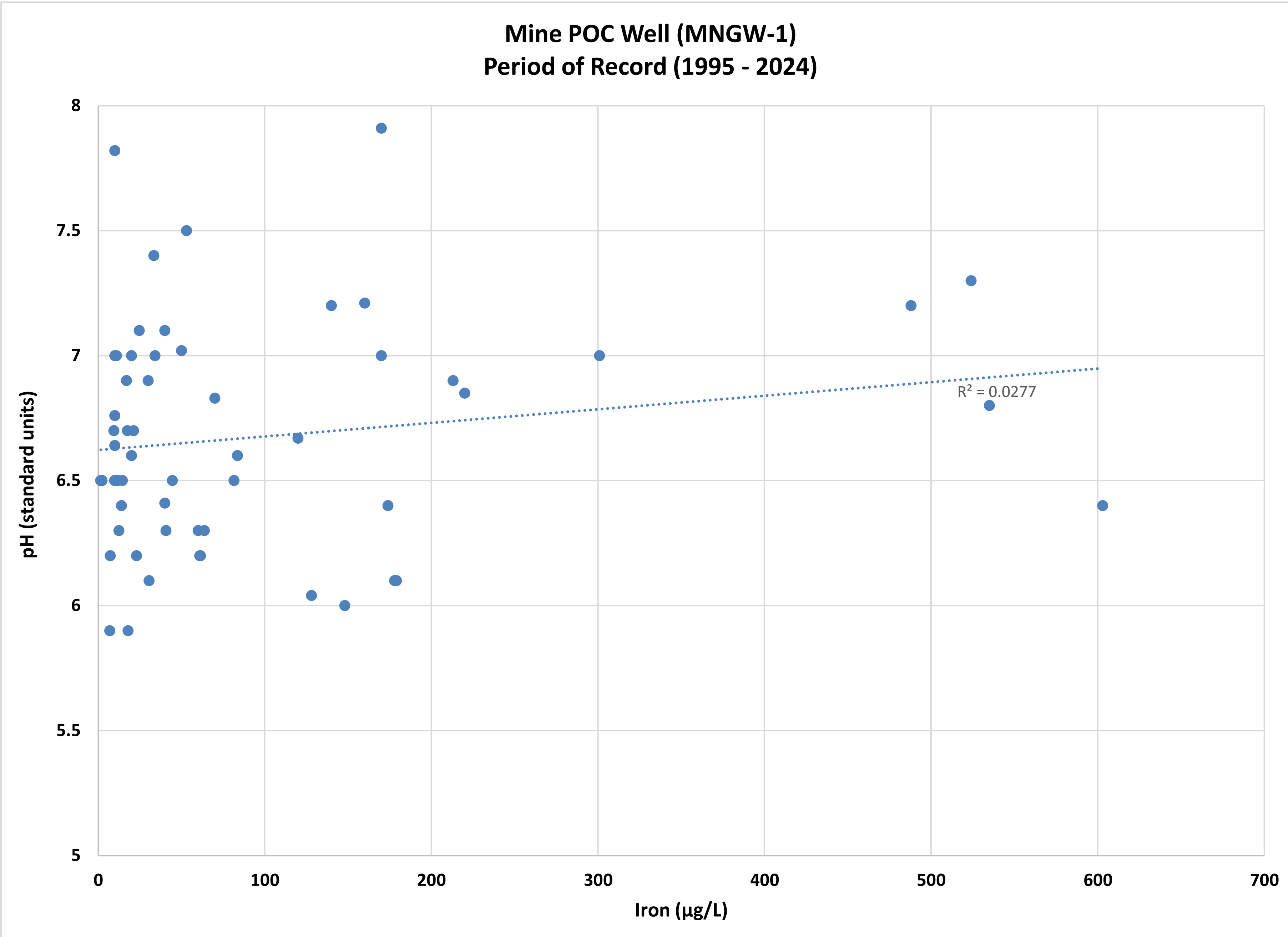
Mine and Mill pH vs Metals Plots

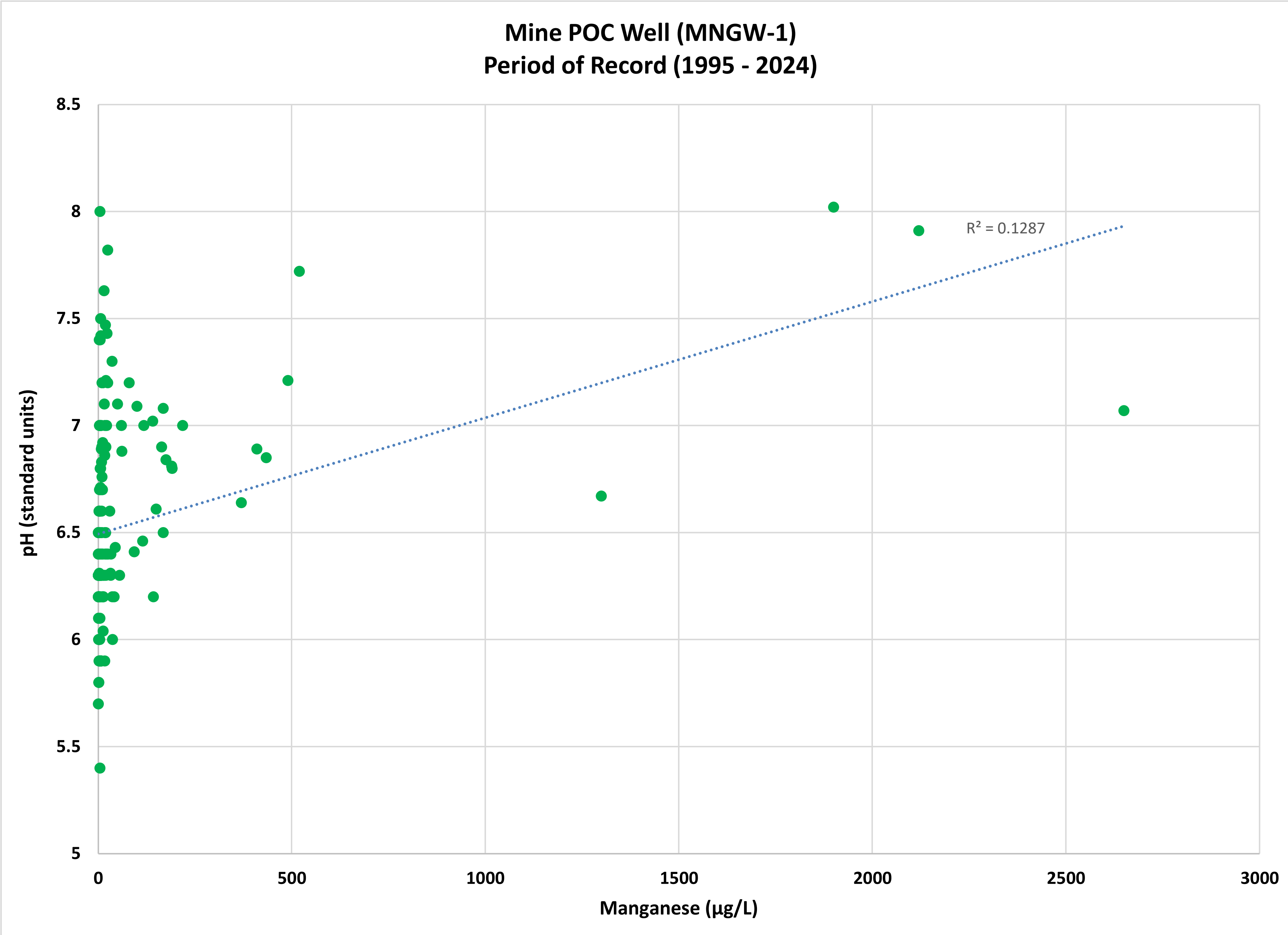


Mill POC Wells (MLGW-17, MLGW-15, MLGW-7)
Period of Record (2012 - 2024)
pH (standard units)
Iron (µg/L)
$R^2 = 0.001$
8
7.5
7
6.5
6
5.5
5
0
200
400
600
800
1000
1200
1400
1600
1800

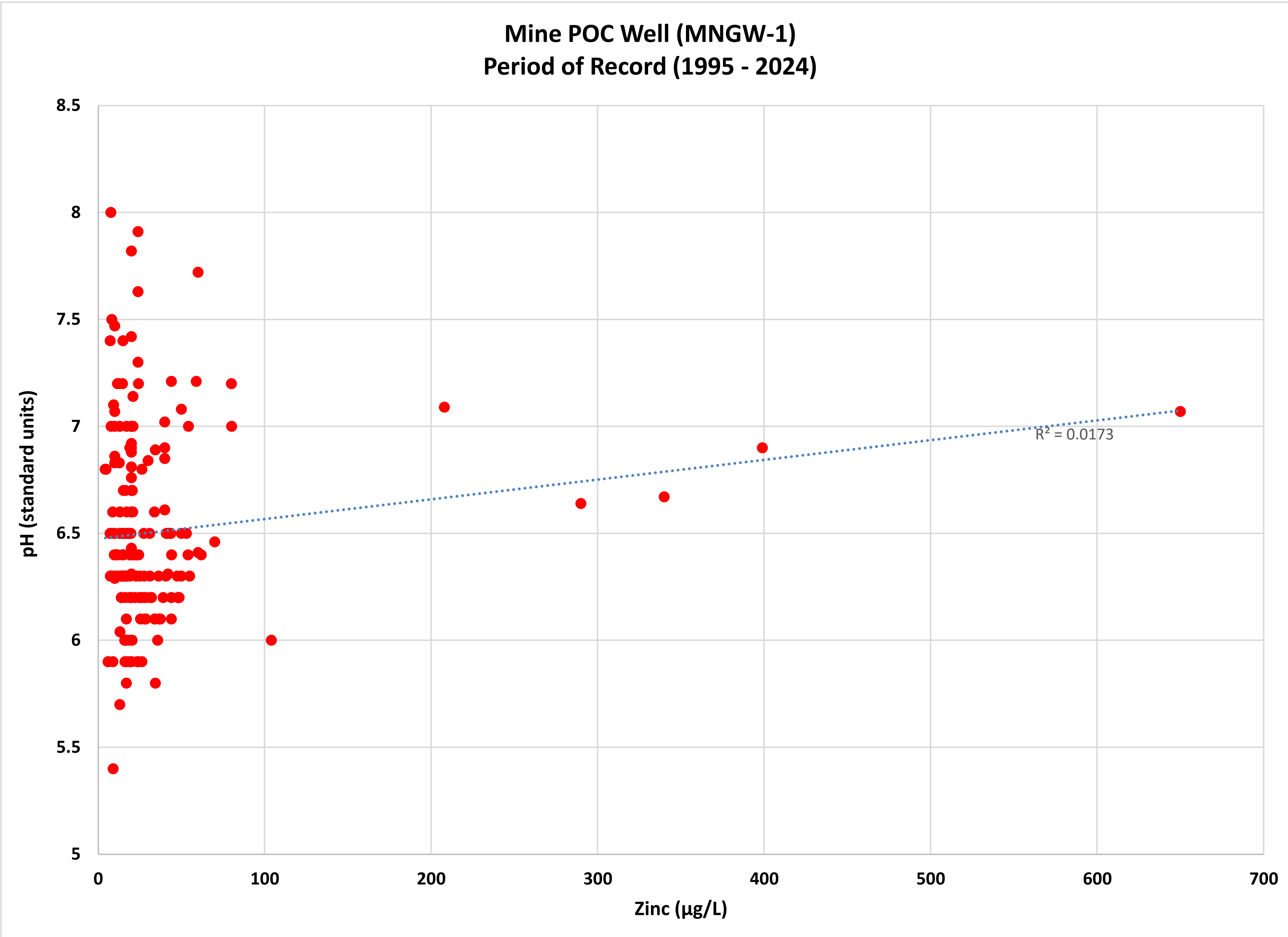

Mill POC Wells (MLGW-17, MLGW-15, MLGW-7)
Period of Record (2012 - 2024)
pH (standard units)
8
7.5
7
6.5
6
5.5
5
0
5
10
15
20
25
30
35
40
45
Manganese (µg/L)
R² = 0.0079


Mill POC Wells (MLGW-17, MLGW-15, MLGW-7)
Period of Record (2012 - 2024)
pH (standard units)
8.00
7.50
7.00
6.50
6.00
5.50
5.00
0
5
10
15
20
25
30
35
Zinc (µg/L)
$R^2 = 0.0103$


Mine POC Well (MNGW-1)
Period of Record (1995 - 2024)
pH (standard units)
8
7.5
7
6.5
6
5.5
5
0
100
200
300
400
500
600
700
Iron (µg/L)
$R^2 = 0.0277$



Mine POC Well (MNGW-1)
Period of Record (1995 - 2024)
pH (standard units)
Manganese (µg/L)
R² = 0.1287
8.5
8
7.5
7
6.5
6
5.5
5
0
500
1000
1500
2000
2500
3000


Mine POC Well (MNGW-1)
Period of Record (1995 - 2024)
8.5
8
7.5
7
6.5
6
5.5
5
pH (standard units)
0
100
200
300
400
500
600
700
Zinc (µg/L)
$R^2 = 0.0173$