ANC URANIUM MILL TAILINGS SITE RESULTS OF 2015 HYDROGEOLOGIC INVESTIGATION

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1.0 EXECUTIVE SUMMARY

The American Nuclear Corporation (ANC) Tailings site is located within the western portion of the historic Gas Hills Uranium Mining District near Riverton, Wyoming. Mining in the West Gas Hills began in the 1950's and continued through the 1980's. Reclamation by mining companies and the State of these historic uranium mine disturbances included backfilling of groundwater-fed mine pits, heap leaches, and regrading/revegetation of the final land surfaces. The Wyoming Department of Environmental Quality (DEQ)/Abandoned Mine Lands Division (AML) began reclamation of abandoned mines in the area in the early 1990's, and that work continues to date. At the completion of reclamation activities, AML installed monitoring wells at each reclaimed site for the purpose of long-term water quality monitoring. Water sampling of these monitoring wells continues to date, and the most recent data will be available at the end of the first quarter 2016. Historically, where the mining companies or AML has backfilled open bodies of water (i.e., groundwater-fed mine pits) during reclamation, groundwater monitoring data has shown an increase in total dissolved solids (TDS), major anions and cations, several metals, including uranium, and radionuclide decay products of uranium. The majority of the historic reclaimed mines in the West Gas Hills are hydrogeologically upgradient of the ANC site.

Lidstone and Associates, Inc. (LA), under contract to the Wyoming DEQ/Land Quality Division (LQD) has completed a hydrogeologic investigation of the ANC Tailings Pond No. 1 area to determine the extent of groundwater quality impacts, if any, downgradient of and to the north/northwest of the ANC permit boundary; and to determine the hydrogeologic setting and controls associated with the movement, if any, of impacted groundwater. Field activities included evaluating several existing ANC monitoring wells, finalizing sites of new monitoring well locations, drilling of three test holes adjacent to existing monitoring wells, drilling and construction of 14 new monitoring wells, development of the wells and subsequent water quality sampling and testing of the wells, and finally, surveying of the well locations.

Based on the September 2015 water quality data, apparent impacts to near surface groundwater from Tailings Pond No. 1 extend farther north than previously anticipated or measured. Based on Wyoming DEQ Chapter 8 Class III groundwater standards for livestock, the most significant water quality impacts exist around and just north of Tailings Pond No. 1 where sulfate concentrations in excess of 3,000 mg/L and radium-226 concentrations in excess of 5 pCi/L exceed water quality standards. Data collected from the network of the existing and new monitoring wells indicate that general water quality impacts extend at least 2 miles downgradient of Tailings Pond No. 1. Water quality maps constructed to show concentrations of uranium, sulfate, chloride, and radium-226 highlight these impacts downgradient of Tailings Pond No. 1 within Willow Springs Draw, and also include surrounding areas near Tailings Pond No. 2, the Bullrush heap leach, and Pathfinder's reclaimed tailings facility. The uranium isoconcentration map illustrates that uranium concentrations in excess of 5 mg/L are present near Tailings Pond No. 1, and that concentrations of up to 1 mg/L extend southeast toward Tailings Pond No. 2 and north toward MW-18 along Willow Springs Draw. The sulfate isoconcentration map indicates a similar pattern, with high concentrations of sulfate centered around Tailings Pond No. 1. It also presents a high sulfate concentration in the drainages below and west of the Pathfinder reclaimed tailings area. The chloride isoconcentration map illustrates the presence of elevated chloride concentrations around Tailings Pond No. 1 that extend downgradient in Willow Springs Draw towards MW-18. Finally, the radium-226 map illustrates an area of high radium concentration centered around Tailings Pond No. 1. With the available data, it appears that the downgradient migration of the water quality impacts is most likely due to the relatively high permeability of hydraulically connected alluvium

and Wind River Formation along preferred flowpaths moving northward from the tailings pond area.

As a result of this investigation, the following additional work is recommended for consideration under Task Order No. 3:

- Completing one or several multiple well aquifer tests at one or more locations. This will involve the construction of one 4-inch diameter pumping well and possibly one or two additional 2-inch observation wells at the selected location(s). The tests could be used to further evaluate how quickly impacted water may be traveling north down Willow Springs Draw (testing at MW-18), assess the degree of hydraulic communication between the alluvium and Wind River Formation (testing at MW-27/MW-2), evaluate how much water is moving into the area along Willow Springs Draw (testing at MW-29), assess how fast water is moving downgradient of Tailings Pond No. 2 (testing at MW-28), and further evaluate the elevated aquifer parameters at MW-25. Given the anticipated high transmissivity near MW-18 and its geographic position north of the tailings pond, conducting a multi-well test at this location is highly recommended.

- Drilling and completing additional monitoring wells in Willow Springs Draw north of MW-18 to identify, if possible, the northern limit of impacted water quality farther downgradient. Additional wells could also be installed to better bracket the east-west limit of impacts near Tailings Pond No. 1, particularly east of MW-22.

- Completing additional monitoring wells in the drainages east of MW-24 and MW-31 and southwest of Tailings Pond No. 1 near the Bullrush heap leach to further assess groundwater quality in these areas.

- Conducting additional routine water quality sampling of the monitoring well network.

2.0 PROJECT HISTORICAL SUMMARY

As shown on **Figure 1**, the ANC Uranium Mill Tailings Site is located within the Gas Hills Uranium Mining District in eastern Fremont County, Wyoming. The site is located approximately 45 miles east of Riverton and 70 miles west of Casper. The site occupies approximately 550 acres that were used for uranium mining and milling activities between 1959 and 1981. ANC suspended milling activities in 1981 due to poor uranium market conditions and began the decommissioning and reclamation process as required by their U.S. Nuclear Regulatory Commission (NRC) Source Material license. As shown on **Figure 2**, the ANC site in 1987 lies amidst numerous historic uranium mines of the West and Central Gas Hills. In 1994, before decommissioning and reclamation was completed, ANC announced that they were going out of business. They subsequently relinquished the remaining surety funds (bond forfeiture) to the State of Wyoming; as part of the bond forfeiture process. The Wyoming DEQ/LQD became the responsible party to address reclamation at ANC's U.S. NRC licensed facility- as stated under a confirmatory agreement signed in 1996. LQD commenced reclamation activities in 1996 but suspended activities in 2009 because of nearly total depletion of the reclamation surety funds. Between 1996 and 2009, LQD completed reclamation activities, including:

1) Reclamation of the Bullrush heap leach site and deposition of contaminated materials into Tailings Pond No. 1.

2) Closure and Reclamation of Tailings Pond No. 2.

3) Construction of Campsite Draw Diversion.

Between 2009 and 2014, site activities have included:

1) Annual sampling of existing downgradient monitoring wells;
2) Operation of the Tailings Pond No. 1 pump back system (Well R4);
3) Monitoring of settlement monuments at Tailings Pond No. 1; and,
4) Review and analysis of downgradient monitoring well data to determine the extent and amount of downgradient impacts on the alluvial aquifer.

In June of 2014, during a final revision of the 1996 confirmatory order, LQD and NRC agreed that the best use of remaining State funds would include:

1) Installation of additional ground and surface water sampling stations to assist in the determination of the extent of surface and groundwater impacts downgradient from Tailings Pond No. 1.

2) Continuation of ground and surface water sampling and analysis from existing and new monitoring stations.

3) Purchase of lands to extend the licensed boundary to include the impacted area.

4) Discontinue use of the pump back system at Well R4.

The Wyoming DEQ/LQD contracted LA in November 2014 to assist with work associated with the reclamation of the ANC site. Task Order No. 001 was approved by LQD November 14, 2014 and contained two primary objectives:

1) Conduct a hydrogeologic investigation at the site to delineate the extent of groundwater quality impacts downgradient to the north/northwest of the ANC permit boundary; and

2) Determine the hydrogeologic setting and controls associated with the movement, if any, of contaminated groundwater.

LA obtained landowner consent, and necessary state and federal permits for access to construct and monitor the new wells. LA performed the hydrogeologic investigation during 2015. This report provides a description of the activities performed under this task order, analysis of collected data, and conclusions and recommendations.

3.0 HYDROGEOLOGIC INVESTIGATION

3.1 Regional Hydrogeology

The ANC site is located in the western portion of the Gas Hills Uranium District within the Wind River Basin. The Wind River Basin is a large sediment filled, northwest trending structural basin. The basin is asymmetric with its synclinal axis located along its northern flank. It is bounded by the Casper Arch on the east, the Owl Creek Mountains on the north, the Wind River Mountains on the west, and the Granite Mountains on the south. The basin contains as much as 30,000 feet of sediments across the axis, which overlie a basement complex of Precambrian granitic rocks. **Figure 1** shows the regional geology of the Gas Hills District.

The uranium present in the basin is hosted in the Eocene age Wind River Formation. The Wind River Formation was formed from the deposition of alluvial fans, stream channels, flood plains,

lakes and swamps and is comprised of alternating and discontinuous layers of medium to coarse arkosic channel sandstones with interbedded granitic pebble to boulder conglomerates, claystones, and siltstones (Van Houten, 1964). The sandstones and conglomerates were deposited along the axes of alluvial fans and form massive coarse-grained units. These alluvial fan deposits are typically the host for the Gas Hills uranium deposits. Thickness of the Wind River Formation ranges from a few feet at the basin margin to several thousand feet in the northern part of the basin.

A regional tectonic extension occurred during late Miocene to early Pliocene time, which resulted in the collapse of the Granite Mountains, abundant normal faulting, and the formation of the Split Rock Syncline. The Split Rock Syncline is a 6,000 square mile, east-west trending symmetrical down warp bounded on the north and south by fault zones. Near the project area, along the north flank of the Split Rock Syncline, the Wind River and younger formations were tilted one to three degrees to the south and cut with several east-west trending normal faults.

Regional uplift during the late Pliocene and early Pleistocene started the present cycle of erosion in the area. The existing primary drainages were formed during this time and included the Sweetwater River flowing east along the axis of the Split Rock Syncline and the Wind River flowing north through the Wind River Basin. These two rivers define the present day topography in the Gas Hills. Drainages south of the Beaver Rim flow into the Sweetwater River. Headward erosion by the north-flowing Wind River tributaries formed the Beaver Rim Escarpment.

The water-bearing sand and conglomerate units of the Wind River Formation are collectively referred to as the Wind River Aquifer. Localized faulting combined with regionally discontinuous low permeability shale horizons have resulted in the perching of some saturated sand horizons above the main saturated zone of the Wind River Aquifer. Subcropping and outcropping of pre-Wind River deposits tend to restrict the regional flow of the Wind River Aquifer, forcing it to discharge through West Canyon Creek and Fraser Draw.

Recharge of the Wind River Aquifer from precipitation occurs where the formation crops out and by vertical migration through overlying younger sediments. Recharge of upper perched horizons occurs along the Beaver Rim and from overlying younger sediments to the south. Recharge may also occur where subcropping pre-Wind River aquifers discharge into the Wind River Formation. Quaternary alluvium occurs along Fraser Draw, Campsite Draw, FAP Gulch, Gas Draw and Willow Springs Draw and consists of unconsolidated sand, silt and clay. It is recharged vertically by precipitation and by discharge from springs, which originate in post Wind River sediments.

3.2 Site Hydrogeology

Major bedrock units in the vicinity of the ANC site are the Wind River Formation (Eocene) and the Cody Shale (Upper Cretaceous). In the vicinity of the site, the Wind River Formation comprises an upper member of coarse grained sandstones and conglomerates disconformably overlying a lower member consisting primarily of siltstone and mudstone (Soister, 1967). The Cody Shale, a massive thick shale unit, forms the bedrock formation over most of the site. In the vicinity of the tailings ponds, the upper Wind River has been largely removed by erosion. Approximately 4,000 to 5,000 feet north of the tailings ponds, the Upper Wind River has been completely removed by erosion approximately 4,000 to 5,000 feet north of the tailings ponds (ANC, 1990; Dames and Moore, 1982).

The site is drained by ephemeral Willow Springs Draw, which flows to the north-northwest to Muskrat Creek, which is a tributary to the Wind River. Gas Draw and FAP Gulch, two minor drainages located north of the tailings ponds, drain to Willow Springs Draw (LQD, 2014). The low permeability of the lower Wind River Formation should minimize the potential for water to move downward into it. Therefore, any impacted water is expected to be contained within the perched

system consisting of the upper Wind River Formation, where it exists, and the alluvial deposits within Willow Springs Draw (Dames and Moore, 1982). **Figure 3** illustrates the bedrock geology of the site.

3.3 Project Pre-Field Activities

Numerous activities were completed in advance of drilling, constructing, and sampling of the new monitoring wells. These activities included the development of a Health and Safety Plan, a Site Investigation Work Plan (SIWP), acquisition of land use permits and clearances from various agencies and private landowners, and identification of potential monitoring well locations.

3.3.1 Project Documents

Site Health and Safety Plan

In accordance with requirements contained within the contract and task order, LA completed and provided to LQD a site health and safety plan within 15 days after issuance of Notice to Proceed. The plan provided site specific safety policies, emergency procedures, hazard protection and emergency contact information. All employees and contractors who were to work onsite were required to read and understand the contents of the plan and attend a safety orientation meeting prior to working at the site.

Site Investigation Work Plan

In accordance with contract requirements, LA also developed a SIWP. The SIWP provided an overview of the site history, geology and hydrogeology. It also provided details of the proposed field investigation activities, including project management, health and safety considerations, the installation of test holes and additional monitoring wells, the collection and analysis of geologic, soils, groundwater and surface water, and project deliverables.

3.3.2 Land Use Permits

The majority of lands involved in the investigation are public lands administered by the U.S. Bureau of Land Management (BLM) requiring receipt of a Right-of-Way Grant (ROW) from the Lander BLM office. Additionally, since a well was to be installed on a section of land administered by the State of Wyoming, a Temporary Use Permit from the Wyoming Office of State Lands and Investments (SLO) was required. Finally, two wells were planned for installation within a section of land held privately by Philp Sheep Company requiring a signed Surface Owner Consent form prior to entering the land.

The BLM ROW application included, amongst other information, a detailed Plan of Development and the National Environmental Protection Act (NEPA) clearances, which included collection of cultural resource, wildlife, including sensitive, threatened and endangered species, birds of a high federal interest, and wetland delineation. Each proposed well site was cleared up to and including a 10 acre area. The application was completed and submitted to BLM for their review and approval in February 2015. BLM issued the ROW for the wells in July 2015. No application fee or annual rental was required for the ROW. The grant expires in 30 years on December 31, 2044, unless it is renewed prior to the expiration date. **Appendix A** contains a copy of the application and the approved ROW document.

The Temporary Use Permit application consisted of a completed application form, a signed Surface Lessee Notification and Comment Form, a site location map, and a check to cover the cost of the application fee and the 2015 consideration fee. A second check in the amount of $50.00 was sent to the surface lessee to cover surface damages. The application was submitted in April 2015 and was approved by the SLO June 4, 2015. The permit term is five years and will expire on March 16, 2020, unless renewed before that date. The $100.00 annual consideration is due on or before March 16 of

each year. If the fee is not paid by the due date, the permit will terminate immediately. **Appendix B** contains a copy of the application and the approved permit.

The two wells installed in Section 21, T33N, R90W are on private surface owned by Philp Sheep Company. A request for access was submitted to the surface owner in January 2015. The signed consent form was received in April 2015. **Appendix C** contains a copy of the signed surface owner consent form.

3.3.3 Monitoring Well Site Selection

Based on available hydrogeological information and working with LQD staff, the additional monitoring well sites were chosen in locations that would assist in the characterization of the length, breadth and depth of groundwater impacts within Willow Springs Draw. Additionally, it was anticipated that the additional drilling would assist in the determination of horizontal and vertical groundwater flow direction components. Several test boreholes were also proposed near existing wells for which lithologic information was not available. **Figure 4** shows the locations of the pre-existing and new monitoring well locations.

3.4 Project Field Activities

LA and its project team completed its field activities between June 10 and November 6, 2015. The purpose, rationale, and proposed methods to accomplish this work were detailed in the SIWP. The principal goal of the field activities was to drill, construct, develop, test, and sample up to 16 new monitoring wells to delineate the extent of downgradient water quality impacts from Tailings Pond No. 1 north/northwest of the ANC permit boundary. Field activities included evaluating several existing ANC monitoring wells, finalizing the sites of new monitoring well locations, drilling three test holes adjacent to existing monitoring wells, drilling and constructing 14 new monitoring wells, developing the wells, water quality sampling and testing of the wells and springs, and finally, surveying the well locations. The following sections provide additional details on the methods that were used to complete these activities and field results.

3.4.1 Test Hole Drilling and Well Completion

In June 2015, LA completed a field reconnaissance of the ANC site to determine whether several existing ANC monitoring wells could still be used, and to finalize the proposed monitoring well and test hole locations. While historical wells TP 2-2 and TP 2-3 were located, it was determined that TP 2-2 was no longer viable as a monitoring well. TP 2-3 was determined to be usable as a monitoring well and was incorporated into the monitoring well network. LA also found historical well MW-12 which was thought to have been destroyed during previous reclamation activities. It was determined that the well was suitable for continued monitoring and was incorporated into the monitoring well network. Sierra Blanca (1989) completed the MW-1 through MW-13 series of wells, and from their report, it was determined that lithologic logs did not exist for monitoring wells MW-2, MW-5, and MW-11. Test holes were drilled adjacent to those existing monitoring wells to obtain a lithologic log. Upon review of the proposed monitoring well locations in the field, the sites of several monitoring wells were moved from their original proposed location while remaining within their environmentally cleared 10-acre land parcels.

Field screening of the groundwater quality (conductivity, pH and chloride) from each monitoring well borehole was used initially to evaluate whether groundwater at each respective location had been impacted by seepage from Tailings Pond No. 1. Furthermore, this field water quality screening process was used to determine how far north new monitoring wells may need to be installed. Based on recent water quality testing results from the pre-existing monitoring wells, a chloride concentration in excess of 30 mg/L, an electrical conductivity reading in excess of 2,500 μmhos/cm,

and/or a pH reading below 7.0 s.u. were considered to be indicative of impacts from the tailings facility or potentially other historic uranium mining activities. To provide verification that the field equipment was operating appropriately and that the screening approach was performing appropriately, field water quality measurements were obtained from three test holes drilled adjacent to three pre-existing monitoring wells (MW-2, MW-5, and MW-11), and those results were compared to laboratory results from the pre-existing ANC wells. These three test holes were drilled prior to the drilling of the new monitoring wells.

Following acquisition of the requisite permits and clearances and under the supervision of an LA Wyoming-licensed professional geologist, Inberg-Miller Engineers (IME) of Riverton, Wyoming, drilled and completed the test holes adjacent to MW-2, MW-5, and MW-11 using a CME-85 hollow stem auger drill rig in July 2015. The locations of these three existing wells are shown on **Figure 4**. A fourth test hole was also drilled southeast of Tailings Pond No. 2. The test holes were completed using hollow stem auger drilling methods. Split spoon samples were collected at 5-foot intervals. Groundwater was encountered in all of the test holes. A grab sample of the water from each test borehole and its associated existing monitoring well was collected by lowering a bailer through the augers or well casing into the water column. The collected grab sample was tested in the field for chloride, electrical conductivity, and pH. Using the well completion information from the Sierra Blanca (1989) report and the lithologic information compiled from the test holes, LA prepared completion diagrams for each of the three existing monitoring wells. Those documents include the results of the field obtained water quality parameters and are included in **Appendix D**. The drilling rig and associated downhole equipment were decontaminated prior to drilling the first hole and between boreholes. The waste drill cuttings were loaded onto a flatbed trailer, hauled to the top of Tailings Pond No. 1, and placed on the top of the tailings pond cover.

IME also drilled and completed 14 new monitoring wells in July 2015 using a CME-85 drill rig. The drilling rig and associated downhole equipment were decontaminated prior to drilling the first well and between wells. **Table 1** provides a summary of the well completion data. The locations of the new monitoring wells are shown relative to the pre-existing wells on **Figure 4**. The alluvial wells were completed using hollow stem auger drilling methods, while the Wind River Formation and Cody Shale wells were completed using hollow stem auger and direct air rotary methods. Where auger drilling was used, split spoon samples were collected at 5-foot intervals. Drill cuttings were composited over 5-foot intervals where direct air rotary methods were used. Waste drill cuttings were loaded onto a flatbed trailer, hauled to the top of Tailings Pond No. 1, and disposed on the top of the tailings pond cover. Groundwater was encountered during the drilling of all but one well. A grab sample of the water from each borehole was collected by lowering a bailer through the augers into the water column. The collected water samples were tested in the field for chloride, electrical conductivity, and pH. While completed to different depths, each monitoring well was cased with 2-inch diameter, flush threaded, Johnson Schedule 40 PVC well casing from the top of the screen to above the surface. The wells were completed using 10 to 20 feet of 2-inch diameter; 0.20-inch factory slotted Johnson PVC well screen typically installed across the water table. The annular space between the borehole wall and the screen/casing was filled with 10X20 Colorado Silica Sand from the bottom of the borehole to a height of 2 to 5 feet above the top of the screened interval. Bentonite chips were then placed into the annular space from the top of the filter pack to within approximately 1 foot of land surface. While PVC well caps were placed to cover the top end of the casing, a lockable steel cover was placed around the PVC wellhead for further wellhead protection. A concrete pad was placed from 1 foot below to above the ground surface around the well to complete the annular seal and secure each wellhead. LA prepared completion diagrams for each of the 14 new monitoring wells. Those documents are included in **Appendix E**, along with a summary of the well drilling history.

After installation, each monitoring well was developed using a combination of surge block and bailing, or surge block and submersible pumping techniques. Well MW-31 was the only well not developed shortly after construction due to the absence of water in the well. This well was developed later in August when enough water was encountered in the well to allow development. At the start of development, IME typically swabbed the screens with the surge block for 10 to 20 minutes. This surging action sufficiently agitated the fine grained materials outside of and near the screen to move them into the well water column. Following swabbing, IME installed a downhole submersible pump and pumped each well for approximately one additional hour until the fine sediment in the water had diminished to acceptable levels. To the extent that depths to water and pumping conditions would allow, IME periodically raised and lowered the pump to facilitate the development of the entire length of the well screen. Due to the depth to water and lack of an adequate pump at the time, bailing techniques were used to develop Well MW-19. Total development times for each well are noted on the well completion diagrams in **Appendix E**.

3.4.2 Surface and Groundwater Sampling

Surface and groundwater samples were collected in August and September 2015. The August sampling event included only 13 of the 14 new monitoring wells that were completed in July 2015, in addition to TP 2-3 and MW-12 which were added to the monitoring well network. Dry upon completion, MW-31 was developed in August and sampled in September. The September sampling event included the 14 new monitoring wells, the pre-existing ANC monitoring wells, and the two Willow Springs (North and South). Willow Springs South is generally present, but Willow Springs North appears to be ephemeral. The locations of five nearby AML monitoring wells that lie in close proximity to and are completed in the Wind River Formation are shown on **Figure 4** along with the locations of all the sampling points.

The wells and springs were sampled in accordance with the sampling and analysis plan protocols contained within the SIWP. All samples were packaged in accordance with EPA and Wyoming DEQ protocol and shipped to an EPA certified laboratory for analysis of the LQD Guideline 8 list of parameters for uranium mines and tailings facilities. Willow Springs North was dry during the September sampling event. Intermountain Laboratories of Sheridan, Wyoming, completed the sample analysis in August, and Energy Laboratories of Casper, Wyoming, completed the September analyses. The results of the lab analysis are summarized in **Table 2** and compared to Wyoming DEQ Chapter 8 Class III groundwater standards for livestock. The laboratory analytical reports for the August and September 2015 sampling events are included in **Appendix F** along with the field data collection sheets. Results of the groundwater sampling events suggest that additional monitoring wells, additional groundwater sampling, or both may be needed.

3.4.3 Well Recovery Aquifer Testing

To acquire additional aquifer parameter data on saturated portions of the alluvium, Wind River Formation, and Cody Shale materials, LA acquired recovery water level data on several of the monitoring wells completed in July 2015. These data will provide important information on aquifer properties should hydrogeologic modeling of the ANC site take place. This information is particularly important at locations north and downgradient of the historic monitoring wells. Depths to water prior to and subsequent to sampling in August and September 2015 were acquired for the 10 wells included in **Table 3**. Water level, field water quality, and well discharge data were collected during the sampling process. Following sample collection and pump shutoff, water level recovery was monitored at each well over an approximate one hour period. The resulting recovery data were analyzed using Aquifertest Pro™ to provide estimates of transmissivity and hydraulic conductivity that are listed in **Table 3**. **Figure 5** illustrates the acquired transmissivities by well

location. The original water level recovery data are included with the field water quality sampling data sheets in **Appendix F**. The analysis results for each of the 10 wells are included in **Appendix G**.

3.4.4 Well Surveying

After the wells were completed, AVI pc. of Cheyenne, Wyoming surveyed the ground and top of casing elevations on each of the pre-existing and new monitoring wells. These points were surveyed to compile a potentiometric surface of the area and to allow an accurate construction of geologic cross sections. The locations of the cross sections are shown on **Figure 3**. **Table 4** presents the water table elevations for September 2015 that were developed based on the surveyed top of casing elevations. **Figure 6** presents the September 2015 potentiometric surface map. The potentiometric surface map was constructed from all monitoring wells that are completed in the alluvium, Wind River Formation, and Cody Shale.

3.5 Data Analysis and Interpretation

Based on the project field activities and the data acquired during 2015, the following sections detail the relationship of the alluvium, Wind River Formation, and Cody Shale as it relates to groundwater impacts from Tailings Pond No. 1.

3.5.1 Lateral and Vertical Extent of Alluvium and Wind River Formation within Willow Springs Draw

The lithologic logs of the monitoring wells and the geologic map presented on **Figure 3** were used to evaluate the extent of the alluvium and Wind River Formation near and downgradient of Tailings Pond No. 1. As shown on **Figure 3**, alluvium underlies the locations of both Tailings Pond No. 1 and No. 2, and is exposed at the land surface for more than 2 miles downstream of the tailings ponds. To evaluate the vertical extent of the alluvium and Wind River Formation below the area, two cross sections were prepared. Cross section A-A' shown on **Figure 7** is located just north of Tailings Pond No. 1, and trends west to east through MW-13, MW-5, MW-3, and MW-2/MW-27. Cross section B-B' shown on **Figure 8** extends from MW-30 south of Tailings Pond No. 1 to the north through MW-6 where the section bends and trends northwest through MW-18 and other wells.

As shown on **Figure 7**, the two draws north of Tailings Pond No. 1 are filled with alluvium to depths of approximately 30 feet. The alluvial channels are narrow and are separated by a ridge of Wind River Formation sandstone and mudstone as shown on **Figure 3** and the lithologic logs of the monitoring wells. The alluvium is predominantly composed of silty sand, while the Wind River Formation is composed of interbedded sandstone and mudstone. The base of the Wind River Formation was not encountered in any of the monitoring well borings in this area.

From Tailings Pond No. 1 north through Willow Springs Draw, alluvium generally forms a thin veneer across the land surface. As shown on **Figure 8**, alluvium is present from land surface in all the monitoring wells located on the cross section, and underlies Tailings Pond No. 1, based on the lithologic logs for MW-30, MW-4, and MW-2/MW-27 and the geologic map presented on **Figure 3**. The thickness of the alluvium ranges from 19 to as much as 40 feet. The Wind River Formation underlies the alluvium across most of the section starting at the south portion of the property. Based on a test hole Sierra Blanca (1989) reported, the Wind River Formation between MW-2/MW-27 and MW-6 extends to a depth of at least 240 feet. As shown on **Figure 8**, the Wind River Formation pinches out north of MW-25, and is not present north of that point. At MW-21, the Cody Shale is present beneath the alluvium, and remains present beyond MW-18. The geologic map on **Figure 3** indicates the Cody Shale subcrop continues north of MW-18.

3.5.2 Recharge/Discharge Relationships between Alluvium, Wind River Formation and Tailings Pond No. 1 within Willow Springs Draw

The recharge discharge relationships between the alluvium, Wind River Formation, Cody Shale and Tailings Pond No. 1 are relatively simple. Groundwater recharge to the alluvium, Wind River Formation, and Cody Shale occurs as snowmelt and infiltrating precipitation. This recharge generally occurs throughout the area and is dependent upon the amount and timing of the respective precipitation. While the Tailings also receive similar recharge, Sierra Blanca (1989) reported that Tailings Pond No. 1 was unsaturated. The present unsaturated condition of the tailings pond is reflected in **Figure 8**, and supported by the depths to water obtained in MW-30 and MW-4.

Near surface groundwater in the vicinity of Tailings Pond No. 1 generally flows from south to north down Willow Springs Draw, as shown on **Figures 6 and 8**. Along this flowpath, groundwater flows from the Wind River Formation and discharges into the alluvium. The alluvium is unsaturated south and upgradient of Tailings Pond Nos. 1 and 2, based on the drilling of monitoring wells MW-29 and MW-30 where groundwater was only encountered in the Wind River Formation. As shown on **Figure 8**, the alluvium remains unsaturated beneath Tailings Pond No. 1 and begins exhibiting water table conditions between MW-4 and MW-2. From MW-2 north to MW-18, groundwater is consistently present within the alluvium.

Based on the cross section shown on **Figure 7**, a local westward trending hydraulic gradient exists north of Tailings Pond No. 1 between MW-2 and MW-13. The unconsolidated sands (alluvium) encountered in MW-2 and MW-5 appear to be hydraulically connected through a Wind River Formation sandstone bed encountered in MW-3 that lies within the ridge shown on **Figure 7**. This formation connection allows for hydraulic communication from the alluvium in FAP Gulch through the Wind River Formation to the alluvium in Gas Draw.

The difference in water levels between MW-2 and MW-27 indicates that there is a vertically downward gradient from the alluvium to the Wind River Formation in this area. Given the lower hydraulic heads in the alluvium downstream in Willow Springs Draw as indicated on **Figures 6 and 8**, this condition appears to be a local phenomenon. Because the Wind River Formation pinches out to the north, and is underlain by relatively impermeable Cody Shale, groundwater from the Wind River Formation discharges to the alluvium.

3.5.3 Well Recovery Test Data

The 10 recovery tests that LA completed on the newly completed monitoring wells provided valuable aquifer parameter information on the alluvium, Wind River Formation, and Cody Shale. The results are summarized in **Table 3**, and shown on **Figure 5**. Not surprisingly, the test of the Cody Shale at MW-19 on the north end of the investigated area yielded the smallest transmissivity of 6 gallons per day per foot (gpd/ft). Borehole drilling of the Cody Shale indicated the presence of some fractures that could locally transmit groundwater, but the overall permeability of the unit is limited. The three tests on the Wind River Formation yielded transmissivities of 850 to 1,640 gpd/ft upgradient of Tailings Pond Nos. 1 and 2 at MW-29 and MW-30, and only 43 gpd/ft downgradient of the Tailings Pond No. 1 at MW-27.

The six tests of the alluvium yielded a wide range in transmissivity and may highlight a preferred flowpath. The test of MW-28 north of Tailings Pond No. 2 yielded the highest transmissivity at 4,400 gpd/ft. Tests of the alluvium at four wells downstream of Tailings Pond No. 1 in Willow Springs Draw and adjacent ephemeral washes yielded transmissivities ranging from 15 to 846 gpd/ft. The alluvial test at MW-18 indicated transmissivities were very high, because water levels recovered too quickly to accurately estimate transmissivity. The distribution of these

transmissivities shown on **Figure 5** suggests the preferred groundwater flowpath with the alluvium lies along the western margin of Willow Springs Draw. Formal aquifer testing may be warranted to further define the aquifer parameters of the alluvium and Wind River Formation in various locations near Tailings Pond No. 1.

3.5.4 Groundwater Flow Velocities

Based on the aquifer parameter and water level data, estimates of the groundwater flow velocity in Willow Springs Draw were prepared. The calculation from Driscoll (1986) is the product of the measured hydraulic conductivity multiplied by the local hydraulic gradient, and divided by the assumed porosity for the saturated materials. Using a porosity of 30% and a hydraulic gradient of 0.0193 based on the water level differences between MW-2 and MW-18, LA estimated the groundwater velocity in Willow Springs Draw at various locations using the measured hydraulic conductivities from **Table 3**.

Results of these calculations indicate that the groundwater velocity in Willow Springs Draw north of Tailings Pond No. 1 is dependent upon local hydraulic conductivities and is comparable to those values calculated previously by the Wyoming DEQ (1997). Based on the testing of MW-25, the groundwater velocity in the alluvium is 295 feet per year on the western side of Willow Springs Draw. On the eastern side of the Draw, LA calculated a groundwater velocity of 31 feet per year at MW-23 near Willow Springs Reservoir. Based on the rates of movement of particular water quality analytes or assumed aquifer parameters, the Wyoming DEQ (1997) reported groundwater velocities ranging from 65 to 500 feet per year. Additional and more accurate testing is warranted to better define the velocity of groundwater movement within Willow Springs Draw.

3.5.5 Extent of Groundwater Impacts within Alluvium and Wind River and Potential for Offsite Influence

Based on local groundwater flow conditions, MW-29 and MW-30 were installed upgradient of Tailings Pond No. 2 and Tailings Pond No. 1, respectively as shown on **Figure 4**, in an attempt to obtain alluvial "background" concentrations of uranium, sulfate, chloride, and radium-226 among other analytes. Because of unsaturated conditions within the alluvium at these two locations, the wells were both completed into the Wind River Formation. While MW-30 lies downgradient of multiple abandoned mine lands as shown on **Figure 2**, the area south of MW-29 in Willow Springs Draw has not been affected by historical mining activities. Based on the results of the field screening process and lab analysis, MW-29 appears to provide a representative estimate of background water quality conditions, while MW-30 appears to have been impacted by previous mining activities. The case for this claim is supported by the following analytical results from the September 2015 sampling round: MW-29 exhibited chloride, sulfate, and uranium concentrations of 1, 463, 0.006 mg/L, respectively, while MW-30 exhibited concentrations of 330, 1,410, and 0.748 mg/L for the same analytes. The radium-226 concentrations for these wells in September 2015 were not significantly different.

From the September 2015 water quality data presented in **Table 2**, LA prepared four isoconcentration water quality maps that illustrate the presence and concentration of uranium, sulfate, chloride, and radium-226. These maps were prepared to assess the extent of groundwater quality impacts downgradient of Tailings Pond No. 1 within Willow Springs Draw, and also include areas near Tailings Pond No. 2, the Bullrush heap leach, and Pathfinder's reclaimed tailings facility. The impacts were assessed from the standpoint of indicator parameters such as chloride and sulfate, as well as Wyoming DEQ Class III groundwater standards for livestock. The uranium isoconcentration map (**Figure 9**) illustrates that uranium concentrations in excess of 5 mg/L are present near Tailings Pond No. 1, and that concentrations of up to 1 mg/L extend southeast toward

Tailings Pond No. 2 and north toward MW-18 along Willow Springs Draw. The sulfate isoconcentration map (**Figure 10**) illustrates a similar pattern, with high concentrations of sulfate centered around Tailings Pond No. 1. It also illustrates a high sulfate concentration in the drainages below and west of the Pathfinder reclaimed tailings area. The chloride isoconcentration map (**Figure 11**) illustrates the presence of elevated chloride concentrations around Tailings Pond No. 1 that extend downgradient in Willow Springs Draw to MW-18. Finally, the radium-226 map (**Figure 12**) illustrates an area of high radium concentration centered around Tailings Pond No. 1.

Based on these figures and the other information collected to date, the following can be stated with respect to groundwater quality impacts within the respective areas identified below:

Potential ANC Tailings Pond No. 1 Impacts

- Historic data suggest that upgradient groundwater within the Wind River Formation has been impacted by historical surface uranium mining and reclamation activities. The processes of backfilling oxidized waste materials (uranium mine spoils) into a groundwater filled impoundment generally results in increases in concentrations of total dissolved solids, major anions and cations, and in select metals and radionuclides (Lidstone and Associates, 2011). Additionally, data collected near the Bullrush heap leach indicates that unsuitable materials (for radium and/or acid and metals concentrations) exist near the surface and at depth within and near the Bullrush heap leach area as well as within the Bullrush spoils to the north of the heap leach area (Rimcon, 2008).

- The alluvium north and downgradient of Tailings Pond No. 1 in both Gas Draw and FAP Gulch has been impacted based on elevated concentrations of uranium, sulfate, chloride, and radium-226. Based on the cross section shown on **Figure 7**, a local westward hydraulic gradient and hydraulic communication through the Wind River Formation to the alluvium could account for the impacts to the western alluvial limb in Gas Draw.

- The Wind River Formation downgradient of Tailings Pond No. 1 has been impacted. Elevated chloride and sulfate concentrations at MW-11, MW-13, and MW-27 indicate this impact has occurred. The low chloride and sulfate concentrations at MW-26 indicate the impact to the Wind River Formation does not extend much farther west.

- Farther north, the alluvium in Willow Springs Draw has been impacted by Tailings Pond No. 1 based on elevated chloride, sulfate, and uranium concentrations at MW-15, MW-16, and MW-25.

- Based on Class III groundwater standards for sulfate and radium-226, the area around and just north of Tailings Pond No. 1 has been most significantly impacted, as sulfate concentrations generally exceed 3,000 mg/L, and radium-226 exceeds 5 pCi/L as shown on **Figures 10 and 12**.

Potential ANC Tailings Pond No. 2 Impacts

- The Wind River Formation south and upgradient of Tailings Pond No. 2 has not been impacted by previous mining activities based on the low sulfate and chloride concentrations at MW-29. The transmissivity of the Wind River Formation in this area is high (1,640 gpd/ft) at MW-29 which serves to convey water into the downgradient alluvium.

- The alluvium downgradient of Tailings Pond No. 2 in Willow Springs Draw has been impacted, based on elevated chloride, sulfate, and uranium concentrations at MW-23, MW-

28, and Willow Springs South. The transmissivity of the alluvium, particularly at MW-28, is high (4,400 gpd/ft) which facilitates the downgradient movement of impacted water. The Wind River Formation appears to have also been impacted based on the elevated chloride, sulfate and uranium concentrations at MW-22.

Potential Impacts in Sections 16 and 17, north of MW-25 and Willow Springs North

- The alluvium in Willow Springs Draw appears to have been impacted by the tailings seepage based on the elevated chloride and sulfate concentrations of MW-18 and MW-21.
- The Cody Shale east and west of Willow Springs Draw appears to have been moderately impacted based on similar elevated sulfate concentrations in MW-19 and MW-20. The transmissivity of this material is very low (6 gpd/ft) as measured at MW-19, which serves to channel water downstream through the alluvium. The high chloride concentration at MW-19 is likely due to the marine origin of the shale.
- The ephemeral drainages entering Willow Springs Draw from the east below the reclaimed Pathfinder Tailings Facility have been impacted based on elevated chloride and sulfate concentrations. MW-24 and MW-31 indicate that groundwater in both of these draws has been affected. Based on hydraulic heads and geographic position, it appears that this impact may be due to off-site sources rather than directly from the ANC tailings ponds. LA reviewed the 2013 Pathfinder Mines Corporation (PMC) semi-annual groundwater monitoring report (Hydro-Engineering, 2013), but found nothing related to these two drainages. The focus of that PMC monitoring has been on Fraser Draw, which lies two drainages east of Willow Springs Draw. It is apparent that PMC does not currently monitor groundwater in the area of Reid Draw, which flows into Willow Springs Draw.
- The high chloride, sulfate, and uranium concentrations at MW-18 indicate that Willow Springs Draw has been impacted significantly at this point more than 2 miles downstream of Tailings Pond No. 1. The transmissivity of the alluvium in this area is very high, and could not be measured confidently from water level recovery tests. There is insufficient data at this time to clearly define the origin of these high concentrations and to establish the downgradient extent of this impacted water.
- Based on Class III groundwater standards for sulfate, the alluvial channel near MW-24 has been most impacted as sulfate concentrations there exceed 3,000 mg/L.

3.5.6 Conceptual Hydrogeologic Model of the Alluvium and Wind River Formations

Near surface groundwater flow through the Wind River Formation, Cody Shale, and alluvium is predicated on permeable flowpaths and the local hydraulic gradient. Upgradient of Tailings Pond No. 1, groundwater moves northward through the saturated permeable sandstones of the Wind River Formation. The local permeability of the Wind River Formation sandstones was captured in the tests of MW-29 and MW-30. The interbedded mudstones of the Wind River Formation can serve as local aquitards depending on their lateral continuity. The underlying Cody Shale generally acts as a confining layer that promotes horizontal flow through the Wind River Formation. Where the potentiometric surface and saturated sandstones of the Wind River Formation intersect the alluvium, groundwater discharges from the Wind River Formation into the alluvium. Given its topographically low position, the alluvium acts as a local sink for groundwater discharge from the Wind River Formation along Willow Springs Draw. These conditions are present between MW-4 and MW-21 as indicated on **Figure 8**. Testing of the wells and the water quality data also indicate

that groundwater preferentially flows through the alluvium along the western portion of Willow Springs Draw. After the alluvial groundwater passes the contact of the Cody Shale and Wind River Formation just west of MW-21, groundwater generally stays in the alluvium due to its higher permeability relative to the Cody Shale, and is conveyed northward past MW-18.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Water quality impacts to near surface groundwater from Tailings Pond No. 1 extend farther north than previously anticipated or measured. Based on Wyoming DEQ Chapter 8 Class III groundwater standards for livestock, the most significant water quality impacts exist around and just north of Tailings Pond No. 1 where sulfate concentrations in excess of 3,000 mg/L and radium-226 concentrations in excess of 5 pCi/L exceed water quality standards. The network of new monitoring wells that were installed in July 2015 has highlighted that general water quality impacts extend more than 2 miles downgradient of Tailings Pond No. 1. The downgradient migration of the water quality impacts is primarily due to the high permeability of the alluvium and Wind River Formation along preferred flowpaths.

Impacts to groundwater from historical mining operations that once surrounded the ANC site are also a probability. Historic mining practices included open pit mining that intersected numerous saturated sandstones within the Wind River Formation and the construction of heap leaches on the land surface. Waste materials (mine spoils) were stockpiled outside of the mine pits and left under oxidizing conditions for several years, sometimes decades. Reclamation practices by mining companies and the State of Wyoming (AML) included backfilling of groundwater-fed mine pits with oxidized spoils and regrading/revegetation of the final land surfaces. Groundwater monitoring at reclaimed sites across the Gas Hills District indicates that water quality has been influenced by these historical mining and reclamation activities, including increases in TDS, major anions and cations, several metals including uranium, and radionuclide decay products of uranium. As stated earlier, a monitoring well network within the Wind River Formation has been established within the Gas Hills and groundwater sampling is currently being performed. The most recent data set of monitoring results should be available by the end of the first quarter 2016. At that time, LA will review the data and revise this draft report accordingly.

As a result of this investigation, the following additional work is recommended for consideration under Task Order No. 003:

- Completing one or several multiple well aquifer tests at one or more locations. This will involve the construction of one 4-inch diameter pumping and possibly one or two additional 2-inch observation wells at the selected location(s). The tests could be used to further evaluate how quickly impacted water may be traveling north down Willow Springs Draw (testing at MW-18), to assess the degree of hydraulic communication between the alluvium and Wind River Formation (testing at MW-27/MW-2), to evaluate how much water is moving into the area along Willow Springs Draw (testing at MW-29), to assess how fast water is moving downgradient of Tailings Pond No. 2 (testing at MW-28), and to evaluate hydrogeologic conditions near MW-25. Given the anticipated high transmissivity near MW-18 and its geographic position north of the tailings pond, conducting a multi-well test at this location is highly recommended.

- Drilling and completing additional monitoring wells in Willow Springs Draw north of MW-18 to identify, if possible, the northern limit of impacted water quality farther downstream. Additional wells could also be installed to better bracket the east-west limit of impacts near Tailings Pond No. 1, particularly east of MW-22.

- Completing additional monitoring wells in the drainages east of MW-24 and MW-31 and southwest of Tailings Pond No. 1 near the Bullrush heap leach to further assess groundwater quality in these areas. Since there is no groundwater data available for the Bullrush reclaimed area, LA considers it prudent to install at least one additional monitoring well within the heap leach area to determine the depth to groundwater and whether this area could be a contributing factor to the impacts seen in Willow Springs Draw.

- Conducting additional routine water quality sampling of the monitoring well network.

Under Task Order No. 002, LA has been working with LQD to develop additional plans that may assist in addressing identified impacts in the area. These efforts have included an aerial survey and topographic mapping of the Tailings Pond No. 1 and 2 area, developing preliminary funding level designs for Tailings Pond No. 1 reclamation, drainage modification designs for the area around Tailings Pond Nos. 1 and 2, and evaluation of windblown tailings potential cleanup needs.

5.0 REFERENCES

American Nuclear Corporation, 1990, Application for Alternate Concentration Limits Gas Hills Site, Volume I.

Dames & Moore, 1982, Assessment of Ground Water Impacts, Tailings Pond No. 2, Gas Hills, Wyoming for Federal American Partners.

Driscoll, F.G., 1986, Groundwater and Wells: Johnson Filtration Systems, Inc., St. Paul, MN.

Hydro-Engineering, LLC, 2013, Semi-Annual Ground-Water Monitoring For Lucky Mc Mine: Consultant's report prepared for Pathfinder Mines Corporation.

Lidstone and Associates, Inc., 2011, AML Project 16M Sagebrush Tablestakes and Sunset AML Reclamation Groundwater Investigation: Consultant's report prepared for the Wyoming Department of Environmental Quality Abandoned Mine Land Division.

Rimcon, LLC, 2008, Bullrush Pit and North Spoil Evaluation Report: Consultant's report prepared for Wyoming Abandoned Mined Lands.

Sierra Blanca Geo-Services, Inc., 1989, Present Day Hydrogeology Near Tailings Impoundment #1, American Nuclear's Gas Hills Project, Fremont County, Wyoming: Consultant's report prepared for American Nuclear Corporation.

Soister, P., 1967, Geology of the Puddle Springs Quadrangle Fremont County, Wyoming: U.S. Geological Survey Bulletin 1242-C.

Van Houten, F.B., 1964, Tertiary Geology of the Beaver Rim Area Fremont and Natrona Counties, Wyoming, U.S. Geological Survey Bulletin 1164.

Wyoming Department of Environmental Quality, 2002, Unpublished lithologic logs and well completion diagrams: DEQ internal documents on file with ANC Mine Permit 352.

Wyoming Department of Environmental Quality, 1997, Memorandum from Roberta Hoy to Mark Moxley regarding Review of Additional Ground Water Information: Internal memorandum prepared by DEQ.

Wyoming Department of Environmental Quality/Land Quality Division, 2014, Summary of ANC Tailings Pond 1 Analysis.

Wyoming Department of Environmental Quality/Land Quality Division, 2014, Guideline 8, Appendix 1.

TABLES

Table 1 Monitoring Well Completion Data Summary
Table 2 ANC Monitoring Well 2015 Water Quality Data Summary
Table 3 Estimated Aquifer Properties from Recovery Tests
Table 4 September 2015 Potentiometric Surface Elevations

Table 1
ANC Tailings Pond No. 1 Project
ANC Monitoring Well Completion Data Summary

Well Name	SIWP Well Name	Well Location	Surveyed Ground Elevation (ft AMSL)	Well Depth from ground surface (ft)	Screened Interval below ground surface (ft)	September 2015 Depth to water below ground surface (ft)	Geologic Formation Screened[1]	Remarks
MW-1	--	T33N, R90W Sec. 29 NENE	6417.47	105	95-105	62.96	Wind River Formation	--
MW-2	--	T33N, R90W Sec. 28 NWNW	6371.16	35	25-35	20.83	Alluvium	--
MW-3	--	T33N, R90W Sec. 29 NENE	6386.97	55	45-55	42.95	Wind River Formation	--
MW-4	--	T33N, R90W Sec. 28 NWNW	6386.27	55	45-55	31.68	Wind River Formation	--
MW-5	--	T33N, R90W Sec. 29 NENE	6363.97	30	10-30	27.62	Alluvium	--
MW-6	--	T33N, R90W Sec. 21 SWSW	6342.23	40	30-40	17.83	Wind River Formation	--
MW-7	--	T33N, R90W Sec. 21 SWSW	6357.99	40	30-40	26.02	Wind River Formation	--
MW-9	--	T33N, R90W Sec. 29 NENE	6372.44	50	40-50	43.69	Wind River Formation	--
MW-10	--	T33N, R90W Sec. 20 SESE	6333.20	40	30-40	10.49	Wind River Formation	--
MW-11	--	T33N, R90W Sec. 20 SESE	6344.59	40	30-40	24.64	Wind River Formation	--
MW-12	--	T33N, R90W Sec. 29 NENE	6378.30	40	30-40	31.10	Wind River Formation	--
MW-13	--	T33N, R90W Sec. 29 NENE	6366.77	60	50-60	32.34	Wind River Formation	--
MW-14A	--	T33N, R90W Sec. 28 SWNE	6415.70	37.5	27.5-37.5	32.14	Alluvium	--
MW-15	--	T33N, R90W Sec. 20 NESE	6281.34	28	18-28	15.25	Alluvium	--
MW-16	--	T33N, R90W Sec. 20 SENE	6268.98	34	24-34	26.07	Alluvium	--
MW-17	--	T33N, R90W Sec. 20 SESE	6306.84	34	24-34	16.18	Alluvium	--
MW-18	PW 1	T33N, R90W Sec. 17 NENW	6155.60	35	15-35	25.29	Alluvium	--
MW-19	PW 2	T33N, R90W Sec. 17 SENE	6250.59	119.5	99.5-119.5	92.27	Cody Shale	--
MW-20	PW 3	T33N, R90W Sec. 17 NESW	6199.56	60	40-60	23.24	Cody Shale	--
MW-21	PW 4	T33N, R90W Sec. 17 SESE	6219.47	34	24-34	23.02	Alluvium	--
MW-22	PW 5	T33N, R90W Sec. 21 NESW	6332.58	39	19-39	25.42	Wind River Formation	--
MW-23	PW 6	T33N, R90W Sec. 21 NESW	6308.96	19	9-19	3.62	Alluvium	--
MW-24	PW 7	T33N, R90W Sec. 17 NESE	6215.17	25	15-25	18.83	Alluvium	--
MW-25	PW 8	T33N, R90W Sec. 20 SWNE	6247.54	43	23-43	29.96	Alluvium	--
MW-26	PW 9	T33N, R90W Sec. 20 NWSE	6333.82	60	40-60	51.38	Wind River Formation	--
MW-27	PW 10	T33N, R90W Sec. 28 NWNW	6371.67	85	65-85	37.29	Wind River Formation	--
MW-28	PW 12	T33N, R90W Sec. 28 SENW	6425.39	54	34-54	38.04	Alluvium	--
MW-29	PW 13	T33N, R90W Sec. 33 NWNE	6506.68	79.5	59.5-79.5	64.38	Wind River Formation	--
MW-30	PW 14	T33N, R90W Sec. 28 NWSW	6464.22	79	59-79	62.51	Wind River Formation	--
MW-31	PW 15	T33N, R90W Sec. 16 NWSW	6225.78	29.5	9.5-29.5	20.39	Alluvium	--
TP 2-3	--	T33N, R90W Sec. 33 NWNW	6508.28	198	38-198	106.48	Wind River Formation	--
R-4	--	T33N, R90W Sec. 29 SENE	6406.80	72	52-72	52.70	Wind River Formation	Pump back well

Notes:
1 - Except for MW-2, MW-5, and MW-11, geologic formations for MW-1 through MW-13 interpreted from Sierra Blanca (1989) report.
Geologic formations for MW-2, MW-5, and MW-11 based on LA 2015 test hole drilling results.
Geologic formations for MW-14a through MW-17 interpreted from completion reports from DEQ (2002).
Formations for wells MW-18 through MW-31 based on LA's July 2015 drilling and completion.
Formations for TP 2-3 and R-4 interpreted from earlier completion reports.

Table 2
ANC Tailings Pond No. 1 Project
ANC Monitoring Well 2015 Water Quality Data Summary

Well/Spring Name --->		WYDEQ Class III, Livestock Standard[1]	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-9	MW-10	MW-11	MW-12	MW-12	MW-13	MW-14A	MW-15	MW-16	MW-17	MW-18	MW-18	MW-19	MW-19	MW-20	MW-20
Analyte	Units		9/21/2015	9/21/2015	9/21/2015	9/21/2015	9/22/2015	9/21/2015	9/21/2015	9/23/2015	9/21/2015	9/21/2015	8/6/2015	9/22/2015	9/21/2015	9/22/2015	9/23/2015	9/23/2015	9/21/2015	8/5/2015	9/23/2015	8/4/2015	9/24/2015	8/5/2015	9/23/2015
Major Ions																									
Calcium	mg/L	--	488	515	234	494	619	533	417	220	562	472	553	607	506	203	468	409	118	414	437	38	38	91	39
Magnesium	mg/L	--	376	447	49	283	237	94	138	62	280	73	85	85	81	40	101	86	32	152	155	19	21	50	18
Potassium	mg/L	--	19	58	18	23	47	25	46	20	44	20	31	26	21	19	36	32	15	66	48	14	10	18	9
Sodium	mg/L	--	393	389	116	302	381	263	133	88	366	84	203	200	90	108	216	193	197	877	797	1200	1190	794	746
Bicarbonate as HCO3	mg/L	--	1230	1570	318	822	238	692	469	267	787	320	496	461	357	317	328	336	284	459	423	1410	1360	734	694
Carbonate as CO3	mg/L	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	38	ND	10	ND
Chloride	mg/L	2000	279	331	26	248	324	153	48	17	285	141	158	180	119	14	106	90	14	208	112	178	180	19	21
Sulfate	mg/L	3000	3750	3640	721	3230	2610	1560	1730	697	2490	1250	1600	1700	1400	598	1680	1430	563	2700	2890	1430	1400	1530	1220
Fluoride	mg/L	--	3.9	0.6	0.3	1.0	0.1	0.2	0.2	0.4	0.1	0.3	0.3	0.2	0.2	0.4	0.4	0.4	0.4	1.0	0.8	0.99	0.6	0.5	0.6
Nitrogen, Ammonia as N	mg/L	--	418	350	0.18	307	55	0.08	68	0.25	76	0.07	0.5	0.31	0.08	ND	ND	ND	0.60	0.3	ND	1.4	1.56	1.1	1.22
Nitrogen, Nitrate+Nitrite as N	mg/L	100	ND	0.2	ND	6.2	94	ND	ND	ND	15	ND	ND	ND	ND	0.1	1.1	4.3	ND	ND	ND	ND	ND	ND	ND
Silica	mg/L	--	19.6	21.9	20.3	18.8	46.9	20.8	16.6	15.8	34.6	21.7	9.1	22.1	25.7	24.5	55.1	49.7	15.5	24.5	58.6	8	10.0	3.9	10.9
Cations	meq/L	--	103	106	21.2	83.5	72.1	46.4	44.0	20.5	73.6	33.7	44.23	46.7	36.4	18.6	42.0	36.7	17.5	73.03	70.4	56.12	55.8	43.74	36.2
Anions	meq/L	--	106	111	21.0	88.3	74.6	48.1	45.2	19.4	73.6	35.3	45.85	48.1	38.4	18.0	43.4	38.1	16.8	69.61	70.2	59.29	56.6	44.76	37.4
A/C Balance (± 5)	%	--	1.74	2.37	0.48	2.77	1.68	1.78	1.33	2.67	0.04	2.38	1.79	1.50	2.67	1.55	1.63	1.95	2.07	2.39	0.15	2.75	0.66	1.14	1.59
Physical Properties																									
pH	s.u.	6.5-8.5	6.44	6.56	7.29	6.65	6.15	7.40	6.79	7.33	6.45	7.55	7.8	6.56	7.31	5.79	7.23	7.21	7.60	8.0	7.36	8.4	7.54	8.3	7.76
Conductivity @ 25 C	umhos/cm	--	8360	8590	1760	7110	5670	3610	3380	1680	5400	2690	2930	3600	2830	1610	3270	2910	1510	4300	5620	4220	5090	3310	3360
Solids, Total Dissolved TDS @ 180 C	mg/L	5000	5320	5830	1400	4760	4890	3080	2660	1320	4360	2320	3220	3220	2520	1240	2890	2500	1100	4750	4850	3470	3610	2920	2380
Metals																									
Dissolved Aluminum	mg/L	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Arsenic	mg/L	0.2	0.014	0.001	ND	0.004	0.004	ND	0.002	ND	ND	ND	0.005	0.007	ND	0.003	0.009	0.010	ND	0.015	0.010	0.004	0.001	0.003	0.004
Dissolved Barium	mg/L	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Beryllium	mg/L	--	0.001	ND	ND	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Boron	mg/L	5	ND	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.2	ND	ND	ND	ND	0.1	0.1	0.1	0.3	0.2	0.5	2.1	2.3	0.7	1.9
Dissolved Cadmium	mg/L	0.05	ND	ND	ND	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Chromium	mg/L	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Copper	mg/L	0.5	ND	0.01	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Iron	mg/L	--	30.9	1.32	0.04	16.6	ND	0.60	1.80	ND	0.04	0.75	0.42	0.79	0.04	ND	ND	ND	ND	ND	ND	ND	0.04	0.17	ND
Dissolved Lead	mg/L	0.1	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Manganese	mg/L	--	7.17	14.8	0.17	9.56	8.63	0.63	6.06	0.09	11.5	0.35	0.35	0.73	0.68	0.04	ND	ND	0.18	ND	ND	0.09	0.07	0.11	0.14
Dissolved Mercury	mg/L	0.00005	ND	0.001	ND	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Molybdenum	mg/L	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Nickel	mg/L	--	0.99	0.92	ND	0.63	0.25	ND	0.05	ND	0.33	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Selenium	mg/L	0.05	0.011	0.003	ND	0.006	0.038	ND	ND	ND	0.011	ND	ND	ND	ND	0.005	0.006	0.003	ND	0.057	0.036	0.001	ND	0.001	ND
Dissolved Uranium	mg/L	--	5.55	9.08	0.0032	2.33	0.606	0.0622	1.01	0.0025	2.21	0.0259	5.61	5.94	0.0022	0.173	0.323	0.299	0.0024	1.13	0.564	0.0015	0.0097	0.0025	0.0045
Dissolved Vanadium	mg/L	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Zinc	mg/L	25	0.04	0.06	0.01	0.26	0.02	ND	ND	ND	0.06	ND	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	0.03	ND	0.01
Total Iron	mg/L	--	34.3	13.7	0.11	24.0	1.07	2.51	2.71	21.3	0.09	1.97	2.37	1.16	2.90	2.29	ND	ND	0.32	0.24	0.64	11.8	4.83	1.71	3.02
Total Manganese	mg/L	--	6.96	14.7	0.17	14.4	11.7	0.65	5.77	0.37	11.0	0.34	1.05	0.71	0.69	0.24	ND	ND	0.17	0.02	0.01	0.22	0.11	0.34	0.20
Radionuclides																									
Gross Alpha (Dissolved)	pCi/L	15	4850	7570	25.2	2110	656	52.7	945	15.5	1620	22.6	3320.0	3620	26.1	140	205	210	6.6	269.0	405	8.7	21.8	5.5	11.3
Gross Beta (Dissolved)	pCi/L	--	319	698	25.8	180	91.6	33.3	93.5	19.2	207	26.7	1110.0	562	24.5	30.0	47.2	41.8	15.0	223.0	66.8	24.7	ND	19.6	ND
Radium 226 (Dissolved)	pCi/L		77	84	6.4	26	7.5	5.2	6.6	1.7	9.4	3.4	26.2	29	6.6	3.2	1.0	1.2	1.3	0.4	0.50	0.5	0.90	0.6	0.72
Radium 228 (Dissolved)	pCi/L	5/60[2]	66.6	61.7	3.7	26.4	4.2	9.5	8.2	3.6	9.9	8.4	16.6	27.1	9.6	3.6	3.4	2.3	1.8	ND	1.5	ND	ND	ND	2.3
Thorium 230 (Dissolved)	pCi/L	--	ND	0.6	ND	ND	ND	ND	ND	ND	ND	0.7	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
Analyte concentrations in units shown above.
ND indicates analyte was not detected above laboratory method detection limits.
August 2015 sampling results from Intermountain Laboratories.
September 2015 sampling results from Energy Laboratories.
Additional details on methods and precision are included on analytical laboratory reports in the Appendix.
1 - Wyoming DEQ Chapter 8, Class III Livestock Standards for groundwater, Radium 226+228
2 - Wyoming DEQ Chapter 1, Class 4B only applicable standard for surface water is for Radium 226.
Yellow highlights analyte concentration exceeds Class III groundwater standard.

Table 2
ANC Tailings Pond No. 1 Project
ANC Monitoring Well 2015 Water Quality Data Sumn

Well/Spring Name --->		MW-21	MW-21	MW-22	MW-22	MW-23	MW-23	MW-24	MW-24	MW-25	MW-25	MW-26	MW-26	MW-27	MW-27	MW-28	MW-28	MW-29	MW-29	MW-30	MW-30	MW-31	Willow Springs South	TP 2-3	TP 2-3	R-4
Analyte	Units	8/4/2015	9/24/2015	8/5/2015	9/23/2015	8/5/2015	9/23/2015	8/4/2015	9/24/2015	8/5/2015	9/23/2015	8/6/2015	9/23/2015	8/6/2015	9/21/2015	8/6/2015	9/22/2015	8/3/2015	9/22/2015	8/3/2015	9/22/2015	9/24/2015	9/23/2015	8/4/2015	9/22/2015	9/21/2015
Major Ions																										
Calcium	mg/L	248	244	347	428	241	269	419	392	463	435	58	57	479	307	464	516	191	209	406	444	428	321	335	300	428
Magnesium	mg/L	63	69	94	117	50	54	399	345	204	188	18	18	101	62	165	168	20	19	35	37	257	92	42	36	290
Potassium	mg/L	35	27	38	32	25	21	15	15	68	51	15	12	35	22	47	39	12	10	16	13	25	34	23	17	9
Sodium	mg/L	311	270	474	439	199	211	1260	1280	676	651	226	249	221	176	217	226	32	35	473	518	520	173	80	75	363
Bicarbonate as HCO3	mg/L	109	222	205	187	350	321	550	467	551	462	206	201	847	459	819	775	ND	255	ND	427	363	335	189	192	ND
Carbonate as CO3	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloride	mg/L	49	46	61	81	40	45	64	56	139	153	13	13	123	75	108	128	2	1	364	330	33	71	58	50	243
Sulfate	mg/L	1290	1270	1950	2260	938	980	4820	4680	2640	2630	544	553	1350	1040	1670	1850	443	463	1350	1410	2900	1260	1050	836	5390
Fluoride	mg/L	0.33	0.3	0.9	0.9	0.8	0.8	2.19	1.1	0.7	0.6	0.6	0.7	0.3	0.3	0.5	0.3	0.3	0.3	0.5	0.2	0.5	0.4	0.42	0.3	0.3
Nitrogen, Ammonia as N	mg/L	0.2	0.34	0.3	0.09	0.4	0.32	0.3	ND	0.3	ND	0.3	0.46	0.7	0.31	0.1	52	0.1	0.06	0.3	ND	0.30	10.9	8.9	8.8	386
Nitrogen, Nitrate+Nitrite as N	mg/L	ND	0.5	0.3	ND	ND	ND	ND	0.3	8.7	7.2	0.4	ND	ND	ND	7.7	10	ND	ND	41.9	58	ND	0.8	0.35	0.9	5.9
Silica	mg/L	15	28.3	13.5	22.6	35.1	42.3	29	17.3	3.8	49.2	10.8	11.5	10.9	20.1	13.7	31.1	27	28.5	29	31.9	18.8	33.9	11	15.7	104
Cations	meq/L	32.04	30.3	46.67	50.9	25.44	27.7	109.07	104	71.03	66.8	14.54	15.4	42.76	28.7	47.37	54.1	12.83	13.8	44.12	48.0	65.8	32.7	24.92	22.2	108
Anions	meq/L	30.07	31.5	45.66	52.5	26.41	27.0	111.31	107	68.65	67.3	15.18	15.2	45.43	31.3	51.74	55.6	13.68	13.9	48.70	49.3	67.3	33.9	26.57	22.1	120
A/C Balance (± 5)	%	3.17	1.99	1.10	1.54	1.87	1.32	1.01	1.31	1.70	0.34	2.17	0.79	3.02	4.35	4.40	1.33	3.20	0.27	4.94	1.27	1.11	1.74	3.19	0.35	5.06
Physical Properties																										
pH	s.u.	7.4	6.66	8.2	7.60	8.1	7.07	8.1	7.26	8.1	7.29	8.4	7.98	7.9	7.03	7.6	4.91	8.3	6.18	8.1	7.16	7.32	7.97	8.1	7.27	3.91
Conductivity @ 25 C	umhos/cm	2400	2580	3040	3990	2030	2320	6240	7850	4150	5250	1400	1500	2880	2500	3330	4240	1140	1190	3390	4070	4890	2670	1940	1850	8370
Solids, Total Dissolved TDS @ 180 C	mg/L	2210	2110	3180	3530	1860	1860	8000	7280	4700	4510	1040	1030	3000	2060	3350	3500	940	925	3350	3230	4510	2170	1760	1490	6930
Metals																										
Dissolved Aluminum	mg/L	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	0.8	ND	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	118
Dissolved Arsenic	mg/L	ND	ND	0.004	0.002	0.007	0.010	ND	0.001	0.008	0.008	0.001	ND	ND	0.001	0.001	0.002	ND	ND	ND	ND	0.005	0.009	ND	ND	0.023
Dissolved Barium	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Beryllium	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.113
Dissolved Boron	mg/L	1.5	0.3	0.1	0.3	0.3	0.4	0.7	1.3	ND	0.6	0.4	0.5	0.1	0.2	ND	0.1	ND	ND	0.3	0.3	0.7	0.1	ND	ND	0.2
Dissolved Cadmium	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.070
Dissolved Chromium	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.08
Dissolved Copper	mg/L	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.22
Dissolved Iron	mg/L	ND	ND	1.82	ND	0.51	0.51	ND	ND	ND	ND	1.19	ND	1.70	0.70	ND	ND	0.62	0.53	ND	ND	ND	ND	ND	ND	71.9
Dissolved Lead	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.004	ND	ND	ND	ND	0.008
Dissolved Manganese	mg/L	0.02	1.17	0.11	0.29	0.38	0.36	0.78	0.13	ND	0.07	0.08	0.12	0.36	0.51	7.11	16.1	0.37	0.40	0.13	0.08	3.30	0.40	0.09	0.04	23.2
Dissolved Mercury	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Molybdenum	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.07	ND	ND
Dissolved Nickel	mg/L	ND	ND	ND	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	0.14	0.33	ND	ND	0.01	ND	ND	ND	0.01	ND	1.99
Dissolved Selenium	mg/L	0.054	ND	0.068	0.021	0.028	0.006	ND	0.014	0.074	0.085	0.001	0.012	ND	ND	0.012	0.014	ND	ND	0.109	0.090	ND	0.042	0.01	0.033	0.148
Dissolved Uranium	mg/L	0.0497	0.0065	0.117	0.155	0.128	0.115	0.0032	0.0395	1.44	1.42	0.0044	0.0072	0.0023	0.0065	0.837	0.961	0.0114	0.0060	0.840	0.748	0.0170	0.200	0.982	0.843	2.19
Dissolved Vanadium	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Zinc	mg/L	ND	0.07	0.01	0.11	ND	ND	0.01	0.05	ND	0.02	0.01	ND	ND	0.04	ND	0.03	ND	ND	ND	0.01	0.01	ND	ND	0.01	1.83
Total Iron	mg/L	2.47	20.6	10.9	3.25	0.55	0.73	0.68	1.77	0.33	3.54	5.94	4.68	11.4	4.86	0.39	0.42	1.25	1.63	0.12	0.07	1.65	0.04	ND	ND	75.6
Total Manganese	mg/L	0.99	1.48	0.27	0.19	0.43	0.35	0.07	0.15	0.07	0.07	0.09	0.20	1.16	0.53	20.4	16.6	0.41	0.39	0.20	0.07	3.42	0.38	0.1	0.06	22.9
Radionuclides																										
Gross Alpha (Dissolved)	pCi/L	43.2	10.2	63.3	121	122.0	96.1	5.5	52.5	583.0	793	5.3	14.6	5.6	56.3	423.0	619	17.3	15.7	282.0	534	15.6	179	481	557	1560
Gross Beta (Dissolved)	pCi/L	30.1	27.6	47.3	34.9	52.6	25.0	24.9	ND	450.0	103	12.1	9.7	19.8	36.7	202.0	94.5	18.4	13.2	118.0	53.6	19.8	47.2	316	65.2	540
Radium 226 (Dissolved)	pCi/L	0.7	1.3	1.1	1.3	1.0	1.1	0.3	0.94	0.7	1.6	0.6	1.1	4.7	7.0	0.7	1.5	3.2	3.2	4.1	2.4	1.2	0.32	5.2	3.4	25
Radium 228 (Dissolved)	pCi/L	ND	1.8	ND	2.0	ND	2.7	ND	ND	ND	3.0	ND	ND	4.7	7.6	1.1	2.5	1.9	1.8	2.2	4.2	ND	1.1	7.5	3.4	6.1
Thorium 230 (Dissolved)	pCi/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	ND	ND	0.6	ND	ND	0.2	ND	ND	ND	ND	ND	ND	73.2

Notes:
Analyte concentrations in units shown above.
ND indicates analyte was not detected above laboratc
August 2015 sampling results from Intermountain Lab
September 2015 sampling results from Energy Labora
Additional details on methods and precision are incluc
1 - Wyoming DEQ Chapter 8, Class III Livestock Standa
2 - Wyoming DEQ Chapter 1, Class 4B only applicable s
Yellow highlights analyte concentration exceeds Class

Table 3					
ANC Tailings Pond No. 1 Project					
Estimated Aquifer Properties from Recovery Tests					
Well Name	Geologic Formation Screened	Water Source in Monitoring Well	Estimated Transmissivity (gpd/ft)	Estimated Hydraulic Conductivity (gpd/ft^2)	Remarks
MW-18	Alluvium	Silty Sand	--	--	Could not estimate as well recovered too quickly.
MW-19	Cody Shale	Sand lenses in shale	6	0.2	
MW-21	Alluvium	Silty Sand	15	2	
MW-23	Alluvium	Silty Sand	81	10	
MW-24	Alluvium	Coarse Sand	157	76	
MW-25	Alluvium	Silty Sand	846	94	
MW-27	Wind River Formation	Sandstone	43	3	
MW-28	Alluvium	Sand/Silty Sand	4400	220	
MW-29	Wind River Formation	Silty Sandstone	1640	108	
MW-30	Wind River Formation	Silty Sandstone	850	51	

Table 4

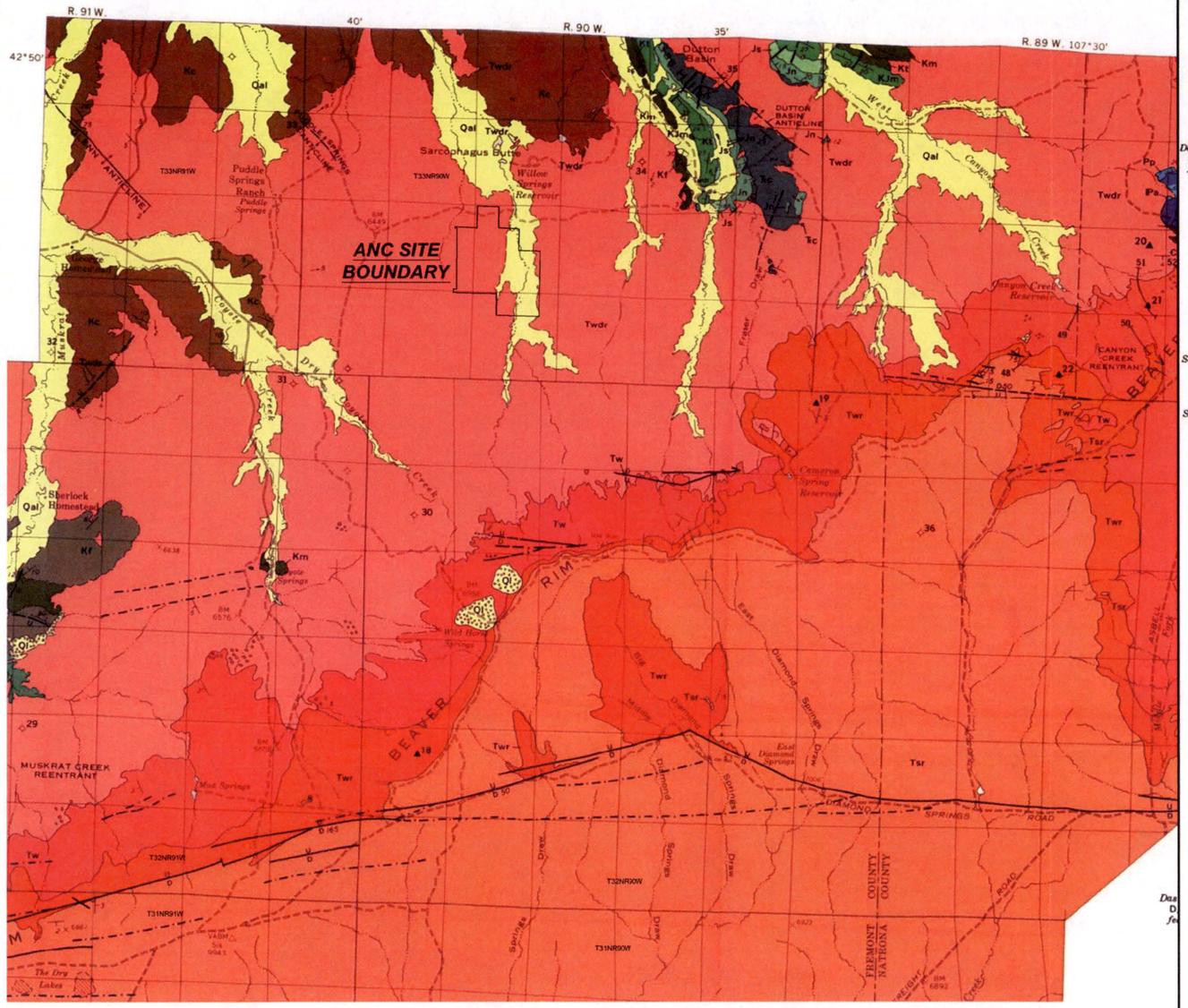
ANC Tailings Pond No. 1 Project

September 2015 Potentiometric Surface Elevations

Well Name	Well Depth from ground surface (ft)	Screened Interval below ground surface (ft)	September 2015 Depth to Water below Top of Casing (ft)	2015 Surveyed Ground elevation (ft AMSL)	2015 Top of Casing elevation (ft AMSL)	GW Elevation (ft AMSL)
MW-1	105	95-105	64.96	6417.47	6419.64	6354.68
MW-2	35	25-35	21.46	6371.16	6371.85	6350.39
MW-3	55	45-55	44.40	6386.97	6388.23	6343.83
MW-4	55	45-55	32.56	6386.27	6387.02	6354.46
MW-5	30	10-30	28.12	6363.97	6364.47	6336.35
MW-6	40	30-40	18.16	6342.23	6343.00	6324.84
MW-7	40	30-40	26.60	6357.99	6358.66	6332.06
MW-9	50	40-50	44.15	6372.44	6373.04	6328.89
MW-10	40	30-40	11.37	6333.20	6334.03	6322.66
MW-11	40	30-40	25.10	6344.59	6345.21	6320.11
MW-12	40	30-40	32.10	6378.30	6379.88	6347.78
MW-13	60	50-60	32.67	6366.77	6367.18	6334.51
MW-14A	37.5	27.5-37.5	34.14	6415.70	6418.31	6384.17
MW-15	28	18-28	17.25	6281.34	6284.00	6266.75
MW-16	34	24-34	28.07	6268.98	6271.40	6243.33
MW-17	34	24-34	18.18	6306.84	6309.03	6290.85
MW-18	35	15-35	28.41	6155.60	6158.68	6130.27
MW-19	119.5	99.5-119.5	95.14	6250.59	6253.47	6158.33
MW-20	60	40-60	26.16	6199.56	6202.47	6176.31
MW-21	34	24-34	25.89	6219.47	6222.32	6196.43
MW-22	39	19-39	28.09	6332.58	6335.32	6307.23
MW-23	19	9-19	6.45	6308.96	6311.86	6305.41
MW-24	25	15-25	21.70	6215.17	6218.07	6196.37
MW-25	43	23-43	31.96	6247.54	6249.62	6217.66
MW-26	60	40-60	54.30	6333.82	6336.75	6282.45
MW-27	85	65-85	39.75	6371.67	6374.01	6334.26
MW-28	54	34-54	40.87	6425.39	6428.19	6387.32
MW-29	79.5	59.5-79.5	67.13	6506.68	6509.45	6442.32
MW-30	79	59-79	65.34	6464.22	6467.12	6401.78
MW-31	29.5	9.5-29.5	23.26	6225.78	6228.78	6205.52
TP 2-3	198	38-198	107.48	6508.28	6509.95	6402.47
R-4	72	52-72	53.70	6406.80	6409.70	6356.00

FIGURES

Figure 1 Regional Geology and Site Map
Figure 2 1987 West & Central Gas Hills Pre-Reclamation Features Relevant to ANC Hydrogeology Study
Figure 3 ANC Site Geology Map
Figure 4 Existing and New Monitoring Well Locations
Figure 5 Transmissivity Map
Figure 6 September 2015 Potentiometric Surface Map
Figure 7 Lateral Extent of Alluvium and Wind River Formation North of Tailings Pond No. 1
Figure 8 Downgradient Extent of Alluvium and Wind River Formation North of Tailings Pond No. 1
Figure 9 September 2015 Uranium Concentration (MG/L)
Figure 10 September 2015 Sulfate Concentration (MG/L)
Figure 11 September 2015 Chloride Concentration (MG/L)
Figure 12 September 2015 Ra 226 Concentration (pCi/L)



LEGEND

EXPLANATION

Contact
Dashed where approximately located; dotted where inferred

Fault
Dashed where approximately located; U, upthrown side; D, downthrown side. Number indicates number of feet displacement on downthrown side

Vertical fault

Concealed major Laramide thrust fault
T, upper plate

Fracture system, jointing

Prominent line on aerial photographs
Probably indicating trend of fractures and faults; nature and displacement unknown

Anticline
Showing axis and direction of plunge. Dashed where approximately located; dotted where concealed

Syncline
Showing axis and direction of plunge. Dashed where approximately located

Strike and dip of beds

Strike and dip of overturned beds

Horizontal beds

Qal — **Alluvium, colluvium, slope-wash, and terrace deposits on low surfaces**

Qls — **Landslide debris**
Composed of formation shown in parentheses

Qtg — **Terrace gravel**

Tsr — **Split Rock Formation**

Twr — **White River Formation**
Boulder symbol indicates localities where formation contains boulders more than 3 feet in diameter

Tw — **Wagon Bed Formation**
Boulder symbol indicates localities where formation contains boulders more than 3 feet in diameter

Twdr — **Wind River Formation**
Boulder symbol indicates localities where formation contains boulders more than 3 feet in diameter

Kc — **Cody Shale**

Kf — **Frontier Formation**

Km — **Mowry Shale**

Kt — **Thermopolis Shale**

Kmt — **Mowry and Thermopolis Shales, undivided**

Kjm — **Cloverly and Morrison Formations, undivided**

Js — **Sundance Formation**

Jn — **Nugget Sandstone**

Tc — **Chugwater Formation**

Td — **Dinwoody Formation**

Pp — **Phosphoria Formation**

PPt — **Tensleep Sandstone**

Pa — **Amsden Formation**

N

SCALE IN FEET

0 4000' 8000' 16000'

NOTES

REFERENCE: FROM GEOLOGIC MAP AND SECTIONS OF BEAVER RIM AREA, FREMONT AND NATRONA COUNTIES, WYOMING.

USGS BULLETIN 1164

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting

WDEQ/LQD
ANC TAILINGS

PROJECT NUMBER:	WYDEQ104	ENGINEER:	PRH
		CHECKED:	PRH
DRAWN DATE:	1/18/16	APPROVED:	CDL

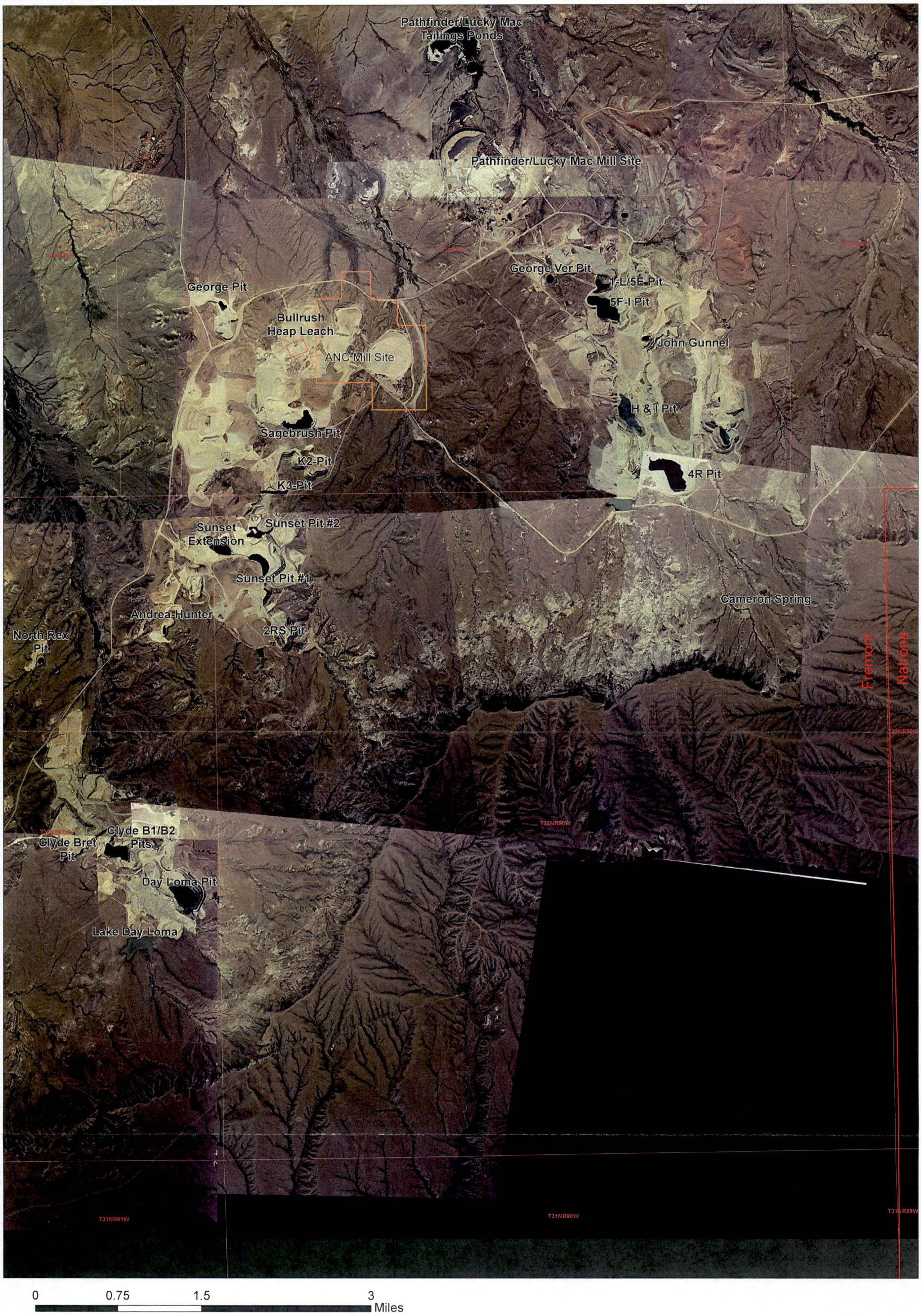
ACAD FILE: WYDEQ104 GEOLOGICAL FIGURES WY83-EF-REV.DWG

REGIONAL GEOLOGY AND SITE MAP

REVISIONS:

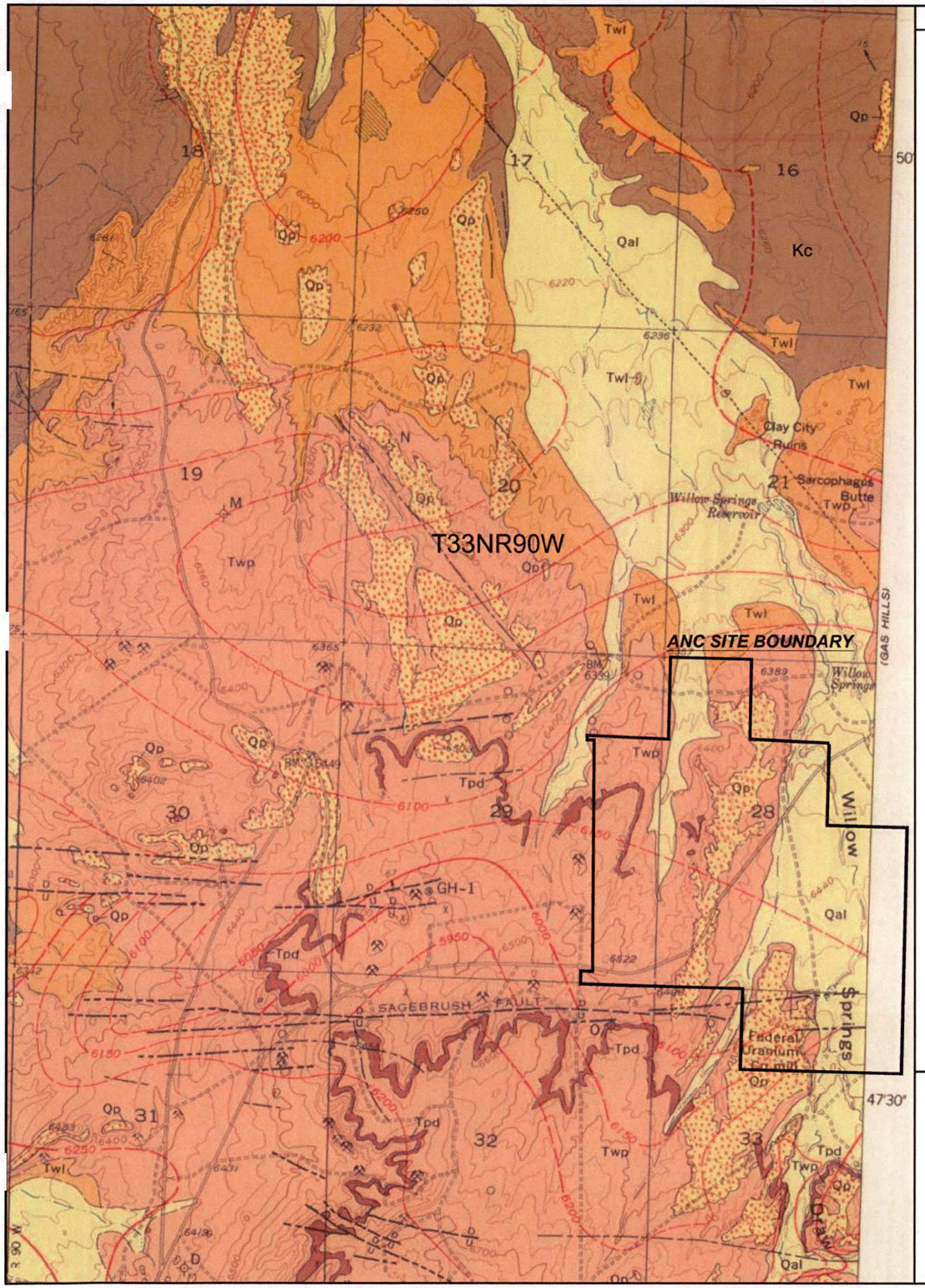
FIGURE 1

Z:\project\WYDEQ104\ACAD\WYDEQ104 GEOLOGICAL FIGURES WY83-EF-rev.dwg, REGIONAL GEOLOGY F1, 2/1/2016 5:17:02 PM, frojh0737, ANSI B (11.00 x 17.00 Inches)



Lidstone and Associates, Inc. Engineering, Geology, & Water Resource Consulting	PROJECT NUMBER: WYDEQ104 T1 DATE: 3/1/2016 DESIGN: JHF CHECKED: PRH APPROVED:	**Figure 2** **1987 West & Central Gas Hills Pre-Reclamation Features Relevant to ANC Hydrogeology Study**	**LEGEND** ANC PERMIT BOUNDARY COUNTY BOUNDARY TOWNSHIP/RANGE

Z:\project\WYDEQ104\GIS\WYDEQ104_Gas Hills Area Pre-Rec-LOCATES-F2.mxd



LEGEND

EXPLANATION

Qal — Alluvium

Qp — Pediment gravels

UNCONFORMITY

Tpm, Twp, Tpd, Twp, Twl — Wind River Formation

Twp, *upper transition zone and Puddle Springs Arkose Member*
Tpm, *Muskrat Conglomerate Bed*
Tpd, *Dry Coyote Conglomerate Bed*
Twl, *lower fine-grained member*

UNCONFORMITY

Kc — Cody shale

Contact
Dashed where approximately located; short dashed where inferred

Fault, showing dip
Dashed where approximately located; short dashed where inferred; dotted where concealed. U, upthrown side; D, downthrown side

Linear feature on aerial photographs; possibly a fault

Fault located by shallow refraction seismograph survey

Anticline, showing trace of axial surface and direction of plunge
Dashed where approximately located; dotted where concealed

Syncline, showing trace of axial surface and direction of plunge
Dashed where approximately located; dotted where concealed

Strike and dip of beds

Strike of vertical beds

Apparent dip of beds

Contours on erosion surface at base of Wind River Formation
Dashed where uncertain; short dashed where removed by Quaternary erosion. Hachures indicate closed basin. Contour interval 50 feet

Open-pit uranium mine
Active or abandoned

Uranium prospect

SCALE IN FEET
0 1000' 2000' 4000'

NOTES

REFERENCE:
GEOLOGIC MAP AND SECTION OF PUDDLE SPRINGS QUADRANGLE, FREMONT COUNTY, WYOMING.

USGS BULLETIN 1242-C

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting

WDEQ/LQD
ANC TAILINGS

PROJECT NUMBER: WYDEQ104	ENGINEER: PRH
DRAWN DATE: 2/2/16	CHECKED: PRH
	APPROVED: CDL

ACAD FILE: WYDEQ104 GEOLOGICAL FIGURES WY83-EF-REV.DWG

ANC SITE GEOLOGIC MAP

REVISIONS:

FIGURE 3

Z:\project\WYDEQ104\AC EQ104 GEOLOGICAL FIGURES WY83-EF-rev.dwg, GEOLOGIC MAP, 3/1/2016 3:19:06 PM, muhso0734, Bluebea

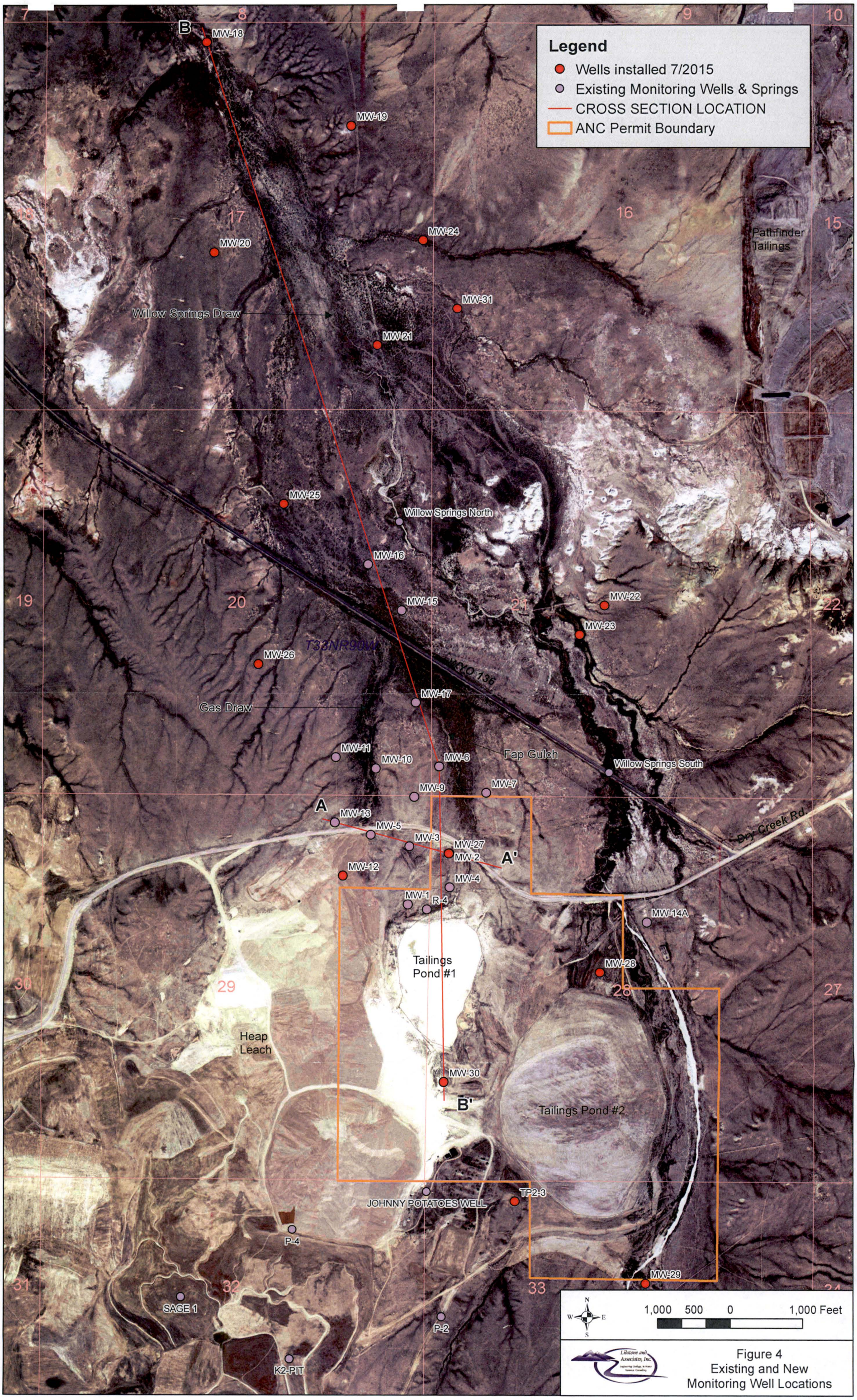
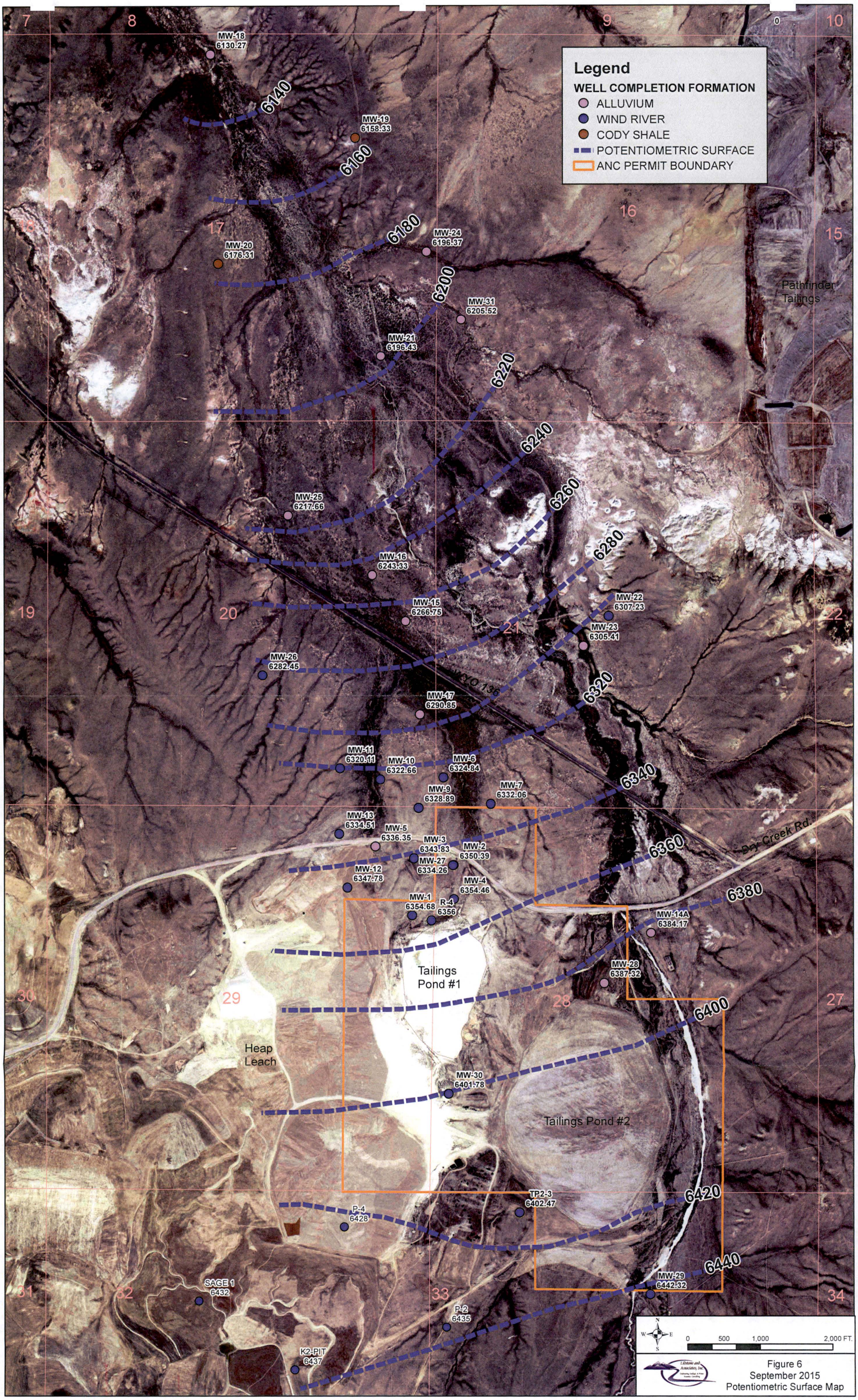


Figure 4
Existing and New
Monitoring Well Locations

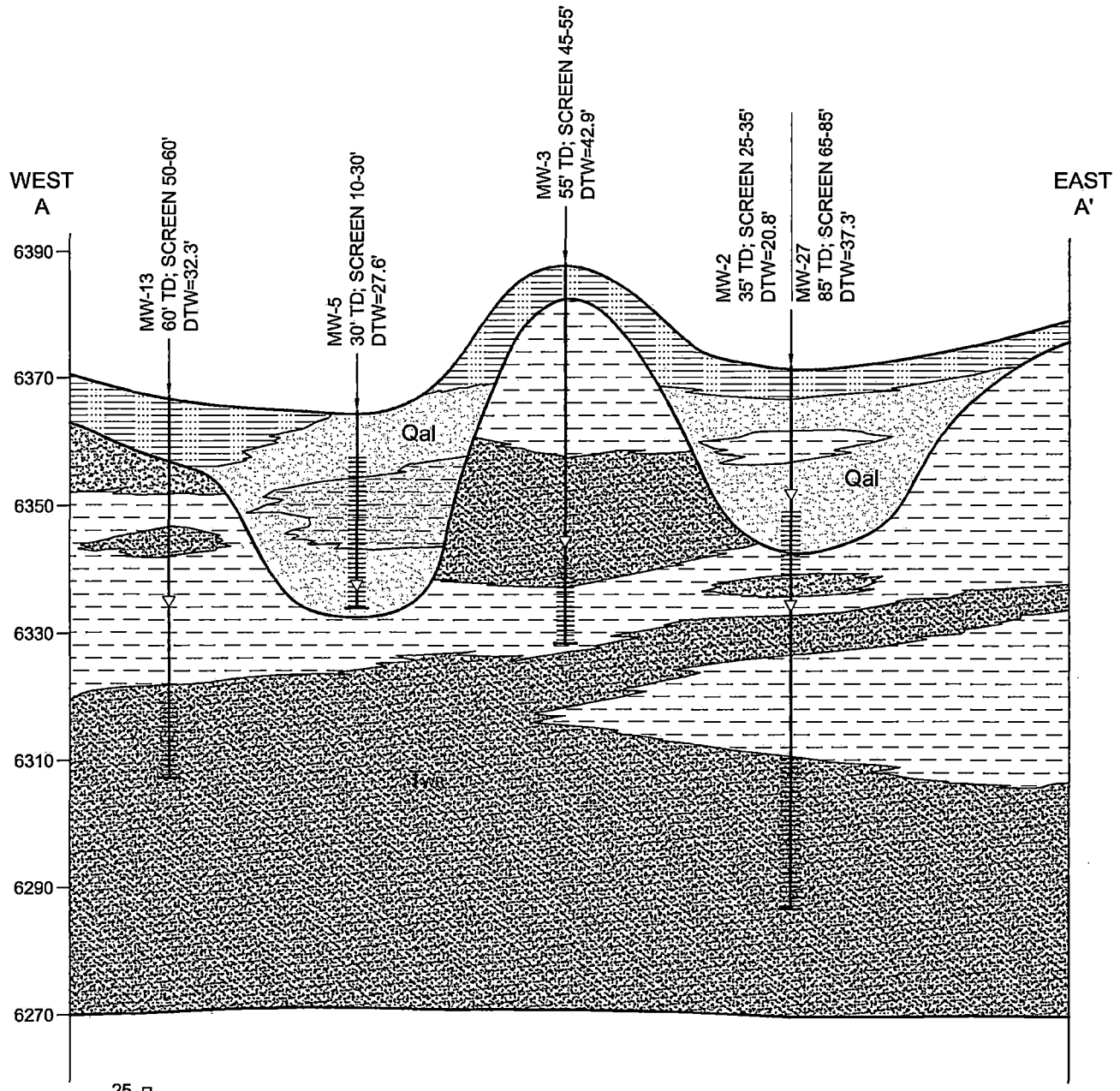
Document Path: Z:\project\WYDEQ104\GIS\WYDEQ104 EXISTING MON WELL LOCATIONS 10-8-15.mxd

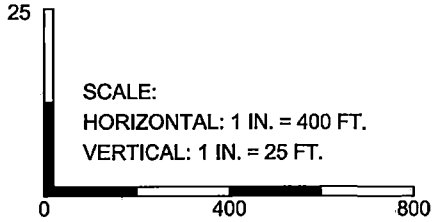
Figure 5
Transmissivity Map
(gpd/ft)

Document Path: Z:\project\WYDEQ104\GIS\WYDEQ104 EXISTING MON WELL TRANSMISSIVITY.mxd



Document Path: Z:\project\WYDEQ104\GIS\WYDEQ104 EXISTING MON WELL LOCATIONS WATER TABLE.mxd





LEGEND

LITHOLOGY

SAND	SANDSTONE	ALLUVIAL (Qal)
SILT	MUDSTONE / CLAYSTONE	WIND RIVER FORMATION = (TWR)
CLAY	CONTACT	WELL SCREEN ▽ WATER

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting

WDEQ/LQD
ANC TAILINGS

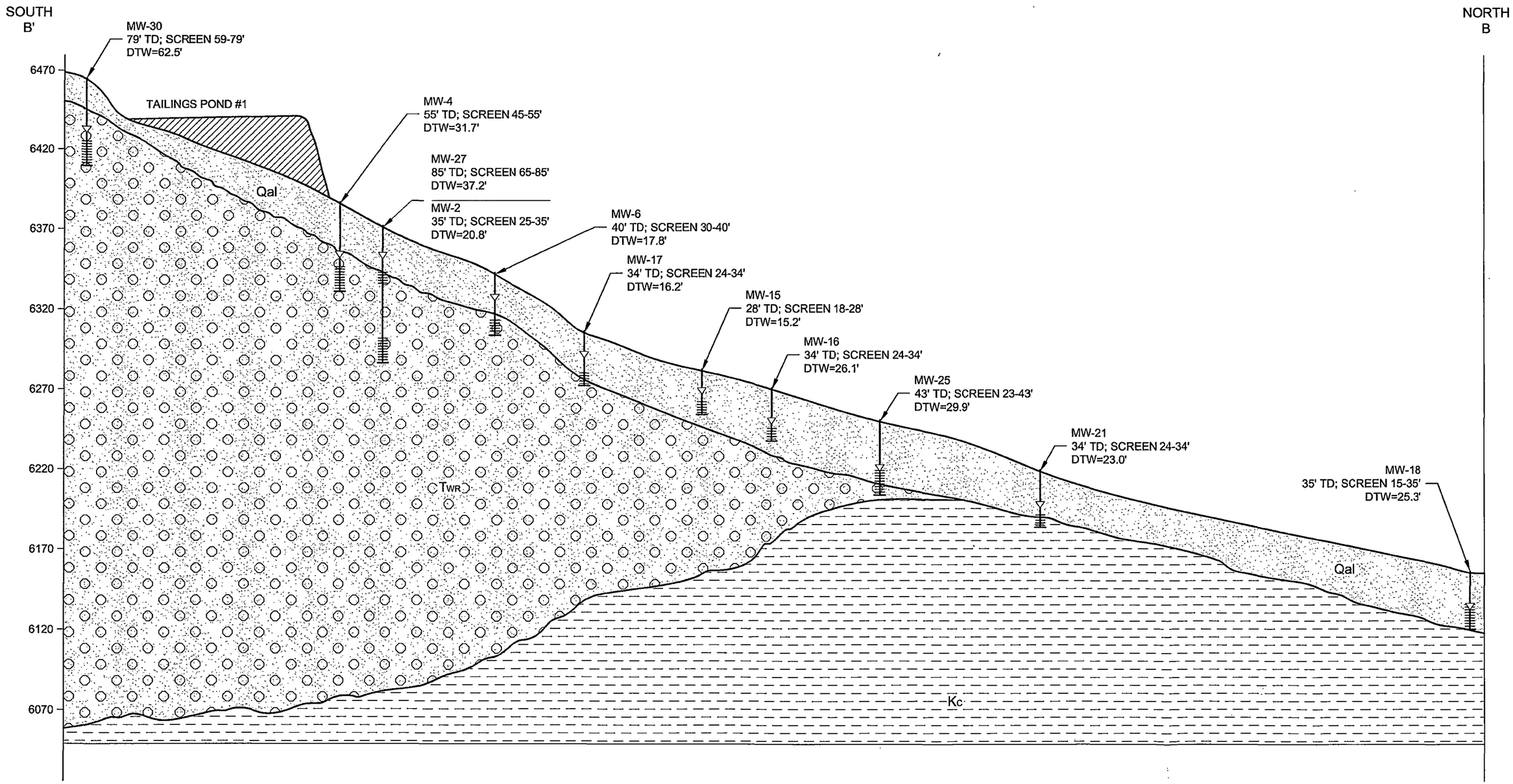
PROJECT NUMBER: WYDEQ104	ENGINEER: MES
DATE: 2/9/16	CHECKED: PRH
	APPROVED: CDL
ACAD FILE: WYDEQ104 GEOLOGICAL X-SEC.DWG	

LATERAL EXTENT OF ALLUVIUM AND WIND RIVER FORMATION NORTH OF TAILINGS POND NO. 1

REVISIONS:

FIGURE 7

Z:\project\WYDEQ\D\WYDEQ104 GEOLOGICAL X-SEC.dwg, LATERAL EXTENT, 3/1/2016 2:38:40 PM, muhso0734, Bluebeam PDF



LEGEND

LITHOLOGY

- TAILINGS
- ALLUVIUM (Qal)
- WELL SCREEN
- WIND RIVER FORMATION (TWR)
- CODY SHALE (Kc)
- CONTACT
- WATER

SCALE:
HORIZONTAL: 1 IN. = 1000 FT.
VERTICAL: 1 IN. = 60 FT.

60 0 1000 2000

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting

WDEQ/LQD
ANC TAILINGS

PROJECT NUMBER:	WYDEQ104	ENGINEER:	MES
		CHECKED:	PRH
DATE:	2/9/16	APPROVED:	CDL

ACAD FILE: WYDEQ104 GEOLOGICAL X-SEC.DWG

DOWNGRADIENT EXTENT OF ALLUVIUM AND WIND RIVER FORMATION NORTH OF TAILINGS POND NO. 1

REVISIONS:

FIGURE 8

EQ104 GEOLOGICAL X-SEC.dwg, DOWNGRADIENT LATERAL, 3/1/2016 2:36:50 PM, mlihso0734, Bluebeam PD

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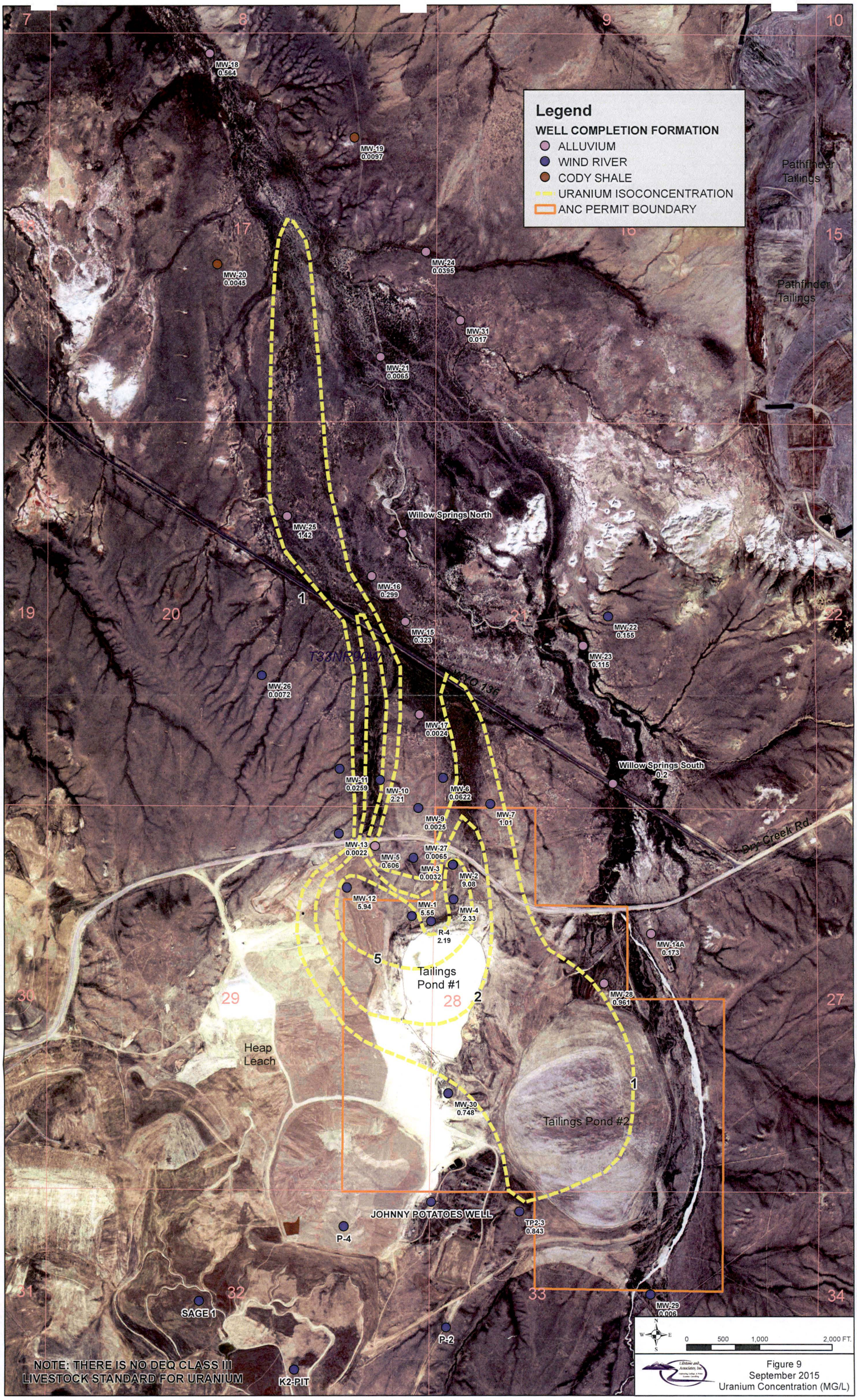


Figure 9
September 2015
Uranium Concentration (MG/L)

Document Path: Z:\project\WYDEQ104\GIS\WYDEQ104 EXISTING MON WELL URANIUM CONCENTRATION_REVISED.mxd

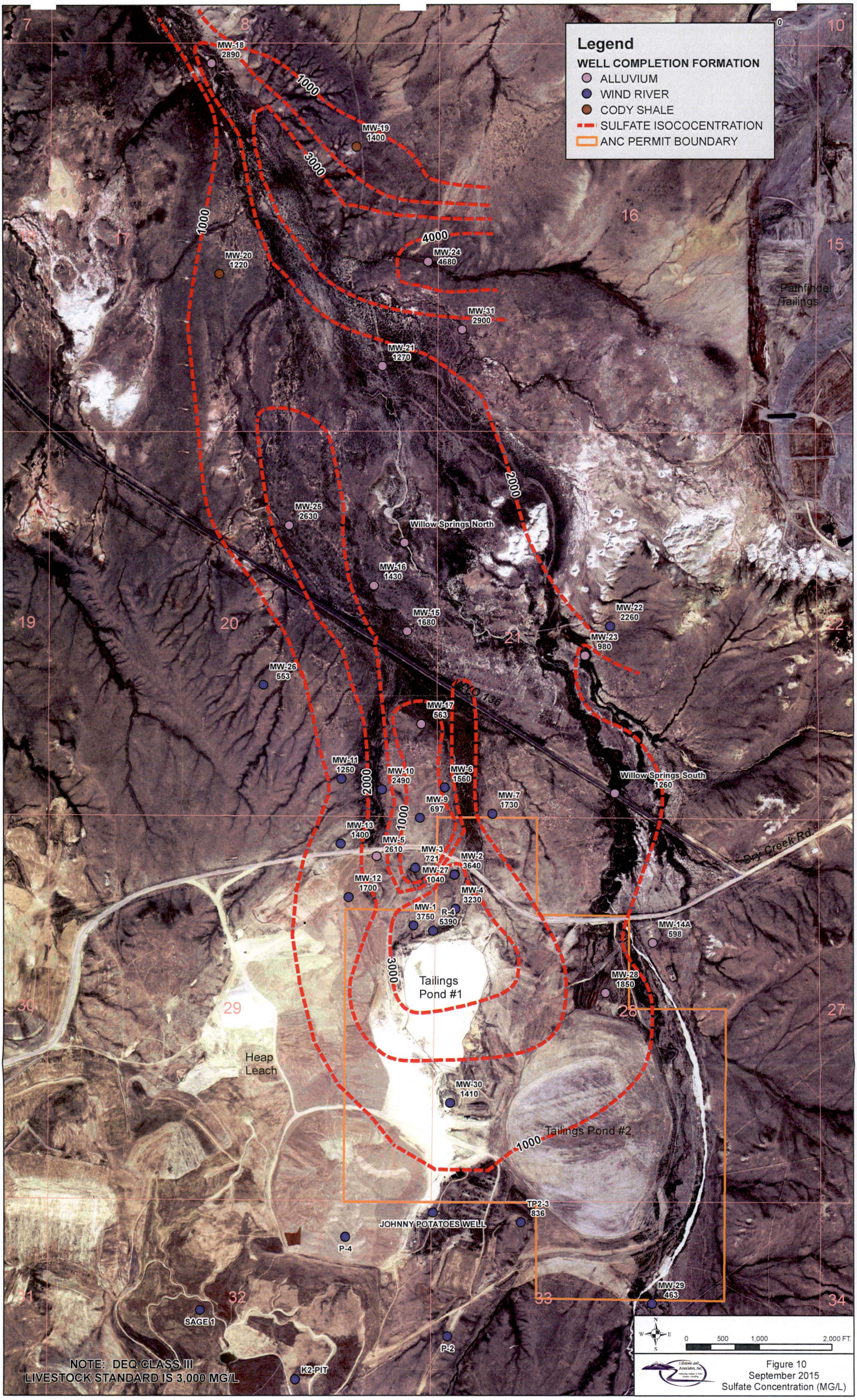
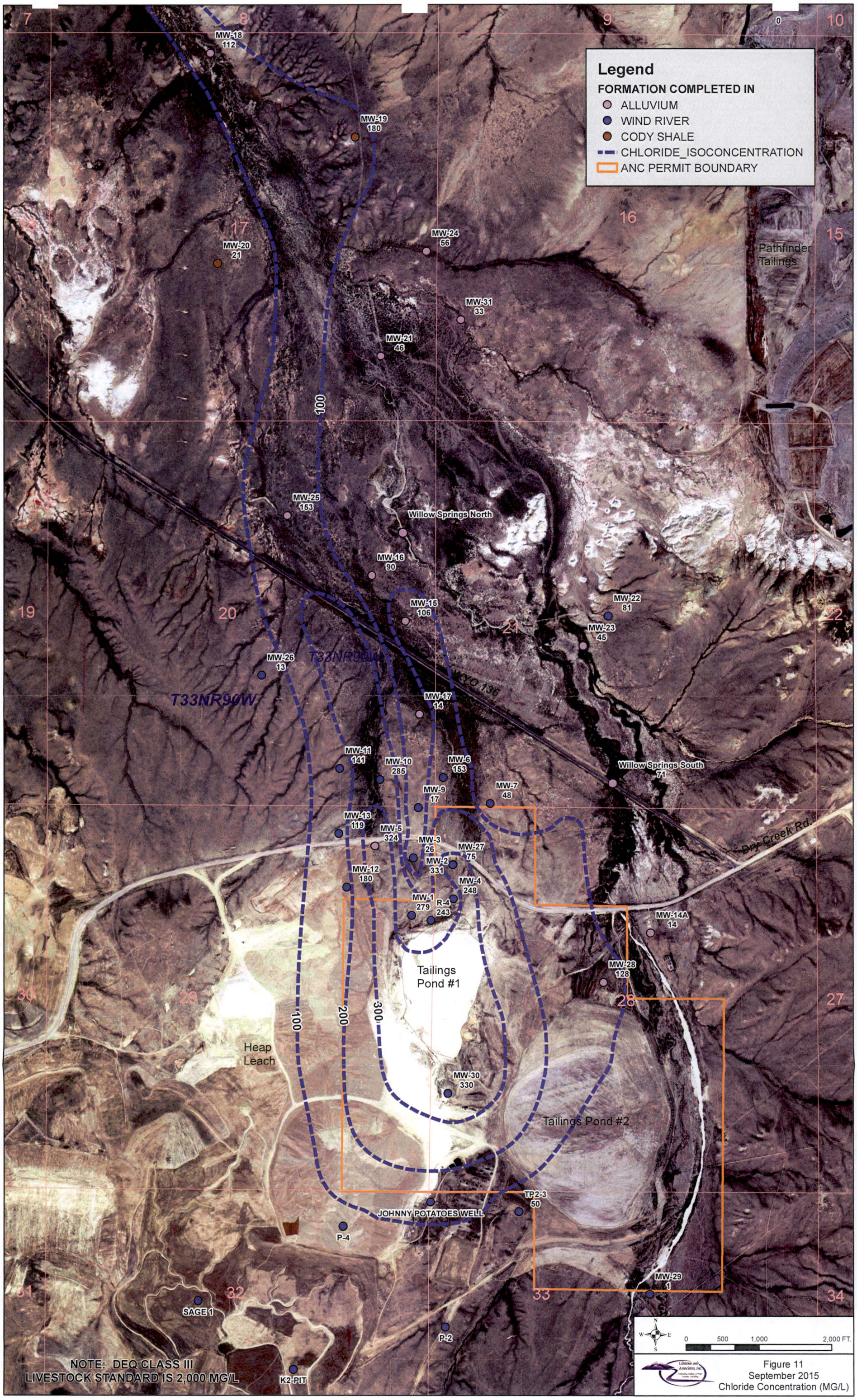


Figure 10
September 2015
Sulfate Concentration (MG/L)

Document Path: Z:\project\WYDEQ104\GIS\WYDEQ104 EXISTING MON WELL SULFATE CONCENTRATION-REVISED.mxd



Document Path: Z:\project\WYDEQ104\GIS\WYDEQ104 EXISTING MON WELL CHLORIDE CONCENTRATION-REVISED.mxd

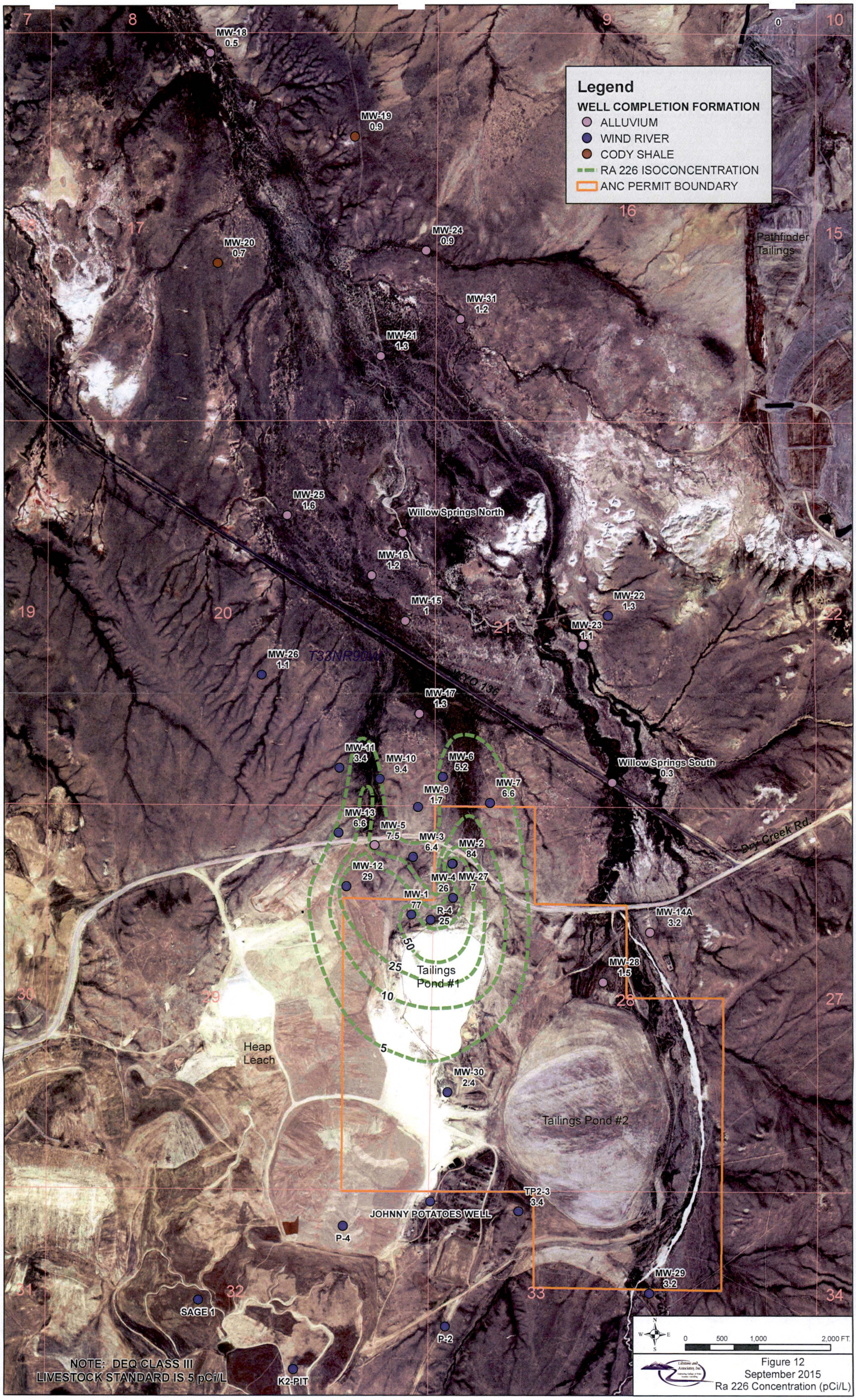


Figure 12
September 2015
Ra 226 Concentration (pCi/L)

Document Path: Z:\project\WYDEQ104\GIS\WYDEQ104 EXISTING MON WELL RA 226 CONCENTRATION REVISED.mxd

APPENDICES

Appendix A BLM ROW Access Agreement
Appendix B State of Wyoming Access Agreement
Appendix C Private Landowner Access Agreement
Appendix D Test Hole Lithology and Existing Monitoring Well Completions
Appendix E New Monitoring Well Completions
Appendix F Laboratory Water Quality Reports
Appendix G Well Recovery Test Analysis Report

Appendix A

BLM ROW Access Agreement

Lidstone and Associates, Inc.

Lidstone and Associates, Inc.
Engineering, Geology and Water Resource Consultants

February 16, 2015

Ms. Debra Larsen
U.S. Bureau of Land Management
Lander Field Office
1335 Main Street
Lander, WY 82520

RE: Right of Way Grant Application for Monitoring Wells and Associated Access at the American Nuclear Corporation Mill Tailings Site Located in Gas Hills, Fremont County, Wyoming

Dear Ms. Larsen:

Lidstone and Associates, Inc. (LA), authorized agent for the Wyoming Department of Environmental Quality/Land Quality Division (LQD), is providing for your review and approval a Right-of-Way (ROW) Grant Application to allow access to and construction of monitoring wells on federal lands that are administered by the U.S. Bureau of Land Management (BLM). Approval of this ROW Grant application would allow access to and construction of up to 11 groundwater monitoring wells and/or test holes to be completed on BLM administered surface. Up to seven additional wells will be completed on private or state surface, but, in all cases, at least partial access will cross BLM surface. The purpose of this well construction project is to provide necessary groundwater quality information to support the State of Wyoming's efforts to document and clean up any adverse impacts related to historical uranium milling at the abandoned American Nuclear Corporation (ANC) mill tailings site. Once the wells are completed, developed and tested, semi-annual to annual sampling of these wells will take place for approximately the next 20 years. LA wishes to commence construction activities as soon as the ROW Grant has been approved and would like to complete the work by late summer 2015. Well construction activities will be in accordance with BLM conditions and construction timing constraints.

Attached for your review and approval are the following completed documents:

- SF 299, Application for Transportation and Utility Systems and Facilities on Federal Lands;
- Plan of Development;
- Right-of-Way Grant Application Letter of Authorization;
- Attachment 1--Environmental Report prepared by Real West Natural Resource Consulting; and
- Attachment 2—June 12, 2014 Confirmatory Order Between LQD and NRC.

4025 Automation Way, Building E, Fort Collins, Colorado 80525-3448 (970) 223-4705 fax: (970) 223-4706 e-mail: water@lidstone.com

Please note that the cultural resource survey report was submitted to your office under separate cover by our cultural resources sub consultant, LTA, Inc.

LA and LQD appreciate your time and effort in reviewing and approving the attached ROW Grant application. Please do not hesitate to call me or Chris Lidstone should you have any questions.

Sincerely,
LIDSTONE AND ASSOCIATES, INC.

Paul Hildenbrand, P.G., R.G.
Senior Geologist

PRH:rce

Enclosure
Sent via: First Class Mail and Email

STANDARD FORM 299 (05/2009)
Prescribed by DOI/USDA/DOT
P.L. 96-487 and Federal
Register Notice 5-22-95

APPLICATION FOR TRANSPORTATION AND UTILITY SYSTEMS AND FACILITIES ON FEDERAL LANDS

FORM APPROVED
OMB Control Number: 0596-0082
Expiration Date: 1/31/2017

FOR AGENCY USE ONLY

Application Number

Date Filed

NOTE: Before completing and filing the application, the applicant should completely review this package and schedule a preapplication meeting with representatives of the agency responsible for processing the application. Each agency may have specific and unique requirements to be met in preparing and processing the application. Many times, with the help of the agency representative, the application can be completed at the preapplication meeting.

1. Name and address of applicant *(include zip code)*	2. Name, title, and address of authorized agent if different from item 1 *(include zip code)*	3. Telephone (area code)
WDEQ/LQD Attn: Muthu Kuchanur 122 West 25th Street Cheyenne, WY 82002	Lidstone and Associates, Inc. Attn: Chris Lidstone 4025 Automation Way, Bldg E Fort Colliuns CO 80525	Applicant 307-777-7756 Authorized Agent 970-223-4705

4. As applicant are you? *(check one)*

a. ☐ Individual
b. ☐ Corporation*
c. ☐ Partnership/Association*
d. ☒ State Government/State Agency
e. ☐ Local Government
f. ☐ Federal Agency

** If checked, complete supplemental page*

5. Specify what application is for: *(check one)*

a. ☒ New authorization
b. ☐ Renewing existing authorization No.
c. ☐ Amend existing authorization No.
d. ☐ Assign existing authorization No.
e. ☐ Existing use for which no authorization has been received *
f. ☐ Other*

** If checked, provide details under item 7*

6. If an individual, or partnership are you a citizen(s) of the United States? ☐ Yes ☐ No

7. Project description (describe in detail): (a) Type of system or facility, *(e.g., canal, pipeline, road);* (b) related structures and facilities; (c) physical specifications *(Length, width, grading, etc.)*; (d) term of years needed: (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction *(Attach additional sheets, if additional space is needed.)*

This project consists of access to and construction of up to 11 additional test holes and/or ground water monitoring wells on federal (BLM) surface. Up to 7 wells will be completed on private or state lands, but in all cases access will cross federal surface. Once the wells are completed and tested, semi-annual to annual sampling of these wells will take place for the next 20 years. Work will commence as soon as this ROW is granted and must be completed by late summer, 2015. Well construction and timing will be in accordance with BLM conditions and construction timing constraints. See attached Plan of Development for further detail.

8. Attach a map covering area and show location of project proposal

9. State or Local government approval: ☐ Attached ☐ Applied for ☒ Not Required

10. Nonreturnable application fee: ☐ Attached ☒ Not required

11. Does project cross international boundary or affect international waterways? ☐ Yes ☒ No *(if "yes," indicate on map)*

12. Give statement of your technical and financial capability to construct, operate, maintain, and terminate system for which authorization is being requested.

The WDEQ/LQD is technically and financially capable of completing the project described in this application.

13a. Describe other reasonable alternative routes and modes considered.

The location of the wells were determined to meet hydrogeologic objectives. The best available access routes to the wells were selected and are shown on Figure 1 of the Plan of Development. Selection criteria included: (1) use of existing two tracks; (2) minimal overland travel; and (3) minimal environmental disturbance.

b. Why were these alternatives not selected?

As stated above, the best possible access routes were selected. The drill sites were based on geological considerations and requirements. Alternative routes were considered but were eliminated because they disturbed more native vegetation or channel/riparian areas. Use of existing two tracks was preferred.

c. Give explanation as t o why it is necessary to cross Federal Lands.

Access to and construction of these wells is necessary to provide monitoring data for the State of Wyoming's effort to clean up and close the American Nuclear Uranium Mill Tailings. Some of the proposed wells are located on BLM land, but access to all wells at least partially cross Federal Lands. See the Plan of Development for more details.

14. List authorizations and pending applications filed for similar projects which may provide information to the authorizing agency. *(Specify number, date, code, or name)*

WYW 168561, Right- of-Way Grant issued July 17, 2014

15. Provide statement of need for project, including the economic feasibility and items such as: (a) cost of proposal (construction, operation, and maintenance); (b) estimated cost of next best alternative; and (c) expected public benefits.

The project is necessary to provide essential water quality monitoring data to support the State of Wyoming's efforts to document and clean up any adverse impacts related to historical uranium milling at the site. This work is in accordance with stipulations in the USNRC revised confirmatory order dated June 12, 2014 (Attachment 2).

16. Describe probable effects on the population in the area, including the social and economic aspects, and the rural lifestyles.

There will be negligible effects on the population of the area. The area is remote with no residences within 10 miles of the site. The only other alternative is to do nothing which would not benefit the State of Wyoming, or the BLM's surface interests. See the Plan of Development for more details

17. Describe likely environmental effects that the proposed project will have on: (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil, and soil stability.

Temporary impacts while installing the wells will be minimal because of the type of equipment and the type of installation that will be used. The long term effects to air quality, visual impacts, surface and ground water quality and quantity, streams, noise levels, and the surface will be negligible.

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, wildlife, and marine life, including threatened and endangered species; and (b) marine mammals, including hunting, capturing, collecting, or killing these animals.

LQD has performed environmental and cultural resource surveys at and around each proposed drill site. Based on the survey results, impacts to wildlife, vegetation and cultural resources will be negligible. The Environmental Report is Attachment1. The cultural report was provided by LTA to BLM directly under separate cover.

19. State whether any hazardous material, as defined in this paragraph, will be used, produced, transported or stored on or within the right-of-way or any of the right-of-way facilities, or used in the construction, operation, maintenance or termination of the right-of-way or any of its facilities. "Hazardous material" means any substance, pollutant or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. 6901 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCIA Section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas.

No hazardous materials or hazardous wastes will be used, produced,transported or stored on or within the right-of-way facilities or used in the construction, operation, maintenance or termination of any right-of-way facilities.

20. Name all the Department(s)/Agency(ies) where this application is being filed.

U.S.BLM, Lander Field Office, 1335 Main Street, Lander, WY 82520, Attn: Ms. Debra Larsen

I HEREBY CERTIFY, That I am of legal age and authorized to do business in the State and that I have personally examined the information contained in the application and believe that the information submitted is correct to the best of my knowledge.

Signature of Applicant	Date
[signature]	Feb. 16, 2015

Title 18, U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

GENERAL INFORMATION
ALASKA NATIONAL INTEREST LANDS

This application will be used when applying for a right-of-way, permit, license, lease, or certificate for the use of Federal lands which lie within conservation system units and National Recreation or Conservation Areas as defined in the Alaska National Interest lands Conservation Act. Conservation system units include the National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers System, National Trails System, National Wilderness Preservation System, and National Forest Monuments.

Transportation and utility systems and facility uses for which the application may be used are:

1. Canals, ditches, flumes, laterals, pipes, pipelines, tunnels, and other systems for the transportation of water.

2. Pipelines and other systems for the transportation of liquids other than water, including oil, natural gas, synthetic liquid and gaseous fuels, and any refined product produced therefrom.

3. Pipelines, slurry and emulsion systems, and conveyor belts for transportation of solid materials.

4. Systems for the transmission and distribution of electric energy.

5. Systems for transmission or reception of radio, television, telephone, telegraph, and other electronic signals, and other means of communications.

6. Improved right-of-way for snow machines, air cushion vehicles, and all-terrain vehicles.

7. Roads, highways, railroads, tunnels, tramways, airports, landing strips, docks, and other systems of general transportation.

This application must be filed simultaneously with each Federal department or agency requiring authorization to establish and operate your proposal.

In Alaska, the following agencies will help the applicant file an application and identify the other agencies the applicant should contact and possibly file with:

Department of Agriculture
Regional Forester, Forest Service (USFS)
Federal Office Building,
P.O. Box 21628
Juneau, Alaska 99802-1628
Telephone: (907) 586-7847 *(or a local Forest Service Office)*

Department of the Interior
Bureau of Indian Affairs (BIA)
Juneau Area Office
Federal Building Annex
9109 Mendenhall Mall Road, Suite 5
Juneau, Alaska 99802
Telephone: (907) 586-7177

Department of the Interior
Bureau of Land Management
222 West 7th Avenue
P.O. Box 13
Anchorage, Alaska 99513-7599
Telephone: (907) 271-5477 (or a local BLM Office)

U.S. Fish & Wildlife Service (FWS)
Office of the Regional Director
1011 East Tudor Road
Anchorage, Alaska 99503
Telephone: (907) 786-3440

National Park Service (NPA)
Alaska Regional Office, 2225
Gambell St., Rm. 107
Anchorage, Alaska 99502-2892
Telephone: (907) 786-3440

Note - Filings with any Interior agency may be filed with any office noted above or with the Office of the Secretary of the Interior, Regional Environmental Office, P.O. Box 120, 1675 C Street, Anchorage, Alaska 9513.

Department of Transportation
Federal Aviation Administration
Alaska Region AAL-4, 222 West 7th Ave., Box 14
Anchorage, Alaska 99513-7587
Telephone: (907) 271-5285

NOTE - The Department of Transportation has established the above central filing point for agencies within that Department. Affected agencies are: Federal Aviation Administration (FAA), Coast Guard (USCG), Federal Highway Administration (FHWA), Federal Railroad Administration (FRA).

OTHER THAN ALASKA NATIONAL INTEREST LANDS

Use of this form is not limited to National Interest Conservation Lands of Alaska.

Individual department/agencies may authorize the use of this form by applicants for transportation and utility systems and facilities on other Federal lands outside those areas described above.

For proposals located outside of Alaska, applications will be filed at the local agency office or at a location specified by the responsible Federal agency.

SPECIFIC INSTRUCTIONS
(Items not listed are self-explanatory)

7 Attach preliminary site and facility construction plans. The responsible agency will provide instructions whenever specific plans are required.

8 Generally, the map must show the section(s), township(s), and range(s) within which the project is to be located. Show the proposed location of the project on the map as accurately as possible. Some agencies require detailed survey maps. The responsible agency will provide additional instructions.

9 , 10, and 12 The responsible agency will provide additional instructions.

13 Providing information on alternate routes and modes in as much detail as possible, discussing why certain routes or modes were rejected and why it is necessary to cross Federal lands will assist the agency(ies) in processing your application and reaching a final decision. Include only reasonable alternate routes and modes as related to current technology and economics.

14 The responsible agency will provide instructions.

15 Generally, a simple statement of the purpose of the proposal will be sufficient. However, major proposals located in critical or sensitive areas may require a full analysis with additional specific information. The responsible agency will provide additional instructions.

16 through 19 Providing this information is as much detail as possible will assist the Federal agency(ies) in processing the application and reaching a decision. When completing these items, you should use a sound judgment in furnishing relevant information. For example, if the project is not near a stream or other body of water, do not address this subject. The responsible agency will provide additional instructions.

Application must be signed by the applicant or applicant's authorized representative.

EFFECT OF NOT PROVIDING INFORMATION: Disclosure of the information is voluntary. If all the information is not provided, the application may be rejected.

DATA COLLECTION STATEMENT

The Federal agencies collect this information from applicants requesting right-of-way, permit, license, lease, or certification for the use of Federal lands. The Federal agencies use this information to evaluate the applicant's proposal. The public is obligated to submit this form if they wish to obtain permission to use Federal lands.

SUPPLEMENTAL		
NOTE: The responsible agency(ies) will provide instructions	CHECK APPROPRIATE BLOCK	
I - PRIVATE CORPORATIONS	ATTACHED	FILED*
a. Articles of Incorporation	☐	☐
b. Corporation Bylaws	☐	☐
c. A certification from the State showing the corporation is in good standing and is entitled to operate within the State	☐	☐
d Copy of resolution authorizing filing	☐	☐
e. The name and address of each shareholder owning 3 percent or more of the shares, together with the number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote and the name and address of each affiliate of the entity together with, in the case of an affiliate controlled by the entity, the number of shares and the percentage of any class of voting stock of that affiliate owned, directly or indirectly, by that entity, and in the case of an affiliate which controls that entity, the number of shares and the percentage of any class of voting stock of that entity owned, directly or indirectly, by the affiliate.	☐	☐
f. If application is for an oil or gas pipeline, describe any related right- of-way or temporary use permit applications, and identify previous applications.	☐	☐
g. If application is for an oil and gas pipeline, identify all Federal lands by agency impacted by proposal.	☐	☐
II - PUBLIC CORPORATIONS		
a. Copy of law forming corporation	☐	☐
b. Proof of organization	☐	☐
c. Copy of Bylaws	☐	☐
d. Copy of resolution authorizing filing	☐	☐
e. If application is for an oil or gas pipeline, provide information required by item "I - f" and "I - g" above.	☐	☐
III - PARTNERSHIP OR OTHER UNINCORPORATED ENTITY		
a. Articles of association, if any	☐	☐
b. If one partner is authorized to sign, resolution authorizing action is	☐	☐
c. Name and address of each participant, partner, association, or other	☐	☐
d. If application is for an oil or gas pipeline, provide information required by item "I - f" and "I - g" above.	☐	☐

*If the required information is already filed with the agency processing this application and is current, check block entitled "Filed." Provide the file identification information *(e.g., number, date, code, name)*. If not on file or current, attach the requested information.

NOTICES

Note: This applies to the Department of Agriculture/Forest Service (FS)

This information is needed by the Forest Service to evaluate the requests to use National Forest System lands and manage those lands to protect natural resources, administer the use, and ensure public health and safety. This information is required to obtain or retain a benefit. The authority for that requirement is provided by the Organic Act of 1897 and the Federal Land Policy and Management Act of 1976, which authorize the secretary of Agriculture to promulgate rules and regulations for authorizing and managing National Forest System lands. These statutes, along with the Term Permit Act, National Forest Ski Area Permit Act, Granger-Thye Act, Mineral Leasing Act, Alaska Term Permit Act, Act of September 3, 1954, Wilderness Act, National Forest Roads and Trails Act, Act of November 16, 1973, Archeological Resources Protection Act, and Alaska National Interest Lands Conservation Act, authorize the Secretary of Agriculture to issue authorizations or the use and occupancy of National Forest System lands. The Secretary of Agriculture's regulations at 36 CFR Part 251, Subpart B, establish procedures for issuing those authorizations.

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According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average 8 hours hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

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PLAN OF DEVELOPMENT
WDEQ/LQD GAS HILLS MONITOR WELL INSTALLATION AND OPERATION
AMERICAN NUCLEAR URANIUM MILL TAILINGS SITE

1. Purpose and Need for the Facility

The American Nuclear Corporation (ANC) began mining and milling uranium ore in the Gas Hills Uranium District in eastern Fremont County, Wyoming in the early 1960's. As part of the milling effort, ANC generated many thousands of cubic yards of unsuitable processed wastes known as uranium mill tailings, a slightly radioactive by-product material, resulting from their milling operations. The generation and permanent closure of this mill waste is regulated by the U. S. Nuclear Regulatory Commission (NRC) under the authority of the Atomic Energy Act of 1954, as amended. ANC was in the decommissioning/reclamation phase when, in 1994, they announced that they were discontinuing all operations and going out of business, thereby effectively "abandoning the site" and forfeiting their reclamation responsibilities and remaining reclamation bond. Up to this point, ANC had completed partial decommissioning and reclamation of their uranium ore processing facilities , including: (1) demolition and reclamation of the mill, (2) re-routing of Willow Springs Draw away from Tailings Pond No. 2, (3) reshaping and placement of an interim earthen cover over the processed material tailings of both tailings ponds, and (4) installation of 13 monitoring wells down gradient of Tailings Pond No.1. At the time of their decision to cease operations, ANC and the regulatory bodies had identified the possibility that, during operations, seepage from Tailings Pond No. 1 had migrated down gradient in the surface alluvium and were in the process of attempting to quantify the volume, characteristics and aerial extent of any down gradient impacts.

At the time of the bond forfeiture, the funds for the completion of this closure work were held by the State of Wyoming. When ANC chose to cease operations, they forfeited their bond to the State of Wyoming. The Wyoming Department of Environmental Quality/Land Quality Division (LQD) assumed the responsibility for implementing the reclamation plan at the Site, which also included the continuation of a groundwater/surface water monitoring program and an effort to withdraw impacted groundwater from under Tailings Pond No. 1 (i.e. a pump back system). The monitoring program included the 13 existing monitoring wells and one surface water monitoring location. These sampling sites have been previously approved by BLM Right-of-Way Grant WYW 168561, issued as a renewed grant on July 17, 2014.

The purpose of this new (second) Right-of-Way application is to drill, construct and sample new strategically placed monitor wells in an effort to define (1) the presence and extent of groundwater impacts; (2) the vertical and spatial extent of potential groundwater impacts; (3) provide sufficient technical information to define a final closure program for the mill site and surrounding area. The Applicant will install additional monitoring wells and geological test holes and continue the large scale water quality sampling program that has been in effect for approximately 20 years. This work will provide information needed to satisfy the 2014 Confirmatory Order with the NRC. At least one of the wells will replace an existing damaged monitoring well.

2. Description of the Facility

Wells - Up to 16 additional monitor wells will be installed at selected locations within the area of interest. The majority of the proposed well locations are on Federal Lands. At least three well sites are proposed to be located on either State or Private Lands (see **Figure 1**). Additionally, up to four test holes will be drilled at offset locations from existing wells to verify the geological conditions of the area. These proposed test hole locations are all located on Federal Lands. The proposed well

and test hole locations are shown on **Figure 1** and described in **Table 1**. The wells will fully penetrate the alluvial deposits or will be completed in the first saturated zone of the Wind River Formation. Well depths will range between 50 and 120 feet, depending on local hydrogeologic conditions and targeted geologic units. The wells will be constructed with 2-inch PVC casing and screen in accordance with the Wyoming Department of Environmental Quality/Water Quality Division Rules and Regulations Chapter 26; Well Construction Standards. These standards will include surface seal, surface casing and a locking cap. The test holes will be completed using the same drilling equipment as for the monitoring wells, and will be abandoned in accordance with State standards using an approved abandonment fluid and filling the hole from the bottom to within 2 feet of the surface. The top 2 feet will be filled with native materials. Finally, two additional surface water locations will also be used as sampling locations. These sites are also located on **Figure 1.**

Roads - No road construction is anticipated. Existing improved access roads will be the primary access with existing two-track roads, where available, providing secondary access. In the absence of existing two-track access roads, final access to the well locations will be overland utilizing rubber tired vehicles into and out of the site. Excessive road wear is not anticipated due to infrequent use.

Water Monitoring Activities

Initial water sampling will occur following well completion and development. Additional sampling on a quarterly, semiannual or annual basis may be required depending on the results of the initial sampling event. Water monitoring efforts will typically consist of a single vehicle for part of a day at each site, approximately once per sampling event. The wells and the surface water locations will be sampled for a standardized suite of constituents as required by the State and NRC.

Right-of-Way Location

Consistent with existing Right-of-Way Grant WYW 168561, this right-of-way request is for approximately 11 drilling/well completion sites to be located on BLM administered lands, each being 25 feet by 25 feet, containing a total of approximately 0.16 acres. **Figure 1** shows the proposed well/test hole and two-track road access locations. **Table 1** provides monitor well and test hole information. It is requested that the right-of-way grant be authorized for a 30-year period from the effective date of the grant.

Construction Schedule

Well installation and test hole drilling is anticipated to commence upon BLM Right-of-Way approval with an effort to begin construction in early to mid-summer. The Applicant anticipates that well construction work will be completed within approximately four to six weeks. Initial water quality sampling and monitoring well recovery testing will take place during the two to three month period following well installation. A schedule for future testing, sampling and monitoring will be developed based upon the results of the initial sampling program.

3. Design Criteria

Monitoring Well Design

The monitoring wells will be constructed using schedule 40 PVC well casing and screen. The screened interval will be selected during the drilling process based on observed down hole conditions. After the hole has been drilled to total depth (TD), the appropriate length of screen will be attached to the bottom most joint of casing. The lengths of casing and screen may be joined either by solvent welding or threaded connections. Each joint of casing will be slowly lowered into the hole until the screen is next to the target zone and just above the bottom of the drill hole. A filter

pack composed of silica sand designed to be compatible with the screen slot size will be placed down the annular space from the bottom of the hole to at least 2 feet above the top of the screen. To create a seal immediately above the filter pack and an annular seal above the top of the filter pack seal, bentonite chips will be placed into the annular space from the toe of the filter pack to within 2 feet of the surface. The bentonite chips will be hydrated with clean water as they are emplaced to ensure complete hydration and a proper seal. The filter pack, bentonite seal, annular seal and surface seal material will be placed into the well in a manner such that no voids or bridging will occur. Concrete will be placed from 2 feet below to the ground surface to complete the annular seal.

Following well completion, a fabricated lockable protective cover will be installed over each wellhead to protect the well from damage. The protective cover will extend upward from the ground surface approximately 3 feet and downward from the ground surface approximately 2 feet into the concrete surface seal. Finally, a concrete surface pad, approximately 2 feet by 2 feet by 4 inches thick and sloped away from the well casing, will be constructed to prevent surface drainage from entering the annular space. The top of the casing will be covered with a PVC end cap to prevent sediment and surface water from entering the well. The wells will be permanently marked with their identifying number on the protective cover, the well cap and/or the wet surface seal concrete. Each completed well will be developed by pumping or other standard development techniques prior to sampling to remove fines from and condition the filter pack. The amount of water removed from each well during development will vary depending on the amount of fines needed to be removed from the screen interval, but it is anticipated that the volume of water discharged during this process will be limited. **Figure 2** shows a typical conceptual well design. These wells will not require permits, dedications or easements, other than this right-of-way.

Monitoring Well Construction

The monitoring wells and test holes will be drilled and completed using a truck mounted CME 75/85 hollow stem auger drill rig, or equivalent equipment, that will be capable of air rotary drilling through Wind River Formation sandstones and conglomerates where needed. Split spoon or core samples of formation materials will be collected at regular intervals throughout the drilling of each well and test hole. It is anticipated that the potential short term surface disturbance (during construction) at each drill site will be less than 2,000 square feet (approximately 0.046 acre) and will have a minor and temporary impact on the local environment. Most of the surface disturbance will be from driving equipment and support vehicles onto the drill site. Mud pits will not be used as the method of drilling includes the rotation of augers and perhaps under special circumstances an air compressor to allow cooling of the bit and the removal of cuttings from the hole. A lay down area for auger flights will not be required as the necessary number of flights to drill these wells and test holes can be stored on the drill rig. There will be minimal well development water discharge at the well sites at the completion of well construction, such that the potential for surface erosion will be negligible. All sites and all disturbances will be hand raked and broadcast seeded utilizing the seed mix shown in **Table 2**. Once drilling is completed, the right-of-way needs and long term disturbance will be significantly smaller and are conservatively estimated at an area of 25 feet by 25 feet or a maximum of 625 square feet (0.014 acres).

Environmental Considerations

The Applicant has gone to great effort to select access routes into the drill sites that will minimize disturbance to the land surface. The Applicant has chosen a method of drilling (auger drilling with a CME 75/85, or equivalent) that allows access via a rubber tired truck mounted drill rig. Other drill rig types and drilling methods would require heavier equipment, construction of mud pits and a significantly larger "lay-down" area. The Applicant has reviewed numerous alternative access routes to the drill and monitor well sites and has selectively chosen routes that utilize existing two-

track roads to the extent possible. The Applicant will not blade or otherwise construct new access roads. Where two track roads do not exist, the Applicant has minimized the length of overland travel to ensure that disturbance to existing vegetation is minimal. The Applicant has avoided disturbance to existing wetlands and riparian communities and has coordinated the selection of sites and access routes with their cultural resource, wildlife and vegetation consultants.

The Applicant will utilize Best Management Practices (BMP) where necessary to ensure that there is little to no disturbance to the surrounding land surface and adjacent streams, springs and bodies of water. Such BMP's could include but are not necessarily limited to locally placed rock to dissipate energy from water, silt fences, straw bales and erosion matting, as deemed necessary.

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Matthew H. Mead, Governor **Todd Parfitt, Director**

November 26, 2014

Mr. Richard Vander Voet
Field Manager, Lander Field Office
Wind River/Bighorn Basin District
United States Bureau of Land Management
1335 Main Street
Lander, WY 82520

RE: Right-of-Way Grant Application Letter of Authorization

Dear Mr. Vander Voet:

By this letter, the Wyoming Department of Environmental Quality/Land Quality Division (LQD) authorizes Lidstone and Associates to act on our behalf as Agent for obtaining a Right-of-Way Grant in LQD's name for certain public lands located in the Gas Hills District, Fremont County, Wyoming.

Sincerely,

Nancy Nuttbrock
Deputy Director, Wyoming Department of Environmental Quality
Administrator, Land Quality Division

cc.: John Erickson, Lander LQD
Muthu Kuchanur, Cheyenne LQD
Lidstone and Associates, Fort Collins, CO

Tables

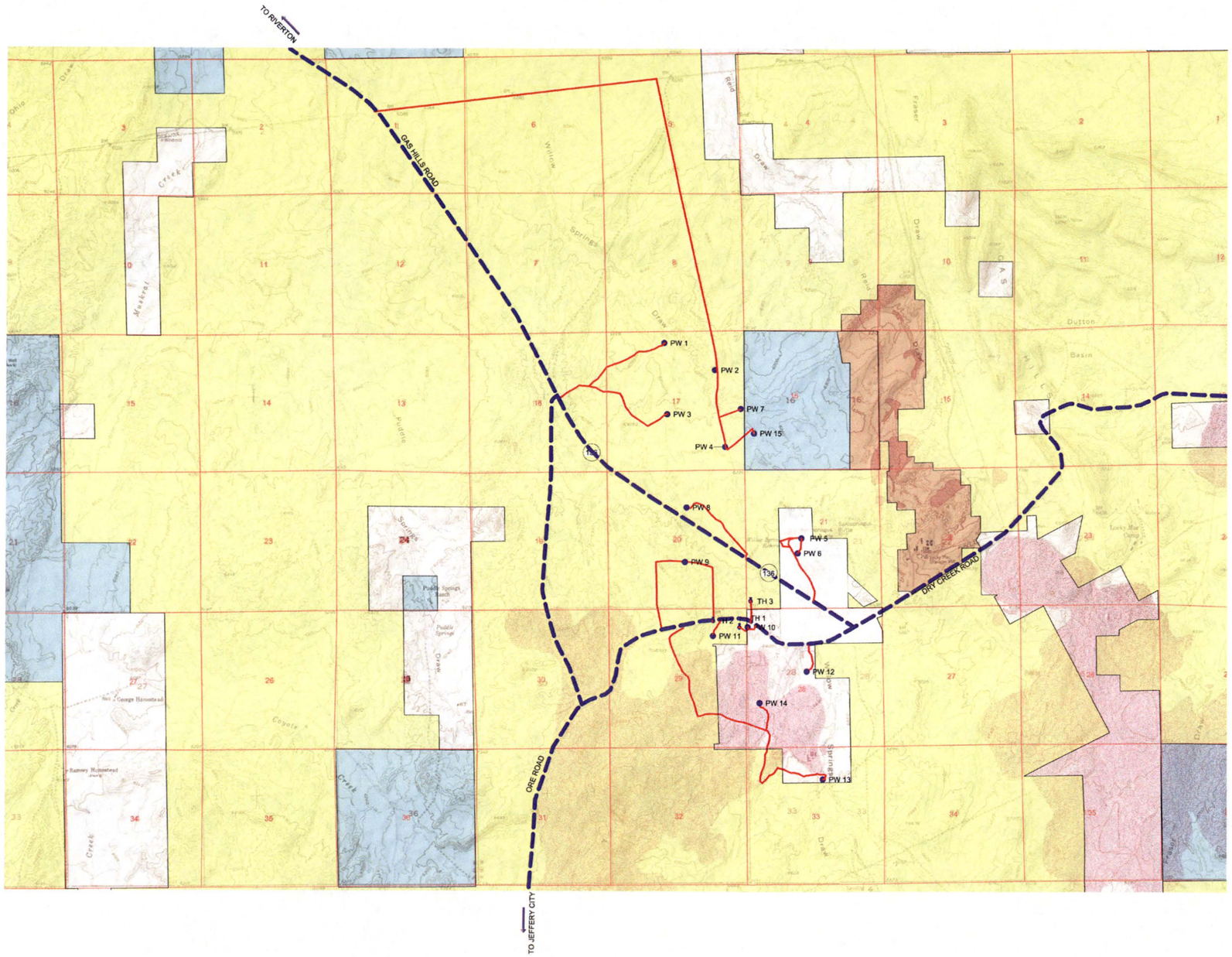
Table 1 Proposed Monitoring Well and Test Hole Locations

Well Name	Well Location (T/R/Sec.)	Surface Elevation (ft)	Anticipated Ground Water Elevation (ft)	Anticipated Depth to Water (ft)	Anticipated Well Depth (ft)	Formation Completed In	Drill Site Ownership
Monitoring Wells							
PW-1	T33N, R90W Sec. 17 NENW	6160	6140	20	40	Alluvium	BLM
PW-2	T33N, R90W Sec. 17 SENE	6270	6170	100	125	Cody Shale	BLM
PW-3	T33N, R90W Sec. 17 NESW	6220	6190	30	60	Cody Shale	BLM
PW-4	T33N, R90W Sec. 17 SESE	6230	6200	30	50	Alluvium	BLM
PW-5	T33N, R90W Sec. 21 NESW	6330	6280	50	100	Wind River	Private
PW-6	T33N, R90W Sec. 21 NESW	6330	6290	40	60	Alluvium	Private
PW-7	T33N, R90W Sec. 17 NESE	6230	6190	40	60	Alluvium	BLM
PW-8	T33N, R90W Sec. 20 SWNE	6265	6210	55	70	Alluvium	BLM
PW-9	T33N, R90W Sec. 20 NWSE	6350	6290	60	80	Wind River	BLM
PW-10	T33N, R90W Sec. 28 NWNW	6390	6346	50	150	Wind River	Private
PW-11	T33N, R90W Sec. 29 NENE	6376	6340	40	60	Fill/Alluvium	BLM
PW-12	T33N, R90W Sec. 28 SENW	6430	6385	45	60	Alluvium	Private
PW-13	T33N, R90W Sec. 33 NWNE	6510	6450	50	75	Alluvium	Private
PW-14	T33N, R90W Sec. 28 NWSW	6440	6390	50	80	Alluvium/Wind River	Private
PW-15	T33N, R90W Sec. 16 NESE	6240	6200	40	60	Alluvium	State
Test Holes							
TH-1	T33N, R90W Sec. 29 NENE	6385	6350	35	60	Wind River	BLM
TH-2	T33N, R90W Sec. 29 NWNE	6360	6340	20	60	Wind River	BLM
TH-3	T33N, R90W Sec. 21 SWSW	6340	6320	20	40	Alluvium	BLM

Table 2. Seed Mix for LQD/ANC Well Installation Project

Species[1]	Application Rate[2]
Western wheatgrass (Rosana)	4 lbs PLS/Acre
Slender wheatgrass (Pryor)	2 lbs PLS/Acre
Bluebunch wheatgrass (Secar)	4 lbs PLS/Acre
Indian ricegrass (Nezpar)	2 lbs PLS/Acre
Green needlegrass (Lodorm)	2 lbs PLS/Acre
Winterfat	1 lbs PLS/Acre
Wyoming big sagebrush	2 lbs PLS/Acre
American Vetch	½ lbs PLS/Acre
Rocky Mountain penstemon (Bandera)	0.3 lbs PLS/Acre
White prairie clover	¼ lbs PLS/Acre
Notes: [1] Forbs may be substituted depending on availability. [2] Assumes drill seeding; if broadcast seeding, double the application rates.	

Figures



LEGEND

- STATE OWNERSHIP
- PRIVATE OWNERSHIP
- U.S. DOE OWNERSHIP (DEPARTMENT OF ENERGY)
- U.S. BLM OWNERSHIP (U.S. BUREAU OF LAND MANAGEMENT)
- RECLAIMED MINE LANDS
- PW 9 PROPOSED MONITORING WELL
- TH 2 PROPOSED TEST HOLE
- ACCESS ROUTE
- MAIN ROADS

GENERAL NOTES

IMAGE FROM GOOGLE EARTH
MAY 2, 2014

N

SCALE IN FEET
0 1000' 2000' 4000'

Livestone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting

WYOMING DEQ
American Nuclear Corporation Tailings

PROJECT NUMBER: ACAD-STD	ENGINEER: DESIGN ENG.
DRAWN DATE: 2/12/15	CHECKED: CHECKED BY
	APPROVED: APPROVED BY

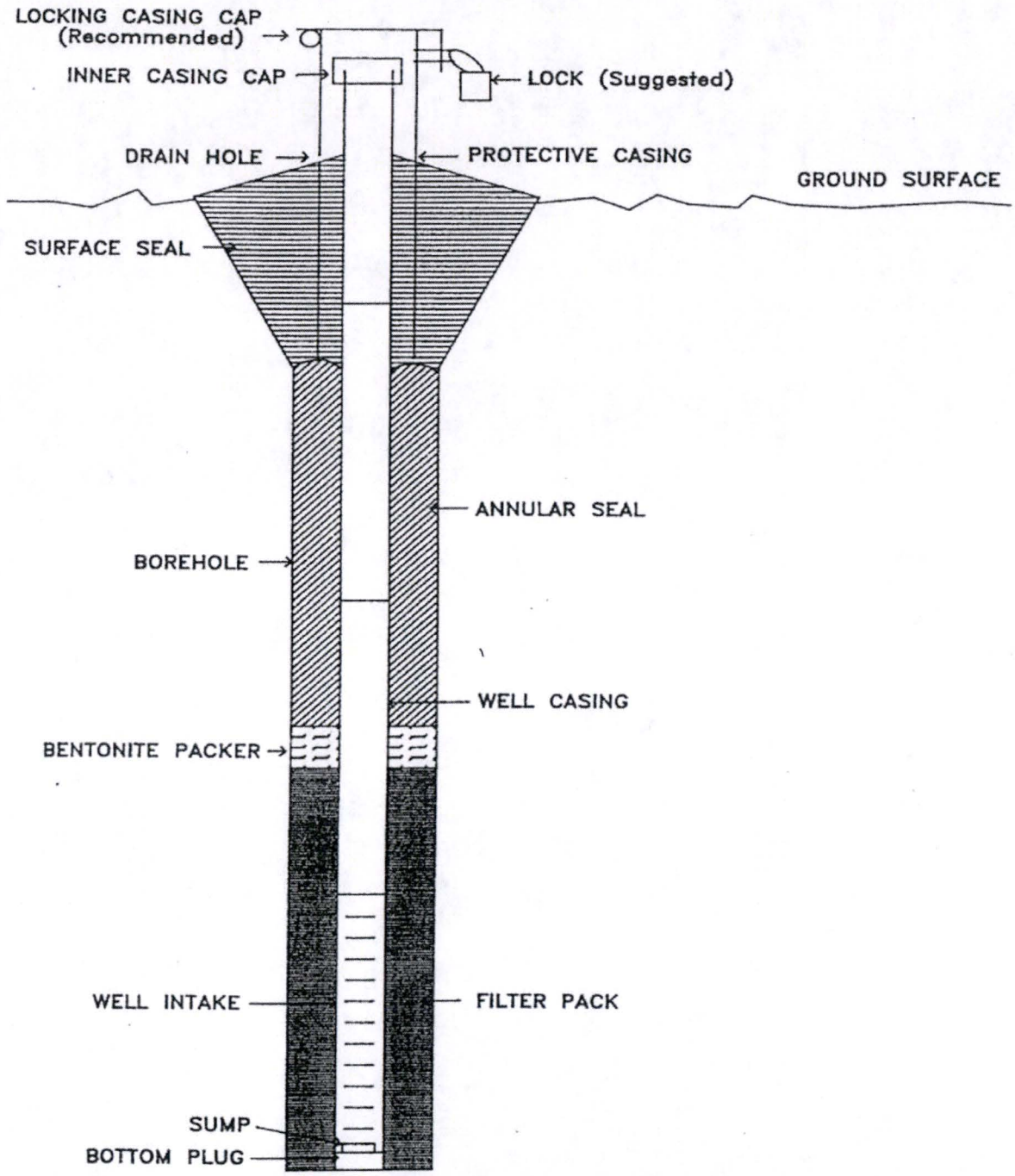
ACAD FILE: L:\WYDEQ104\ACAD\WYDEQ104 BASE WY83-WCF-REV.DWG

PROPOSED
MONITORING WELL/TEST HOLE
LOCATION MAP

REVISIONS:

FIGURE
1

Figure 2: Conceptual Design of a Ground Water Monitoring Well



Attachments

Attachment 1

ANC Uranium Mill Tailings Project

Environmental Report

Prepared for

Lidstone and Associates, Inc.
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

And

Wyoming Department of Environmental Quality –Land Quality Division
122 West 25th ST, Herschler Building
Cheyenne, WY 82002

And
Bureau of Land Management
Wyoming - Lander Field Office
1335 Main Street,
Lander, WY 82520

Prepared by

Real West
NATURAL RESOURCE CONSULTING

Amber Travsky
Real West Natural Resource Consulting
1116 Albin St.
Laramie, WY 82072

January 2015

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APPENDIX B: Photographs of the Proposed Well Sites

APPENDIX C: Photographs and Maps of Proposed Well Sites No. 5, 6 and 13

1.0 INTRODUCTION

Lindstone and Associates, Inc. (Lidstone) has been contracted by the Wyoming Department of Environmental Quality – Land Quality Division (WDEQ), to construct a series of groundwater monitoring wells to collect water samples. The purpose of the sampling is to further understand groundwater migration pathways associated with the ANC Uranium Mill Tailings Site in the Gas hills Uranium Mining District in eastern Fremont County.

The project site is approximately 45 miles east of Riverton and 70 miles west of Casper. The monitoring will occur in the vicinity of the Willow Springs Draw and is primarily on federal lands managed by the Bureau of Land Management (BLM). The proposed well sites are also on private lands and some road access is on land owned by the State of Wyoming. The proposed 14 well sites are located in T33N, R90W, Sections 16, 17, 20, 21, 28, 29, and 33.

Real West Natural Resource Consulting (Real West) was contracted to address environmental concerns that may be present at or in the vicinity of the proposed well sites. The purpose of this report is to document the environmental conditions at the proposed well site locations to aid in securing a right-of-way with the BLM for the monitoring wells.

2.0 PROJECT DESCRIPTION AND BACKGROUND

Uranium was mined at the ANC Uranium Mill Tailings Site between 1959 and 1981, first on behalf of the U.S. Atomic Energy Commission and, later, for the Tennessee Valley Authority. Of the 550 total acres within the licensed mining area, approximately 140 acres incudes the decommissioned mill site and two tailings ponds that are in varied stages of reclamation. Tailings Pond No. 1 encompasses approximately 40 acres and Tailings Pond No. 2 encompasses approximately 120 acres. Mining and milling activities were discontinued in 1981 and the mill was decommissioned in 1989. Mill components and material that could not be economically cleaned were buried in Tailings Pond No. 2.

Reclamation has continued through the Wyoming Department of Environmental Quality – Abandoned Mine Lands (WDEQ/AML) between 1996 and 2009. Those efforts included review and analysis of the down gradient monitoring well analytical data to determine extent and amount of down gradient impact on the alluvial aquifer. Lidstone is currently under contract with WDEQ/AML to complete the annual sampling of the ANC monitoring wells.

Construction of each new well site is anticipated to take between 1 and 3 days. Temporary disturbance during well construction will consist of a 50 ft. by 50 ft. (0.057 acres) area around each well site to accommodate a water well drill rig and one or two support vehicles. A permanent easement is being requested to provide a 25 ft. by 25 ft. (0.014 acres) area around each well site for the new right-of-way. The actual permanent disturbed area is expected to be approximately 2 ft. by 2 ft. or up to 3 ft. by 3 ft. around each 2-inch diameter well (including the wellhead protective cover).

The well sites will be accessed via existing improved roads as well as unimproved two-track roads. The well sites and access roads are shown in Figure A-1, Appendix A. In the absence of existing two-track roads, final access to the well locations will be overland, utilizing the same track in and out of the site. On these overland routes, it is anticipated that narrow two-track trails may be visible for the short term but will revert to a natural state once well monitoring ceases. No new roads will be constructed with this project.

Initially there will be one and possibly two sampling events, approximately one calendar quarter apart. Additional sampling events will depend upon the results of the initial sampling results and the requirements of the regulatory agencies. The existing wells are currently being sampled on an annual basis.

3.0 METHODS

Prior to conducting a site reconnaissance, Tim Vosburgh, BLM wildlife biologist, was contacted by Real West to obtain a map of previously recorded raptor nests. Additional information on wildlife species expected and previously reported in the area was obtained from the U.S. Fish and Wildlife Service Information, Planning, and Conservation System (IPaC) website (USFWS 2014).

Supplemental information on potential big game crucial range and sage-grouse core areas as well as sage-grouse connectivity areas on the site or in the vicinity were obtained through the Wyoming Interagency Spatial Database and Online Management (WISDOM) System (WISDOM 2014). This database also provided habitat type listings expected in the area and the potential for other wildlife, including mammals, amphibians, reptiles and avian species, to inhabit the area.

Amber Travsky, a biologist with Real West, conducted habitat evaluations and surveys on the project site on November 15 and 16, 2014. Each proposed well site was inspected along with the proposed access routes. In addition, the project area, which included a buffer zone within one mile of any well location, was searched for raptor nests. Habitats in the vicinity were also noted. The surveys were conducted both on foot and via 4-wheel drive vehicle.

4.0 RESULTS

4.1 Habitat and Site Description

The project area, which includes the 14 proposed well sites and a 1-mile buffer around the sites, covers approximately 8,600 acres in an elongated oval. The site is bisected, from north to south, by Willow Springs Draw, which is the dominant topographic feature in the project area. The draw forms an intermittent drainage that, in some segments, drops 5 to 10 feet from the adjacent bank into the drainage bottom. In other sections, the bank is less abrupt but, throughout its length on the project site, the drainage shows areas of erosion with some bank undercutting and sluffing into the drainage bottom. The drainage bottom ranges in width from approximately 10 to 40 feet. At the time of the November 2014 survey, the drainage lacked flowing water.

4.1.1 Mixed Grassland Prairie Habitat

The dominant vegetation across the project area is mixed grassland prairie. Dominant shrub species in this habitat are big sagebrush (*Artemisia tridentata*) and rabbitbrush (*Chrysothamnus vicidiflorus*, *C. nauseous*). Sagebrush heights are typically from 8 to 12 inches but the sagebrush is especially robust in some drainage bottoms where it reaches heights of 4 to 5 feet. Other shrubs that are less abundant throughout the project area, although often abundant in localized areas,

include greasewood (*Sarcobatus vermiculatis*), Gardner saltbush (*Atriplex gardneri*), and birdfoot sage (*Artemisia pedifidita*).

Grasses include western wheatgrass (*Pascopyrum smithii*), bluebunch wheatgrass (*Pseudoroegneria spicata*), prairie junegrass (*Koeleria macrantha*), sandberg bluegrass (*Poa secunda*), Indian ricegrass (*Oryzopsis hymenoides*), needleandthread (*Stipa comata*), green needlegrass (*Nassella viridula*), great basin wildrye (*Leymus cinereus*), blue grama (*Bouteloua gracilis*), smooth brome (*Bromus inermis*), and cheatgrass (*Bromus tectorum*). Forb species, which were not easily visible during the November survey, include phlox (*Phlox hoodii*), wild buckwheat (*Eriogonum brevicaule*), and goldenweed (*Haplopappus multicaulis*). Other forb species expected include beard-tongue (*Penstemon* spp.), wild onion (*Allium textile*), milkvetch (*Astragalus spp.*), bastard toadflax (*Comandra umbellata*), Indian paintbrush (*Castilleja linariifolia*), buttercup (*Ranunculus* spp.), and American vetch (*Vicia americana*). The only trees within this habitat type are a few scattered Russian olive trees (*Elaeagnus angustifolia*) along Willow Springs Draw.

Woodland areas that support limber pine (*Pinus flexilis*) and juniper (*Juniperus scopulorum*) are also in the vicinity. The nearest patch of woodland is 1.0 miles east of the project area.

4.1.2 Disturbed Habitat

Approximately 1,033 acres of the site has been previously disturbed, primarily through mining and also associated activities such as road construction and man-camp sites. Reclamation on the mine site consists primarily of grass species with various percentages of ground cover. The disturbed area lacks trees with the exception of a 12-acre former man-camp site that supports scattered cottonwood, Russian olive, and other ornamental trees that were planted when the site was used as a residential area.

4.1.3 Wetlands

Each of the proposed well sites was inspected for the presence of wetlands. Photographs of each of the sites are in Appendix B.

The National Wetland Inventory (NWI) map of the site (USFWS 2014a) shows scattered man-made reservoirs within the mined and reclaimed areas. Additional man-made reservoirs are scattered through the mixed prairie grassland and are primarily for livestock use. The largest of these, covering approximately 0.47 acres, is along the access road that leads to proposed well sites No. 1 and 3. The access road crosses at the dam of the reservoir, though, and will not impact any wetlands. The access road leading to proposed well No. 3 continues along a playa wetland. The wetland covers approximately 7.74 acres but will be avoided and not impacted by the proposed project.

One area of concern within the project area is with well sites No. 5 and 6. The NWI map of the site, as shown in Figure C-1 (Appendix C), indicates the drainage is a wetland classified as a palustrine emergent wetland that is seasonally flooded and created by a dike or impoundment (PEMCh). The infrared aerial photograph of the site is in Figure C-2 and photographs of the drainage are shown in Figure C-3.

While well No. 5 is in upland habitat, proposed well No. 6 is within the flood plain of the draw. The vegetation in the drainage bottom is dominated by big sagebrush reaching up to 4 to 5 feet in height. The understory includes smooth brome and scattered great basin wildrye. Smooth brome is classified as a facultative upland (FACU) plant, meaning it usually occurs in non-wetlands but, occasionally in wetlands (NRCS 2015). Great basin wildrye is classified as an upland species. Due to the lack of hydrophytic vegetation, no sampling was conducted to determine if the site had hydrophytic soil indicators.

The draw has a narrow sandy bottom that is void of vegetation. It is expected that water flows in the draw in the spring and following precipitation events but water apparently is not present in sufficient duration or quantity to support a wetland that would meet the criteria of supporting hydrophytic vegetation, hydrophytic soil indicators, and hydrology. The only impacts with the proposed well construction in the drainage bottom are the brief periods when vehicles are driven across the gully. These activities are expected to occur only 2 to 3 times during construction and then during well monitoring, likely at least two more times. No disturbance, aside from inadvertent tire tracks, will occur in the drainage bottom where water flows intermittently.

Proposed well No. 14 would be located adjacent to a broad arroyo. The NWI map of the area (Figure C-4) indicates there are no wetlands in the arroyo or in the vicinity of the proposed well. The infrared aerial of the site (Figure C-5), also shows a lack of wet areas in the vicinity. Photographs (Figure C-6) show the sandy arroyo bottom is mostly void of vegetation. The well will be constructed on the bank above the drainage with the only impacts to the arroyo due to the limited vehicle access which will occur only a few times during construction.

In summary, no impacts to wetlands are expected with the drilling of the proposed monitoring wells. Access to proposed wells 6 and 13 will require driving through two drainage bottoms where water flow is possible. Such actions will occur only a couple times during construction, though, and will not result in any impacts to wetlands or Waters of the U.S.

4.2 Threatened and Endangered Species

Two federally listed threatened, endangered or candidate species have the potential to occur in the area, based on the IPaC analysis (USFWS 2014). The two species, which include the greater sage-grouse (*Centrocercus urophasianus*) and the Ute ladies'-tresses plant (*Spiranthes diluvialis*), are discussed in more detail below.

4.2.1 Greater Sage-Grouse

The greater sage-grouse was listed as a candidate species in March 2010 and a determination of its status is expected in September 2015. Sage-grouse inhabit foothills, plains, and mountain slopes where sagebrush is present (American Ornithologists' Union 1983) or a mixture of sagebrush, meadows, and aspen is in close proximity. Suitable habitat is found in the mixed prairie grassland habitat where sagebrush density varies from 0 to approximately 10%.

The project area is outside any designated sage-grouse core area but there is an occupied lek within two miles of several of the proposed well sites. The Puddle Springs Lek is located south of the project area, as shown in Figure A-3, Appendix A. The typical stipulation for active leks is a restriction of no disturbance within two miles from March 15 through June 30. Six proposed wells are within the 2-mile buffer: 6, 10 11, 12, 13 and 14.

There is also a No Surface Occupancy or disturbance/disruptive activity stipulation from 6 p.m. to 8 a.m. within 0.25 mile of an occupied lek during the period from March 1 – May 15. Currently no proposed wells are within 0.25 mile of the occupied lek so this stipulation would not apply.

4.1.2 Ute Ladies'-tresses

The Ute ladies'-tresses plant is endemic to moist soils near springs, lakes, or perennial streams. The elevation range of known orchid occurrences is 4,200 to 7,000 feet. Most of the occurrences are in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows in the floodplains of perennial streams (USFWS 1995).

Suitable potential habitat is typically found along streams that experience heavy spring runoff of sufficient magnitude to create movement and reshaping of the stream channel. The orchid is generally intolerant of deep shade and strongly alkaline or clay soils and cannot compete with aggressive rhizomatous species such as reed canarygrass (*Phalaris arundinacea*) and cattails (*Typha latifolia*), or introduced species such as Canada thistle (*Cirsium arvense*).

Suitable habitat is lacking in the vicinity of the proposed well sites and access routes. Therefore, the proposed well construction will have no effect on this species.

4.3 Migratory Birds of Concern

The USFWS IPAC identified 21 migratory bird species potentially occurring in the project area that are identified as Natural Resources of Concern. The species and their preferred habitat are listed in Table 4-1. Also listed is the potential for the species to occur on the project area based on the presence of suitable habitat. Those species that could occur on the project area are discussed in more detail.

Table 4-1. Migratory Birds of Concern potentially within the project area.

Common Name	Scientific Name	Preferred Habitat[1]	Potential on Site
American bittern	*Botaurus lentiginosus*	Freshwater marshes with tall vegetation	Unlikely
Bald eagle	*Haliaeetus leucocephalus*	Near lakes, reservoirs, rivers, marshes and coasts.	Unlikely
Brewer's sparrow	*Spizella breweri*	Strongly associated with dense sagebrush.	Unlikely
Burrowing owl	*Athene cunicularia*	In active or active prairie dog burrow.	Unlikely
Cassin's finch	*Carpodacus cassinii*	Open coniferous forest.	Unlikely
Ferruginous hawk	*Buteo regalis*	Open country; nests in tall trees, on cliff ledges, river-cut banks, hillsides.	Possible
Fox sparrow	*Passerella liaca*	Dense thickets in coniferous or mixed woodlands; requires dense brushy cover during the nesting season.	Unlikely
Golden eagle	*Aquila chrysaetos*	Inhabits open and semi-open country; nests on rock ledges of cliffs or in larger trees.	Possible
Lewis's woodpecker	*Melanerpes lewis*	Open forest and woodland.	Unlikely
Loggerhead shrike	*Lanius ludovicianus*	Open country with scattered trees and shrubs.	Possible
Long-billed curlew	*Numenius americanus*	Breeds on prairies and grassy meadows near water.	Unlikely
McCown's longspur	*Calcarius mccownii*	Sparse short-grass plains, plowed and stubble fields, and areas of bare or nearly bare ground.	Possible
Mountain plover	*Charadrius montanus*	Nests in shortgrass prairie, commonly in prairie dog towns.	Possible
Olive-sided flycatcher	*Contopus cooperi*	Forest and woodland habitats.	Unlikely
Pinyon jay	*Gymnorhinus cyanocephalus*	Pinyon-juniper woodland, less frequently pine.	Unlikely
Sage thrasher	*Oreoscoptes montanus*	Sagebrush plains.	Possible
Short-eared owl	*Asio flammeus*	Generally nests on high ground or upland sites; forage and nests on open land with low vegetation.	Possible

Table 4-1 (Cont.). Migratory Birds of Concern potentially within the project area.

Common Name	Scientific Name	Preferred Habitat[1]	Potential on Site
Swainson's hawk	*Buteo swainsoni*	Nests in trees; forages on open terrain with scattered trees.	Possible
Williamson's sapsucker	*Sphyrapicus thyroideus*	Middle to high elevation coniferous forest.	Unlikely

[1]Habitat information obtained from:

NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer.

Dorn J.L and R.D. Dorn. 1990. Wyoming Birds. Mountain West Publishing, Cheyenne, WY. 139 pp.

4.3.1 Ferruginous Hawk

The ferruginous hawk prefers unbroken, semiarid grassland with elevated nesting sites such as trees, rock outcrops, hills and ridgelines (Johnsgard 1990). Ferruginous hawks are closely associated with areas that contain high densities of rodents and lagomorphs (Johnsgard 1990).

Suitable nesting habitat, in the form of trees or rock outcrops, is present but scarce on the project area. BLM records indicate ferruginous hawks have been observed nesting in the vicinity and potential active nests are shown in Figure A-2, Appendix A. The figure also shows a 1-mile buffer area with both ferruginous hawk and golden eagle nests.

Suitable habitat is present in the vicinity and there is the potential for this species in the area. No nests were observed during the 2014 surveys by Real West and no ferruginous hawks were observed on the project are or in the vicinity. However, there is the potential for these raptors to nest in the vicinity. Should an active raptor nest become established prior to the initiation of drilling activities, construction should be avoided within 1.0 mile of any active ferruginous hawk nest during the nesting season.

4.3.2 Golden Eagle

Golden eagles typically nest on the rock ledges of cliffs but they also nest occasionally in large trees (NatureServe 2014). Suitable nesting habitat is found in the project area, although it is limited primarily to rock outcrops. The only trees in the area are located in the abandoned man-camp on the old mine site and a few scattered small Russian olive trees. There is the potential for this species to nest in the area although no golden eagles or nests were observed during the 2014 surveys by Real West. Should an active raptor nest become established prior to the initiation of mining activities, construction should be avoided within 1.0 mile of any active golden eagle nest during the nesting season.

4.3.3 Loggerhead Shrike

This species prefers relatively open country with scattered trees and shrubs, savanna, desert scrub (southwestern U.S.), and, occasionally, open woodland; it often perches on poles, wires or fenceposts (AOU 1983). Suitable hunting perches are an important part of the habitat (Yosef and Grubb 1994). Loggerhead shrikes nest in shrubs or small trees (deciduous or coniferous) and, in northern latitudes, nest sites include spruce and fir trees (Bent 1950, Brooks 1988). Suitable habitat is present on the project area and in the vicinity; therefore, it is possible that this species inhabits the area. An individual bird or nest could be disturbed by construction; however, due to the minimal disturbance proposed with construction of the 14 wells, it is unlikely this species would be affected.

4.3.4 McCown's Longspur

This small songbird inhabits sparse short-grass plains, plowed and stubble fields, and areas of bare or nearly bare ground (American Ornithologists' Union 1983). It uses grasslands with little litter and low vegetation cover, such as that provided by shortgrass or heavily grazed mixed-grass prairie. Suitable habitat is present on the project area although no McCown's longspurs were observed during the 2014 survey by Real West. This was a late survey, though, and potentially was after the migration period for this species. Suitable habitat is present and, therefore, this

species could occur in the project area. Due to the limited amount of disturbance with the proposed well construction, it is unlikely any McCown's longspurs would be affected.

4.3.5 Mountain Plover

The mountain plover was proposed for listing as a threatened species in 1999. On May 11, 2011 the USFWS determined that the mountain plover is not threatened or endangered throughout all or a significant portion of its range. While it is not protected under the Endangered Species Act, it is a migratory bird and, as a result, remains protected under the Migratory Bird Treaty Act. It is also considered a Sensitive Species in the State of Wyoming.

This ground nesting species is typically found in areas of short (less than four inches) vegetation on slopes of less than five percent. Any short grass, very short shrub, or cushion plant community could be considered plover nesting habitat (Parrish et al. 1993), however, mountain plovers prefer shortgrass prairie with open, level or slightly rolling areas dominated by blue grama (*Bouteloua gracilis*) and buffalograss (*Buchloe dactyloides*) (Dinsmore 1981, Kantrud and Kologiski 1982).

Suitable habitat is present in the vicinity of the well sites but is limited primarily to the reclaimed habitat in areas where vegetation is sparse. No wells are proposed within the reclaimed habitat with the exception of Well No. 14, which is close to reclaimed areas. Due to the small size of the disturbance, though, no impacts to this species are expected.

4.3.6 Sage Thrasher

This medium-sized songbird breeds in sagebrush plains, primarily in arid or semi-arid situations and is rarely found around towns (AOU 1998). It is most abundant when sagebrush density is at least 11%. It usually nests in shrubs but occasionally on the ground. Suitable habitat is present, although much of the sagebrush lacks the density to provide optimal habitat. It is possible for this species to occur in the area, though. It could be disturbed by construction however, due to the minimal disturbance proposed with construction of the 14 wells, it is unlikely this species would be affected.

4.3.7 Short-Eared Owl

The short-eared owl ranges over mid and tall grasses and marshes, often hunting during daylight (Sibley 2000). Small rodents, especially voles *(Microtis spp.),* compose a preponderance of its diet, and there have been strong shifts between years in the density and location of breeding owls, depending on fluctuating food resources (Wiggins 2004). Suitable habitat is present on the project area and in the vicinity; therefore, it is possible this species inhabits the site. Should an active nest become established prior to the initiation of drilling activities, construction should be avoided within 0.75 mile of any active short-eared owl nest during the nesting season.

4.3.8 Swainson's Hawk

Swainson's hawks inhabit open country such as grassland, shrubland, and agriculture areas (NatureServe 2014). They also are found within urban areas. These raptors nest in trees, usually those bordering agricultural fields, in wetland borders, and on abandoned farms.

On the project area, nesting substrate is limited to the abandoned man-camp on the old mine site and a few scattered small Russian olive trees. No Swainson's hawks or nests were observed during the 2014 surveys by Real West and it is unlikely these hawks nest in the vicinity. Should an active nest become established prior to the initiation of mining activities, construction should be avoided within 0.75 mile of any active nest during the nesting season.

4.4 Big Game

Two big game species occur in the project area: pronghorn antelope (*Antilocapra americana*) and mule deer (*Odocoileus hemionus)*. Both species were observed on the project area during the 2014 survey by Real West.

Crucial pronghorn range is found on the northern half of the project area, as shown in Figures A-4 and A-5, Appendix A. Proposed wells within this area include 1, 2, 3, 4, 5, 6, and 8. The typical BLM stipulation for big game crucial range is to avoid construction between November 15 and April 30.

4.5 Raptors

The only raptor observed during the November 2014 survey by Real West was a great horned owl (*Bubo virginianus*). It was roosting in a tree within the former man-camp site adjacent to the previously mined area. A search of the trees on the site indicated no nests were present.

No raptor nests were located on the project area during the 2014 surveys by Real West. However, several nests have been reported previously in BLM records. Active raptor nests and the buffer areas are shown in Figure A-2, Appendix A. All of the wells sites are outside these buffer areas. To ensure no previously undocumented nests are present, an additional survey will be conducted by Real West between April 15 and June 1, 2015. If any active nests are found, the BLM will be notified and no construction will occur within 1.0 mile of an active ferruginous hawk or golden eagle nest and 0.75 mile from all other raptor species.

5.0 MITIGATION

Potential impacts and mitigation measures for wildlife on the project site are listed in Table 5-1. The proposed drilling will result in "no effect" to threatened or endangered wildlife species since none are expected in the area. The site is outside any sage-grouse core area but six well sites are within 2 miles of an occupied lek. BLM stipulations require no construction activities from March 15 and June 30 within 2 miles of an occupied lek.

Crucial big game range is present on the northern half of the project area. BLM stipulations require no construction between November 15 and April 30.

While no raptor nests were found within 1.0 mile of any proposed well site and BLM records have not identified any documented nest site within this distance, a second raptor nest survey will be conducted between April 15 and June 1, 2015 to verify that no nests are present. If an active nest is found that is within 1.0 mile of a proposed well site, the BLM will be notified and no construction will occur within 1.0 mile of a golden eagle or ferruginous hawk nest and 0.75 mile of all other species while the nest is active.

Table 5-1. Summary of Environmental Consequences and Mitigation Measures for Construction of the Proposed Monitoring Well Sites.

Resource/Impact	Mitigation
Threatened and Endangered Species: No federally listed species are expected on the site.	No mitigation needed.
Greater Sage-grouse (candidate species): An occupied lek is south of the project area.	No construction activities from March 15 and June 30 within 2 miles of an occupied lek.
Migratory Birds of Concern Habitat is present for several avian species considered migratory birds of concern.	No mitigation needed due to the limited size of the well sites; there is minimal disturbance to native vegetation.
Big Game Crucial pronghorn range is present.	No construction between November 15 and April 30 at well sites within the crucial range.
Raptors No raptor nests found.	A raptor nest survey will be conducted between April 15 and June 1, 2015 to verify that no nests are present within one mile of any proposed well site. If an active nest is found that is within 1.0 mile of a proposed well site, the BLM will be notified and no construction will occur within 1.0 mile of a golden eagle or ferruginous hawk nest and 0.75 mile of all other species while the nest is active.

A summary of stipulations associated with each of the proposed well sites is shown in Table 5.2. The possible drilling dates are also listed for each site. This assumes no raptor nests are located during the spring 2015 survey.

No impacts to wetlands are expected with the drilling of the proposed monitoring wells. Access to proposed wells 6 and 13 will require driving through two drainage bottoms where water flow is possible. Such actions will occur only a couple times during construction, though, and will not result in any impacts to wetlands or Waters of the U.S.

Table 5-2. Summary of possible stipulations on each of the proposed well sites.

Well Number and Land Ownership	Big Game Stipulation (Nov. 15 – Apr. 30)	Sage-grouse Stipulation (March 15 – June 30)	Drilling Dates
1 (BLM)	X		May 1 – Nov. 14
2 (BLM)	X		May 1 – Nov. 14
3 (BLM)	X		May 1 – Nov. 14
4 (BLM)	X		May 1 – Nov. 14
5 (Private)	X		May 1 – Nov. 14
6 (Private)	X	X	July 1 – Nov. 14
7 (BLM)			No stipulations
8 (BLM)	X		May 1 – Nov. 14
9 (BLM)			No stipulations
10 (BLM)		X	July 1 – March 14
11 (BLM)		X	July 1 – March 14
12 (Private)		X	July 1 – March 14
13 (Private)		X	July 1 – March 14
14 (Private)		X	July 1 – March 14

6.0 LITERATURE CITED

American Ornithologists' Union (AOU), Committee on Classification and Nomenclature. 1983. Check-list of North American Birds. Sixth Edition. American Ornithologists' Union, Allen Press, Inc., Lawrence, Kansas.

Bent, A.C., et al. 1968. Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows, and allies. Part Two. U.S. National Museum Bulletin 237. (reprinted by Dover Publications, Inc., New York, NY).

Brooks, B. L. 1988. The breeding distribution, population dynamics, and habitat availability of an upper Midwest loggerhead shrike population. Master's thesis, Univ. Wisconsin, Madison.

Dinsmore, J.J. 1981. Mountain plovers, a synthesis of the literature and an annotated bibliography. 24pp.

Dorn, J. and R Dorn. 1990. Wyoming Birds. Mountain West Publishing, Cheyenne, Wyoming. 138 pp.

Johnsgard, P. A. 1990. Hawks, eagles and falcons of North America. Smithsonian Institute Press, Washington D.C. 403 p.

Kantrud, H.A. and R. Kologiski. 1982. Effects of soils and grazing on breading birds of uncultivated upland grasslands of the northern Great Plains. Wildl. Res. Report 14. 9pp.

Natural Resource Conservation Service. 2015. The PLANTS Database (http://plants.usda.gov, 22 January 2015). National Plant Data Team, Greensboro, NC 27401-4901 USA.

NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. http://www.natureserve.org/explorer.

Parrish, T.L., S.H. Anderson, and W.F. Oelklaus. 1993. Mountain plover habitat selection in the Powder River Basin, Wyoming. Prairie Naturalist 25(3):219-226.

Sibley, D. A. 2000. The Sibley guide to birds. National Audubon Society. Alfred A. Knopf, New York, N.Y. 545pp.

U.S. Fish and Wildlife Service. 2014. Information, Planning and Conservation System listing of Threatened and Endangered Species potentially occurring in the project area. Website: http://www.fws.gov/.

U. S. Fish and Wildlife Service. 2014a. National Wetland Inventory Map. Via Wetland Mapper at: http://www.fws.gov/nwi/

U.S. Fish and Wildlife Service. 1995. Recommendations and Guidelines for Ute Ladies' Tresses Orchid (*Spiranthes diluvialis*) Recovery and Fulfilling Section 7 Consultation Responsibilities. Memo dated June 1, 1995.

Wiggins, D. A. 2004. Short-eared owl *(Asio flammeus)*: a technical conservation assessment. (Online). USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/shortearedowl.pdf

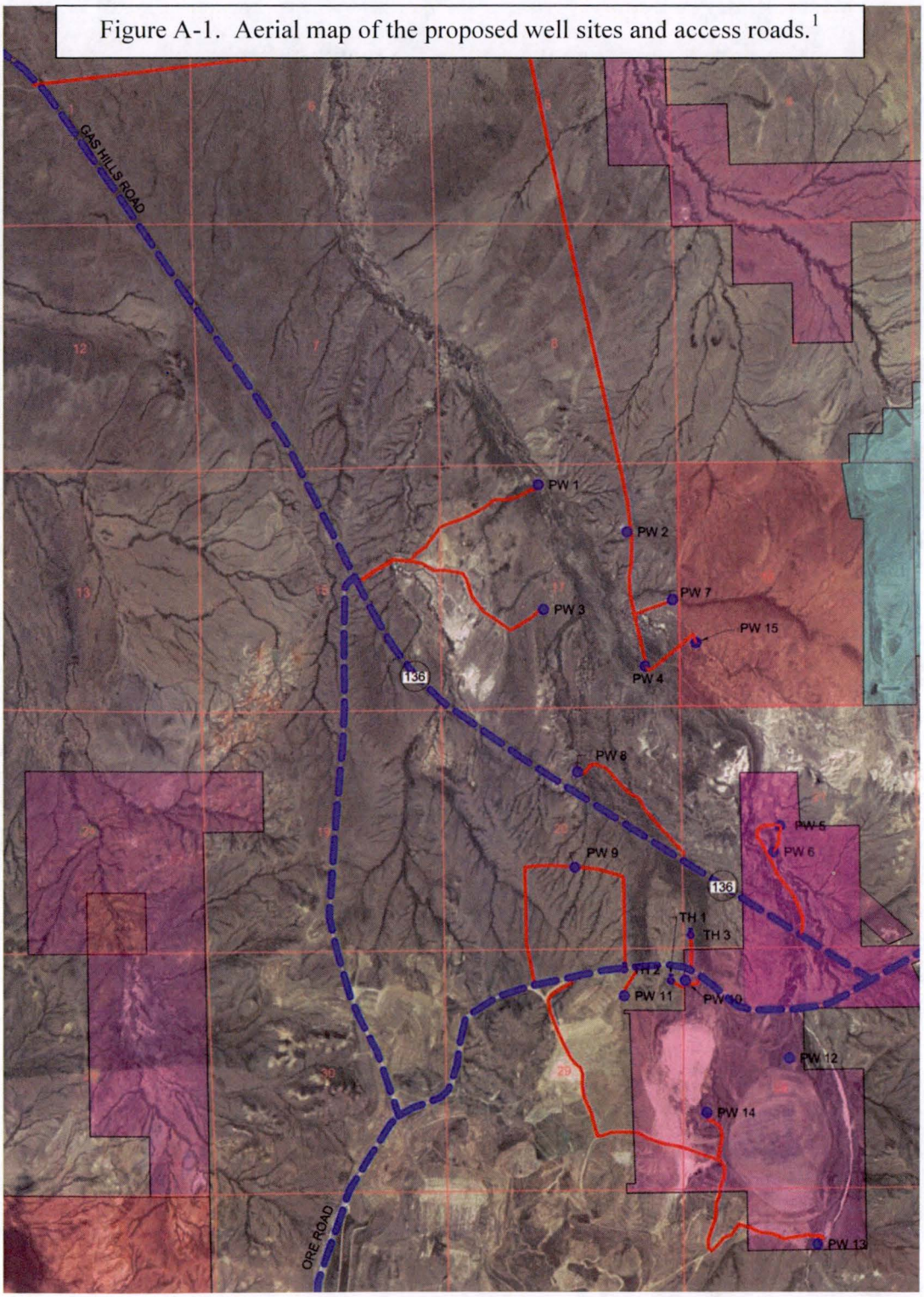
Wyoming Interagency Spatial Database and Online Management System (WISDOM). 2014. Report from database search conducted on October 30, 2014 and again on Jan. 15, 2015.

Yosef, R., and T. C. Grubb, Jr. 1992. Territory size influences nutritional condition in nonbreeding loggerhead shrikes (LANIUS LUDOVICIANUS): a ptilochronology approach. Conservation Biology 6:447-449.

APPENDIX A

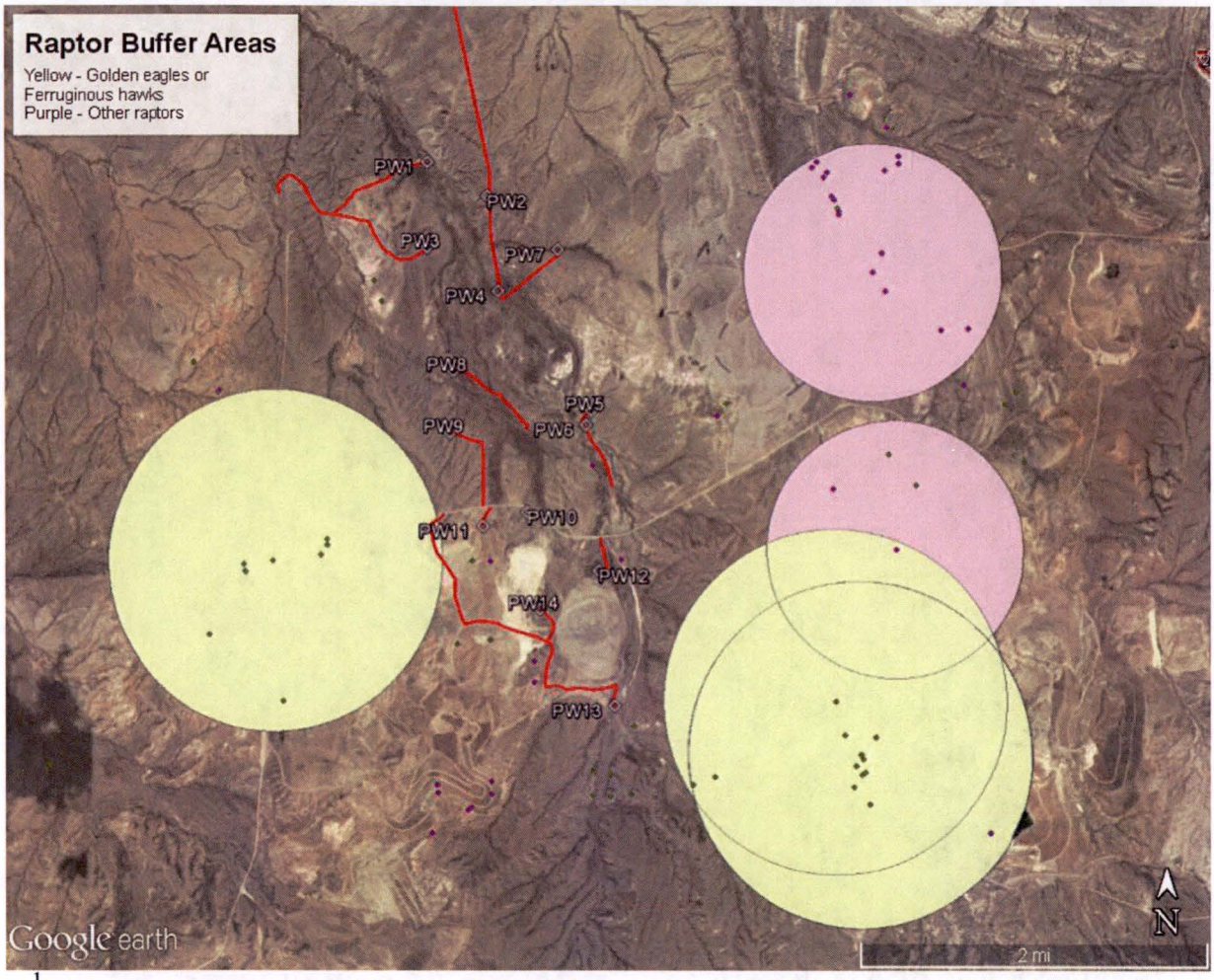
Maps and Aerial Photographs of the Project Area

Figure A-1. Aerial map of the proposed well sites and access roads.[1]



[1]Figure provided by Lidstone and Associates (1/18/2015). Land ownership is designated with private (purple), State of Wyoming (maroon), and Department of Energy (teal); the remainder is federal land managed by the Bureau of Land Management.

Figure A-2. Aerial photograph of the raptor buffer areas.[1]



[1] *Data provided by the Bureau of Land Management (via kmz file from Sarah Wempen on Jan. 6, 2015)*

Figure A-3. Sage-grouse lek buffer area.

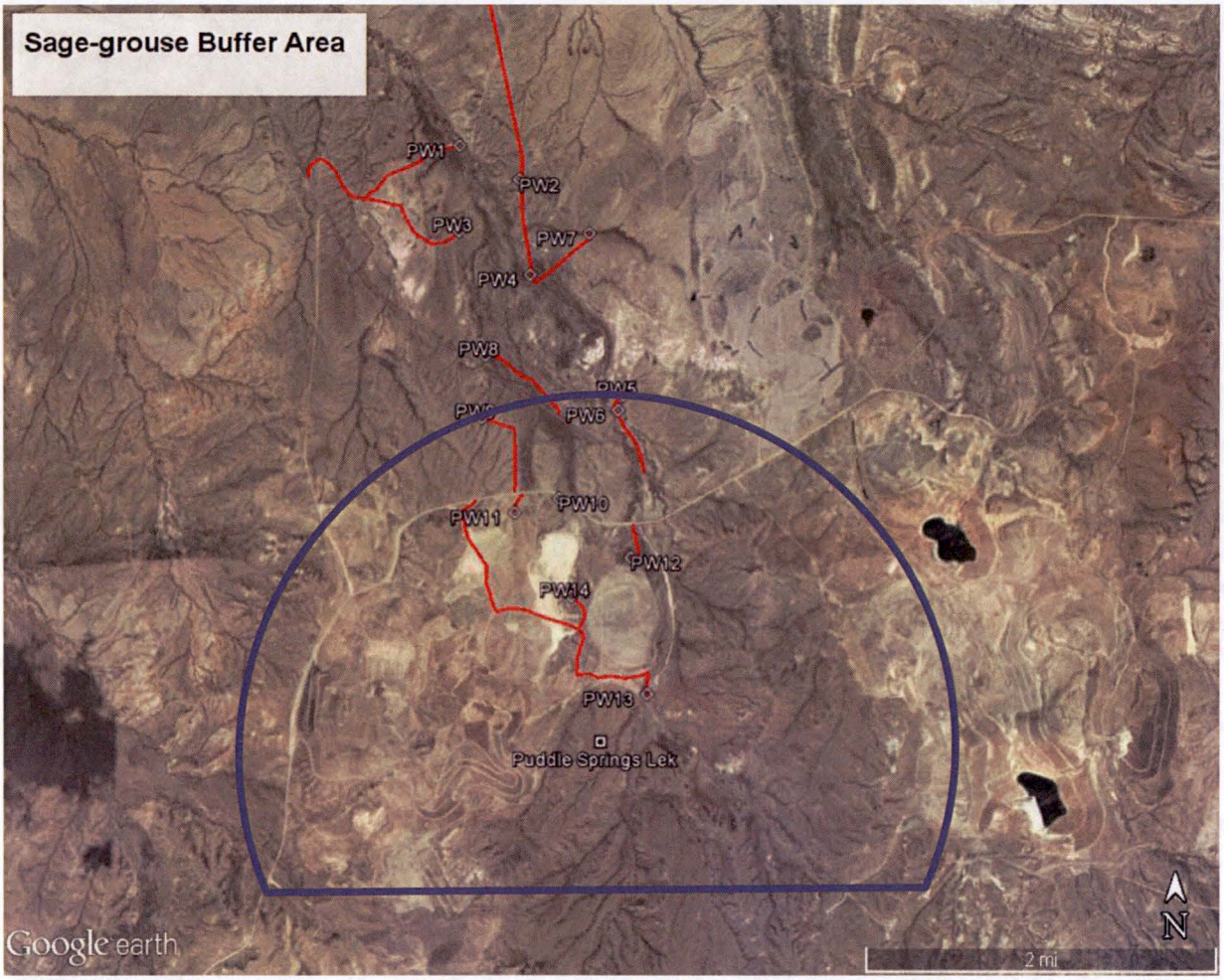
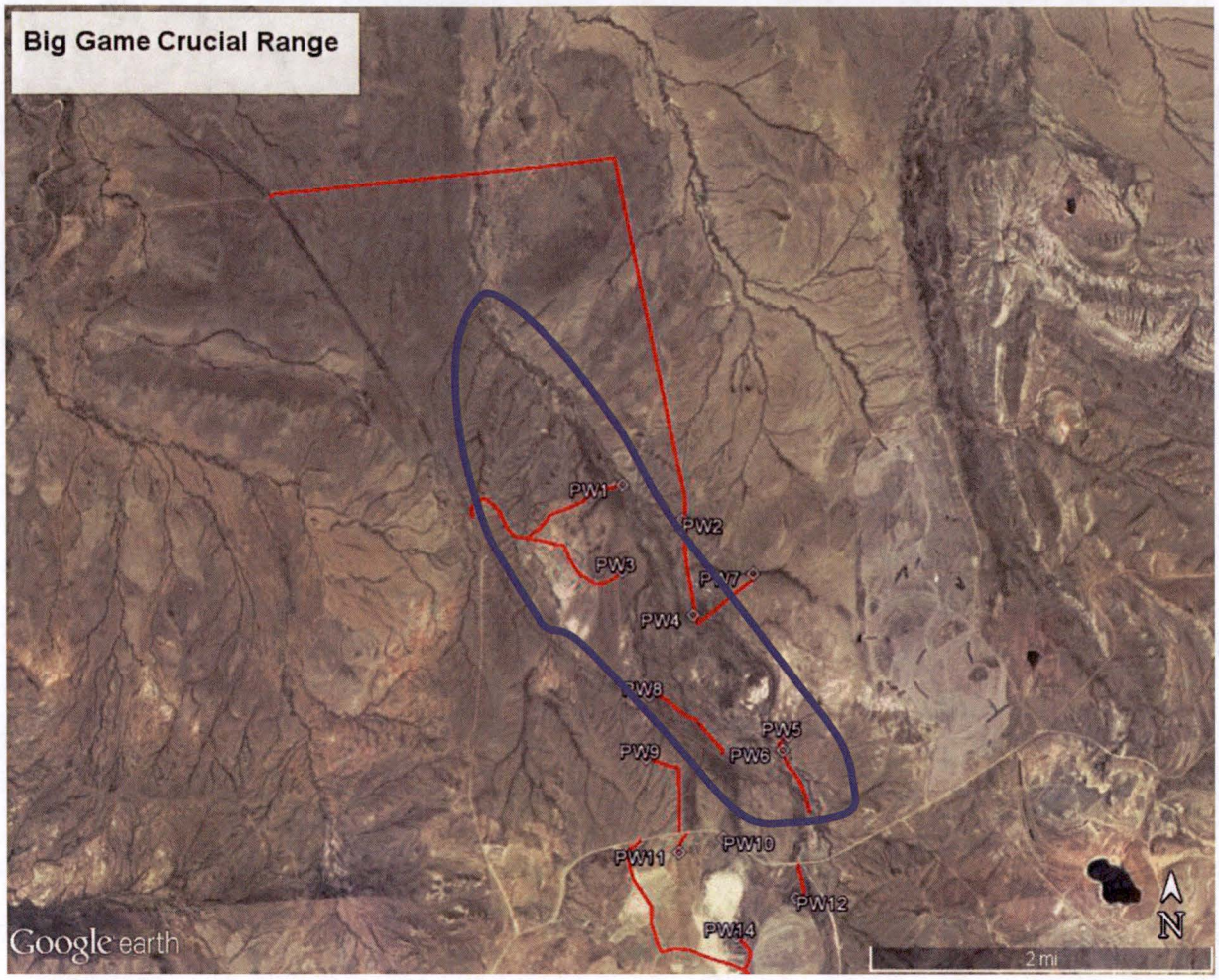
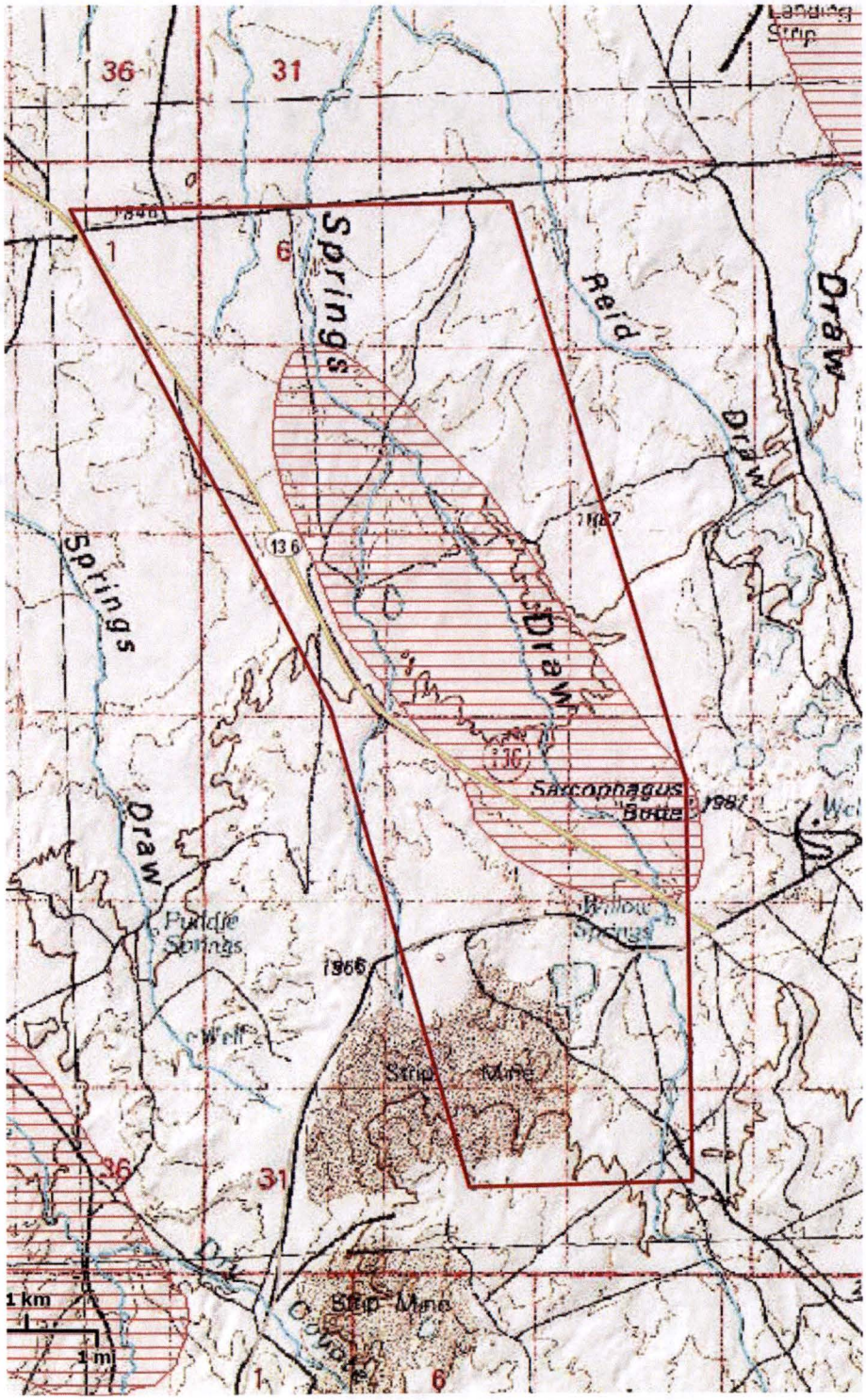


Figure A-4. Big Game Crucial Range.[1]



[1]Area indicated is an approximation based on the Wyoming Game and Fish Department data (WISDOM 2014) and shown in the topographic map in Figure A-5.

Figure A-5. Topographic map of the big game crucial range (WISDOM 2014).



ADDENDUM B

Photographs of the proposed well sites

Proposed Well #1

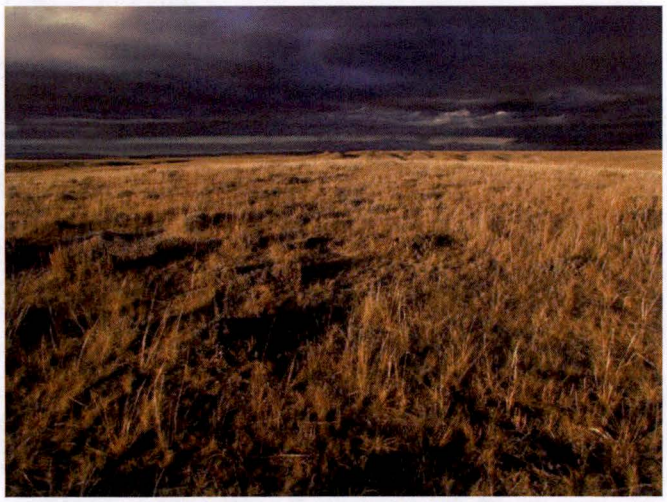
This site is an upland site dominated by black greasewood with an understory of western wheatgrass and cheatgrass.

Proposed Well #2

This site is upland mixed grass prairie habitat. The site supports less than 10% big sagebrush with grass species including needle-and-thread grass and western wheatgrass.

Proposed Well #3

This site is mixed grass prairie with big sagebrush, needle-and-thread grass, blue grama and western wheatgrass.



Proposed Well #4

This site supports dense big sagebrush and black greasewood with an understory of western wheatgrass. There is evidence of some recent surface water due to the presence of cattle hoof marks and soil surface churning.

Proposed Well #5

This site is upland mixed grass prairie habitat with birdfoot sagebrush and big sagebrush with western wheatgrass.

Proposed Well #6

This site is upland mixed grass prairie habitat with birdfoot sagebrush, big sagebrush, saltbush, greasewood, sandberg bluegrass and western wheatgrass. NOTE: after the field work the location of this site was adjusted to be within the flood plain of the adjacent Willow Springs Draw.

Proposed Well #7

This site is a narrow grassy swale with the proposed well site at the head of the swale. Evidence of some pooling of water seasonally is located downhill of the site. Vegetation on the well site includes green rabbitbrush, big sagebrush, western wheatgrass, green needlegrass, and cheatgrass.

Proposed Well #8

This site is adjacent to a small stock pond that was dried up and void of vegetation at the time of the site survey. Vegetation next to the pond is upland mixed grass prairie with big sagebrush, western wheatgrass, and cheatgrass.

Proposed Well #9

This site supports mixed grass prairie habitat with big sagebrush, rabbitbrush, western wheatgrass and needle-and-thread grass.

Proposed Well #10

This site is upland mixed grass prairie habitat with big sagebrush, rabbitbrush and western wheatgrass.

Proposed Well #11

This site is upland mixed grass prairie habitat adjacent to reclaimed grassland. Vegetation includes big sagebrush, rabbitbrush and western wheatgrass.

Proposed Well #12

This site supports dense rabbitbrush with sagebrush and an understory of western wheatgrass.

Proposed Well #13

This site is adjacent to a dry arroyo that drops quickly about 6 feet to the drainage bottom. The arroyo is bound by steep cutbanks and the drainage bottom is mostly void of vegetation except for the edges which support big sagebrush, rabbitbrush, western wheatgrass and cheatgrass. The bank above supports big sagebrush, rabbitbrush, prairie junegrass, Indian ricegrass and western wheatgrass.

Proposed Well #14

This site supports upland mixed grass prairie with big sagebrush and rabbitbrush. The understory includes green needlegrass, sandberg bluegrass and western wheatgrass.

APPENDIX C

Additional Wetland Information and Photographs for Proposed Wells No. 5, 6 and 13

Figure C-1. National Wetland Inventory Map of the proposed Well No. 5 and No. 6.

Figure C-2. Infrared aerial photograph of the proposed wells sites No. 5 and 6.

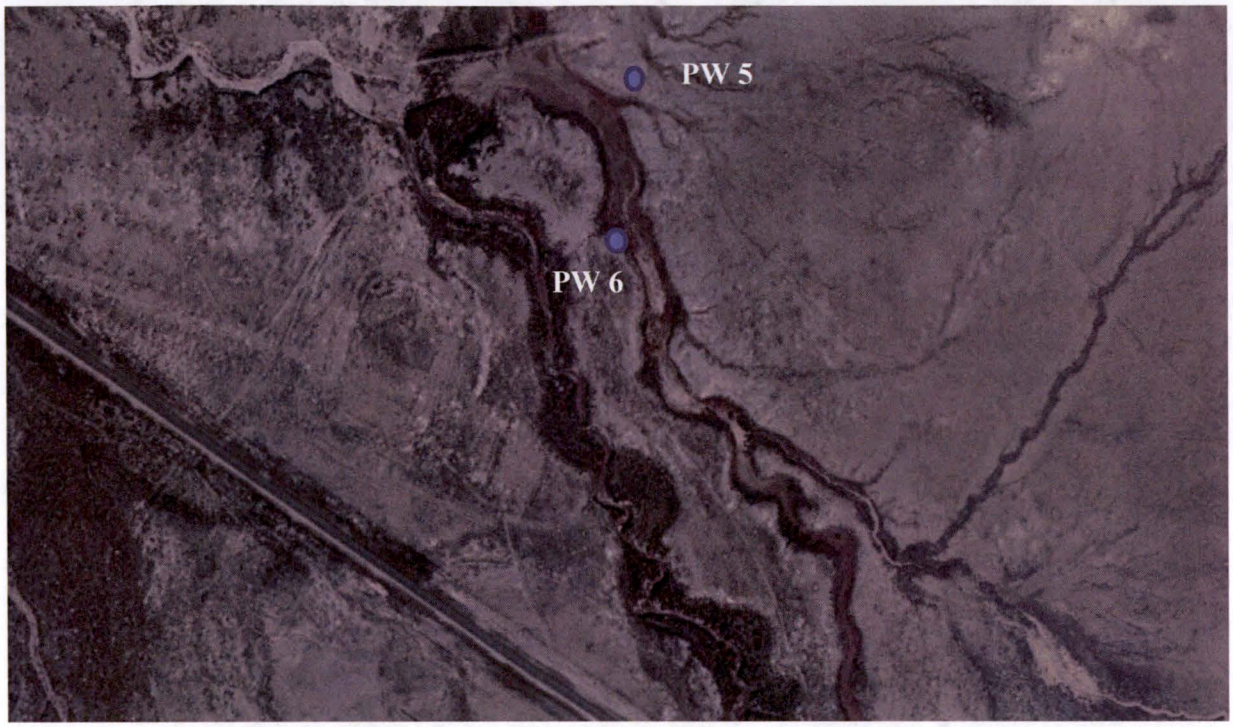


Figure C-3. Photographs of the drainage between proposed well sites No. 5 and No. 6.

Figure C-4. National Wetland Inventory Map of the proposed Well No. 13.

Figure C-5. Infrared aerial photograph of the proposed well No. 13.

Figure C-6. Photographs of the arroyo and vegetation adjacent to well site 13.

Attachment 2

June 12, 2014

Ms. Nancy Nuttbrock, LQD Administrator
Wyoming Department of Environmental Quality
122 West 25th St.
3rd Floor West
Herschler Building
Cheyenne, WY 82002

SUBJECT: PERMANENT MODIFICATION OF PROVISIONS IN CONFIRMATORY ORDER, DOCKET NO. 40-4492- AMERICAN NUCLEAR CORPORATION GAS HILLS SITE

Dear Ms. Nuttbrock:

On May 9, 1994, the American Nuclear Corporation (ANC) announced that it intended to discontinue operations at its Gas Hills Site and go out of business. The company forfeited its $3.2 million reclamation bond to Wyoming Department of Environmental Quality (WDEQ) during October 1994, and WDEQ subsequently undertook reclamation activities at the site using these funds. The site encompasses about 550 acres of land, and consists of two former tailings impoundments.

In 1996, the WDEQ accepted and agreed to the terms of Confirmatory Order (Order) issued by the U.S. Nuclear Regulatory Commission (NRC) for the reclamation of the ANC Gas Hills site. The Order was signed by the NRC and WDEQ in October 1996 (Agencywide Document Access Management System (ADAMS) Accession No. ML071520354). In response to a request by WDEQ, the Order was subsequently modified by letter dated August 11, 2009 (ADAMS Accession No. ML091330303). By letter dated May 29, 2012, the NRC proposed additional modifications to the Order that would result in the temporary suspension of the majority of the Parts until financial issues affecting WDEQ's remediation could be resolved (ADAMS Accession No. ML120670346). WDEQ agreed to these additional modifications by letter dated July 30, 2012 (ADAMS Accession No. ML14122A199).

Since the Order was last modified, WDEQ and the NRC have maintained a dialog on the financial and technical issues related to the reclamation of the ANC Gas Hills site. As a result of these on-going discussions, the NRC and WDEQ have agreed to suspend parts of the Order. NRC and WDEQ recognize that, contrary to WDEQ's initial projections, there are insufficient funds remaining to finish reclamation of the site. The Order requirements currently in effect include implementation of the groundwater corrective action program, sampling of wells and springs, measuring settlement monuments on Pond #1, and providing an annual report to NRC. NRC and WDEQ agree that Pond #1 has reached 90 percent settlement and that the groundwater corrective action program should be discontinued. NRC and WDEQ have decided that the best use of the remaining reclamation funds would be the installation of new monitoring wells and surface water sampling stations to determine the extent of the groundwater plume flowing off-site and, if feasible, to purchase land to extend the site boundary beyond the plume.

The specific parts of the Order to be suspended are Parts I, II, and III, and Paragraphs 1 – 10, 12, and 14 – 16 of Part IV. Elimination of Paragraph 16 of Part IV means that WDEQ will not have to pay for the long-term surveillance and control fund when the site is transferred to the U.S. Department of Energy. Part IV, paragraph 11, will be modified to read as follows:

> Using the funds remaining from the forfeited reclamation bond, install new wells and surface water sampling stations at locations agreed upon by WDEQ and NRC. WDEQ shall sample all existing wells and surface water stations, plus any new wells and surface water stations, on an annual frequency for the analytes found in the WDEQ Annual Report for CY 2013 for the ANC Gas Hills Reclamation Project submitted to the NRC by letter dated February 13, 2014 (ADAMS Accession No. ML14071A343), namely: MAJOR IONS--Carbonate as C03, Bicarbonate as HCO3, Calcium, Chloride, Fluoride, Magnesium, Nitrogen, Ammonia as N, Nitrogen, Nitrate+Nitrite as N, Potassium, Silica, Sodium, Sulfate; PHYSICAL PROPERTIES--Conductivity @ 25 C, pH, Total Dissolved Solids, TDS @ 180 C; METALS – DISSOLVED—Aluminum, Arsenic, Barium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Uranium, Vanadium, Zinc; METALS – TOTAL—Iron, and Manganese. The corrective action program will be discontinued.

In order to effectuate these modifications to the Order, WDEQ should review and document its acceptance of these changes to the Order in writing within 60 days. If WDEQ is not in agreement with the proposed changes, please contact the NRC immediately.

If you have any questions, please contact Tom McLaughlin, the Project Manager for the site, at Thomas.McLaughlin@nrc.gov or (301) 415-5869.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedures," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of ADAMS. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

/RA/

Larry Camper, Director
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No: 04004492

cc: Tanya King, WDEQ

The specific parts of the Order to be suspended are Parts I, II, and III, and Paragraphs 1 – 10, 12, and 14 – 16 of Part IV. Elimination of Paragraph 16 of Part IV means that WDEQ will not have to pay for the long-term surveillance and control fund when the site is transferred to the U.S. Department of Energy. Part IV, paragraph 11, will be modified to read as follows:

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In order to effectuate these modifications to the Order, WDEQ should review and document its acceptance of these changes to the Order in writing within 60 days. If WDEQ is not in agreement with the proposed changes, please contact the NRC immediately.
If you have any questions, please contact Tom McLaughlin, the Project Manager for the site, at Thomas.McLaughlin@nrc.gov or (301) 415-5869.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedures," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of ADAMS. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

/RA/

Larry Camper, Director
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: .04004492
cc: Tanya King, WDEQ
DISTRIBUTION:
RIV LGersey/RIV REvans/RIV

ML14106A328

OFFICE	MDB/PM	MDB/LA	OGC	MDB/BC	DURLD/DD	DWMEP/D
NAME	TMcLaughlin	CHolston	BJones	MNorato	APersinko	LCamper
DATE	4/16/14	4/1714	5/15/14	5/27/14	5/27/14	6/12/14

OFFICIAL RECORD COPY

Appendix B

State of Wyoming Access Agreement

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting

WYOMING OFFICE OF STATE LANDS AND INVESTMENTS

122 West 25th Street
Cheyenne, WY 82002
Phone: 307.777.7331
Fax: 307.777.3524
slfmail@wyo.gov

MATTHEW H. MEAD
Governor

BRIDGET HILL
Director

RECEIVED
JUN - 8 2015

June 4, 2015

Mr. Paul R. Hildenbrand
Lidstone and Associates, Inc.
4025 Automation Way, Bldg. E
Ft. Collins, CO 80525

Re: Temporary Use Permit No. 02644
Monitoring Well: Section 16-33N-90W

Dear Mr. Hildenbrand:

The Board of Land Commissioners in regular session on June 4, 2015, approved the above temporary use permit for a five year term. Approval was based on consideration of $100.00 per year. Receipt of the first year's consideration is hereby acknowledged.

Enclosed for your disposition is a copy of the temporary use permit. If you have any questions, please contact me at (307) 777-7333.

Sincerely,

Brenda S. Davis

Brenda S. Davis
Lands Management Specialist
Trust Land Management Division

Enclosure

STATE OF WYOMING
BOARD OF LAND COMMISSIONERS

SURFACE LESSEE NOTIFICATION AND COMMENT FORM

(Sections A & B to be completed by applicant)

A. PROJECT/ACTIVITY INFORMATION:

Type of Project:	Monitoring well to be associated with the American Nuclear Corporation site			
	(WDEQ/LQD Permit 352C) Reclamation Project			
Applicant:	Lidstone and Associates, Inc.			
Address:	4025 Automation Way, Bldg. E			
	Fort Collins, CO 80525		Phone:	(970) 223-4705

State Land Involved:

Section	16	Township	33N	Range	90	County	Fremont
Section		Township		Range		County	
Section		Township		Range		County	

B. SURFACE LESSEE INFORMATION:

Lease No.:	3-852J
Name:	Philp Sheep Co.
Address:	131 S. Hidden Valley Rd.
	Shoshoni, WY 82649
Phone No.:	(307) 856-6102

C. SURFACE LESSEE COMMENTS: (to be completed by surface lessee)

If this project will negatively affect your grazing/agricultural operation, please explain.

_____ _____

(Signature of Surface Lessee) (Date)

_____

(Please type or print name)

ADDITIONAL INFORMATION AND INSTRUCTIONS:

1. The completed Surface Lessee Notification and Comment Form **must** accompany the easement or temporary use permit application when submitted to Office of State Lands and Investments for processing.
2. Surface Impact payments will be made directly to the surface lessee by the applicant in accordance with the approved impact payment schedule. The schedule will be reviewed and revised annually.

SURFACE IMPACT PAYMENT SCHEDULE
FOR TEMPORARY USE PERMITS

SURFACE IMPACT PAYMENT SCHEDULE
FOR TEMPORARY USE PERMITS
(Paid Directly to the Surface Lessee)

APPROVED BY THE BOARD OF LAND COMMISSIONERS
ON AUGUST 14, 2014

Surface Impact Payments for Temporary Use Permits are to be paid directly to the surface lessee and are **not** part of the consideration paid to the State for the Temporary Use Permit. The surface impact payments represent a one-time payment for adverse impacts to the lessee's grazing lease and operations. The annual consideration for the Temporary Use Permit is to be negotiated with and paid directly to the Office of State Lands and Investments (OSLI). The surface impact payment schedule eliminates the necessity for negotiation with the surface lessees with respect to payment for impacts to the leasehold operations, including nuisance and inconvenience, created by the Temporary Use Permit. The lessee must still be contacted and notified of the applicant's proposed facility, and the applicant must submit the executed lessee comment form with its application. If the surface lessee(s) refuses to execute a lessee comment form, the applicant should indicate that fact on its application, along with a summary of the applicant's efforts at trying to obtain the executed lessee comment form. The surface lessee is encouraged to negotiate location of the facility in a manner which will reduce the adverse impacts to its leasehold operations. If the surface lessee refuses to negotiate the location of the facility, OSLI will work directly with the applicant to locate its facility.

THE SCHEDULE IS SUBJECT TO CHANGE BY THE BOARD; SEE BOARD RULES – Chapter 14, Section 5(a)

TYPE OF USE	SURFACE IMPACT PAYMENT
Hot Mix Plant	**Greater of $10.00 per acre or $50.00**
Hot Mix Plant (WyDOT)	**$50.00 per site (per Board decision on December 6, 1990)**
Stockpile Site (WyDOT)	**$50.00 per site (per Board decision on December 6, 1990)**
Roadway (existing two track)	**Greater of $5.00 per rod or $50.00**
Roadway (new construction)	**Greater of $5.00 per rod or $250.00**
Construction Activities (generally for TUPs issued in connection with Easement Construction)	**Greater of $10.00 per affected acre or $100.00**
Newly constructed CBM Water Storage Reservoirs[a]	**None – if providing water for irrigation or livestock.** **If not – Greater of $100.00/reservoir or $50.00 per disturbed acre/reservoir**
Pre-existing Reservoirs Converted for use as a CBM Water Storage Reservoir[b]	**None – if providing water for irrigation or livestock.** **If not – Greater of $50.00/reservoir or $25.00 per disturbed acre/reservoir**
Disposal or Injection Wells	**$50.00 per site plus roadway**
Organized Recreation Activities	**None**
Outfitting and Guiding Activities	**None**
Meteorological Towers	**$50.00 per site plus roadway**
Other authorized use of a temporary duration	**To be determined by OSLI**

[a] A mineral lessee is required to submit a full Water Management Plan to OSLI (with a copy to the Surface Lessee) prior to its implementation

[b] A mineral lessee is required to submit a full Water Management Plan to OSLI (with a copy to the Surface Lessee) prior to its implementation

Lidstone and Associates, Inc.
Engineering, Geology and Water Resource Consultants

April 21, 2015

State of Wyoming
Office of State Lands & Investments
Herschler Building 3-West
122 West 25th Street
Cheyenne, WY 82002-0600
Attn.: Brenda Davis

RE: Application for Temporary Use Permit

Dear Ms. Davis:

Lidstone and Associates (LA) is hereby applying for a Temporary Use Permit for the SW/NW/SW of Section 16, Township 33 North, Range 90 West in Fremont County, Wyoming. The purpose of this Temporary Use Permit is to allow LA and its contractors onto this parcel of land to install one monitoring well and collect ground water samples. This well will be associated with a groundwater investigation phase of the WDEQ/Land Quality Division's reclamation of the former American Nuclear Corporation Uranium Mill Tailings Site located in the Gas Hills District of Fremont County.

Attached to this letter for your consideration and approval are the completed temporary use permit application form, a signed Surface Lessee Notification and Comment Form, a map showing the location of the proposed monitoring well, and our check No. 22189 in the amount of $125.00 to cover the application fee ($25.00) and the 2015 annual consideration fee ($100.00).

LA appreciates your timely consideration and approval of this temporary use permit. Please call me if you have any questions.

Sincerely,
LIDSTONE AND ASSOCIATES, INC.

Paul Hildenbrand, P.G., R.G.
Senior Geologist

PRH:rce

Enclosure
Sent via: First Class Mail

K:\OPEN\WYDEQ104 - ANC Tailings\TASK ORDER 1\Ltr to State Lands.docx

4025 Automation Way, Building E, Fort Collins, Colorado 80525-3448 (970) 223-4705 fax: (970) 223-4706 e-mail: water@lidstone.com

Revised October 2010

PERMIT APPLICATION FEE $25.00

STATE OF WYOMING

BOARD OF LAND COMMISSIONERS

APPLICATION FOR TEMPORARY USE PERMIT

APPLICATION NO. _____ (Assigned by office) **COUNTY** Fremont

APPLICANT:

Name Lidstone and Associates, Inc.

Address 4025 Automation Way, Bldg E

Fort Collins, CO 80525

Phone (970) 223-4705

Use applied for: (check one)

[ ] Construction activity (indicate total acreage affected _____)
[ ] Hot mix facility (indicate total acreage affected _____)
[ ] Organized recreation activity
[ ] Roadway (indicate proposed width _____ and length _____)
[ ] Sign Board (indicate dimensions: width _____ and length _____)
[ ] Stockpile site (indicate total acreage affected _____)
[ ] Water removal facility
[ ] Outfitting/guiding activities (indicate exclusive ____ or nonexclusive ____ and provide outfitting/guiding license no. _____)
[ ] Disposal and/or Injection Well
[ ] Non-commercial Decorative Rock/Stone Removal
[X] Other: (specify) Monitoring well for the ANC project

Specifically describe proposed use: The request is for the installation of a monitoring well that will be associated with the WDEQ – Land Quality Division's American Nuclear Corporation Reclamation Project.

List any improvements to be placed on the land: The well will be relatively shallow in depth, on the order of 50 feet. The well will be constructed using a hollow stem auger rig and the initial site disturbance will be on the order of 15' by 20'. Once installed the area of disturbance will be approximately three-feet square. The well will be sampled approximately twice a year.

Describe the state land applied for (use a separate sheet if necessary). **Delineate the proposed permit area on a quad map and attach the map.**

Legal Description	Sec.	Twp.	Rng.	length/ft	County		
SWNWSW	16	33N	90W		Fremont		

Requested duration of permit: Number of years 5 from 3/15/2015 (Date) to 4/1/2020 (Date)

Annual Consideration offered to the State of Wyoming for this permit: $ 100.00

Surface Impact paid to the Surface Lessee: $ 50.00 on 4/16/15 (Date) Check No. 22188

****

This form must be **fully** completed and **be accompanied** by the **executed Lessee Comment Form, Quad Map, Application Fee** and **Consideration to the State. If not, all will be returned.**

****

I hereby certify that I have read and agree to abide by the Rules and Regulations of the Board of Land Commissioners governing temporary use permits and the terms and conditions of the temporary use permit.

Paul R Hildenbrand 4/21/2015

Signature of Applicant (Date)

Paul R. Hildenbrand

Print or Type Name

STATE OF WYOMING
BOARD OF LAND COMMISSIONERS

SURFACE LESSEE NOTIFICATION AND COMMENT FORM

(Sections A & B to be completed by applicant)

A. PROJECT/ACTIVITY INFORMATION:

Type of Project:	Monitoring well to be associated with the American Nuclear Corporation site		
	(WDEQ/LQD Permit 352C) Reclamation Project		
Applicant:	Lidstone and Associates, Inc.		
Address:	4025 Automation Way, Bldg. E		
	Fort Collins, CO 80525		Phone: (970) 223-4705

State Land Involved:

Section	16	Township	33N	Range	90	County	Fremont
Section		Township		Range		County	
Section		Township		Range		County	

B. SURFACE LESSEE INFORMATION:

Lease No.:	3-8521
Name:	Philp Sheep Co.
Address:	131 S. Hidden Valley Rd.
	Shoshoni. WY 82649
Phone No.:	(307) 856-6102

C. SURFACE LESSEE COMMENTS: (to be completed by surface lessee)

If this project will negatively affect your grazing/agricultural operation, please explain.

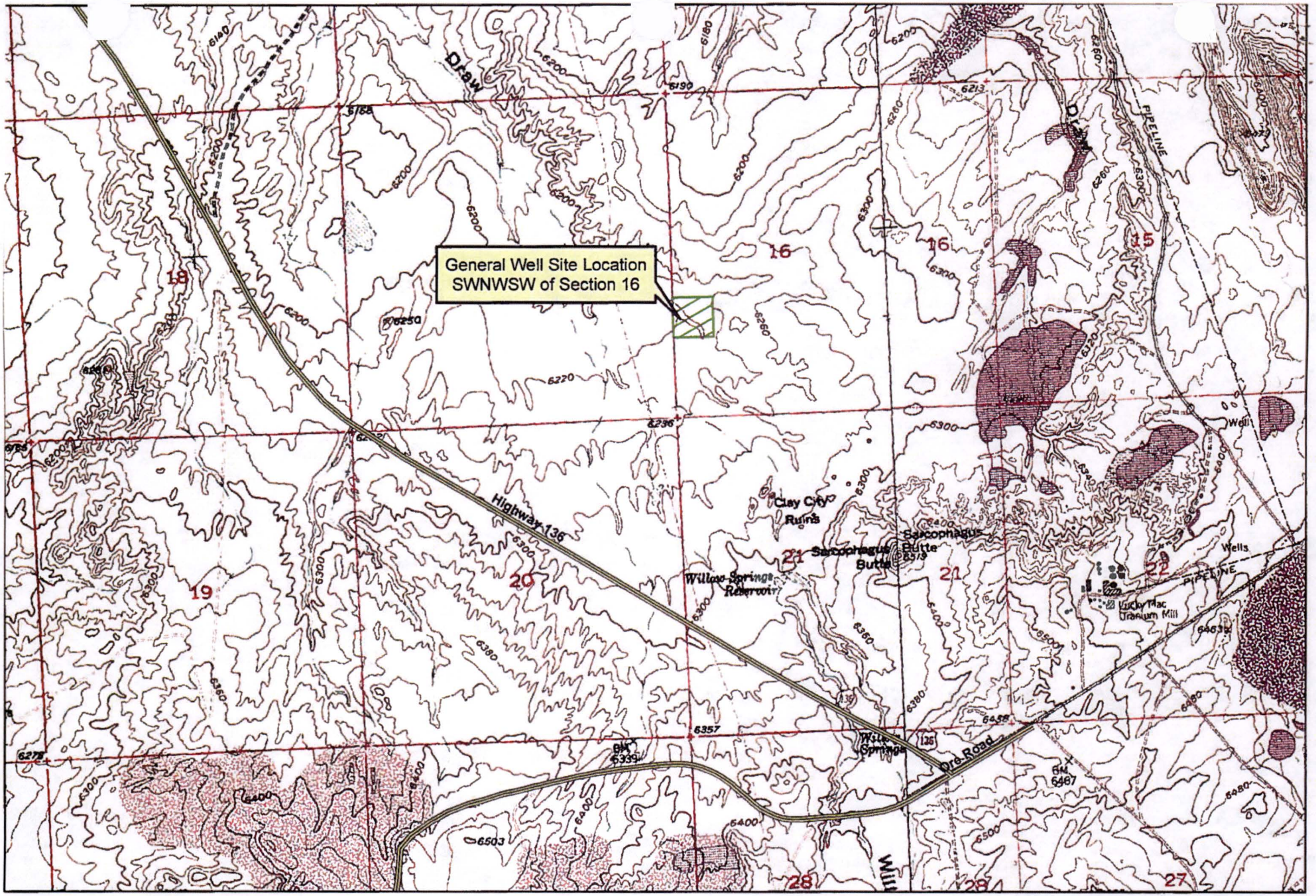
Elizabeth Philp

(Signature of Surface Lessee)

April 8, 2015
Date

Elizabeth Philp

(Please type or print name)



ANC Reclamation Project
Monitor Well Location
Temporary Use Permit Application
Office of State Lands & Investments

N

Township 33N, Range 90W

0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet

WDEQ - Land Quality Division
122 West 25th Street
Herschler Bldg. 3W
Cheyenne, WY 82002

SURFACE IMPACT PAYMENT SCHEDULE
FOR TEMPORARY USE PERMITS
(Paid Directly to the Surface Lessee)

APPROVED BY THE BOARD OF LAND COMMISSIONERS
ON AUGUST 14, 2014

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Roadway (new construction)	**Greater of $5.00 per rod or $250.00**
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Pre-existing Reservoirs Converted for use as a CBM Water Storage Reservoir[b]	**None – if providing water for irrigation or livestock.** **If not – Greater of $50.00/reservoir or $25.00 per disturbed acre/reservoir**
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Outfitting and Guiding Activities	**None**
Meteorological Towers	**$50.00 per site plus roadway**
Other authorized use of a temporary duration	**To be determined by OSLI**

[a] A mineral lessee is required to submit a full Water Management Plan to OSLI (with a copy to the Surface Lessee) prior to its implementation

[b] A mineral lessee is required to submit a full Water Management Plan to OSLI (with a copy to the Surface Lessee) prior to its implementation

Appendix C

Private Landowner Access Agreement

Lidstone and Associates, Inc.

SURFACE OWNER CONSENT FOR ACCESS
TO CERTAIN LANDS FOR THE PURPOSE OF INVESTIGATING POTENTIAL GROUND WATER CONTAMINATION AT THE WDEQ/LQD ANC TAILINGS RECLAMATION PROJECT

SITE OR NAME: American Nuclear Corporation Gas Hills Uranium Mill Tailings Site, Gas Hills, Fremont County, Wyoming

LQD PROJECT OFFICER: Muthu Kuchanur
LQD CONSULTANT: Lidstone and Associates, Inc.

I/we, the Owner(s) [or Authorized Agent] of record of the following described property located in Fremont County, Wyoming:

E1/2, SE/NW, Section 21, Township 33N, R90W (See attached map)
(Metes and Bounds Description, Mineral Claim Name, Etc.)

Hereby grant to the Wyoming Department of Environmental Quality, Land Quality Division (LQD), its Consultants, and Contractors access to the above described property for the purpose of investigating the potential for ground water contamination due to historic mining and milling of uranium at the former ANC mill and tailings disposal site installing monitoring wells and collecting ground water samples from said wells. Approved activities include water well drill rig and support vehicle access into the site, investigation and collection of baseline data, surveying, installation of approximately two (2) monitoring wells and subsequent sampling of these wells for chemical analysis. No road construction is anticipated. However a new gate will likely be constructed to permit rig access and said gate shall be completed in a workmanlike manner and in accordance with BLM specifications.

This consent to enter and access the property and sample the monitor wells is granted by the Owner for a five (5) year period with a right to renew this easement if all parties agree. This easement shall also terminate upon transfer or sale of the property or upon abandonment of the monitor wells and/or the termination of water sampling needs, if such an event precedes the five (5) year or its renewal period. Existing two-track roads, where available, will be used for access to the well sites. Care shall be taken to prevent more than incidental, temporary impacts due to travel by vehicle, foot, ATV, etc. during access for the installation and subsequent sampling of the wells. All gates will remain closed and any damage to fences will be repaired. Renewal or termination of this agreement may be made in writing by either the Owner or LQD.

A reasonable attempt will be made to contact the Owner or designated Representative approximately one (1) week prior to accessing the property

OWNER:/s/ Philp Sheep Co DATE: 4-8-15

OWNER'S REPRESENTATIVE: Elizabeth Philp, Treas. Philp Sheep Co DATE: _____

OWNER'S REPRESENTATIVE NAME AND MAILING ADDRESS:

Ms. Elizabeth Philp, 313 S. Hidden Valley Road, Shoshoni, WY 82649-8631

TELEPHONE: 307-856-6102

LQD Consultant

BY: _____ DATE: _____

*A copy of the signing representative's authorization must be attached to this form.

STATE OF WYOMING
BOARD OF LAND COMMISSIONERS

SURFACE LESSEE NOTIFICATION AND COMMENT FORM

(Sections A & B to be completed by applicant)

A. PROJECT/ACTIVITY INFORMATION:

Type of Project:	Monitoring well to be associated with the American Nuclear Corporation site			
	(WDEQ/LQD Permit 352C) Reclamation Project			
Applicant:	WDEQ – Land Quality Division			
Address:	122 West 25th St. / Herschler Bldg. 3W			
	Cheyenne, WY 82002		Phone:	(307) 777-7756

State Land Involved:

Section	16	Township	33N	Range	90	County	Fremont
Section		Township		Range		County	
Section		Township		Range		County	

B. SURFACE LESSEE INFORMATION:

Lease No.:	3-852J
Name:	Philp Sheep Co.
Address:	131 S. Hidden Valley Rd.
	Shoshoni, WY 82649
Phone No.:	(307) 856-6102

C. SURFACE LESSEE COMMENTS: (to be completed by surface lessee)

If this project will negatively affect your grazing/agricultural operation, please explain.

Elizabeth Philp

(Signature of Surface Lessee)

Elizabeth Philp

(Please type or print name)

April 8, 2015

(Date)

Appendix D

Test Hole Lithology and Existing Monitoring Well Completions

Lidstone and Associates, Inc.
Engineering Geology & Water Resources Consulting

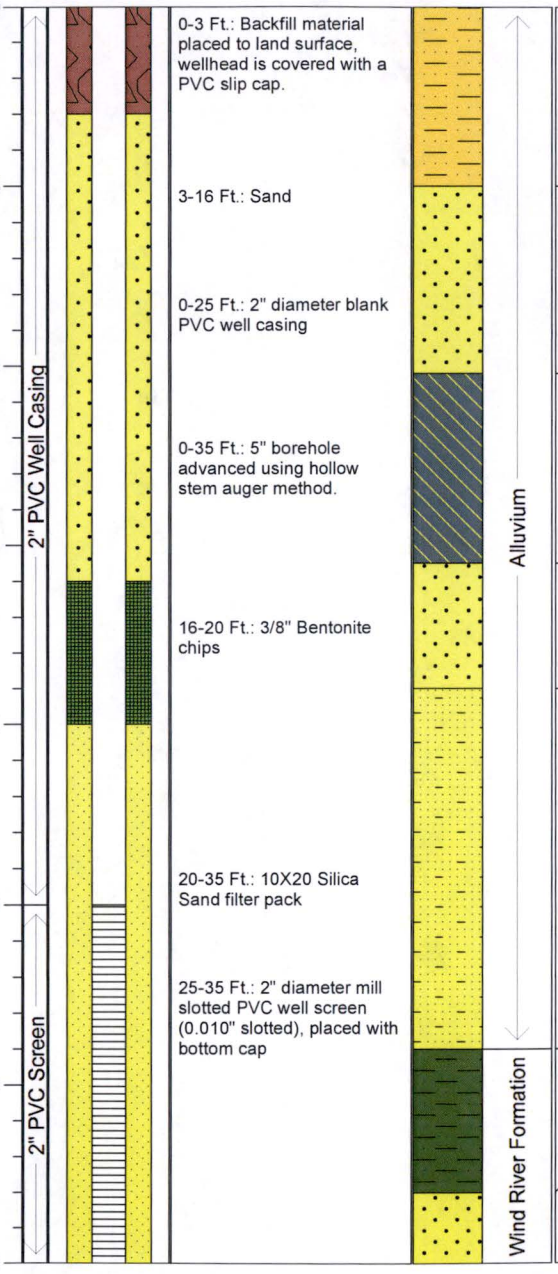
Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Project: ANC Tailings
Location: T33N, R90W, Sec. 28 NWNW
Drilled by: Morris Drilling/Inberg Miller
Date started: September 14, 1989
Date completed: September 14, 1989

Well Name: MW-2
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy
Total depth: 35 Ft.
Elev.: 6,371 Ft.

Depth (feet)

Well Construction



0-3 Ft.: Backfill material placed to land surface, wellhead is covered with a PVC slip cap.

3-16 Ft.: Sand

0-25 Ft.: 2" diameter blank PVC well casing

0-35 Ft.: 5" borehole advanced using hollow stem auger method.

16-20 Ft.: 3/8" Bentonite chips

20-35 Ft.: 10X20 Silica Sand filter pack

25-35 Ft.: 2" diameter mill slotted PVC well screen (0.010" slotted), placed with bottom cap

Lithology

(0- 5) SANDY SILT (ML): very fine grained, well sorted sand in silt matrix; loose; dry; soft; orangy brown

(5- 10) SAND (SM): very fine to fine grained quartz sand with 20% silt intermixed; coarser toward 6.5 feet; dry; loose; poorly sorted; yellowish brown

(10- 16) SANDY CLAY (CL): very fine grained sand in clay matrix; soft; rolls into threads; moist; white evaporite deposits; sand coarser toward 15 feet; brown

(16- 19) SAND (SM): poorly sorted; loose; very fine to medium grained quartz sand; apporoximately 10% silt intermixed; dry; sand is subangular to subrounded in shape; oxidized; orangy brown to yellowish brown

(19- 29) SILTY SAND (SM): poorly sorted, very fine to medium grained quartz sand; oxidized; wet at 20 feet; iron stained; loose; permeable; subangular; dense; some black carbonaceous material; yellowish brown

(29- 33) SANDY MUDSTONE: fine to medium grained sand in clay; unoxidized; semi-consolidated; gypsum; rolls into threads; moist; not permeable; harder, slower drilling with auger rig; greenish gray

(33- 35) SILTY SANDSTONE: poorly sorted quartz sand; unoxidized; moist; poor permeability; fine to medium grained; greenish gray and white

Remarks

Wellhead stickup to top of PVC casing = 0.63 feet

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Depth to water measured to be 21.46 feet below the top of casing on 9/21/2015. First observed water in the alluvium of the test hole at a depth of 20 feet.

Wind River Formation (bedrock) encountered at a depth of 29 feet.

Obtained water sample during test hole drilling at a depth of 30 feet: pH = 6.30; electrical conductivity = 8.65 mS/cm; temperature = 18.5C. Also obtained water sample from MW-2 for comparison: pH = 6.19; electrical conductivity = 9.37 mS/cm; temperature = 13.0C.

Notes: This figure presents the completion details for the MW-2 monitoring well. The well lies immediately north of Tailings Pond 1 next to PW-10. Morris Drilling drilled and completed the well utilizing hollow stem auger methods. Because there was no geologic log for this existing well, Inberg Miller Engineers drilled an 8 1/4 inch diameter test hole adjacent to this well to determine the formations this well is completed in. This figure presents a compilation of the well completion information from 9/14/89 and the geologic data acquired from the test hole on 7/13/15.

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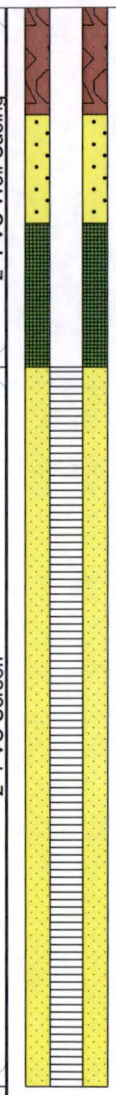
Project: ANC Tailings
Location: T33N, R90W, Sec. 29 NENE
Drilled by: Morris Drilling/Inberg Miller
Date started: September 16, 1989
Date completed: September 16, 1989

Well Name: MW-5
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy
Total depth: 30 Ft.
Elev.: 6,364 Ft.

Depth (feet)

Well Construction



0-3 Ft.: Backfill material placed to land surface, wellhead is covered with a PVC slip cap.

3-6 Ft.: Sand

0-10 Ft.: 2" diameter blank PVC well casing

6-10 Ft.: 3/8" Bentonite chips

0-30 Ft.: 5" borehole advanced using hollow stem auger method.

10-30 Ft.: 10X20 Silica Sand filter pack

10-30 Ft.: 2" diameter mill slotted PVC well screen (0.010" slotted), placed with bottom cap

Lithology

(0- 10) SILTY SAND (SM): very fine to fine grained quartz sand with silt; dry; loose; unconsolidated; some fine grained gravel intermixed; gypsum at 10 feet; poorly sorted; ~20% clay where present; 30% silt; oxidized; rooted; yellowish brown

(10- 21) CLAYEY SAND (SC): very fine to coarse grained quartz and lithic sand with clay; rolls into threads; dry; loose; gypsum/evaporitic deposits below 10 feet; mottled/marbled appearance; oxidized; some thin sandy interbeds; yellowish brown

(21- 22) CLAY (CL): some fine sand in clay matrix; wet/very moist; dark chocolate brown

(22- 31) SILTY SAND (SM): very fine to medium grained quartz sand with silt; very moist; oxidized; iron stained; loose; poorly sorted; permeable; wet at 30 feet; yellowish brown

(31- 35) SANDY CLAY (CL): very fine to fine grained sand in clay; mottled; very moist; rolls into threads; iron stained particularly on partings/veins; oxidized; orangy brown and yellowish brown

Remarks

Wellhead stickup to top of PVC casing = 0.50 feet

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Depth to water measured to be 28.12 feet below the top of casing on 9/22/2015. First observed water in the alluvium of the test hole at a depth of 30 feet.

Obtained water sample during test hole drilling at a depth of 35 feet: pH = 6.44; electrical conductivity = 4.14 mS/cm; temperature = 18.2C. Also obtained water sample from MW-5 for comparison: pH = 6.07; electrical conductivity = 6.24 mS/cm; temperature = 12.7C.

Notes: This figure presents the completion details for the MW-5 monitoring well. The well lies in Gas Draw northwest of Tailings Pond 1. Morris Drilling drilled and completed the well utilizing hollow stem auger methods. Because there was no geologic log for this existing well, Inberg Miller Engineers drilled an 8 1/4 inch diameter test hole adjacent to this well to determine the formations this well is completed in. This figure presents a compilation of the well completion information from 9/16/89 and the geologic data acquired from the test hole on 7/14/15.

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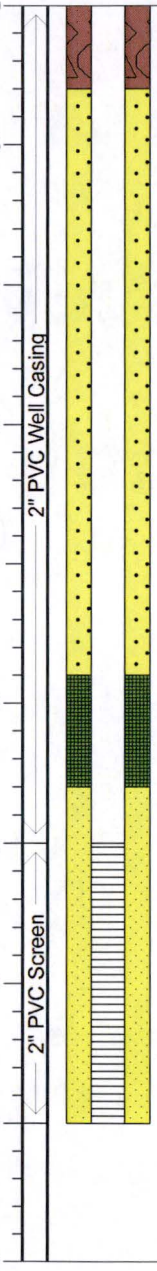
Project: ANC Tailings
Location: T33N, R90W, Sec. 20 SESE
Drilled by: Morris Drilling/Inberg Miller
Date started: September 15, 1989
Date completed: September 15, 1989

Well Name: MW-11
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy
Total depth: 40 Ft.
Elev.: 6,344 Ft.

Depth (feet)

Well Construction



0-3 Ft.: Backfill material placed to land surface, wellhead is covered with a PVC slip cap.

3-24 Ft.: Sand

0-30 Ft.: 2" diameter blank PVC well casing

0-40 Ft.: 5" borehole advanced using hollow stem auger method.

24-28 Ft.: 3/8" Bentonite chips

28-40 Ft.: 10X20 Silica Sand filter pack

30-40 Ft.: 2" diameter mill slotted PVC well screen (0.010" slotted), placed with bottom cap

Lithology

(0- 4) SILTY SAND (SM): well sorted fine grained sand with silt; loose; unconsolidated; dry; rooted; thin soil surface; brown

(4- 16) SANDY CLAY (CL): very fine and fine grained sand in clay matrix; dry; evaporite deposits throughout appear to be gypsum; oxidized; iron stained particularly on fracture/bedding surfaces at 16 feet; some thin sandy lenses; trace biotite; weathered bedrock; greenish brown and orangy brown

(16- 26) SANDY MUDSTONE: fine grained sand in clay/mudstone matrix; very stiff; dense; slightly oxidized; yellowish brown and greenish brown

(26- 38) SILTY SANDSTONE: poorly sorted fine to medium grained quartz sand with 30% silt; friable; weathered; oxidized; very moist to wet; biotite mica present; arkosic; iron stained; black manganese coatings; carbonaceous; permeable; unweathered at 36 feet; greenish gray

(38- 42) MUDSTONE: fine grained sand in mudstone matrix; some gypsum present; greenish gray

Remarks

Wellhead stickup to top of PVC casing = 0.46 feet

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Wind River Formation (bedrock) encountered at a depth of 16 feet.

Depth to water measured to be 25.10 feet below the top of casing on 9/21/2015. First observed water in the test hole at a depth of 27 feet.

Obtained water sample during test hole drilling at a depth of 40 feet: pH = 7.48; electrical conductivity = 2.19 mS/cm; temperature = 21.9C. Also obtained water sample from MW-11 for comparison: pH = 7.29; electrical conductivity = 3.02 mS/cm; temperature = 12.0C.

Notes: This figure presents the completion details for the MW-11 monitoring well. The well lies west of Gas Draw northwest of Tailings Pond 1. Morris Drilling drilled and completed the well utilizing hollow stem auger methods. Completion details on annular materials are estimated from other monitoring wells completed in the area in 1989. Because there was no geologic log for this existing well, Inberg Miller Engineers drilled an 8 1/4 inch diameter test hole adjacent to this well to determine the formations this well is completed in. This figure presents a compilation of the well completion information from 9/89 and the geologic data acquired from the test hole on 7/14/15.

Appendix E

New Monitoring Well Completions

Lidstone and Associates, Inc.

ANC Tailings Pond No. 1 Project
Monitor Well Drilling History

Owner: Wyoming Department of Environmental Quality (WDEQ)
Engineer: Lidstone and Associates, Inc. (LA)
Contractor: Inberg Miller Engineers (IME)

Date, Day	Site Activities
7/30/15, Thursday	Drilled, completed, and developed PW-10. The Wind River Formation had a field conductivity of 4.20 mS/cm, and a chloride concentration of 241 mg/L. Developed PW13 and PW14.
7/29/15, Wednesday	Finished drilling, completed, and developed PW2. The Cody Shale had a field conductivity of 5.33 mS/cm, and a chloride concentration of 452 mg/L. Developed PW3. The Cody Shale at this location had a field conductivity of 4.35 mS/cm, and a chloride concentration of 57 mg/L.
7/28/15, Tuesday	Developed PW5. The Wind River Formation at this site had a field conductivity of 3.77 mS/cm, and a chloride concentration of 86 mg/L. Drilled and completed PW3. Encountered water in the Cody Shale. Began drilling PW2.
7/27/15, Monday	Drilled and completed PW 5.
7/23/15, Thursday	Completed and developed PW9. The Wind River had a field conductivity of 2.21 mS/cm, and a chloride concentration of 64 mg/L.
7/22/15, Wednesday	Finished drilling and completed PW14. The Wind River had a field conductivity of 4.46 mS/cm and a chloride concentration of 587 mg/L. Drilled PW9.
7/21/15, Tuesday	Completed PW13B. Initiated but could not finish development. Partially drilled PW14. The alluvium was dry at PW14, but the Wind River Formation is water bearing.
7/20/15, Monday	Drilled and abandoned at test hole at PW13A. The alluvium was dry, but water was encountered in the Wind River Formation. The Wind River had an electrical conductivity of 1,175 uS/cm, and a chloride concentration of 19 mg/L. Drilled and partially completed PW13B. Again, the alluvium was dry, but water was obtained from the Wind River Formation. At this location, the Wind River had an electrical conductivity of 1,305 uS/cm, and a chloride concentration of 22 mg/L.
7/19/15, Sunday	Finished drilling, completed, and developed PW12. The alluvium at PW12 had a field conductivity of 4.74 mS/cm and a chloride concentration of 199 mg/L.
7/18/15, Saturday	Drilled, completed, and developed PW1. The alluvium at PW1 had a field conductivity of 6.08 mS/cm and a chloride concentration of 154 mg/L. Began drilling at the PW12 drill site and will finish tomorrow.
7/17/15, Friday	Drilled, completed, and developed PW15 and PW7. The alluvium at PW15 was dry. The alluvium at PW7 had a field conductivity of 9.58 mS/cm and a chloride concentration of 113 mg/L.
7/16/15, Thursday	Completed and developed PW8. The alluvium at PW8 had a conductivity of 5.66 mS/cm and a chloride concentration of 192 mg/L. Drilled, completed, and developed PW4. The alluvium at PW4 exhibited an electrical conductivity of 2.95 mS/cm and a chloride concentration of 76 mg/L.
7/15/15, Wednesday	Drilled and completed PW6 to a depth of 19 feet. Completed development on PW6. The alluvium at PW6 had a conductivity of 2.58 mS/cm, and a chloride concentration of 66 mg/L. Drilled and partially completed PW8. An afternoon thunderstorm delayed well completion and development on PW8 until Thursday.
7/14/15, Tuesday	IME and LA collaborated to complete the drilling of test holes adjacent to MW-2, MW-5, and MW-11. The test holes had the following

ANC Tailings Pond No. 1 Project
Monitor Well Drilling History

Owner: Wyoming Department of Environmental Quality (WDEQ)
Engineer: Lidstone and Associates, Inc. (LA)
Contractor: Inberg Miller Engineers (IME)

Date, Day	Site Activities
	conductivity/chloride concentrations: MW-2 – 8.65 mS/cm/478 mg/L; MW-5 – 4.14 mS/cm/217 mg/L; and MW-11 – 2.19 mS/cm/101 mg/L. Test holes were drilled at these locations to identify geologic conditions that were not previously reported for these wells.
7/13/15, Monday	IME and LA arrived onsite, visited all the drilling locations to confirm access, built the gate to access PW 5 and PW6, and started drilling the test hole adjacent to MW-2.

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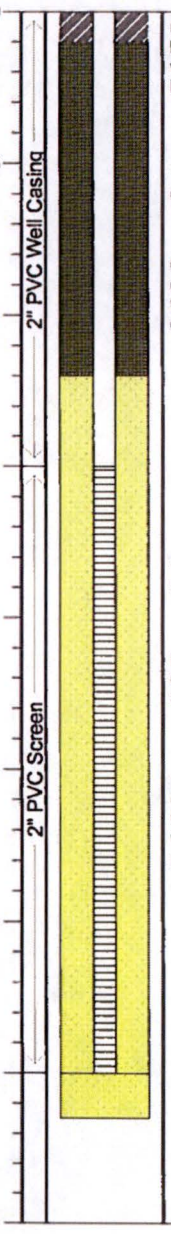
Fort Collins, CO 80525

Project: ANC Tailings
Location: T33N, R90W, Sec. 17 NENW
Drilled by: Inberg Miller Engineers
Date started: July 18, 2015
Date completed: July 18, 2015

Well Name: MW-18
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy/C. Cannan
Total depth: 35 Ft.
Elev.: 6,155 Ft.

Depth (feet)

Well Construction



0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

1-12 Ft.: 3/8" Bentonite chips

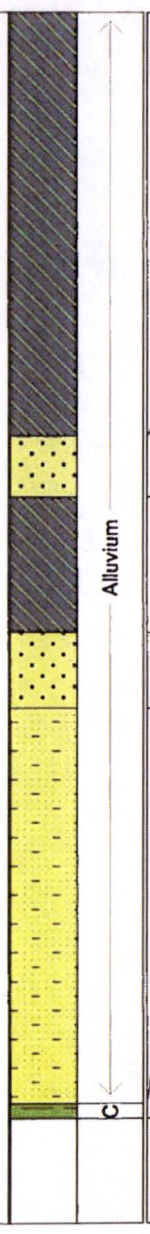
0-15 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

12-36.5 Ft.: 10X20 Silica Sand filter pack

0-36.5 Ft.: 8 1/4" borehole advanced using hollow stem auger method.

15-35 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

Lithology



(0- 14) SANDY CLAY (CL): fine grained, well rounded sand in clay matrix; dry; rolls easily into threads; soft; unconsolidated; thin sandy interbeds; trace coarse sand; evaporite minerals throughout

(14- 16) SAND (SW): poorly sorted, fine to medium grained sand with trace coarse sand; predominantly quartz in composition; few black lithics; slightly moist

(16- 21) SANDY CLAY (CL): fine grained sand in clay matrix; thin sand interbeds; light brown

(21- 23) SAND (SW): medium grained angular sand; predominantly quartz; poorly sorted; medium dense; light brown

(23- 36) SILTY SAND (SM): poorly sorted sand with silt; thin clayey interbeds; wet at 24 feet; predominately quartz in composition; arkosic; ~15% black lithics; loose; less silty sand interbeds; trace gravel; light brown; permeable

(36- 37) SHALE: dark gray, moist, hard clay with very thin sand and clay interbeds; iron stained; dense; weathered bedrock; impermeable

Remarks

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Wellhead stickup to top of PVC casing = 3.12 feet

Depth to water measured to be 28.41 feet below the top of casing on 9/23/2015. First observed water during drilling at a depth of 24 feet.

Obtained water sample during drilling at a depth of 30 feet: pH = 7.36; electrical conductivity = 5.89 mS/cm; temperature = 14.4C.

Cody Shale (bedrock) encountered at a depth of 36 feet.

Notes: This figure presents the completion details for the MW-18 monitoring well. The well lies in Willow Springs Draw north of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and hollow stem auger methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.5 hours. LA recorded an average pumping discharge of 1.2 gallons per minute during development. Final water quality parameters upon completion of development included the following: pH = 7.30, temperature = 10.4C, and electrical conductivity = 6.08 mS/cm.

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Project: ANC Tailings
Location: T33N, R90W, Sec. 17 SENE
Drilled by: Inberg Miller Engineers
Date started: July 28, 2015
Date completed: July 29, 2015

Well Name: MW-19
Drilling Method: Hollow Stem Auger/Rotary
Logged by: M. Stacy/C. Cannan
Total depth: 119.5 Ft.
Elev.: 6,250 Ft.

Depth (feet)	Well Construction	Lithology	Remarks
0	0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover	(0- 6) SILTY SAND (SM): poorly sorted fine to coarse grained quartz sand; arkosic; silty; some gravel interbeds; dry	Wellhead stickup to top of PVC casing = 2.87 feet
5–120	0-20 Ft.: 10 1/4" borehole advanced using hollow stem auger method.	(6- 120) SHALE: dry, thinly bedded clay with very thin interbeds of well sorted fine grained sand; heavy iron staining in some intervals; evaporite vein deposits; impermeable; weathered bedrock at 20 feet transitioning to unweathered bedrock; large gypsum crystals in some beds and gypsum lined fractures; minor fracturing; thins sandstone and siltstone interbeds; slighly moist at 90 and 100 feet; more moist at 114 feet	Cody Shale (bedrock) encountered at a depth of 6 feet.
25–30	0-99.5 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing		Drive samples and blow counts collected every five feet starting at a depth of 5 feet. At 20 feet, changed to direct air rotary drilling. Samples over the remainder of the borehole were composited over five foot intervals.
40–45	1-87 Ft.: 3/8" Bentonite chips		
60–65	20-120 Ft.: 6 1/4" borehole advanced using direct air rotary method.		
95	87-120 Ft.: 10X20 Silica Sand filter pack		Depth to water measured to be 95.14 feet below the top of casing on 9/24/2015. First observed water during drilling at a depth of 90 feet.
105–110	99.5-119.5 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap		Obtained water sample during drilling at a depth of 120 feet: pH = 8.01; electrical conductivity = 5.31 mS/cm; temperature = 14.7C.

Colluv

Cody Shale

2" PVC Well Casing

2" PVC Screen

Notes: This figure presents the completion details for the MW-19 monitoring well. The well lies northeast of Willow Springs Draw north of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and both hollow stem auger and direct air rotary methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and bailing techniques. The well screens were developed for approximately 1.5 hours. LA recorded an average pumping discharge of 0.1gallons per minute during development. Final water quality parameters following development included the following: pH = 8.09, temperature = 12.9C, and electrical conductivity = 5.33 mS/cm.

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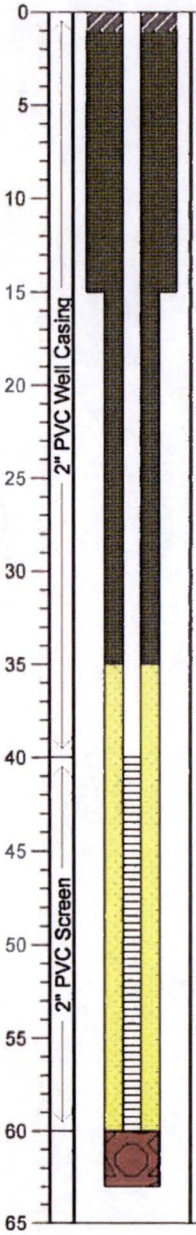
Project: ANC Tailings	Well Name: MW-20
Location: T33N, R90W, Sec. 17 NESW	Drilling Method: Hollow Stem Auger/Rotary
Drilled by: Inberg Miller Engineers	Logged by: M. Stacy/C. Cannan
Date started: July 28, 2015	Total depth: 60 Ft.
Date completed: July 28, 2015	Elev.: 6,199 Ft.

Depth (feet)

Well Construction



0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

0-15 Ft.: 10 1/4" borehole advanced using hollow stem auger method.

1-35 Ft.: 3/8" Bentonite chips

0-40 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

15-63 Ft.: 6 1/4" borehole advanced using direct air rotary method.

35-60 Ft.: 10X20 Silica Sand filter pack

40-60 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

Lithology

(0- 7) CLAYEY SAND (SC): dry, soft clay with poorly sorted quartz sand; sand is fine to coarse grained; few thin gravel lenses

(7- 63) SHALE: upper 1.5 feet is weathered to clay that is medium stiff with thin sandy interbeds and some iron staining; below weathered horizon, shale is dry and stiff with thin sandy interbeds; impermeable; gypsum deposits; evaporites appear in sandy layers which may reflect small flows through these zones; thin siltstone interbeds; slightly moist at 21 feet; sandier and moister at 37 feet; thin sandstone interbeds at 60 feet; wet at 35-45 and 50-55 foot intervals

Remarks

Wellhead stickup to top of PVC casing = 2.92 feet

Cody Shale (bedrock) encountered at a depth of 6.5 feet.

Drive samples and blow counts collected every five feet starting at a depth of 5 feet. At 15 feet, changed to direct air rotary drilling. Samples over the remainder of the borehole were composited over five foot intervals.

Depth to water measured to be 26.16 feet below the top of casing on 9/23/2015. First observed water during drilling at a depth of 21 feet.

Notes: This figure presents the completion details for the MW-20 monitoring well. The well lies southwest of Willow Springs Draw north of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and both hollow stem auger and direct air rotary methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.0 hour. LA recorded an average pumping discharge of 0.4gallons per minute during development. Final water quality parameters following development included: pH = 8.07, temperature = 12.6C, and electrical conductivity = 4.35 mS/cm.

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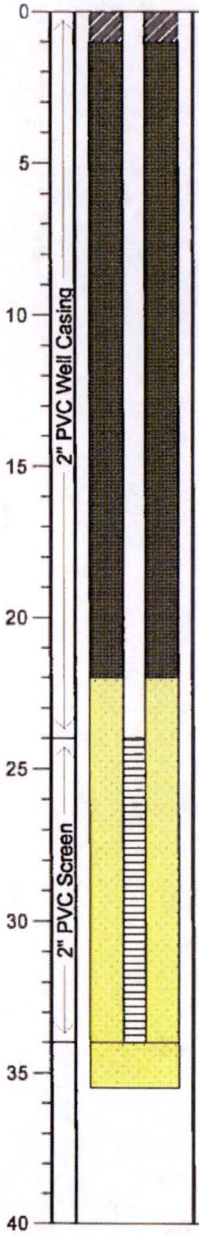
Project: ANC Tailings
Location: T33N, R90W, Sec. 17 SESE
Drilled by: Inberg Miller Engineers
Date started: July 16, 2015
Date completed: July 16, 2015

Well Name: MW-21
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy
Total depth: 34 Ft.
Elev.: 6,219 Ft.



Well Construction

0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

1-22 Ft.: 3/8" Bentonite chips

0-24 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

0-35.5 Ft.: 8 1/4" borehole advanced using hollow stem auger method.

22-35.5 Ft.: 10X20 Silica Sand filter pack

24-34 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

Lithology

Alluvium

(0- 4) SILTY SAND (SM): very fine to fine grained sand with silt (30%) and clay (20%); dry; very loose; unconsolidated

(4- 9) SAND (SW): fine to coarse grained quartz sand; 10% silt intermixed; dry; loose; unconsolidated; permeable; arkosic; thin clayey interbeds; some evaporite deposits

(9- 13) SANDY CLAY (CL): very fine to fine grained sand in clay matrix; gypsum or other evaporitic minerals present; dry; medium stiff; yellowish brown

(13- 19) SILTY SAND (SM): very fine to medium grained quartz sand; poorly sorted; dry; very loose; some thin clay lenses; permeable; evaporites present in clay zones

(19- 23) SANDY CLAY (CL): well sorted fine grained sand in clay; yellow mottling throughout; very moist; rolls into threads; sulfur banding?; yellowish brown

(23- 30) SILTY SAND (SM): very fine to fine grained quartz sand with 30-40% silt; yellow mottling; wet/very moist; wet at 26 feet; well sorted; some coarse sand intermixed; very dense; gravelly from 28-29.5 feet; light gray and yellow

Cody Shale

(30- 36) SHALE: dark gray, moist, hard clay with very thin sand and clay interbeds; iron stained; dense; weathered bedrock; impermeable

Remarks

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Wellhead stickup to top of PVC casing = 2.87 feet

Depth to water measured to be 25.89 feet below the top of casing on 9/24/2015. First observed water during drilling at a depth of 26 feet.

Cody Shale (bedrock) encountered at a depth of 29.5 feet.

Attempted to grab water sample during drilling at a depth of 35 feet, but there was not sufficient water to sample.

Notes: This figure presents the completion details for the MW-21 monitoring well. The well lies in Willow Springs Draw north of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and hollow stem auger methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.0 hour. LA recorded an average pumping discharge of 0.3 gallons per minute during development. Final water quality parameters upon completion of development included the following: pH = 6.96, temperature = 20.8C, and electrical conductivity = 2.95 mS/cm.

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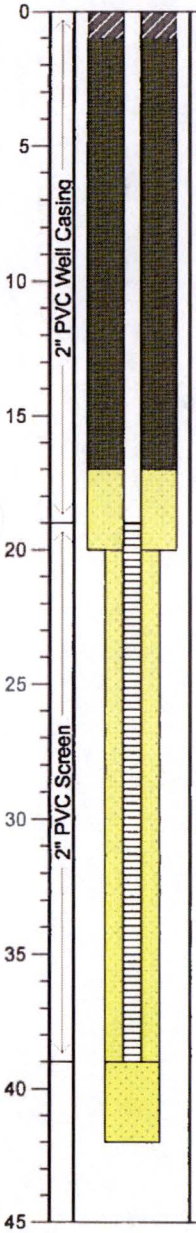
Project: ANC Tailings
Location: T33N, R90W, Sec. 21 NESW
Drilled by: Inberg Miller Engineers
Date started: July 27, 2015
Date completed: July 27, 2015

Well Name: MW-22
Drilling Method: Hollow Stem Auger/Rotary
Logged by: M. Stacy/C. Cannan
Total depth: 39 Ft.
Elev.: 6,332 Ft.

Depth (feet)

Well Construction



0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

0-20 Ft.: 10 1/4" borehole advanced using hollow stem auger method.

1-17 Ft.: 3/8" Bentonite chips

0-19 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

17-42 Ft.: 10X20 Silica Sand filter pack

19-39 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

20-42 Ft.: 6 1/4" borehole advanced using direct air rotary method.

Lithology

(0- 9) CLAYEY SAND (SC): dry, poorly sorted sand with clay; evaporite deposits; thin sand interbeds; oxidized; clay ~30%

(9- 21) SANDY MUDSTONE: stiff, slightly moist clay with ~15% poorly sorted quartz and arkosic sand; marbled with evaporite deposits; some iron staining; very moist and heavily mottled at 20 feet; oxidized

(21- 37) MUDSTONE: very moist, soft clay with minor fine grained sand; low permeability; some sandy interbeds; oxidized

(37- 42) SILTSTONE: fine grained, dry, silt with minor sand and clay; clayey interbeds; low permeability; poorly consolidated

Remarks

Wellhead stickup to top of PVC casing = 2.66 feet

Wind River Formation (bedrock) encountered at a depth of 9 feet.

Drive samples and blow counts collected every five feet starting at a depth of 5 feet. At 20 feet, changed to direct air rotary drilling. Samples over the remainder of the borehole were composited over five foot intervals.

Depth to water measured to be 28.09 feet below the top of casing on 9/23/2015. First observed water during drilling at a depth of 30 feet.

Notes: This figure presents the completion details for the MW-22 monitoring well. The well lies northeast of Willow Springs Reservoir north of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and both hollow stem auger and direct air rotary methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.0 hour. LA recorded an average pumping discharge of 0.3 gallons per minute during development. Final water quality parameters thereafter included: pH = 8.33, temperature = 13.9C, and electrical conductivity = 3.77 mS/cm.

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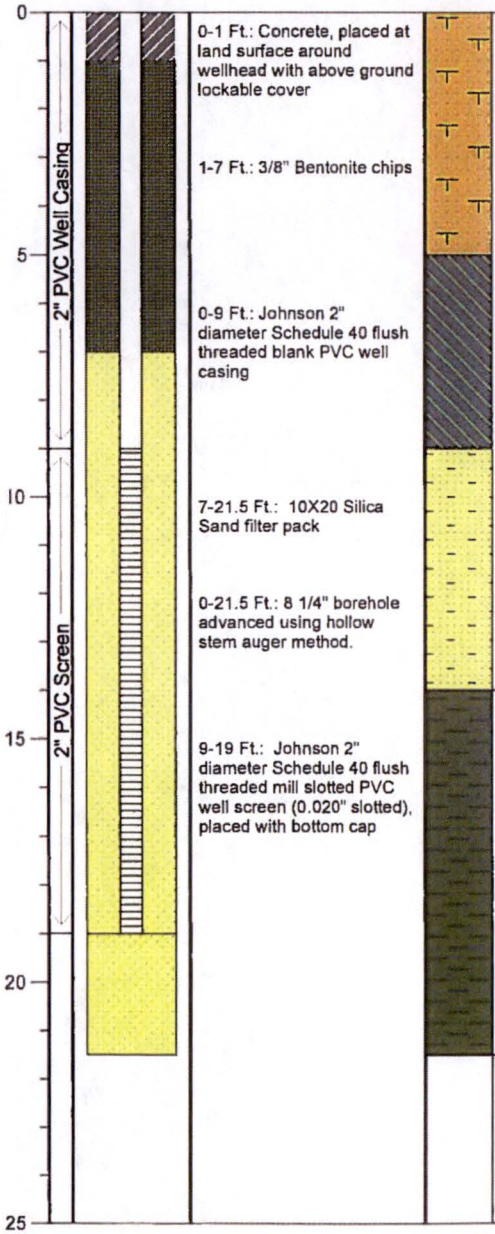
Project: ANC Tailings
Location: T33N, R90W, Sec. 21 NESW
Drilled by: Inberg Miller Engineers
Date started: July 15, 2015
Date completed: July 15, 2015

Well Name: MW-23
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy
Total depth: 19 Ft.
Elev.: 6,309 Ft.



Well Construction

0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

1-7 Ft.: 3/8" Bentonite chips

0-9 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

7-21.5 Ft.: 10X20 Silica Sand filter pack

0-21.5 Ft.: 8 1/4" borehole advanced using hollow stem auger method.

9-19 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

Lithology

Alluvium

(0- 5) CLAYEY SAND (SC): fine grained sand with clay; dry; rolls into threads; loose; unconsolidated; yellowish brown

(5- 9) CLAY (OH/CL): trace fine grained sand in clay matrix; oxidized; very soft; iron stained on cleavage surfaces; organic rich; very moist at 6 feet; reddish brown to black

(9- 14) SILTY SAND (SM): very fine to medium grained quartz sand; loose; unconsolidated; permeable; some iron staining; some clay mixed in; wet near base of bed; greenish gray

Wind River Formation

(14- 22) MUDSTONE: semiconsolidated clay; unweathered; unoxidized; some fine grained sand intermixed; harder toward 17-20 feet

Remarks

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Wellhead stickup to top of PVC casing = 2.83 feet

Depth to water measured to be 6.45 feet below the top of casing on 9/23/2015. First observed water during drilling at a depth of 6 feet.

Wind River Formation (bedrock) encountered at a depth of 14 feet.

Obtained water sample during drilling at a depth of 20 feet: pH = 7.32; electrical conductivity = 2.61 mS/cm; temperature = 19.1C.

Notes: This figure presents the completion details for the MW-23 monitoring well. The well lies in Willow Springs Draw just above Willow Springs Reservoir north of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and hollow stem auger methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.0 hour. LA recorded an average pumping discharge of 1.3 gallons per minute during development. Final water quality parameters thereafter included: pH = 7.26, temperature = 11.0C, and electrical conductivity = 2.57 mS/cm.

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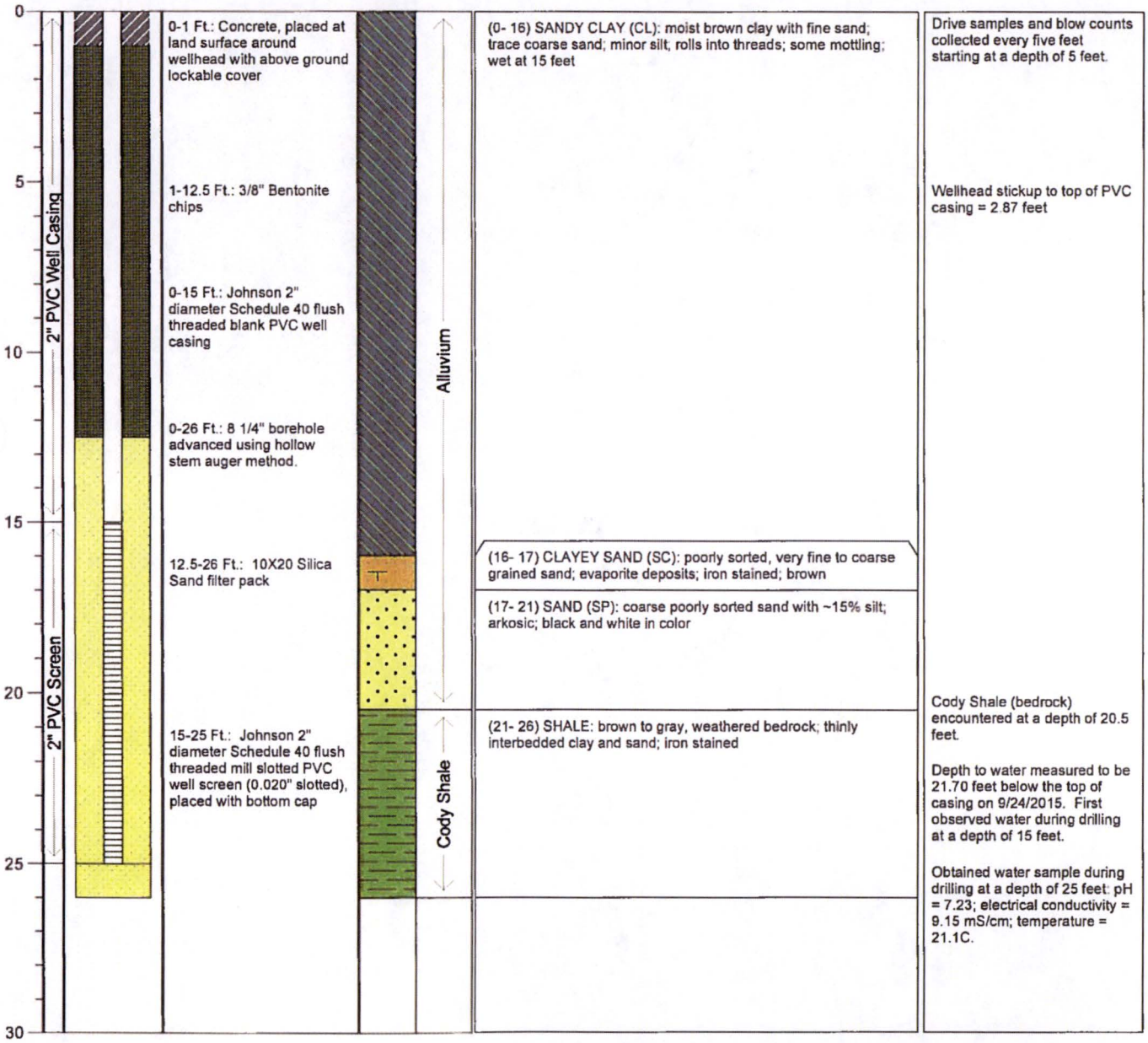
Project: ANC Tailings
Location: T33N, R90W, Sec. 17 NESE
Drilled by: Inberg Miller Engineers
Date started: July 17, 2015
Date completed: July 17, 2015

Well Name: MW-24
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy/C. Cannan
Total depth: 25 Ft.
Elev.: 6,215 Ft.



Notes: This figure presents the completion details for the MW-24 monitoring well. The well lies northeast of Willow Springs Draw north of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and hollow stem auger methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.0 hour. LA recorded an average pumping discharge of 0.3 gallons per minute during development. Final water quality parameters upon completion of development included the following: pH = 7.24, temp = 12.7C, and electrical conductivity = 9.58 mS/cm.

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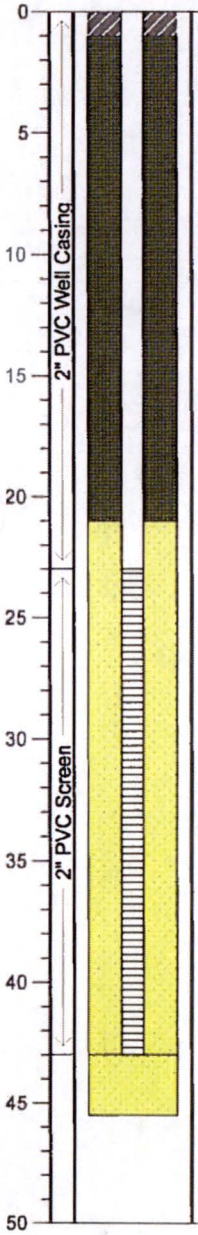
Project: ANC Tailings
Location: T33N, R90W, Sec. 20 NWNE
Drilled by: Inberg Miller Engineers
Date started: July 15, 2015
Date completed: July 15, 2015

Well Name: MW-25
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy
Total depth: 43 Ft.
Elev.: 6,247 Ft.

Depth (feet)

Well Construction



0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

1-21 Ft.: 3/8" Bentonite chips

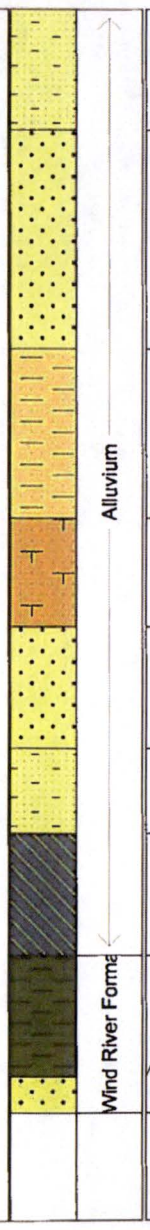
0-23 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

0-45.5 Ft.: 8 1/4" borehole advanced using hollow stem auger method.

21-45.5 Ft.: 10X20 Silica Sand filter pack

23-43 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

Lithology



(0- 5) SILTY SAND (SM): well sorted, fine grained quartz sand with 30% silt; dry; very loose; unconsolidated; some medium grained sand intermixed; yellowish brown

(5- 14) SAND (SW): poorly sorted, very fine to medium grained quartz sand; loose; unconsolidated; dry; arkosic; few fines; subangular to subrounded in shape; ~5% fine gravel intermixed with sizes up to 0.5 inches diameter; some silty interbeds; permeable; yellowish brown

(14- 21) SANDY SILT (ML): well sorted very fine grained sand in silt matrix; dry; loose; some gypsum/evaporite deposits at 15 and 20 feet; oxidized; some iron staining; some thin sand interbeds; tan

(21- 26) CLAYEY SAND (SC): fine grained quartz sand with clay; well sorted; dry; loose; limited permeability; gypsum vein-like deposits; yellowish brown

(26- 31) SAND (SP): poorly sorted, fine to coarse grained sand; dry; loose; arkosic; iron stained; 95% quartz in composition; subrounded in shape; permeable; wet at 30.5 feet; yellowish brown and white

(31- 34) SILTY SAND (SM): poorly sorted, very fine to coarse grained quartz sand with silt; iron stained; trace fine gravel; permeable; wet; yellowish brown and orangy brown

(34- 39) SANDY CLAY (CL): fine grained sand in clay matrix; dry; firm; no permeability; moist; weathered bedrock; dark brown

(39- 44) SANDY MUDSTONE: fine grained well sorted sand in clay matrix; dense; bedrock; moist; some thin sandy interbeds; light gray

(44- 46) SANDSTONE: very fine grained well sorted quartz sand; poorly cemented; friable; hard; moist; light gray

Remarks

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Wellhead stickup to top of PVC casing = 2.00 feet

Depth to water measured to be 31.96 feet below the top of casing on 9/23/2015. First observed water during drilling at a depth of 30.5 feet.

Wind River Formation (bedrock) encountered at a depth of 39 feet.

Attempted to obtain water samples during drilling at depths of 40 and 45 feet, but there was not sufficient water to sample at either depth.

Notes: This figure presents the completion details for the MW-25 monitoring well. The well lies in Willow Springs Draw north of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and hollow stem auger methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.0 hour. LA recorded an average pumping discharge of 0.6 gallons per minute during development. Final water quality parameters following development included the following: pH = 7.38, temperature = 13.3C, and electrical conductivity = 5.66 mS/cm.

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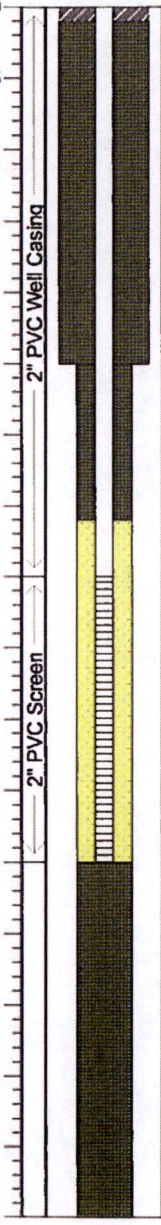
Project: ANC Tailings	Well Name: MW-26
Location: T33N, R90W, Sec. 20 NWSE	Drilling Method: Hollow Stem Auger/Rotary
Drilled by: Inberg Miller Engineers	Logged by: M. Stacy
Date started: July 22, 2015	Total depth: 60 Ft.
Date completed: July 23, 2015	Elev.: 6,334 Ft.

Depth (feet)

Well Construction



0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

0-25 Ft.: 10 1/4" borehole advanced using hollow stem auger method.

1-36 Ft.: 3/8" Bentonite chips

0-40 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

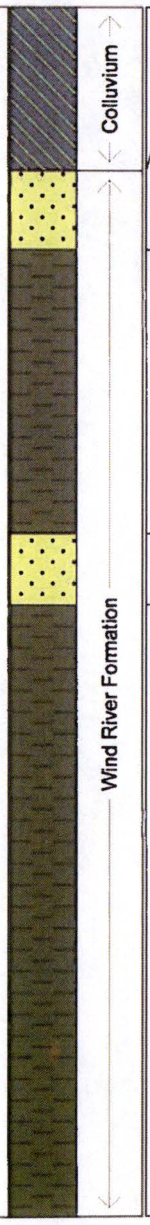
36-60 Ft.: 10X20 Silica Sand filter pack

40-60 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

25-85 Ft.: 6 1/4" borehole advanced using direct air rotary method.

60-85 Ft.: 3/8" Bentonite chips

Lithology



(0- 12) SANDY CLAY (CL): fine grained sand; some minor gypsum/evaporite deposits; rooted; dry to slightly moist; trace medium to coarse grained sand; some thin sandy interbeds; brown

(12- 17) SANDSTONE: poorly sorted, fine to coarse grained quartz sand with ~10% silt and ~10% black lithics; arkosic; dry; loose; weathered; iron stained; some manganese present; sand is angular to subangular in shape; some thin clayey interbeds; yellowish to orangy brown

(17- 37) SANDY MUDSTONE: fine to medium grained quartz sand in clay; semi consolidated; very stiff; black manganese spots throughout interval; iron oxidized; oxidized; greenish gray to reddish gray to yellowish brown

(37- 42) SILTY SANDSTONE: dry; fine to medium grained quartz sand; oxidized; friable; permeable; moist to wet; yellowish brown

(42- 85) MUDSTONE: trace sand intermixed in clay; dry to moist; moister at 68 feet; poor permeability; unoxidized; red and greenish gray

Remarks

Wellhead stickup to top of PVC casing = 2.92 feet

Wind River Formation (bedrock) encountered at a depth of 11.5 feet.

Drive samples and blow counts collected every five feet starting at a depth of 5 feet. At 25 feet, changed to direct air rotary drilling. Samples over the remainder of the borehole were composited over five foot intervals.

Depth to water measured to be 54.30 feet below the top of casing on 9/23/2015. First observed water during drilling at a depth of 40 feet.

Obtained water sample the morning after drilling to 85 feet. Field water quality paramaters from approximately 52 feet included: pH = 8.64; electrical conductivity = 1.72 mS/cm; temperature = 13.6C.

Notes: This figure presents the completion details for the MW-26 monitoring well. The well lies southwest of Willow Springs Draw north of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and both hollow stem auger and direct air rotary methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.0 hour. LA recorded an average pumping discharge of 0.4 gallons per minute during development. Final water quality parameters after development included: pH = 9.08, temperature = 13.1C, and electrical conductivity = 2.21 mS/cm.

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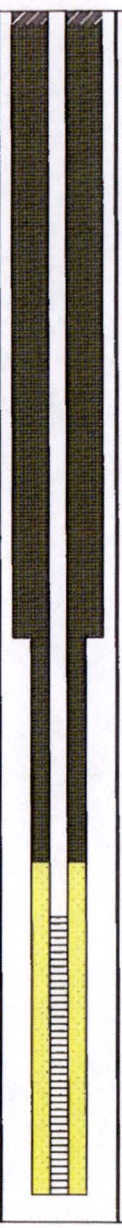
Project: ANC Tailings
Location: T33N, R90W, Sec. 28 NWNW
Drilled by: Inberg Miller Engineers
Date started: July 30, 2015
Date completed: July 30, 2015

Well Name: MW-27
Drilling Method: Hollow Stem Auger/Rotary
Logged by: M. Stacy/C. Cannan
Total depth: 85 Ft.
Elev.: 6,372 Ft.

Depth (feet): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85

Well Construction



0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

0-45 Ft.: 10 1/4" borehole advanced using hollow stem auger method.

1-61 Ft.: 3/8" Bentonite chips

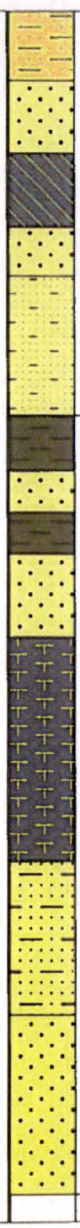
0-65 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

45-85 Ft.: 6 1/4" borehole advanced using direct air rotary method.

61-85 Ft.: 10X20 Silica Sand filter pack

65-85 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

Lithology



(0- 5) SANDY SILT (ML): very fine grained, well sorted sand in silt matrix; loose; dry; soft; orangy brown

(5- 10) SAND (SM): very fine to fine grained quartz sand with 20% silt intermixed; coarser toward 6.5 feet; dry; loose; poorly sorted; yellowish brown

(10- 16) SANDY CLAY (CL): very fine grained sand in clay matrix; soft; rolls into threads; moist; white evaporite deposits; sand coarser toward 15 feet; brown

(16- 19) SAND (SM): poorly sorted; loose; very fine to medium grained quartz sand; apporoximately 10% silt intermixed; dry; sand is subangular to subrounded in shape; oxidized; orangy brown to yellowish brown

(19- 29) SILTY SAND (SM): poorly sorted, very fine to medium grained quartz sand; oxidized; wet at 20 feet; iron stained; loose; permeable; subangular; dense; some black carbonaceous material; yellowish brown

(29- 33) SANDY MUDSTONE: fine to medium grained sand in clay; unoxidized; semi-consolidated; gypsum; rolls into threads; moist; not permeable; harder, slower drilling with auger rig; greenish gray

(33- 36) SILTY SANDSTONE: poorly sorted quartz sand; unoxidized; moist; poor permeability; fine to medium grained; greenish gray and white

(36- 39) SANDY MUDSTONE: quartz sand in clay matrix; moist; rolls into threads; greenish gray

(39- 45) SANDSTONE: well sorted, fine grained quartz sandstone; good permeability; ~10% silt; dense; poorly cemented; carbonaceous; micaceous (biotite); subangular to subrounded grains; some silty interbeds; greenish gray

(45- 61) CLAYSTONE: stiff clay with white bentonite(?) clay and minor fine grained sand; impermeable; dry; moist from 54-58 feet; iron staining; greenish gray and reddish brown

(61- 72) CLAYEY SANDSTONE: loose, moist fine grained sand, well sorted; some claystone interbeds; slightly moist; poorly cemented; greenish gray

(72- 85) SANDSTONE: moderately sorted, fine to medium grained quartz sand; moist; permeable; some clay interbeds; wet at 81 feet; trace coarse sand; poorly cemented; greenish gray

Remarks

Wellhead stickup to top of PVC casing = 2.46 feet

Drive samples and blow counts collected every five feet starting at a depth of 5 feet. At 45 feet, changed to direct air rotary drilling. Samples over the remainder of the borehole were composited over five foot intervals.

Wind River Formation (bedrock) encountered at a depth of 29 feet.

Depth to water measured to be 39.75 feet below the top of casing on 9/21/2015. Observed water in the alluvium at a depth of 20 feet; first observed water in the Wind River Formation at a depth of 54 feet.

Did not obtain a water sample during drilling due to the possibility of losing the borehole due to collapse.

Notes: This figure presents the completion details for the MW-27 monitoring well. The well lies immediately north of Tailings Pond 1 next to MW-2. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and both hollow stem auger and direct air rotary methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.25 hours. LA recorded an average pumping discharge of 1.2 gallons per minute during development. Final water quality parameters after development included: pH = 6.70, temperature = 12.0C, and electrical conductivity = 4.20 mS/cm.

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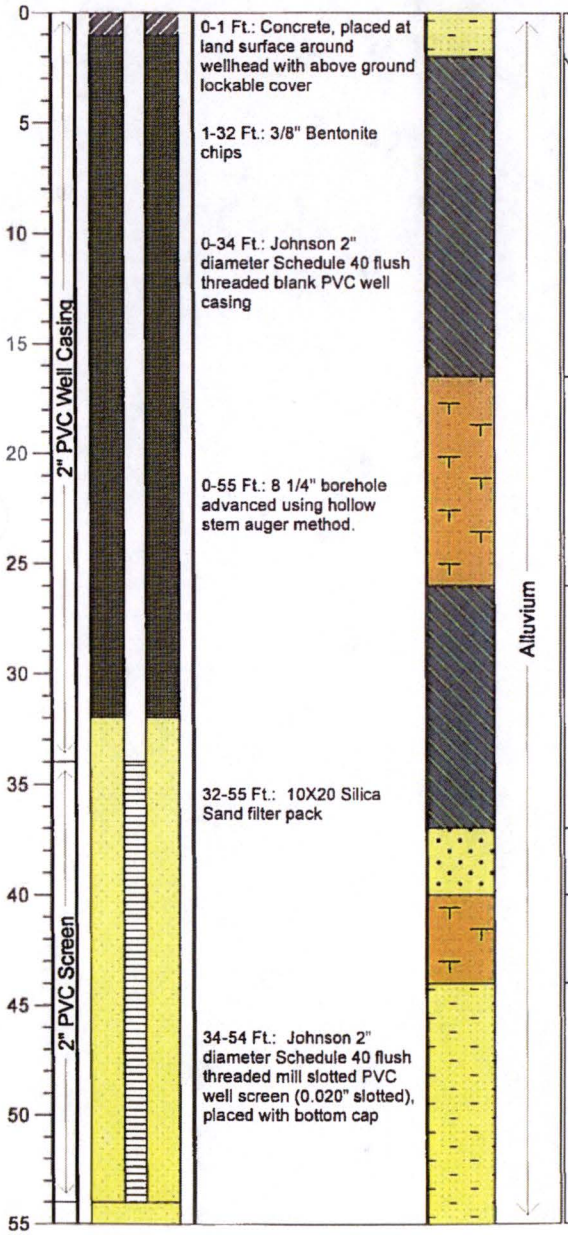
Project: ANC Tailings
Location: T33N, R90W, Sec. 28 SENW
Drilled by: Inberg Miller Engineers
Date started: July 18, 2015
Date completed: July 19, 2015

Well Name: MW-28
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy/C. Cannan
Total depth: 54 Ft.
Elev.: 6,425 Ft.



Well Construction

0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

1-32 Ft.: 3/8" Bentonite chips

0-34 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

0-55 Ft.: 8 1/4" borehole advanced using hollow stem auger method.

32-55 Ft.: 10X20 Silica Sand filter pack

34-54 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

Lithology

(0- 2) SILTY SAND (SM): poorly sorted quartz sand; subrounded; fine to medium grained; dry; trace clay

(2- 17) SANDY CLAY (CL): dry soft clay with sand; evaporite deposits; sand is fine to medium grained; light brown

(17- 26) CLAYEY SAND (SC): fine to medium grained quartz sand; subangular; dry; loose; some sandy interbeds; light brown

(26- 37) SANDY CLAY (CL): soft moist clay; rolls easily into threads; fine to medium grained quartz sand intermixed; evaporite deposits; some thin sand interbeds; wet at 36.5 feet; dark brown and gray

(37- 40) SAND (SC): fine grained quartz sand with clay interbeds; wet

(40- 44) CLAYEY SAND (SC): poorly sorted, subangular quartz sand; wet; cobbles present

(44- 55) SILTY SAND (SM): moderately well sorted fine to medium grained quartz sand; arkosic; some thin clay and sand interbeds; iron stained; permeable; light brown

Remarks

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Wellhead stickup to top of PVC casing = 2.83 feet

Depth to water measured to be 40.87 feet below the top of casing on 9/22/2015. First observed water during drilling at a depth of 36.5 feet.

Obtained water sample during drilling at a depth of 55 feet: pH = 6.47; electrical conductivity = 4.67 mS/cm; temperature = 15.2C.

Notes: This figure presents the completion details for the MW-28 monitoring well. The well lies in Willow Springs Draw immediately north of Tailings Pond 2. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and hollow stem auger methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.0 hours. LA recorded an average pumping discharge of 1.0 gallons per minute during development. Final water quality parameters after development included: pH = 6.45, temperature = 11.3C, and electrical conductivity = 4.74 mS/cm.

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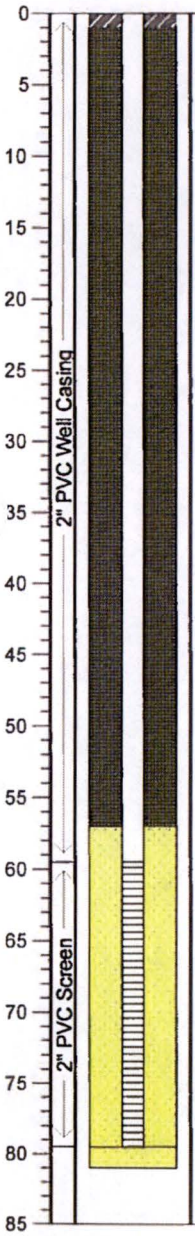
Project: ANC Tailings
Location: T33N, R90W, Sec. 33 SWNE
Drilled by: Inberg Miller Engineers
Date started: July 20, 2015
Date completed: July 21, 2015

Well Name: MW-29
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy/C. Cannan
Total depth: 79.5 Ft.
Elev.: 6,507 Ft.

Depth (feet)

Well Construction



0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

0-59.5 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

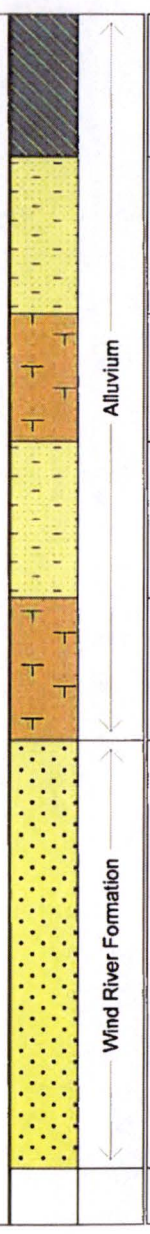
1-57 Ft.: 3/8" Bentonite chips

0-81 Ft.: 8 1/4" borehole advanced using hollow stem auger method.

57-81 Ft.: 10X20 Silica Sand filter pack

59.5-79.5 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

Lithology



(0- 10) SANDY CLAY (CL): dry soft clay with poorly sorted fine to medium grained quartz sand; dark brown

(10- 21) SILTY SAND (SM): poorly sorted, fine to coarse grained quartz sand; arkosic; dry; trace gravel; yellowish brown

(21- 30) CLAYEY SAND (SC): moderately well sorted quartz sand; arkosic; fine to medium grained; dry; loose; sandy interbeds; trace coarse sand; slightly moist; yellowish brown

(30- 41) SILTY SAND (SM): poorly sorted quartz sand; arkosic; fine to coarse grained; clayey sand interbeds; well sorted fine grained sand interbeds; light brown to yellowish brown

(41- 51) CLAYEY SAND (SC): moderately well sorted quartz sand; arkosic; moderately dense; dry; silty sand interbeds; iron stained; some manganese coatings; yellowish brown

(51- 81) SILTY SANDSTONE: poorly sorted, fine to coarse grained quartz sand; moist; arkosic; loose; permeable; some cobbly beds; unoxidized; mottled; wet at 62 and 70 feet; some thin mudstone interbeds; thin well sorted sand interbeds; greenish gray

Remarks

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Wellhead stickup to top of PVC casing = 2.75 feet

Wind River Formation (bedrock) encountered at a depth of 51 feet.

Depth to water measured to be 67.13 feet below the top of casing on 9/22/2015. First observed water during drilling at a depth of 62 feet.

Obtained water sample during drilling at a depth of 80 feet: pH = 7.25; electrical conductivity = 1.30 mS/cm; temperature = 16.1C.

Notes: This figure presents the completion details for the MW-29 monitoring well. The well lies in Willow Springs Draw south of Tailings Pond 2. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and hollow stem auger methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.5 hours. LA recorded an average pumping discharge of 1.4 gallons per minute during development. Final water quality parameters following development included: pH = 7.32, temperature = 10.5C, and electrical conductivity = 1.27 mS/cm.

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. B
Fort Collins, CO 80525

Project: ANC Tailings
Location: T33N, R90W, Sec. 28 NWSW
Drilled by: Inberg Miller Engineers
Date started: July 21, 2015
Date completed: July 22, 2015

Well Name: MW-30
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy/C. Cannan
Total depth: 79 Ft.
Elev.: 6,464 Ft.

Depth (feet): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80

Well Construction

0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

0-59 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

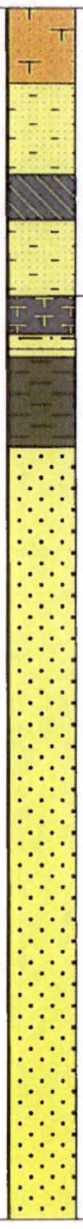
1-56.5 Ft.: 3/8" Bentonite chips

0-80 Ft.: 8 1/4" borehole advanced using hollow stem auger method.

56.5-80 Ft.: 10X20 Silica Sand filter pack

59-79 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

Lithology



(0- 5) CLAYEY SAND (SC): poorly sorted quartz sand that is fine to coarse grained; arkosic; dry; fill(?); dark brown

(5- 11) SILTY SAND (SM): poorly sorted quartz sand; arkosic; dry; loose; trace cobbles; fill?; yellowish brown

(11- 14) SANDY CLAY (CL): clay with poorly sorted quartz sand; dry; soft; topsoil?

(14- 19) SILTY SAND (SM): fine to coarse grained poorly sorted quartz sand with silt; arkosic; dry; yellowish brown

(19- 22) CLAYSTONE: weathered bedrock; stiff, slightly moist clay with fine grained sand intermixed; iron staining along fracture surfaces; light brown and gray

(22- 23) CLAYEY SANDSTONE: moderately well sorted quartz sand with black lithics; slightly moist; iron stained; gray

(23- 23) SANDSTONE: quartz sand; limited permeability; moderately well sorted; fine to medium grained; dry; white to gray

(23- 29) SANDY MUDSTONE: very stiff clay with fine grained sand; impermeable; iron staining on fractures; dry; greenish gray

(29- 80) SILTY SANDSTONE: poorly sorted quartz sand; arkosic; silty; oxidized; dense; mottled; permeable; thin sandy mudstone interbeds; slightly moist; wet at 63 feet; some coarse sand interbeds; yellowish brown

Remarks

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Wellhead stickup to top of PVC casing = 2.83 feet

Wind River Formation (bedrock) encountered at a depth of 19 feet.

Depth to water measured to be 65.34 feet below the top of casing on 9/22/2015. First observed water during drilling at a depth of 63 feet.

Obtained water sample during drilling at a depth of 80 feet: pH = 6.81; electrical conductivity = 4.46 mS/cm; temperature = 17.0C.

Notes: This figure presents the completion details for the MW-30 monitoring well. The well lies immediately south and upgradient of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and hollow stem auger methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers developed the well by swabbing with a surge block, and pumping and surging techniques. The well screens were developed for approximately 1.0 hour. LA recorded an average pumping discharge of 1.3 gallons per minute during development. Final water quality parameters after development included: pH = 7.06, temperature = 10.9C, and electrical conductivity = 4.84 mS/cm.

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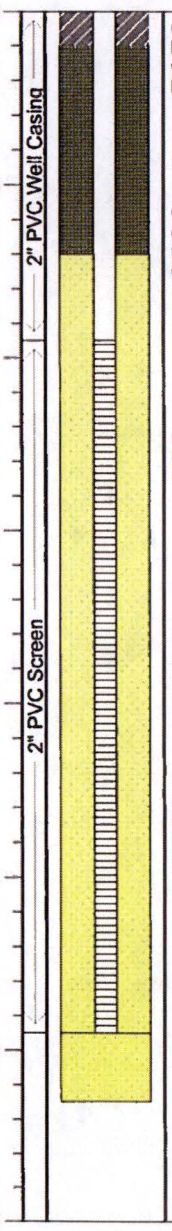
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Project: ANC Tailings
Location: T33N, R90W, Sec. 16 NWSW
Drilled by: Inberg Miller Engineers
Date started: July 17, 2015
Date completed: July 17, 2015

Well Name: MW-31
Drilling Method: Hollow Stem Auger
Logged by: M. Stacy
Total depth: 29.5 Ft.
Elev.: 6,226 Ft.

Depth (feet)

Well Construction



0-1 Ft.: Concrete, placed at land surface around wellhead with above ground lockable cover

1-7 Ft.: 3/8" Bentonite chips

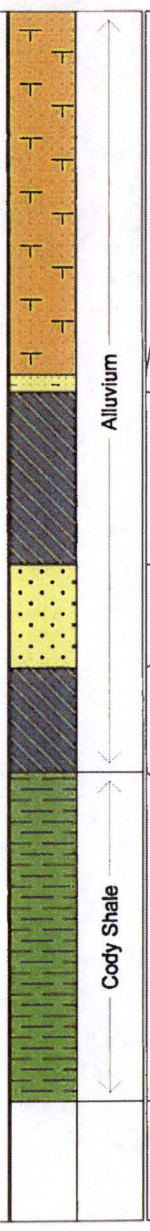
0-9.5 Ft.: Johnson 2" diameter Schedule 40 flush threaded blank PVC well casing

0-31.5 Ft.: 8 1/4" borehole advanced using hollow stem auger method.

7-31.5 Ft.: 10X20 Silica Sand filter pack

9.5-29.5 Ft.: Johnson 2" diameter Schedule 40 flush threaded mill slotted PVC well screen (0.020" slotted), placed with bottom cap

Lithology



(0- 11) CLAYEY SAND (SC): fine grained sand with trace coarse grains and clay; very loose; unconsolidated; rolls into threads due to clay content; less coarse below three feet; white evaporitic deposits between 5 and 6 feet

(11- 11) SILTY SAND (SM): very fine to fine grained quartz sand with silt; loose; dry; well sorted; permeable; 10% black lithics; sand is subrounded in shape

(11- 16) SANDY CLAY (CL): well sorted fine grained sand in clay matrix; stiff; dry; yellow mottling; iron stained; some coarse sand lenses; light brown

(16- 19) SAND (SW): poorly sorted very fine to coarse grained sand; 50% quartz and 50% black lithics; dense; subrounded; permeable; dry; ~10% silt; arkosic; yellow mottling/staining; light brown and black

(19- 22) SANDY CLAY (CL): very fine grained sand in clay matrix; large gypsum crystals; iron staining; minor coal or carbonaceous material; iron concretions; weathered bedrock; moist; thin sand and clay interbeds; sand is oxidized and iron stained; reddish brown, black and yellowish brown

(22- 32) SANDY SHALE: fine grained sand interbedded with dark brown shale; unoxidized; bedrock; dry

Remarks

Drive samples and blow counts collected every five feet starting at a depth of 5 feet.

Wellhead stickup to top of PVC casing = 2.87 feet

Groundwater did not enter the borehole or completed well fast enough for sampling during drilling or for well development. For that reason, the well was not developed at the time of completion.

Depth to water measured to be 23.26 feet below the top of casing on 9/24/2015. First observed water during drilling at a depth of 22 feet.

Notes: This figure presents the completion details for the MW-31 monitoring well. The well lies northeast of Willow Springs Draw north of Tailings Pond 1. Inberg Miller Engineers drilled the well utilizing a CME 85 rig and hollow stem auger methods. Following two inch diameter flush threaded PVC casing and screen installation, Inberg Miller Engineers did not develop the well because it was dry at the time of completion. LA initially developed the well in August 2015. Final water quality parameters from that event included the following: pH = 7.60, temperature = 15.2C, and electrical conductivity = 6.14 mS/cm.

Appendix F

Laboratory Water Quality Reports

Lidstone and Associates, Inc.

August 2015

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

oject: WYDEQ104
Client: ANC
Well No.: PW-1/MW-18
Measuring Point (MP): T.O.C.
Static Water Level from MP: 27.91 = 9.59'
Total Well Depth from MP: 37.50

Date: 8/5/15
Technicians: JVG, AEM
Casing Type/Dia.: 2" PVC
Pump Depth: ~32
Well Volume (WV): 1.57 gal
Total to Evacuate (WVx3): 4.70

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
9:50	0.25	7.40	16.4	5.70	28.05	clear, little cloudy
9:55	0.32	7.46	12.7	5.95	"	flow rate higher?
10:00	0.31	7.41	12.2	5.99	"	20 oz. in 30 sec
10:05	0.28	7.40	12.5	5.99	"	18 oz in 30 sec slowing? clear
10:10	0.25	7.40	12.6	6.01	"	
☆	☆	Sampled	@ 10:	12 ☆	☆	
		Pump off	@	10:29		
	H_2O level	(ft)				H_2O Level Recovery Data
10:29	27.74					Collected w/ Pump in
10:34	27.95	- contents of hose fell back into				Well
10:39	27.94	well when pump shut off				
10:44	27.94	- raised static above original				
10:49	27.94					
10:54	27.94	- pulled out pump @			10:56	
10:59	27.935	- static remained @ 27.94'				
11:04	27.935					
11:09	27.93					
11:14	27.93					
11:19	27.93					
11:24	27.93					
11:29	27.93					

SAMPLE Name: John Cohn Date: 8/5/15 Time: 10:12

Total Minutes Pumped: 39
Total Gallons Pumped: 11.8

Sample Handling:
Type of Analysis: Guideline 8

Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: Yes (No)

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting
4025 Automation Way, Bldg. 1
Fort Collins, CO 80525

Project	WYDEQ 104	Date	8/4/15
Client	ANC	Technicians	JWG, HEM
Well No.	PW-2 / MW-19	Casing Type/Dia.	2" PVC
Measuring Point (MP)	T.O.C.	Pump Depth	~110'
Static Water Level from MP	~~95.04'~~ 95.10'	Well Volume (WV)	4.46 gal
Total Well Depth from MP	122.42' 27.32	Total to Evacuate (WVx3)	13.38 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
11:30	0.25				97.92	94.6' w/pump set
11:40	"	7.76	15.1	5.34	99.10	very cloudy, Gray
11:45	0.156	7.71	16.0	5.45	99.12	slowed pump
11:50	0.125	7.72	15.0	5.45	99.90	
11:55					100.45	
12:00	0.094	7.71	16.5	5.43	100.72	6 oz. in 30 sec
12:05	0.078	7.71	16.9	5.47		5 oz in 30 sec
12:15	1.03	~~pumped dry~~		turned pump	up to Dry	~ 6 gallons pumped so far
~~[illegible]~~	~~[illegible]~~					
12:20	1.03	7.76	12.8	5.40		tape not reading - jammed
12:22	RATE slowed - Got Dirty					
12:25	- Pumped Dry - turned off pump				AND Removed	- put tape in to Recover
12:30	→			→	111.25	
12:32					110.50	
12:35		13:15	103.07		109.38	
12:40		13:20	102.60		108.10	
12:45		13:25	102.22		107.05	
12:50		13:30	101.88		106.05	
12:55					105.35	
13:00	→			→	104.75	
13:05					104.18	
13:10					103.57	

SAMPLE Name: John Gow Date: 8/4/15 Time:

Total Minutes Pumped
Total Gallons Pumped

Sample Handling
Type of Analysis Guidelines 8

Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes No

Comments / Notes:
7:32 pm static = 96.25 - pump set @ ~112' 95.57 w/pump set - 4.25 GALLONS in CASING

TIME	GPM	pH	Temp	COND	DRAWDOWN	Comments
7:52	0.28	7.74	14.5	5.37		Cloudy, Dark, Greenish water
7:58	0.25	7.79	14.1	5.34		
	☆ ☆	☆	sampled	@ 8:00 pm		☆ ☆ ☆
			pump	off @	8:15 pm	

Ground Water Field Sampling Sheet

oject WYDEQ104

Client ANC

Well No. PW-3 / MW-20

Measuring Point (MP) T.O.C.

Static Water Level from MP 26.175

Total Well Depth from MP 62.69' = 36.515'

Date 8/5/15

Technicians JVG, AEM

Casing Type/Dia. 2" PVC

Pump Depth ~ 42' → 48'

Well Volume (WV) 5.86 gal

Total to Evacuate (WVx3) 17.88 gal

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
11:48	0.375	7.88	18.6	4.08	35.40	24.51 static w/pump set
11:53	0.141	7.86	16.4	4.10	36.05	slowed pump
11:58	0.141	7.84	18.0	4.09	37.25	
12:03	0.109	7.84	19.3	4.09	37.92	flow slowing
12:10	0.078				37.55	turned up slightly
12:13	0.25	7.83	19.5	4.07	37.95	lowered pump to ~ 48'
12:20	0.125					
12:25	0.125	7.81	18.0	4.17	40.56'	
12:29		7.77	18.6	4.16	40.70'	7.3 gallons
12:31	0.078	7.78	19.4	4.17	40.70'	
12:36	0.094	7.75	20.0	4.16	40.50'	7.93 gallons
12:41	0.086	7.70	20.2	4.18	40.30'	8.36 gallons
12:51	0.125	7.63	18.3	4.20	42.30'	9.61 "
1:01	0.140	7.65	16.9	4.12	42.65'	19 oz/min 11 gal total
1:11	0.094	7.58	18.7	4.24	42.25'	11.94
1:21	0.102	7.63	19.2	4.22	41.87'	12.96
1:31	0.102	7.60	19.6	4.23	41.72'	14 GAL
1:41	0.102	7.56	20.2	4.25	41.46'	begin filling 1 GAL jugs - 15 GAL
1:51	0.102	7.53	20.0	4.27	42.05'	16 GAL
2:01	0.094	7.55	20.5	4.23	41.42'	17 GAL
2:11	0.094	7.53	18.9	4.23	41.30'	3x casing vol
★★★	Sampling @ 2:15		WELL	OFF @ 2:35		

SAMPLE Name: John Coin Date: 8/5/15 Time:

Total Minutes Pumped 169
Total Gallons Pumped ~ 20 gallons

Sample Handling
Type of Analysis Guideline 8

Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

started sampling @ 1:45 parameters stabilized after 2.5 casing vol's

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting
4025 Automation Way, Bldg. I
Fort Collins, CO 80525

Project: WYDEQ 104
Date: 8/4/15
Client: ANC
Technicians: JVG, AEM
Well No.: PW-4 / MW-21
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~31'
Static Water Level from MP: 25.67
Well Volume (WV): 1.89 gal
Total Well Depth from MP: 37.25 = 11.58'
Total to Evacuate (WVx3): 5.67 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
4:30	0.45	7.03	15.8	2.97	26.95	25.28 w/ pump set
4:33	0.31				27.62	slowed pump
4:36	0.31	7.20	13.5	3.11	28.30	cloudy, milky
4:41	0.25	7.04	13.5	3.04	28.90	slowed pump AGAIN
4:46	0.14	6.64	13.8	2.98	29.52	slowed pump AGAIN
4:55	0.14	6.73	14.6	2.99	29.31	
5:00	"	6.53	15.3	2.94	29.27	
5:05	"	6.35	15.2	2.89	29.37	water getting warm in hose
5:10	"	6.30	15.1	2.89	29.42	
☆	☆ ☆	sampled	@ 5:15	☆ ☆ ☆		
		pump	OFF @	5:40 –	pulled out pump and put level tape in well	
Time	H_2O level (ft)		Time	H_2O level (ft)		
5:41	28.69		6:26	26.50		
5:46	28.19		6:31	26.45		
5:51	27.67		6:36	26.38		
5:56	27.38		6:41	26.35		
6:01	27.16					
6:06	26.97					
6:11	26.81					
~~6:16~~ 6:19	26:63	← taken @	6:19			
6:21	N/A	← skipped				

SAMPLE Name: Down Gain Date: 8/4/15 Time: 5:15 pm

Total Minutes Pumped: 70
Total Gallons Pumped: 12.6
Sample Handling:
Type of Analysis: GUIDELINE 8
Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: Yes / (No)

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. L
Fort Collins, CO 80525

oject: WYDEQ 104
Client: ANC
Well No.: PW-5 / MW-22
Measuring Point (MP): T.O.C.
Static Water Level from MP: 27.71'
Total Well Depth from MP: 42.07' = 14.36'

Date: 8/5/15
Technicians: JVG, AEM
Casing Type/Dia.: 2" PVC
Pump Depth: ~34' → 38'
Well Volume (WV): 2.34 gal
Total to Evacuate (WVx3): 7.03 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
7:06	0.28				29.10	27.35' w/ pump set
7:09	0.28				29.40	little milky
7:11	0.28	7.91	16.1	3.97	30.15	1.4 GAL
7:13	0.22				30.70	
7:15	0.22	8.04	14.3	3.93	31.10	1 casing volume - 2.28 gal
7:17	0.17				31.60	3.13 GALLONS
7:20	0.17	8.04	13.9	3.98	N/A	slowed pump to trickle - water level (w/ pump)
7:23	0.09				32.35	lowered pump to 38'
7:25	0.09				32.70'	3.58 GAL
7:29	0.09	8.05	15.1	4.07	33.17	3.94 GAL
7:33	0.08				33.48'	4.26 GAL
7:38	0.08	8.04	16.0	4.02	33.67'	4.66 GAL
7:45	0.08	8.01	17.0	4.04	33.90'	5.22 GAL
7:49	0.07	8.01	18.0	4.05	34.20'	5.5 GAL
7:59	0.05	8.00	18.4	4.05	34.75	6.2 GAL
8:09	0.05	8.01	16.2	4.04	35.6	6.7 GAL - STARTED SAMPLING
8:19	0.05	8.00		4.04	N/A	7.2 GAL - (3) CASINGS
8:29	0.04	8.02	16.8	4.03	N/A	1 GALLON FULL 7.6
8:39	0.03					
8:49	0.03	8.01	17.1		N/A	
8:59	0.03					2 GALLON FULL - 8.5 GAL
9:15	0.03	8.02	17.0	4.06	N/A	BOTTLES FULL - 9 GAL

SAMPLE Name: JOHN GOTN Date: 8/5/15 Time: 8:19 pm

Total Minutes Pumped: 134
Total Gallons Pumped: 9.1 GALLONS
Sample Handling:
Type of Analysis: Guideline 8
Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: (Yes) / No

Comments / Notes:

BEGAN FILLING (1) GALLON JUGS @ 8:09 p.m.
Sampled @ 8:19
Filled Bottles @ 9:15
pumped Well Dry

9:20 pump off

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting
4025 Automation Way, Bldg. 1
Fort Collins, CO 80525

Project: WYDEQ104
Date: 8/5/15
Client: ANC
Technicians: JVG, AEM
Well No.: PW-6 / MW-23
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~16'
Static Water Level from MP: 9.08'
Well Volume (WV): 2.21 GAL
Total Well Depth from MP: 22.63' = 13.55'
Total to Evacuate (WVx3): 6.63 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
5:19	0.56				10.77'	9.08' w/ pump set
5:20	"	7.08	16.9	2.52	10.80'	
5:23	"	7.42	12.1	2.57	11.10'	
5:25	0.56				11.30'	
5:28	"	7.28	10.9	2.59	11.51'	Running clear
5:30	0.56				11.62'	(3) casing vols
5:32	"	7.28	10.8	2.59	11.70'	
5:35					11.86'	
5:37		7.29	10.6	2.59	11.92'	
★★★	SAMPLED @		5:38	★★★★	12.12'	Pump off @ 5:49
						pumped down to begin
TIME	H_2O level (ft)		TIME	H_2O level (ft)		recovery to 13.5'
5:49	10.72'		6:25	9.72'		
5:50	10.82'		6:30	9.67		
5:51	10.68'		6:35	9.62'		level went down first
5:53	10.50'		6:40	9.59'		when hose emptied
5:55	10.35'		6:45	9.56'		into well 5:49 → 5:50
6:00	10.16'		6:50	9.53'		
6:05	10.03'					
6:10	9.92					
6:15	9.84					
6:20	9.76					

SAMPLE Name: JOHN GOIN Date: 8/5/15 Time:

Total Minutes Pumped: 30
Total Gallons Pumped: 16.9 gal
Sample Handling:
Type of Analysis: Guideline 8
Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: Yes (No)

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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4025 Automation Way, Bldg. I.
Fort Collins, CO 80525

Project	WYDEQ 104	Date	8/4/15
Client	ANC	Technicians	JVG, AEM
Well No.	PW-7 / MW-24	Casing Type/Dia.	2" PVC
Measuring Point (MP)	T.O.C.	Pump Depth	24' ~
Static Water Level from MP	21.30'	Well Volume (WV)	0.944 gal
Total Well Depth from MP	27.09' (=5.79')	Total to Evacuate (WVx3)	2.83 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
1:50		Pump	ON			21.25 w/ pump set
1:52	0.5	7.38	16.0	8.95	tape cannot	read b/c hitting pump
1:57	0.48	7.40	13.1	9.28	"	"
2:01	0.45	slowed pump down slightly				
2:02	0.25	7.39	12.9	9.33		little milky
2:07	0.28	7.37	13.0	9.06		
2:12	0.28	7.36	12.7	9.06		cleared up
☆☆☆		samples	@ 2:15	☆☆☆		
		Pump	OFF @	2:30		
Time	H_2O Level (ft)		Note			
12:30	23.15		Pump off at 12:30 – pulled out to			insert level tape
2:32	22.53					
2:35	22.08					
2:40	21.80		Time	H_2O Level (ft)		
2:45	21.71		3:25	21.55		
2:50	21.66		3:30	21.545		
2:55	21.63					
3:00	21.61					
3:05	21.595					
3:10	21.58					
3:15	21.575					
3:20	21.56					

SAMPLE Name: John Goin Date: 8/4/15 Time: 2:15 pm

Total Minutes Pumped 40
Total Gallons Pumped 13.3
Sample Handling
Type of Analysis Guideline 8
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Stickup = 2' on 2 4"

Ground Water Field Sampling Sheet

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Fort Collins CO 80525

Project: WYDEQ 104
Date: 8/5/15
Client: ANC
Technicians: JVG, AEM
Well No.: PW-8 / MW-25
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~40'
Static Water Level from MP: 32.02'
Total Well Depth from MP: 45.19 = 13.17'
Well Volume (WV): 2.15 gal
Total to Evacuate (WVx3): 6.45 gal

Volume factor: 2" 0.163 gal/ft; 4" 0.653 gal/ft; 5" 1.02 gal/ft; 6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
3:05	0.66				33.25	31.95 w/ pump set
3:08	0.66	7.62	16.4	3.77	33.85	
3:10	0.66				34.35	somewhat clear
3:12	0.66	7.54	13.5	4.45	34.80	
3:14	0.66	7.45	12.7	5.30	35.17	
3:15	0.66				35.35	slowed pump
3:16	0.44				35.20	Evacuated (3) casing vol's
3:18	0.44	7.41	13.4	5.40	35.10	
3:21	"	7.41	13.4	5.66	34.95	
3:25	"	7.39	13.3	5.70	34.87	
3:30	0.44	7.39	13.2	5.71	34.79'	
☆☆☆ sampled @ 3:30 ☆☆☆					34.62	pump off @ 3:45
						pumped down to begin recovery
TIME	H_2O level (ft)		TIME	H_2O level (ft)		to 36.60'
3:46	34.60		4:26	32.06		
3:51	32.90		4:31	32.055		
3:56	32.26		4:36	32.055		
4:01	32.12		4:41	32.055		
4:06	32.085		4:46			
4:01	32.08					
4:16	32.065					
4:21	32.065					

SAMPLE Name: DOWN GOW Date: 8/5/15 Time: 3:30 pm

Total Minutes Pumped: 40 MIN
Total Gallons Pumped: ~20 gal
Sample Handling:
Type of Analysis: Guideline 8
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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4025 Automation Way, Bldg. F
Fort Collins, CO 80525

oject: WYDEQ104
Date: 8/6/15
Client: ANC
Technicians: JVG, AEM
Well No.: PW-9 / MW-26
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~ 56
Static Water Level from MP: 45.21'
Well Volume (WV): 2.85 gal
Total Well Depth from MP: 62.71' = 17.50'
Total to Evacuate (WVx3): 8.57 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
2:02	0.22				46.85'	44.77' w/ pump set
2:04	0.22				47.36	clear
2:06	0.22	8.34	18.3	1669	48.0	slowed pump 0.9 GAL(or)
2:08	0.13				48.45	GRAY, cloudy
2:12	0.13	8.42	17.1	1700	49.17	1.7 GAL dirty water
2:14	0.11	8.42	17.4	1760	49.38	1.9 GAL
2:18	0.08	8.43	18.1	1782	49.67	2.2 GAL
2:24	0.08				50.00	2.72 GAL (1) CASING VOL
2:35	0.09	8.28	17.1	1627	51.22	3.66 GAL
2:45	0.08	8.13	19.0	1548	51.72	4.44 GAL
2:57	0.08	8.08	20.1	1581	51.65	5.38 GAL
3:10	0.08	8.08	20.2	1545	51.72	6.42 GAL
3:17	0.19				51.90'	flow slows - turned up pump ~7 GAL
3:20	0.19	8.06	18.9	1541	52.15	cleared 7.6 GAL
3:23	0.17				N/A	slowed pump 8.3 GAL
3:26	0.16	8.07	17.7	1451	N/A	(3) CASING vol's 8.6 GAL
3:31	0.09	8.05	19.8	1465	52.75	
3:35	0.09	8.06	19.0	1460	52.75	9.4 GALLONS
★★★	sampled @		3:40	★★★★		
	pump	OFF @	4:07			

SAMPLE Name: JOHN GOIN Date: 8/6/15 Time: 3:40

Total Minutes Pumped: 125
Total Gallons Pumped: ~12.3
Sample Handling:
Type of Analysis: GUIDELINE 8
Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: Yes (No)

Comments / Notes:

Ground Water Field Sampling Sheet

Sampled @ 10:40 a.m.

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Fort Collins, CO 80525

Project: WYDEQ 104
Date: 8/6/14
Client: ANC
Technicians: JVG, AEM
Well No.: PW-10 / MW-27
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~65'
Static Water Level from MP: 39.68 = 49.28'
Well Volume (WV): 7.72 Gal
Total Well Depth from MP: 86.96
Total to Evacuate (WVx3): 23.15 Gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
9:22	0.375				44.60'	37.6 w/ pump set
9:25	0.28	7.00	14.3	3.44	46.95'	1.125 Gal
9:28	0.27				49.10	Clear 34 oz/min - 1.93 Gal
9:30	0.27	7.05	13.3	3.42	49.90'	2.48 Gal
9:32	0.19				49.85'	2.86 Gal
9:35	0.19	7.05	13.9	3.41	49.90'	3.45 Gal
9:40	0.20	7.07	13.8	3.39	49.85	4.46 Gal Cloudy - milky
9:50	0.19	7.09	14.4	3.46	50.5'	6.34 Gal Gray - cloudy
9:53	0.375				52.20'	flow stopped - turned pump up
9:55	0.375				51.20'	flow slowed - Erratic flow
10:00	0.53	7.04	12.8	3.46	52.15	9.76 Gal
10:04	0.375				54.6'	11.26 Gal
10:05	0.08				52.6'	11.34 Gal - turned pump up
10:07	0.47					12.7 Gal
10:09	0.08	7.04	13.5	3.52	54.10	12.8
10:10	0.5				55.15	13.3
10:14	0.5				56.65	15.3 (2) casings stable
10:15	0.5	7.02	12.7	3.52	57.30'	15.8 - flow slowed to trickle rising
10:20	0.56				54.90'	10:16-10:19 very slow - 16 Gal
10:25	"	6.93	13.7	3.26	58.10'	18.8 Gal 10:27 flow slowed - 19.8 Gal
10:35	0.56	6.91	12.9	3.76	55.20'	10:27-10:32 slow - 20.3 + 1.7 = 22.0 Gal
10:40	"	6.86	12.8	3.83	59.50'	Sampled @ 10:40 - pump off 10:57

SAMPLE Name: JOHN GOIN Date: 8/6/15 Time: 10:40

Total Minutes Pumped: 95
Total Gallons Pumped: ~31 Gallons
Sample Handling:
Type of Analysis: Guideline 8
Method: Bailer (Pump) Grab
Bailed/Pumped Dry?: Yes / (No)

Comments / Notes:

Time	H_2O level	Time	H_2O level	Time	H_2O level
10:59	58.50'	11:10	45.80'	11:35	40.35
11:00	56.20	11:15	43.25'	11:40	N/A sorry!
11:01	54.25'	11:20	41.95'	11:45	40.1'
11:02	53.30'	11:25	41.12'	11:50	N/A
11:03	51.80'	11:30	40.68'	11:55	39.99
11:05	49.60				

pumped down to begin recovery

Ground Water Field Sampling Sheet

oject WYDEQ104

Client ANC

Well No. PW-12 / MW-28

Measuring Point (MP) T.O.C.

Static Water Level from MP 40.78

Total Well Depth from MP 56.43' = 15.65

Date 8/6/15

Technicians JVG, AEM

Casing Type/Dia. 2"

Pump Depth ~48'

Well Volume (WV) 2.55 GAL

Total to Evacuate (WVx3) 7.66 GAL

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Fort Collins, CO 80525

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
4:40	0.75					40.8 w/ pump set
4:41	~~0.84~~				41.15	
4:44		6.54	13.5	4.53	"	3 GALLONS (1) CASING
4:46	1.125				41.22	INCREASE FLOW RATE - 4.5 GAL
4:48	"	6.63	11.4	4.53		6.75 GAL
4:50	"	6.57	10.8	4.53	41.27	9 GAL (3) CASING VOL'S
4:54	1.125	6.57	10.7	4.53	"	13.5 GAL little cloudy
4:58	"	6.54	10.7	4.50	"	
5:00		6.55	11.3	4.51	"	20.25 GALLONS
5:02		6.55	10.6	4.52	"	22.5 GALLONS
☆ ☆ ☆		SAMPLED	@ 5:03	☆ ☆	☆	
		PUMP	OFF @	5:08		PUMPED DOWN before RECOVERY
TIME	H_2O level (ft)		TIME	H_2O level (ft)		
5:15	40.90		5:45	40.805		PULLED PUMP OUT to START RECOVERY
5:16	40.85		5:50	40.805		
5:17	40.85		5:55	40.805		
5:18	40.83		6:00	40.805		
5:20	40.825		6:05	40.805		
5:25	40.81		6:10	40.805		
5:30	40.81		6:15	40.805		
5:35	40.81					
5:40	40.805					

SAMPLE Name: JOHN GOIN Date: 8/6/15 Time: 5:03

Total Minutes Pumped 28
Total Gallons Pumped 29.25

Sample Handling
Type of Analysis GUIDELINE 8

Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: Yes / (No)

Comments / Notes:

Ground Water Field Sampling Sheet

Project: WYDEQ104
Date: 8/3/15
Client: ANC
Technicians: JVG, AEM
Well No.: PW-13 / MW-29
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C
Pump Depth: 75'
Static Water Level from MP: 67.13' -14.49'
Well Volume (WV): 2.36 gal
Total Well Depth from MP: 81.62
Total to Evacuate (WVx3): 7.09 gal

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Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
6:25	0.47	7.36	12.6	1262	68.3	67.08 static w/pump set
6:35	0.44	7.24	11.6	1248	68.25	milky
6:40	0.44	7.27	11.7	1231	68.30	clearing
6:45	0.44	7.25	11.5	1239	68.38	"
6:50	0.44	7.22	11.4	1250	68.36	
6:55	0.44	7.24	11.3	1239	68.38	
☆ ☆	☆	sampled @		6:58 ☆	☆ ☆	
	Pump OFF	@ 7:07 - LEFT IN WELL			68.38	
7:09					67.22	
7:14					67.19	
7:19					67.17	
7:24					67.16	
7:29					67.16'	
7:34					67.16'	
7:39					67.15'	
7:44					67.15'	
7:49					67.15	
7:54					67.15	
7:59					67.15	
8:04					67.15	
8:09					"	

SAMPLE Name: John Gorr Date: 8/3/15 Time: 6:58 pm

Total Minutes Pumped: 42
Total Gallons Pumped: 18.8
Sample Handling:
Type of Analysis: Gasoline 8
Method: Bailer (Pump) / Grab
Bailed/Pumped Dry?: Yes (No)

Comments / Notes:

Ground Water Field Sampling Sheet

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oject: WYDEQ104
Date: 8/3/15
Client: ANC
Technicians: JVG, AEM
Well No.: PW-14/MW-30
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: 75'
Static Water Level from MP: 65.30 = 16.32'
Well Volume (WV): ~~0.375~~ 2.66 gal
Total Well Depth from MP: 81.62
Total to Evacuate (WVx3): = 8 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
4:25	0.91	7.22	12.5	4.33	66.0	started brown
4:35	0.875	7.22	11.5	4.37	66.05	
4:40	0.875	7.12	11.3	4.43	66.11	clears
4:45	0.875	7.13	11.3	4.51	66.16	
☆	☆ ☆	sample	d @	4:50 ☆	☆ ☆	
4:55	- pump	OFF	- Left	in well	66.25	
5:00					65.51	
5:05					65.51	
5:10					65.47	
5:15					65.45	
5:20					65.42	
5:25					65.42	
5:30					65.40	
5:35					65.40	
5:40					65.395	
5:45					65.39	
5:50					65.38	
5:55					65.38	

SAMPLE Name: John Goir Date: 8/3/15 Time: 4:50 pm

Total Minutes Pumped: 30
Total Gallons Pumped: 18.4
Sample Handling:
Type of Analysis: Guidance 8
Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: Yes / (No)

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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Project: WyDEQ104
Date: 8/4/15
Client: ANC
Technicians: JVG, AEM
Well No.: PW-15/MW-31
Casing Type/Dia.: 2" PVC
Measuring Point (MP): TOC
Pump Depth: ~28 ft
Static Water Level from MP: 23.31
Well Volume (WV): 1.51 gal
Total Well Depth from MP: ~~30~~ 32.58
Total to Evacuate (WVx3): 4.53

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
3:50	0.6				23.39	23.09 w/ pump set
3:55	"				water level below pump	
3:56	0.56	7.40	14.0	4.97	"	
4:00	"	7.45	11.5	5.74	"	
4:04	pumped Dry		– pumped 7.8 Gallons – will			return
4:04		7.56	12.5	6.99		
6:50 pm	static = 29.30'		= 3.28'	of water =	0.53 gallons in	well. pump @ 31'
7:00 pm	0.20					start pump very slow
7:08	0.19	7.60	15.2	6.14	N/A	set just off bottom of well
7:11	"		pumped	Dry – took ± 2 gallons		out
		Could	not	sample		
9:17				Static =	31.08 when	leaving

SAMPLE Name: John Goin Date: 8/4/15 Time: _____

Total Minutes Pumped _____ Sample Handling _____ Method: Bailer / Pump / Grab
Total Gallons Pumped _____ Type of Analysis _____ Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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Project	WYDEQ104	Date	8/4/15
Client	ANC	Technicians	JVG AEM
Well No.	TP 2-3	Casing Type/Dia.	5" PVC
Measuring Point (MP)	T.O.C. (Arrow)	Pump Depth	~ 130'
Static Water Level from MP	107.37' .7453	Well Volume (WV)	76 gal
Total Well Depth from MP	181.9'	Total to Evacuate (WVx3)	227 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
9:20	1.59	7.73	11.5	1704	107.78	107.38' w/ pump set
9:28	1.59	7.64	10.9	1700	107.82	clear
9:35	1.59	7.57	10.9	1795	107.82	"
9:40	1.59	7.49	11.0	1881	107.83	
9:45	1.50	7.38	10.9	1928	107.84	
9:50	1.50	7.42	10.8	1959	107.86	
9:55	1.50	7.40	10.8	1986	107.86	
10:00	1.50	7.40	10.8	2200	107.86	
10:05	1.31	7.40	10.9	2250	107.87	
10:10	1.31	7.38	10.9	2280	"	
10:15	1.31	7.38	10.8	2330	107.88	
10:20	"	7.38	10.8	2360	"	
10:25	"	7.34	10.9	2370	107.89	
*	* sampled @		10:28			
	pump off @		10:32			

SAMPLE Name: John Goin Date: 8/4/15 Time: 10:28

Total Minutes Pumped 72
Total Gallons Pumped 103.7

Sample Handling
Type of Analysis Guideline 8

Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Project: WYDEQ 104
Date: 8/6/14
Client: ANC
Technicians: JVG, AEM
Well No.: MW-12
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~ 37'
Static Water Level from MP: 32.11
Well Volume (WV): 1.66 GAL
Total Well Depth from MP: 42.30' = 10.19'
Total to Evacuate (WVx3): 4.99 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
1:02	0.3125				32.72	32.08' w/ pump set
1:05	"	6.83	20.0	3.65	32.70'	
1:07	"				32.70'	increase pumping rate 1.56 Gp
1:08	0.56	6.91	14.1	3.89	33.05	
1:11	0.50	6.83	12.9	3.91	33.05	3.5 GALLONS
1:14	"	6.79	12.6	3.92	33.05	(3) CASING VOL'S
1:17		6.78	12.5	3.93		RUNNING CLEAR
***	SAMPLED	@	1:18 pm	***		
1:29	PUMP	OFF				

SAMPLE Name: JOHN GOIN Date: 8/6/15 Time:

Total Minutes Pumped: 27
Total Gallons Pumped: 12.5
Sample Handling:
Type of Analysis: Guideline 8
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Inter-Mountain Labs
Sheridan, WY and Gillette, WY

CHAIN OF CUSTODY RECORD

All shaded fields must be completed.
This is a legal document: any misrepresentation may be construed as fraud.

Page # 161504

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
ANC- LIDSTONE		John Goin	970-690-2925

Report Address
4025 Automation Way, Bldg E
Fort Collins, Co 80525

Contact Name John Goin
Email jug@lidstone.com
Phone 970-690-2925

Invoice Address " " "

Purchase Order #

Quote #

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	REMARKS
1	S1508037-01	8/3/15	19:00	PW-13/MW-29	WT	7	
2	02	8/3/15	16:50	PW-14/MW-30	WT	7	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							

2005 Guideline 8 plus Beryllium and Thorium 230

Do not ~~sample~~ Analyze for SAR, Nitrate, Alkalinity

Uranium will be Analyzed for Dissolved

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
3.5	John Goin	8/3	22:00	Kathy Bay	8.4.15	12:21

SHIPPING INFO	MATRIX CODES		TURNAROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☐ UPS	Water	WT	**Check desired service**	Compliance Monitoring? (Y)/N	
☐ Fed Express	Soil	SL	☐ Standard turnaround	Program (SDWA, NPDES,...) WDEQ	
☐ US Mail	Solid	SD	☐ **RUSH - 5 Working Days**	PWSID / Permit #	
☐ Hand Carried	Filter	FT	☒ **URGENT** - < 2 Working Days	Chlorinated? Y/(N)	
☐ Other _____	Other	OT	***Rush & Urgent Surcharges will be applied***	Sample Disposal: Lab ☒ Client	

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 9/1/2015

CLIENT: Lidstone & Associates Inc
Project: ANC
Lab Order: S1508037

CASE NARRATIVE

Report ID: S1508037001

Samples PW-13, and PW-14 were received on August 4, 2015.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition
40 CFR Parts 136 and 141
40 CFR Part 50, Appendices B, J, L, and O
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Qualifiers by sample

S1508036-002 - Cations by ICP (Method 200.7)/Potassium - Spike Recovery outside accepted recovery limits

Reviewed by:
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 8/18/2015
Report ID S1508037001

ProjectName: ANC
Lab ID: S1508037-001
ClientSample ID: PW-13 /MW-29
COC: 161504

WorkOrder: S1508037
CollectionDate: 8/3/2015 7:00:00 PM
DateReceived: 8/4/2015 12:21:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	220	mg/L		5	SM 2320B	08/11/2015 1445	LJK
Alkalinity, Bicarbonate as HCO3	ND	mg/L		5	SM 2320B	08/11/2015 1445	LJK
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/11/2015 1445	LJK
Chloride	2	mg/L		1	EPA 300.0	08/05/2015 017	AB
Fluoride	0.3	mg/L		0.1	EPA 300.0	08/05/2015 017	AB
Nitrate+Nitrite as N	ND	mg/L		0.1	EPA 300.0	08/05/2015 017	AB
Sulfate	443	mg/L		1	EPA 300.0	08/05/2015 044	AB
Calcium	191	mg/L		1	EPA 200.7	08/05/2015 1051	DG
Magnesium	20	mg/L		1	EPA 200.7	08/05/2015 1051	DG
Potassium	12	mg/L		1	EPA 200.7	08/05/2015 1051	DG
Sodium	32	mg/L		1	EPA 200.7	08/05/2015 1051	DG
Nitrogen, Ammonia (As N)	0.1	mg/L		0.1	EPA 350.1	08/05/2015 1354	AMB
Silica as SiO2	27	mg/L		1	EPA 200.7	08/05/2015 1051	DG
General Parameters							
pH	8.3	s.u.		0.1	SM 4500 H B	08/11/2015 1445	LJK
Electrical Conductivity	1140	µmhos/cm		5	SM 2510B	08/11/2015 1445	LJK
Total Dissolved Solids (180)	940	mg/L		10	SM 2540	08/04/2015 1455	TS
Sodium Adsorption Ratio	0.6			0.1	Calculation	08/25/2015 1445	WN
Data Quality							
Cation Sum	12.83	meq/L		0.01	SM 1030E	08/25/2015 1445	WN
Anion Sum	13.68	meq/L		0.01	SM 1030E	08/25/2015 1445	WN
Cation-Anion Balance (± 5%)	3.20	%		0.01	SM 1030E	08/25/2015 1445	WN
Solids, Total Dissolved (Calc)	860	mg/L		10	SM 1030E	08/25/2015 1445	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.09	dec. %		0.01	Calculation	08/25/2015 1450	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 8/18/2015
Report ID S1508037001

ProjectName: ANC
Lab ID: S1508037-001
ClientSample ID: PW-13 /MW-29
COC: 161504

WorkOrder: S1508037
CollectionDate: 8/3/2015 7:00:00 PM
DateReceived: 8/4/2015 12:21:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/05/2015 1051	DG
Arsenic	ND	mg/L		0.001	EPA 200.8	08/05/2015 023	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/05/2015 023	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/05/2015 1051	DG
Boron	ND	mg/L		0.1	EPA 200.7	08/05/2015 1051	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/05/2015 023	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/05/2015 1051	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/05/2015 023	MS
Iron	0.62	mg/L		0.05	EPA 200.7	08/05/2015 1051	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/05/2015 023	MS
Manganese	0.37	mg/L		0.02	EPA 200.7	08/05/2015 1051	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/07/2015 1000	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/05/2015 023	MS
Nickel	ND	mg/L		0.01	EPA 200.7	08/05/2015 1051	DG
Selenium	ND	mg/L		0.001	EPA 200.8	08/05/2015 023	MS
Uranium	0.0114	mg/L		0.0003	EPA 200.8	08/05/2015 023	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/05/2015 023	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/05/2015 1051	DG
Metals - Total							
Iron	1.25	mg/L		0.05	EPA 200.7	08/05/2015 1454	DG
Manganese	0.41	mg/L		0.02	EPA 200.7	08/05/2015 1454	DG

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 8/18/2015
Report ID S1508037001

ProjectName: ANC
Lab ID: S1508037-001
ClientSample ID: PW-13 /MW-29
COC: 161504

WorkOrder: S1508037
CollectionDate: 8/3/2015 7:00:00 PM
DateReceived: 8/4/2015 12:21:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	17.3	pCi/L		2	SM 7110B	08/13/2015 1615	MB
Gross Alpha Precision (±)	3.0	pCi/L			SM 7110B	08/13/2015 1615	MB
Gross Beta	18.4	pCi/L		3	SM 7110B	08/13/2015 1615	MB
Gross Beta Precision (±)	3.3	pCi/L			SM 7110B	08/13/2015 1615	MB
Radium 226	3.2	pCi/L		0.2	SM 7500 Ra-B	08/11/2015 1755	MB
Radium 226 Precision (±)	0.2	pCi/L			SM 7500 Ra-B	08/11/2015 1755	MB
Radium 228	1.9	pCi/L		1	Ga-Tech	08/12/2015 2124	MB
Radium 228 Precision (±)	1.1	pCi/L			Ga-Tech	08/12/2015 2124	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/11/2015 1701	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/11/2015 1701	MB
Thorium 229 Tracer (30-120)	100	%			ACW10	08/11/2015 1701	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

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Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 8/18/2015
Report ID S1508037001

ProjectName: ANC
Lab ID: S1508037-002
ClientSample ID: PW-14/MW-30
COC: 161504

WorkOrder: S1508037
CollectionDate: 8/3/2015 4:50:00 PM
DateReceived: 8/4/2015 12:21:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	371	mg/L		5	SM 2320B	08/11/2015 1454	LJK
Alkalinity, Bicarbonate as HCO3	ND	mg/L		5	SM 2320B	08/11/2015 1454	LJK
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/11/2015 1454	LJK
Chloride	364	mg/L		1	EPA 300.0	08/05/2015 058	AB
Fluoride	0.5	mg/L		0.1	EPA 300.0	08/05/2015 031	AB
Nitrate+Nitrite as N	41.9	mg/L		0.1	EPA 300.0	08/05/2015 058	AB
Sulfate	1350	mg/L		1	EPA 300.0	08/05/2015 058	AB
Calcium	406	mg/L		1	EPA 200.7	08/05/2015 1053	DG
Magnesium	35	mg/L		1	EPA 200.7	08/05/2015 1053	DG
Potassium	16	mg/L		1	EPA 200.7	08/05/2015 1053	DG
Sodium	473	mg/L		1	EPA 200.7	08/05/2015 1053	DG
Nitrogen, Ammonia (As N)	0.3	mg/L		0.1	EPA 350.1	08/05/2015 1355	AMB
Silica as SiO2	29	mg/L		1	EPA 200.7	08/05/2015 1053	DG
General Parameters							
pH	8.1	s.u.		0.1	SM 4500 H B	08/11/2015 1454	LJK
Electrical Conductivity	3390	µmhos/cm		5	SM 2510B	08/11/2015 1454	LJK
Total Dissolved Solids (180)	3350	mg/L		10	SM 2540	08/04/2015 1457	TS
Sodium Adsorption Ratio	6.0			0.1	Calculation	08/25/2015 1445	WN
Data Quality							
Cation Sum	44.12	meq/L		0.01	SM 1030E	08/25/2015 1445	WN
Anion Sum	48.70	meq/L		0.01	SM 1030E	08/25/2015 1445	WN
Cation-Anion Balance (± 5%)	4.94	%		0.01	SM 1030E	08/25/2015 1445	WN
Solids, Total Dissolved (Calc)	3080	mg/L		10	SM 1030E	08/25/2015 1445	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.09	dec. %		0.01	Calculation	08/25/2015 1450	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 8/18/2015
Report ID S1508037001

ProjectName: ANC
Lab ID: S1508037-002
ClientSample ID: PW-14 /MW-30
COC: 161504

WorkOrder: S1508037
CollectionDate: 8/3/2015 4:50:00 PM
DateReceived: 8/4/2015 12:21:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/05/2015 1053	DG
Arsenic	ND	mg/L		0.001	EPA 200.8	08/05/2015 028	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/05/2015 028	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/05/2015 1053	DG
Boron	0.3	mg/L		0.1	EPA 200.7	08/05/2015 1053	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/05/2015 028	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/05/2015 1053	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/05/2015 028	MS
Iron	ND	mg/L		0.05	EPA 200.7	08/05/2015 1053	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/05/2015 028	MS
Manganese	0.13	mg/L		0.02	EPA 200.7	08/05/2015 1053	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/07/2015 1002	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/05/2015 028	MS
Nickel	0.01	mg/L		0.01	EPA 200.7	08/05/2015 1053	DG
Selenium	0.109	mg/L		0.001	EPA 200.8	08/05/2015 028	MS
Uranium	0.840	mg/L		0.0003	EPA 200.8	08/05/2015 028	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/05/2015 028	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/05/2015 1053	DG
Metals - Total							
Iron	0.12	mg/L		0.05	EPA 200.7	08/05/2015 1456	DG
Manganese	0.20	mg/L		0.02	EPA 200.7	08/05/2015 1456	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 8/18/2015
Report ID S1508037001

ProjectName: ANC
Lab ID: S1508037-002
ClientSample ID: PW-14 /MW-30
COC: 161504

WorkOrder: S1508037
CollectionDate: 8/3/2015 4:50:00 PM
DateReceived: 8/4/2015 12:21:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	282	pCi/L		2	SM 7110B	08/13/2015 1615	MB
Gross Alpha Precision (±)	25.9	pCi/L			SM 7110B	08/13/2015 1615	MB
Gross Beta	118	pCi/L		3	SM 7110B	08/13/2015 1615	MB
Gross Beta Precision (±)	16.9	pCi/L			SM 7110B	08/13/2015 1615	MB
Radium 226	4.1	pCi/L		0.2	SM 7500 Ra-B	08/11/2015 1357	MB
Radium 226 Precision (±)	0.3	pCi/L			SM 7500 Ra-B	08/11/2015 1357	MB
Radium 228	2.2	pCi/L		1	Ga-Tech	08/12/2015 1823	MB
Radium 228 Precision (±)	1.1	pCi/L			Ga-Tech	08/12/2015 1823	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/11/2015 1701	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/11/2015 1701	MB
Thorium 229 Tracer (30-120)	100	%			ACW10	08/11/2015 1701	MB

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508037
Project: ANC

Date: 9/1/2015
Report ID: S1508037001

Alkalinity Sample Type **MBLK** Units: mg/L

MB-R125280 (08/11/15 14:45) RunNo: 125280

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Alkalinity, Total (As CaCO3)	ND	5					

Alkalinity Sample Type **LCS** Units: mg/L

LCS (08/11/15 14:45) RunNo: 125280

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Alkalinity, Total (As CaCO3)	602	5	595		101	90 - 110	

Alkalinity Sample Type **DUP** Units: mg/L

S1508070-004A (08/05/15 18:29) RunNo: 124547

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Alkalinity, Bicarbonate as HCO3	1030	5	1030	0.00530		20	
Alkalinity, Carbonate as CO3	ND	5	ND			20	
Alkalinity, Hydroxide as OH	ND	5	ND			20	
Alkalinity, Total (As CaCO3)	845	5	845	0.00530		20	

Conductivity Sample Type **MBLK** Units: µmhos/cm

MB-R125280 (08/11/15 14:45) RunNo: 125280

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Electrical Conductivity	ND	5					

Conductivity Sample Type **LCS** Units: µmhos/cm

LCS (08/11/15 14:45) RunNo: 125280

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Electrical Conductivity	1030	5	1060		97.3	90 - 110	

Conductivity Sample Type **DUP** Units: µmhos/cm

S1508070-009A (08/05/15 19:45) RunNo: 124547

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Electrical Conductivity	4960	5	4950	0.202		20	

ualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508037
Project: ANC

Date: 9/1/2015
Report ID: S1508037001

Dissolved Mercury by EPA 245.1 - Water Sample Type **MBLK** Units: mg/L

LRB (08/07/15 10:56) RunNo: 124629

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Mercury	ND	0.001					

Dissolved Mercury by EPA 245.1 - Water Sample Type **LCS** Units: mg/L

LCS (08/07/15 09:43) RunNo: 124629

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Mercury	0.002	0.001	0.002		90.0	85 - 115	

Dissolved Mercury by EPA 245.1 - Water Sample Type **MS** Units: mg/L

S1508036-002C (08/07/15 09:50) RunNo: 124629

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Mercury	0.002	0.001	0.00197	ND	89.1	70 - 130	

Dissolved Mercury by EPA 245.1 - Water Sample Type **MSD** Units: mg/L

S1508036-002C (08/07/15 09:52) RunNo: 124629

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Mercury	0.002	0.001	0.002	1.01	88.2	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508037
Project: ANC

Date: 9/1/2015
Report ID: S1508037001

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **MBLK** Units: mg/L

MBLK DISS/CAT (08/05/15 09:02) RunNo: 124539

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Aluminum	ND	0.1					
Beryllium	ND	0.01					
Boron	ND	0.1					
Chromium	ND	0.01					
Iron	ND	0.05					
Manganese	ND	0.02					
Nickel	ND	0.01					
Zinc	ND	0.01					

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **LCS** Units: mg/L

DISS LCS Q (08/05/15 09:04) RunNo: 124539

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Aluminum	1.0	0.1	1		96.5	85 - 115	
Beryllium	1.02	0.01	1		102	85 - 115	
Boron	1.0	0.1	1		99.9	85 - 115	
Chromium	0.97	0.01	1		96.9	85 - 115	
Iron	0.96	0.05	1		96.0	85 - 115	
Manganese	1.02	0.02	1		102	85 - 115	
Nickel	1.00	0.01	1		100	85 - 115	
Zinc	0.97	0.01	1		97.3	85 - 115	

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **MS** Units: mg/L

S1508022-001BS (08/19/15 16:36) RunNo: 125060

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Aluminum	0.3	0.1	0.25	ND	104	70 - 130	
Beryllium	0.28	0.01	0.25	ND	112	70 - 130	
Boron	0.3	0.1	0.25	ND	101	70 - 130	
Chromium	0.26	0.01	0.25	ND	105	70 - 130	
Iron	0.26	0.05	0.25	ND	104	70 - 130	
Manganese	0.26	0.02	0.25	ND	103	70 - 130	
Nickel	0.26	0.01	0.25	ND	104	70 - 130	
Zinc	0.26	0.01	0.25	ND	105	70 - 130	

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **MSD** Units: mg/L

S1508032-001CMSD (08/19/15 16:23) RunNo: 125060

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Aluminum	0.3	0.1	0.3	9.58	109	20	
Beryllium	0.29	0.01	0.27	9.65	118	20	
Boron	0.63	0.03	0.60	5.64	106	20	
Chromium	0.27	0.01	0.25	8.76	110	20	
Iron	0.33	0.05	0.30	7.47	106	20	
Manganese	0.83	0.02	0.81	2.24	90.7	20	
Nickel	0.27	0.01	0.25	8.41	108	20	
Zinc	0.27	0.01	0.25	7.77	109	20	

ıalifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508037
Project: ANC

Date: 9/1/2015
Report ID: S1508037001

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MBLK** Units: mg/L

MBLK (08/04/15 13:59) RunNo: 124500

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Arsenic	ND	0.005					
Barium	ND	0.1					
Cadmium	ND	0.001					
Copper	ND	0.01					
Lead	ND	0.02					
Molybdenum	ND	0.02					
Selenium	ND	0.001					
Uranium	ND	0.0003					
Vanadium	ND	0.02					

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **LCS** Units: mg/L

LCS (08/04/15 13:53) RunNo: 124500

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Arsenic	0.101	0.005	0.1		101	85 - 115	
Barium	0.1	0.1	0.1		103	85 - 115	
Cadmium	0.099	0.001	0.1		99.1	85 - 115	
Copper	0.10	0.01	0.1		103	85 - 115	
Lead	0.10	0.02	0.1		101	85 - 115	
Molybdenum	0.10	0.02	0.1		101	85 - 115	
Selenium	0.103	0.001	0.1		103	85 - 115	
Uranium	0.105	0.0003	0.1		105	85 - 115	
Vanadium	0.10	0.02	0.1		99.5	85 - 115	

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MS** Units: mg/L

S1508036-002CS (08/04/15 23:56) RunNo: 124500

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Arsenic	1.12	0.005	1.1	ND	102	70 - 130	
Barium	1.2	0.5	1.1	ND	102	70 - 130	
Cadmium	1.09	0.002	1.1	ND	98.7	70 - 130	
Copper	1.10	0.01	1.1	ND	100	70 - 130	
Lead	1.09	0.02	1.1	ND	99.4	70 - 130	
Molybdenum	1.10	0.02	1.1	ND	99.7	70 - 130	
Selenium	1.14	0.005	1.1	ND	104	70 - 130	
Uranium	1.14	0.001	1.1	0.003	104	70 - 130	
Vanadium	1.12	0.02	1.1	ND	102	70 - 130	

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MSD** Units: mg/L

S1508036-002CMSD (08/05/15 00:01) RunNo: 124500

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Arsenic	1.11	0.005	1.12	1.03	101	20	
Barium	1.2	0.5	1.2	2.96	98.4	20	
Cadmium	1.05	0.002	1.09	3.50	95.3	20	
Copper	1.10	0.01	1.10	0.0236	100	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508037
Project: ANC

Date: 9/1/2015
Report ID: S1508037001

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MSD** Units: mg/L

S1508036-002CMSD (08/05/15 00:01) RunNo: 124500

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Lead	1.07	0.02	1.09	2.00	97.4	20	
Molybdenum	1.10	0.02	1.10	0.0533	99.7	20	
Selenium	1.22	0.005	1.14	6.58	111	20	
Uranium	1.12	0.001	1.14	2.11	102	20	
Vanadium	1.09	0.02	1.12	2.97	98.9	20	

Gross Alpha, Beta by SM 7110B Sample Type **MBLK** Units: pCi/L

MB-338 (08/13/15 16:15) RunNo: 124987 PrepDate: 08/05/15 0:00 BatchID: R124987

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	ND	2					
Gross Beta (Dissolved)	ND	3					

Gross Alpha, Beta by SM 7110B Sample Type **LCS** Units: pCi/L

LCS-338 (08/13/15 16:15) RunNo: 124987 PrepDate: 08/05/15 0:00 BatchID: R124987

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	71	2	72.6		98.0	59.5 - 130	
Gross Beta (Dissolved)	128	3	118		108	80 - 122	

Gross Alpha, Beta by SM 7110B Sample Type **MS** Units: pCi/L

S1507477-001G MS (08/13/15 16:15) RunNo: 124987 PrepDate: 08/05/15 0:00 BatchID: R124987

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	84	2	72.6	11	101	50 - 150	
Gross Beta (Dissolved)	152	3	118	10	120	61.4 - 150	

Gross Alpha, Beta by SM 7110B Sample Type **DUP** Units: pCi/L

S1507477-002G DUP (08/13/15 16:15) RunNo: 124987 PrepDate: 08/05/15 0:00 BatchID: R124987

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Gross Alpha (Dissolved)	153	2	ND				
Gross Beta (Dissolved)	63	3	ND				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508037
Project: ANC

Date: 9/1/2015
Report ID: S1508037001

Anions by ION Chromatography Sample Type **MBLK** Units: mg/L

BLK (08/04/15 10:28) RunNo: 124480

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Chloride	ND	1					
Fluoride	ND	0.1					
Nitrate+Nitrite as N	ND	0.05					
Sulfate	ND	1					

Anions by ION Chromatography Sample Type **LCS** Units: mg/L

DIONEX (08/04/15 10:41) RunNo: 124480

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Chloride	30	1	30		99.4	90 - 110	
Sulfate	144	1	150		95.9	90 - 110	

DIONEX (08/04/15 10:55) RunNo: 124480

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Fluoride	19.4	0.1	20		96.8	90 - 110	
Nitrate+Nitrite as N	49.2	0.1	53		92.7	90 - 110	

Anions by ION Chromatography Sample Type **MS** Units: mg/L

S1508037-002ASPK (08/05/15 01:25) RunNo: 124480

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Chloride	629	1	236	364	112	80 - 120	
Fluoride	123	0.1	118	ND	104	80 - 120	
Nitrate+Nitrite as N	298	0.1	236	41.9	108	80 - 120	
Sulfate	3320	1	1770	1350	111	80 - 120	

Anions by ION Chromatography Sample Type **MSD** Units: mg/L

S1508037-002ASPK (08/05/15 01:39) RunNo: 124480

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Chloride	623	1	629	0.956	110	20	
Fluoride	122	0.1	123	0.869	103	20	
Nitrate+Nitrite as N	296	0.1	298	0.791	107		
Sulfate	3290	1	3320	0.984	109	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

Inter-Mountain Labs
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ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508037
Project: ANC

Date: 9/1/2015
Report ID: S1508037001

Cations by ICP (Method 200.7) Sample Type **MBLK** Units: mg/L

MBLK DISS/CAT (08/05/15 09:02) RunNo: 124535

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	ND	1					
Magnesium	ND	1					
Potassium	ND	1					
Sodium	ND	1					

Cations by ICP (Method 200.7) Sample Type **LCS** Units: mg/L

CAT LCS IML3 (08/05/15 09:06) RunNo: 124535

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	38	1	40		95.2	85 - 115	
Magnesium	41	1	40		103	85 - 115	
Potassium	38	1	40		94.3	85 - 115	
Sodium	41	1	40		101	85 - 115	

Cations by ICP (Method 200.7) Sample Type **MS** Units: mg/L

S1508036-002AS (08/05/15 10:33) RunNo: 124535

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	156	1	25	132	96.6	70 - 130	
Magnesium	116	1	25	88	113	70 - 130	
Potassium	42	1	25	7	142	70 - 130	S
Sodium	85	1	25	53	128	70 - 130	

Cations by ICP (Method 200.7) Sample Type **DUP** Units: mg/L

S1508036-001AD (08/05/15 10:29) RunNo: 124535

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Calcium	146	1	146	0.420		20	
Magnesium	92	1	92	0.243		20	
Potassium	8	1	8	0.267		20	
Sodium	53	1	52	0.345		20	

ualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508037
Project: ANC

Date: 9/1/2015
Report ID: S1508037001

Nitrogen, Ammonia (as N) Sample Type **MBLK** Units: mg/L

BLANK (08/05/15 13:46) RunNo: 124530

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Ammonia (As N)	ND	0.1					

Nitrogen, Ammonia (as N) Sample Type **LCS** Units: mg/L

QC (08/05/15 13:48) RunNo: 124530

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Ammonia (As N)	2.6	0.1	2.5		104	90 - 110	

Nitrogen, Ammonia (as N) Sample Type **MS** Units: mg/L

S1507499-002B (08/05/15 14:08) RunNo: 124530

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Ammonia (As N)	5.2	0.1	2.5	2.8	95.0	90 - 110	

Nitrogen, Ammonia (as N) Sample Type **MSD** Units: mg/L

S1507499-002B (08/05/15 14:10) RunNo: 124530

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Nitrogen, Ammonia (As N)	5.4	0.1	5.2	3.60	103	20	

Radium 228 by Ga/Tech Sample Type **MBLK** Units: pCi/L

MB-10598 (08/11/15 18:16) RunNo: 124859 PrepDate: 08/05/15 10:00 BatchID: 10598

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qu
Radium 228 (Dissolved)	ND	1					

Radium 228 by Ga/Tech Sample Type **LCS** Units: pCi/L

LCS-10598 (08/11/15 21:17) RunNo: 124859 PrepDate: 08/05/15 10:00 BatchID: 10598

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 228 (Dissolved)	35	1	39.2		89.6	60 - 120	

Radium 228 by Ga/Tech Sample Type **MS** Units: pCi/L

MS-10598 (08/12/15 03:18) RunNo: 124859 PrepDate: 08/05/15 10:00 BatchID: 10598

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 228 (Dissolved)	35	1	39.2	ND	89.9	66.7 - 120	

Radium 228 by Ga/Tech Sample Type **MSD** Units: pCi/L

MSD-10598 (08/12/15 06:19) RunNo: 124859 PrepDate: 08/05/15 10:00 BatchID: 10598

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 228 (Dissolved)	36	1	35	2.48	92.2	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508037
Project: ANC

Date: 9/1/2015
Report ID: S1508037001

Radium 226 in Water - Dissolved Sample Type **MBLK** Units: pCi/L

MB-1494 (08/11/15 13:57) RunNo: 124765 PrepDate: 08/05/15 0:00 BatchID: 10589

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226 (Dissolved)	ND	0.2					

Radium 226 in Water - Dissolved Sample Type **LCS** Units: pCi/L

LCS-1494 (08/11/15 13:57) RunNo: 124765 PrepDate: 08/05/15 0:00 BatchID: 10589

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226 (Dissolved)	4.9	0.2	5.03		97.0	67.6 - 120	

Radium 226 in Water - Dissolved Sample Type **MS** Units: pCi/L

MS-1494 (08/11/15 13:57) RunNo: 124765 PrepDate: 08/05/15 0:00 BatchID: 10589

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226 (Dissolved)	4.6	0.2	5.03	ND	90.4	69.4 - 120	

Radium 226 in Water - Dissolved Sample Type **MSD** Units: pCi/L

MSD-1494 (08/11/15 13:57) RunNo: 124765 PrepDate: 08/05/15 0:00 BatchID: 10589

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226 (Dissolved)	4.9	0.2	4.6	8.02	98.0	20	

Thorium 230 in Water - Dissolved Sample Type **MBLK** Units: pCi/L

MB-463 (08/11/15 17:01) RunNo: 124767 PrepDate: 08/05/15 0:00 BatchID: R124767

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Thorium 230 (Dissolved)	ND	0.2					

Thorium 230 in Water - Dissolved Sample Type **LCS** Units: pCi/L

LCS-463 (08/11/15 17:01) RunNo: 124767 PrepDate: 08/05/15 0:00 BatchID: R124767

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Thorium 230 (Dissolved)	13	0.2	12		100	64.6 - 147	

Thorium 230 in Water - Dissolved Sample Type **LCSD** Units: pCi/L

LCSD-463 (08/11/15 17:01) RunNo: 124767 PrepDate: 08/05/15 0:00 BatchID: R124767

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Thorium 230 (Dissolved)	13	0.2	13	4.29	105	20	

Silica as SiO2 Sample Type **MBLK** Units: mg/L

MBLK DISS/CAT (08/05/15 09:02) RunNo: 124541

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Silica as SiO2	ND	0.1					

Silica as SiO2 Sample Type **LCS** Units: mg/L

DISS LCS Q (08/05/15 09:04) RunNo: 124541

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Silica as SiO2	2.1	0.1	2.14		100	85 - 115	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508037
Project: ANC

Date: 9/1/2015
Report ID: S1508037001

Solids By SM 2540 Sample Type **MBLK** Units: mg/L

DI (08/04/15 14:33) RunNo: 124569

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Dissolved Solids (180)	ND	10					

Solids By SM 2540 Sample Type **LCS** Units: mg/L

CONTROL (08/04/15 14:34) RunNo: 124569

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Dissolved Solids (180)	220	10	226		98.2	90 - 110	

Solids By SM 2540 Sample Type **DUP** Units: mg/L

S1508037-001A (08/04/15 14:56) RunNo: 124569

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Total Dissolved Solids (180)	950	10	940	1.05		20	

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **MBLK** Units: mg/L

MB-10566 (08/05/15 13:42) RunNo: 124551 PrepDate: 08/05/15 6:15 BatchID: 10566

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Iron	ND	0.05					
Manganese	ND	0.02					

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **LCS** Units: mg/L

LCS-10566 (08/05/15 13:44) RunNo: 124551 PrepDate: 08/05/15 6:15 BatchID: 10566

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qu
Iron	0.50	0.05	0.5		99.9	85 - 115	
Manganese	0.20	0.02	0.2		99.3	85 - 115	

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **MS** Units: mg/L

S1508032-002DS (08/05/15 14:00) RunNo: 124551 PrepDate: 08/05/15 6:15 BatchID: 10566

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Iron	0.61	0.05	0.5	0.14	95.4	70 - 130	
Manganese	0.23	0.02	0.2	0.03	98.8	70 - 130	

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **MSD** Units: mg/L

S1508032-002DMSD (08/05/15 14:09) RunNo: 124551 PrepDate: 08/05/15 6:15 BatchID: 10566

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Iron	0.63	0.05	0.61	2.53	98.5	20	
Manganese	0.23	0.02	0.23	0.601	99.5	20	

pH Water Sample Type **LCS** Units: s.u.

LCS (08/11/15 14:45) RunNo: 125280

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
pH	8.8	0.1	8.6		102	90 - 110	

pH Water Sample Type **DUP** Units: s.u.

S1508052-001B (08/05/15 15:50) RunNo: 124547

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
pH	8.1	0.1	8.1	0.120		20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

Inter-Mountain Labs
Sheridan, WY and Gillette, WY

CHAIN OF CUSTODY RECORD

All shaded fields must be completed.
This is a legal document: any misrepresentation may be construed as fraud.

Page # 161502

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
ANC-Lidstone		John Goin	970 670 2925

Report Address: 4025 Automation Way, Fort Collins, CO 80525

Invoice Address:

Contact Name: Paul Hildenbrand
Email: PRH@lidstone.com
Phone: 970 223 4705

Purchase Order #:

Quote #:

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	ANALYSES / PARAMETERS	REMARKS
1	9150807-01	8/4/15	17:15	PW-4/MW-21	WT	7		5.6
2	002	8/4/15	20:00	PW-2/MW-19	WT	7	2005 Guideline 8	5.6
3	003	8/4/15	12:15	PW-7/MW-24	WT	7	plus Berylium and	5.5
4	004	8/4/15	10:05	TP2-3	WT	7	Thorium 230	5.5
5								
6							Do not analyse for	
7							SAR, Nitrate,	
8							Alkylinity	
9								
10							Uranium will be	
11							analyzed for disolved	
12								
13								
14								

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	Adam Marsh	8/4/15	22:20	Kathy Boyd	8.5.15	12:02

SHIPPING INFO
- ☐ UPS
- ☐ Fed Express
- ☐ US Mail
- ☐ Hand Carried
- ☐ Other _____

MATRIX CODES

Water	WT
Soil	SL
Solid	SD
Filter	FT
Other	OT

TURNAROUND TIMES
Check desired service
- ☐ Standard turnaround
- ☐ RUSH - 5 Working Days
- ☒ URGENT - < 2 Working Days

Rush & Urgent Surcharges will be applied

COMPLIANCE INFORMATION
Compliance Monitoring? (Y) / N
Program (SDWA, NPDES,...)
PWSID / Permit #
Chlorinated? Y / (N)
Sample Disposal: Lab X Client

ADDITIONAL REMARKS

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 9/11/2015

CLIENT: Lidstone & Associates Inc
Project: ANC
Lab Order: S1508071

CASE NARRATIVE

Report ID: S1508071001

Samples PW-2, PW-4, PW-7, and TP2-3 were received on August 5, 2015.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition
40 CFR Parts 136 and 141
40 CFR Part 50, Appendices B, J, L, and O
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-001
ClientSample ID: PW-4 /MW-21
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 5:15:00 PM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	89	mg/L		5	SM 2320B	08/11/2015 1502	MRL
Alkalinity, Bicarbonate as HCO3	109	mg/L		5	SM 2320B	08/11/2015 1502	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/11/2015 1502	MRL
Chloride	49	mg/L		1	EPA 300.0	08/28/2015 922	AB
Fluoride	0.33	mg/L		0.05	EPA 300.0	08/05/2015 2217	AB
Nitrate+Nitrite as N	ND	mg/L		0.05	EPA 300.0	08/05/2015 2217	AB
Sulfate	1290	mg/L		1	EPA 300.0	08/28/2015 922	AB
Calcium	248	mg/L		1	EPA 200.7	08/28/2015 1301	DG
Magnesium	63	mg/L		1	EPA 200.7	08/28/2015 1301	DG
Potassium	35	mg/L		1	EPA 200.7	08/28/2015 1301	DG
Sodium	311	mg/L		1	EPA 200.7	08/28/2015 1301	DG
Nitrogen, Ammonia (As N)	0.2	mg/L		0.1	EPA 350.1	08/06/2015 1046	AMB
Silica as SiO2	15	mg/L		1	EPA 200.7	08/06/2015 1538	DG
General Parameters							
pH	7.4	s.u.		0.1	SM 4500 H B	08/07/2015 2036	MRL
Electrical Conductivity	2400	µmhos/cm		5	SM 2510B	08/07/2015 2036	MRL
Total Dissolved Solids (180)	2210	mg/L		10	SM 2540	08/05/2015 1511	TS
Data Quality							
Cation Sum	32.04	meq/L		0.01	SM 1030E	09/01/2015 911	WN
Anion Sum	30.07	meq/L		0.01	SM 1030E	09/01/2015 911	WN
Cation-Anion Balance (± 5%)	3.17	%		0.01	SM 1030E	09/01/2015 911	WN
Solids, Total Dissolved (Calc)	2070	mg/L		10	SM 1030E	09/01/2015 911	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.07	dec. %		0.01	Calculation	09/01/2015 914	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-001
ClientSample ID: PW-4 /MW-21
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 5:15:00 PM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/06/2015 1538	DG
Arsenic	ND	mg/L		0.001	EPA 200.8	08/05/2015 2004	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/05/2015 2004	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/06/2015 1538	DG
Boron	1.5	mg/L		0.1	EPA 200.7	08/06/2015 1538	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/05/2015 2004	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/06/2015 1538	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/05/2015 2004	MS
Iron	ND	mg/L		0.05	EPA 200.7	08/06/2015 1538	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/05/2015 2004	MS
Manganese	0.02	mg/L		0.02	EPA 200.7	08/06/2015 1538	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/07/2015 1109	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/05/2015 2004	MS
Nickel	ND	mg/L		0.01	EPA 200.7	08/06/2015 1538	DG
Selenium	0.054	mg/L		0.001	EPA 200.8	08/05/2015 2004	MS
Uranium	0.0497	mg/L		0.0003	EPA 200.8	08/05/2015 2004	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/05/2015 2004	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/06/2015 1538	DG
Metals - Total							
Iron	2.47	mg/L		0.05	EPA 200.7	08/06/2015 1909	DG
Manganese	0.99	mg/L		0.02	EPA 200.7	08/06/2015 1909	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-001
ClientSample ID: PW-4 /MW-21
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 5:15:00 PM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	43.2	pCi/L		2	SM 7110B	08/21/2015 858	MB
Gross Alpha Precision (±)	12.2	pCi/L			SM 7110B	08/21/2015 858	MB
Gross Beta	30.1	pCi/L		3	SM 7110B	08/21/2015 858	MB
Gross Beta Precision (±)	14.2	pCi/L			SM 7110B	08/21/2015 858	MB
Radium 226	0.7	pCi/L		0.2	SM 7500 Ra-B	08/20/2015 1106	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/20/2015 1106	MB
Radium 228	ND	pCi/L		1	Ga-Tech	08/28/2015 654	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/28/2015 654	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 845	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 845	MB
Thorium 229 Tracer (30-120)	78	%			ACW10	08/24/2015 845	MB

These results apply only to the samples tested. **RL - Reporting Limit**

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- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-002
ClientSample ID: PW-2/MW-19
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 8:00:00 PM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	1220	mg/L		5	SM 2320B	08/11/2015 1513	MRL
Alkalinity, Bicarbonate as HCO3	1410	mg/L		5	SM 2320B	08/11/2015 1513	MRL
Alkalinity, Carbonate as CO3	38	mg/L		5	SM 2320B	08/11/2015 1513	MRL
Chloride	178	mg/L		1	EPA 300.0	08/06/2015 1346	AB
Fluoride	0.99	mg/L		0.05	EPA 300.0	08/05/2015 2230	AB
Nitrate+Nitrite as N	ND	mg/L		0.05	EPA 300.0	08/05/2015 2230	AB
Sulfate	1430	mg/L		1	EPA 300.0	08/06/2015 1346	AB
Calcium	38	mg/L		1	EPA 200.7	08/06/2015 1540	DG
Magnesium	19	mg/L		1	EPA 200.7	08/06/2015 1540	DG
Potassium	14	mg/L		1	EPA 200.7	08/06/2015 1540	DG
Sodium	1200	mg/L		1	EPA 200.7	08/06/2015 1540	DG
Nitrogen, Ammonia (As N)	1.4	mg/L		0.1	EPA 350.1	08/06/2015 1057	AMB
Silica as SiO2	8	mg/L		1	EPA 200.7	08/06/2015 1540	DG
General Parameters							
pH	8.4	s.u.		0.1	SM 4500 H B	08/07/2015 2041	MRL
Electrical Conductivity	4220	µmhos/cm		5	SM 2510B	08/07/2015 2041	MRL
Total Dissolved Solids (180)	3470	mg/L		10	SM 2540	08/05/2015 1512	TS
Data Quality							
Cation Sum	56.12	meq/L		0.01	SM 1030E	09/01/2015 911	WN
Anion Sum	59.29	meq/L		0.01	SM 1030E	09/01/2015 911	WN
Cation-Anion Balance (± 5%)	2.75	%		0.01	SM 1030E	09/01/2015 911	WN
Solids, Total Dissolved (Calc)	3620	mg/L		10	SM 1030E	09/01/2015 911	WN
Calculated TDS/TDS Ratio (0.80-1.20)	0.96	dec. %		0.01	Calculation	09/01/2015 914	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-002
ClientSample ID: PW-2/MW-19
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 8:00:00 PM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/06/2015 1540	DG
Arsenic	0.004	mg/L		0.001	EPA 200.8	08/05/2015 2010	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/05/2015 2010	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/06/2015 1540	DG
Boron	2.1	mg/L		0.1	EPA 200.7	08/06/2015 1540	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/05/2015 2010	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/06/2015 1540	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/05/2015 2010	MS
Iron	ND	mg/L		0.05	EPA 200.7	08/06/2015 1540	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/05/2015 2010	MS
Manganese	0.09	mg/L		0.02	EPA 200.7	08/06/2015 1540	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/07/2015 1111	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/05/2015 2010	MS
Nickel	ND	mg/L		0.01	EPA 200.7	08/06/2015 1540	DG
Selenium	0.001	mg/L		0.001	EPA 200.8	08/05/2015 2010	MS
Uranium	0.0015	mg/L		0.0003	EPA 200.8	08/05/2015 2010	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/05/2015 2010	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/06/2015 1540	DG
Metals - Total							
Iron	11.8	mg/L		0.05	EPA 200.7	08/06/2015 1911	DG
Manganese	0.22	mg/L		0.02	EPA 200.7	08/06/2015 1911	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-002
ClientSample ID: PW-2/MW-19
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 8:00:00 PM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	8.7	pCi/L		2	SM 7110B	09/10/2015 729	WN
Gross Alpha Precision (±)	6.2	pCi/L			SM 7110B	09/10/2015 729	WN
Gross Beta	24.7	pCi/L		3	SM 7110B	09/10/2015 729	WN
Gross Beta Precision (±)	13.7	pCi/L			SM 7110B	09/10/2015 729	WN
Radium 226	0.5	pCi/L		0.2	SM 7500 Ra-B	08/20/2015 1106	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/20/2015 1106	MB
Radium 228	ND	pCi/L		1	Ga-Tech	08/28/2015 955	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/28/2015 955	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 845	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 845	MB
Thorium 229 Tracer (30-120)	77	%			ACW10	08/24/2015 845	MB

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-003
ClientSample ID: PW-7 /MW-24
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 12:15:00 PM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	451	mg/L		5	SM 2320B	08/11/2015 1522	MRL
Alkalinity, Bicarbonate as HCO3	550	mg/L		5	SM 2320B	08/11/2015 1522	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/11/2015 1522	MRL
Chloride	64	mg/L		1	EPA 300.0	08/28/2015 935	AB
Fluoride	2.19	mg/L		0.05	EPA 300.0	08/05/2015 2244	AB
Nitrate+Nitrite as N	ND	mg/L		0.05	EPA 300.0	08/05/2015 2244	AB
Sulfate	4820	mg/L		1	EPA 300.0	08/28/2015 935	AB
Calcium	419	mg/L		1	EPA 200.7	08/31/2015 1502	DG
Magnesium	399	mg/L		1	EPA 200.7	08/31/2015 1502	DG
Potassium	15	mg/L		1	EPA 200.7	08/31/2015 1502	DG
Sodium	1260	mg/L		1	EPA 200.7	08/31/2015 1502	DG
Nitrogen, Ammonia (As N)	0.3	mg/L		0.1	EPA 350.1	08/06/2015 1058	AMB
Silica as SiO2	29	mg/L		1	EPA 200.7	08/06/2015 1542	DG
General Parameters							
pH	8.1	s.u.		0.1	SM 4500 H B	08/07/2015 2046	MRL
Electrical Conductivity	6240	µmhos/cm		5	SM 2510B	08/07/2015 2046	MRL
Total Dissolved Solids (180)	8000	mg/L		10	SM 2540	08/05/2015 1513	TS
Data Quality							
Cation Sum	109.07	meq/L		0.01	SM 1030E	09/01/2015 911	WN
Anion Sum	111.31	meq/L		0.01	SM 1030E	09/01/2015 911	WN
Cation-Anion Balance (± 5%)	1.01	%		0.01	SM 1030E	09/01/2015 911	WN
Solids, Total Dissolved (Calc)	7250	mg/L		10	SM 1030E	09/01/2015 911	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.10	dec. %		0.01	Calculation	09/01/2015 914	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-003
ClientSample ID: PW-7 /MW-24
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 12:15:00 PM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/06/2015 1542	DG
Arsenic	ND	mg/L		0.001	EPA 200.8	08/05/2015 2015	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/05/2015 2015	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/06/2015 1542	DG
Boron	0.7	mg/L		0.1	EPA 200.7	08/06/2015 1542	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/05/2015 2015	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/06/2015 1542	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/05/2015 2015	MS
Iron	ND	mg/L		0.05	EPA 200.7	08/06/2015 1542	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/05/2015 2015	MS
Manganese	0.78	mg/L		0.02	EPA 200.7	08/06/2015 1542	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/07/2015 1113	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/05/2015 2015	MS
Nickel	0.04	mg/L		0.01	EPA 200.7	08/06/2015 1542	DG
Selenium	ND	mg/L		0.001	EPA 200.8	08/05/2015 2015	MS
Uranium	0.0032	mg/L		0.0003	EPA 200.8	08/05/2015 2015	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/05/2015 2015	MS
Zinc	0.01	mg/L		0.01	EPA 200.7	08/06/2015 1542	DG
Metals - Total							
Iron	0.68	mg/L		0.05	EPA 200.7	08/06/2015 1921	DG
Manganese	0.07	mg/L		0.02	EPA 200.7	08/06/2015 1921	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-003
ClientSample ID: PW-7 /MW-24
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 12:15:00 PM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	5.5	pCi/L		2	SM 7110B	08/21/2015 858	MB
Gross Alpha Precision (±)	2.9	pCi/L			SM 7110B	08/21/2015 858	MB
Gross Beta	24.9	pCi/L		3	SM 7110B	08/21/2015 858	MB
Gross Beta Precision (±)	6.0	pCi/L			SM 7110B	08/21/2015 858	MB
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	08/20/2015 1106	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/20/2015 1106	MB
Radium 228	ND	pCi/L		1	Ga-Tech	08/28/2015 1256	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/28/2015 1256	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 845	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 845	MB
Thorium 229 Tracer (30-120)	84	%			ACW10	08/24/2015 845	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

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1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-004
ClientSample ID: TP2-3
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 10:05:00 AM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	155	mg/L		5	SM 2320B	08/11/2015 1531	MRL
Alkalinity, Bicarbonate as HCO3	189	mg/L		5	SM 2320B	08/11/2015 1531	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/11/2015 1531	MRL
Chloride	58	mg/L		1	EPA 300.0	08/05/2015 2257	AB
Fluoride	0.42	mg/L		0.05	EPA 300.0	08/05/2015 2257	AB
Nitrate+Nitrite as N	0.35	mg/L		0.05	EPA 300.0	08/05/2015 2257	AB
Sulfate	1050	mg/L		1	EPA 300.0	08/07/2015 1400	AB
Calcium	335	mg/L		1	EPA 200.7	08/06/2015 1545	DG
Magnesium	42	mg/L		1	EPA 200.7	08/06/2015 1545	DG
Potassium	23	mg/L		1	EPA 200.7	08/06/2015 1545	DG
Sodium	80	mg/L		1	EPA 200.7	08/06/2015 1545	DG
Nitrogen, Ammonia (As N)	8.9	mg/L		0.1	EPA 350.1	08/06/2015 1059	AMB
Silica as SiO2	11	mg/L		1	EPA 200.7	08/06/2015 1545	DG
General Parameters							
pH	8.1	s.u.		0.1	SM 4500 H B	08/07/2015 2051	MRL
Electrical Conductivity	1940	µmhos/cm		5	SM 2510B	08/07/2015 2051	MRL
Total Dissolved Solids (180)	1760	mg/L		10	SM 2540	08/05/2015 1514	TS
Data Quality							
Cation Sum	24.92	meq/L		0.01	SM 1030E	09/01/2015 911	WN
Anion Sum	26.57	meq/L		0.01	SM 1030E	09/01/2015 911	WN
Cation-Anion Balance (± 5%)	3.19	%		0.01	SM 1030E	09/01/2015 911	WN
Solids, Total Dissolved (Calc)	1690	mg/L		10	SM 1030E	09/01/2015 911	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.04	dec. %		0.01	Calculation	09/01/2015 914	WN

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

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Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-004
ClientSample ID: TP2-3
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 10:05:00 AM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/06/2015 1545	DG
Arsenic	ND	mg/L		0.001	EPA 200.8	08/05/2015 2021	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/05/2015 2021	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/06/2015 1545	DG
Boron	ND	mg/L		0.1	EPA 200.7	08/06/2015 1545	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/05/2015 2021	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/06/2015 1545	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/05/2015 2021	MS
Iron	ND	mg/L		0.05	EPA 200.7	08/06/2015 1545	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/05/2015 2021	MS
Manganese	0.09	mg/L		0.02	EPA 200.7	08/06/2015 1545	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/07/2015 1115	AW
Molybdenum	0.07	mg/L		0.02	EPA 200.8	08/05/2015 2021	MS
Nickel	0.01	mg/L		0.01	EPA 200.7	08/06/2015 1545	DG
Selenium	0.010	mg/L		0.001	EPA 200.8	08/05/2015 2021	MS
Uranium	0.982	mg/L		0.0003	EPA 200.8	08/05/2015 2021	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/05/2015 2021	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/06/2015 1545	DG
Metals - Total							
Iron	ND	mg/L		0.05	EPA 200.7	08/06/2015 1923	DG
Manganese	0.10	mg/L		0.02	EPA 200.7	08/06/2015 1923	DG

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508071001

ProjectName: ANC
Lab ID: S1508071-004
ClientSample ID: TP2-3
COC: 161502

WorkOrder: S1508071
CollectionDate: 8/4/2015 10:05:00 AM
DateReceived: 8/5/2015 12:02:00 PM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	481	pCi/L		2	SM 7110B	09/10/2015 729	WN
Gross Alpha Precision (±)	29.4	pCi/L			SM 7110B	09/10/2015 729	WN
Gross Beta	316	pCi/L		3	SM 7110B	09/10/2015 729	WN
Gross Beta Precision (±)	22.5	pCi/L			SM 7110B	09/10/2015 729	WN
Radium 226	5.2	pCi/L		0.2	SM 7500 Ra-B	08/20/2015 1106	MB
Radium 226 Precision (±)	0.3	pCi/L			SM 7500 Ra-B	08/20/2015 1106	MB
Radium 228	7.5	pCi/L		1	Ga-Tech	08/28/2015 1557	MB
Radium 228 Precision (±)	1.3	pCi/L			Ga-Tech	08/28/2015 1557	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 845	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 845	MB
Thorium 229 Tracer (30-120)	97	%			ACW10	08/24/2015 845	MB

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508071
Project: ANC

Date: 9/11/2015
Report ID: S1508071001

Alkalinity Sample Type **MBLK** Units: mg/L

BLANK (08/10/15 15:46) RunNo: 124703

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Alkalinity, Total (As CaCO3)	ND	5					

Alkalinity Sample Type **LCS** Units: mg/L

ATQC (08/10/15 15:35) RunNo: 124703

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Alkalinity, Total (As CaCO3)	602	5	595		101	90 - 110	

Alkalinity Sample Type **DUP** Units: mg/L

S1508070-005A (08/07/15 19:36) RunNo: 124664

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Alkalinity, Bicarbonate as HCO3	1370	5	1380	0.829		20	
Alkalinity, Carbonate as CO3	ND	5	ND			20	
Alkalinity, Hydroxide as OH	ND	5	ND			20	
Alkalinity, Total (As CaCO3)	1120	5	1130	0.829		20	

Conductivity Sample Type **MBLK** Units: µmhos/cm

BLANK (08/10/15 15:46) RunNo: 124703

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Electrical Conductivity	ND	5					

Conductivity Sample Type **LCS** Units: µmhos/cm

ATQC (08/10/15 15:35) RunNo: 124703

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Electrical Conductivity	1030	5	1060		97.3	90 - 110	

Conductivity Sample Type **DUP** Units: µmhos/cm

S1508070-005A (08/07/15 19:36) RunNo: 124664

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Electrical Conductivity	4250	5	4270	0.469		20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508071
Project: ANC

Date: 9/11/2015
Report ID: S1508071001

Dissolved Mercury by EPA 245.1 - Water Sample Type **MBLK** Units: mg/L

LRB (08/07/15 09:45) RunNo: 124629

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Mercury	ND	0.001					

Dissolved Mercury by EPA 245.1 - Water Sample Type **LCS** Units: mg/L

LCS (08/07/15 08:47) RunNo: 124629

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Mercury	0.002	0.001	0.002		89.1	85 - 115	

Dissolved Mercury by EPA 245.1 - Water Sample Type **MS** Units: mg/L

S1508070-007C (08/07/15 11:02) RunNo: 124629

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Mercury	0.002	0.001	0.00197	ND	97.3	70 - 130	

Dissolved Mercury by EPA 245.1 - Water Sample Type **MSD** Units: mg/L

S1508070-007C (08/07/15 11:04) RunNo: 124629

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Mercury	0.002	0.001	0.002	0.151	97.2	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508071
Project: ANC

Date: 9/11/2015
Report ID: S1508071001

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **MBLK** Units: mg/L

MBLK DISS/CAT (08/06/15 13:25) RunNo: 124591

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Aluminum	ND	0.1					
Beryllium	ND	0.01					
Boron	ND	0.1					
Chromium	ND	0.01					
Iron	ND	0.05					
Manganese	ND	0.02					
Nickel	ND	0.01					
Zinc	ND	0.01					

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **LCS** Units: mg/L

DISS LCS Q (08/06/15 13:27) RunNo: 124591

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Aluminum	1.0	0.1	1		98.6	85 - 115	
Beryllium	0.99	0.01	1		98.6	85 - 115	
Boron	1.0	0.1	1		101	85 - 115	
Chromium	0.99	0.01	1		98.8	85 - 115	
Iron	0.98	0.05	1		98.1	85 - 115	
Manganese	1.01	0.02	1		101	85 - 115	
Nickel	1.01	0.01	1		101	85 - 115	
Zinc	0.96	0.01	1		96.3	85 - 115	

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **MS** Units: mg/L

S1508083-008CS (08/06/15 17:23) RunNo: 124591

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Aluminum	0.33	0.02	0.25	0.06	108	70 - 130	
Beryllium	0.286	0.002	0.25	ND	114	70 - 130	
Boron	0.94	0.03	0.25	0.70	94.2	70 - 130	
Chromium	0.28	0.01	0.25	ND	113	70 - 130	
Iron	0.30	0.02	0.25	0.02	109	70 - 130	
Manganese	0.28	0.01	0.25	ND	110	70 - 130	
Nickel	0.28	0.01	0.25	ND	112	70 - 130	
Zinc	0.28	0.01	0.25	ND	110	70 - 130	

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **MSD** Units: mg/L

S1508083-008CSD (08/06/15 17:25) RunNo: 124591

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Aluminum	0.35	0.02	0.33	5.92	116	20	
Beryllium	0.308	0.002	0.286	7.41	123	20	
Boron	0.97	0.03	0.94	3.28	107	20	
Chromium	0.31	0.01	0.28	7.71	122	20	
Iron	0.32	0.02	0.30	6.16	117	20	
Manganese	0.30	0.01	0.28	7.11	118	20	
Nickel	0.30	0.01	0.28	7.27	120	20	
Zinc	0.30	0.01	0.28	7.15	118	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508071
Project: ANC

Date: 9/11/2015
Report ID: S1508071001

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MBLK** Units: mg/L

MBLK (08/05/15 14:14) RunNo: 124546

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Arsenic	ND	0.005					
Barium	ND	0.1					
Cadmium	ND	0.001					
Copper	ND	0.01					
Lead	ND	0.02					
Molybdenum	ND	0.02					
Selenium	ND	0.001					
Uranium	ND	0.0003					
Vanadium	ND	0.02					

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **LCS** Units: mg/L

LCS (08/05/15 14:38) RunNo: 124546

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Arsenic	0.101	0.005	0.1		101	85 - 115	
Barium	ND	0.1	0.1		95.4	85 - 115	
Cadmium	0.098	0.001	0.1		98.0	85 - 115	
Copper	0.10	0.01	0.1		98.2	85 - 115	
Lead	0.10	0.02	0.1		96.1	85 - 115	
Molybdenum	0.10	0.02	0.1		96.1	85 - 115	
Selenium	0.100	0.001	0.1		99.6	85 - 115	
Uranium	0.103	0.0003	0.1		103	85 - 115	
Vanadium	0.10	0.02	0.1		103	85 - 115	

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MS** Units: mg/L

S1508076-005DS (08/05/15 22:16) RunNo: 124546

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Arsenic	1.05	0.005	1.1	ND	95.6	70 - 130	
Barium	1.1	0.5	1.1	ND	97.5	70 - 130	
Cadmium	1.05	0.002	1.1	ND	95.4	70 - 130	
Copper	1.02	0.01	1.1	ND	92.3	70 - 130	
Lead	1.07	0.02	1.1	ND	97.2	70 - 130	
Molybdenum	1.08	0.02	1.1	ND	98.2	70 - 130	
Selenium	0.860	0.005	1.1	0.064	72.4	70 - 130	
Uranium	1.08	0.001	1.1	ND	98.5	70 - 130	
Vanadium	1.12	0.02	1.1	ND	102	70 - 130	

S1508063-001CS (08/05/15 17:14) RunNo: 124546

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Arsenic	1.12	0.003	1.1	ND	102	70 - 130	
Lead	1.1	0.2	1.1	ND	95.2	70 - 130	
Selenium	1.12	0.005	1.1	ND	101	70 - 130	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508071
Project: ANC

Date: 9/11/2015
Report ID: S1508071001

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MSD** Units: mg/L

S1508076-005DMSD (08/05/15 22:21) RunNo: 124546

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Arsenic	1.08	0.005	1.05	2.54	98.1	20	
Barium	1.1	0.5	1.1	0.302	97.8	20	
Cadmium	1.05	0.002	1.05	0.0468	95.4	20	
Copper	1.03	0.01	1.02	0.886	93.2	20	
Lead	1.08	0.02	1.07	0.922	98.1	20	
Molybdenum	1.08	0.02	1.08	0.274	97.9	20	
Selenium	0.872	0.005	0.860	1.42	73.5	20	
Uranium	1.10	0.001	1.08	1.20	99.7	20	
Vanadium	1.08	0.02	1.12	3.40	98.3	20	

Gross Alpha, Beta by SM 7110B Sample Type **MBLK** Units: pCi/L

MB-339 (08/21/15 08:58) RunNo: 125254 PrepDate: 08/18/15 0:00 BatchID: R125254

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	ND	2					
Gross Beta (Dissolved)	ND	3					

MB-343 (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	ND	2					
Gross Beta (Dissolved)	ND	3					

Gross Alpha, Beta by SM 7110B Sample Type **LCS** Units: pCi/L

LCS-339 (08/21/15 08:58) RunNo: 125254 PrepDate: 08/18/15 0:00 BatchID: R125254

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	53	2	72.6		73.3	59.5 - 130	
Gross Beta (Dissolved)	125	3	118		105	80 - 122	

LCS-343 A (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	77	2	70		109	59.5 - 130	

LCS-343 B (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Beta (Dissolved)	145	3	126		116	84.2 - 125	

Gross Alpha, Beta by SM 7110B Sample Type **MS** Units: pCi/L

S1508155-001F MS (08/21/15 08:58) RunNo: 125254 PrepDate: 08/18/15 0:00 BatchID: R125254

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	89	2	72.6	20	94.9	50 - 150	
Gross Beta (Dissolved)	154	3	118	8	124	61.4 - 150	

S1508462-001D MSA (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	158	2	140	3	111	50 - 150	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508071
Project: ANC

Date: 9/11/2015
Report ID: S1508071001

Gross Alpha, Beta by SM 7110B Sample Type **MS** Units: pCi/L

S1508462-001D MSB (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Beta (Dissolved)	288	3	251	73	85.9	66.1 - 145	

Gross Alpha, Beta by SM 7110B Sample Type **DUP** Units: pCi/L

S1508199-006H DUP (08/21/15 08:58) RunNo: 125254 PrepDate: 08/18/15 0:00 BatchID: R125254

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Gross Alpha (Dissolved)	11	2	11	5.95		20	
Gross Beta (Dissolved)	17	3	18	5.73		20	

S1508462-002D DUP (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Gross Alpha (Dissolved)	4	2	4	12.0		20	
Gross Beta (Dissolved)	14	3	17	19.9		20	

Anions by ION Chromatography Sample Type **MBLK** Units: mg/L

BLK (08/05/15 09:58) RunNo: 124550

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Chloride	ND	1					
Fluoride	ND	0.1					
Nitrate+Nitrite as N	ND	0.05					
Sulfate	ND	1					

Anions by ION Chromatography Sample Type **LCS** Units: mg/L

DIONEX (08/05/15 10:12) RunNo: 124550

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Chloride	30	1	30		99.7	90 - 110	
Fluoride	20.7	0.1	20		103	90 - 110	
Nitrate+Nitrite as N	52.2	0.05	53		98.5	90 - 110	
Sulfate	144	1	150		95.7	90 - 110	

DIONEX (08/05/15 10:25) RunNo: 124550

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Fluoride	19.4	0.1	20		96.9	90 - 110	

Anions by ION Chromatography Sample Type **MS** Units: mg/L

S1508070-009ASPK (08/05/15 21:22) RunNo: 124550

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Chloride	272	1	236	24	105	80 - 120	
Fluoride	120	0.05	118	ND	102	80 - 120	
Sulfate	4550	1	1770	2590	110	80 - 120	

Anions by ION Chromatography Sample Type **MSD** Units: mg/L

S1508070-009ASPK (08/05/15 21:36) RunNo: 124550

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Chloride	271	1	272	0.292	105	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508071
Project: ANC

Date: 9/11/2015
Report ID: S1508071001

Anions by ION Chromatography Sample Type **MSD** Units: mg/L

S1508070-009ASPK (08/05/15 21:36) RunNo: 124550

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Fluoride	121	0.05	120	0.901	103	20	
Sulfate	4510	1	4550	0.784	108	20	

Cations by ICP (Method 200.7) Sample Type **MBLK** Units: mg/L

MBLK DISS/CAT (08/07/15 12:16) RunNo: 124648

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	ND	1					
Magnesium	ND	1					
Potassium	ND	1					
Sodium	ND	1					

Cations by ICP (Method 200.7) Sample Type **LCS** Units: mg/L

CAT LCS IML3 (08/31/15 14:37) RunNo: 125529

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	40	1	40		100	85 - 115	
Magnesium	41	1	40		102	85 - 115	
Potassium	41	1	40		103	85 - 115	
Sodium	41	1	40		103	85 - 115	

Cations by ICP (Method 200.7) Sample Type **MS** Units: mg/L

S1508090-004AS (08/07/15 13:35) RunNo: 124648

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	82	1	25	61	87.2	70 - 130	
Magnesium	36	1	25	11	98.7	70 - 130	
Potassium	31	1	25	3	109	70 - 130	
Sodium	60	1	25	37	91.9	70 - 130	

Cations by ICP (Method 200.7) Sample Type **MSD** Units: mg/L

S1508090-004ASD (08/07/15 13:37) RunNo: 124648

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Calcium	86	1	82	3.91	100	20	
Magnesium	39	1	36	10.2	114	20	
Potassium	34	1	31	11.4	123	20	
Sodium	64	1	60	5.87	106	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508071
Project: ANC

Date: 9/11/2015
Report ID: S1508071001

Nitrogen, Ammonia (as N) Sample Type **MBLK** Units: mg/L

BLANK (08/06/15 10:06) RunNo: 124749

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Ammonia (As N)	ND	0.1					

Nitrogen, Ammonia (as N) Sample Type **LCS** Units: mg/L

QC (08/06/15 10:09) RunNo: 124749

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Ammonia (As N)	2.4	0.1	2.5		95.8	90 - 110	

Nitrogen, Ammonia (as N) Sample Type **MS** Units: mg/L

S1507464-006B (08/06/15 10:29) RunNo: 124749

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Ammonia (As N)	3.3	0.1	2.5	0.6	106	90 - 110	

Nitrogen, Ammonia (as N) Sample Type **MSD** Units: mg/L

S1507464-006B (08/06/15 10:30) RunNo: 124749

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Nitrogen, Ammonia (As N)	3.3	0.1	3.3	0.171	105	20	

Radium 228 by Ga/Tech Sample Type **MBLK** Units: pCi/L

MB-10645 (08/27/15 15:49) RunNo: 125563 PrepDate: 08/26/15 9:33 BatchID: 10645

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 228 (Dissolved)	ND	1					

Radium 228 by Ga/Tech Sample Type **LCS** Units: pCi/L

LCS-10645 (08/27/15 18:50) RunNo: 125563 PrepDate: 08/26/15 9:33 BatchID: 10645

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 228 (Dissolved)	32	1	39.2		80.5	61.3 - 120	

Radium 228 by Ga/Tech Sample Type **MS** Units: pCi/L

MS-10645 (08/28/15 00:52) RunNo: 125563 PrepDate: 08/18/15 9:00 BatchID: 10645

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 228 (Dissolved)	35	1	39.2	ND	88.0	64.3 - 120	

Radium 228 by Ga/Tech Sample Type **MSD** Units: pCi/L

MSD-10645 (08/28/15 03:53) RunNo: 125563 PrepDate: 08/18/15 9:00 BatchID: 10645

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 228 (Dissolved)	38	1	35	10.7	98.0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508071
Project: ANC

Date: 9/11/2015
Report ID: S1508071001

Radium 226 in Water - Dissolved Sample Type **MBLK** Units: pCi/L

MB-1496 (08/20/15 09:01) RunNo: 125102 PrepDate: 08/10/15 0:00 BatchID: 10563

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226 (Dissolved)	ND	0.2					

Radium 226 in Water - Dissolved Sample Type **LCS** Units: pCi/L

LCS-1496 (08/20/15 09:01) RunNo: 125102 PrepDate: 08/10/15 0:00 BatchID: 10563

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226 (Dissolved)	4.5	0.2	5.03		89.2	72.5 - 120	

Radium 226 in Water - Dissolved Sample Type **MS** Units: pCi/L

MS-1496 (08/20/15 09:01) RunNo: 125102 PrepDate: 08/10/15 0:00 BatchID: 10563

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226 (Dissolved)	4.9	0.2	5.03	ND	97.1	69.6 - 120	

Radium 226 in Water - Dissolved Sample Type **MSD** Units: pCi/L

MSD-1496 (08/20/15 09:01) RunNo: 125102 PrepDate: 08/10/15 0:00 BatchID: 10563

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226 (Dissolved)	4.2	0.2	4.9	15.8	82.9	20	

Thorium 230 in Water - Dissolved Sample Type **MBLK** Units: pCi/L

MB-464 (08/24/15 08:45) RunNo: 125247 PrepDate: 08/18/15 0:00 BatchID: R125247

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Thorium 230 (Dissolved)	ND	0.2					

Thorium 230 in Water - Dissolved Sample Type **LCS** Units: pCi/L

LCS-464 (08/24/15 08:45) RunNo: 125247 PrepDate: 08/18/15 0:00 BatchID: R125247

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Thorium 230 (Dissolved)	12	0.2	12		94.3	68 - 146	

Silica as SiO2 Sample Type **MBLK** Units: mg/L

MBLK DISS/CAT (08/06/15 13:25) RunNo: 124593

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Silica as SiO2	ND	0.1					

Silica as SiO2 Sample Type **LCS** Units: mg/L

DISS LCS Q (08/06/15 13:27) RunNo: 124593

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Silica as SiO2	2.1	0.1	2.14		98.2	85 - 115	

ualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508071
Project: ANC

Date: 9/11/2015
Report ID: S1508071001

Solids By SM 2540 Sample Type **MBLK** Units: mg/L

DI (08/05/15 14:42) RunNo: 124670

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Dissolved Solids (180)	ND	10					

Solids By SM 2540 Sample Type **LCS** Units: mg/L

CONTROL (08/05/15 14:43) RunNo: 124670

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Dissolved Solids (180)	210	10	226		94.7	90 - 110	

Solids By SM 2540 Sample Type **DUP** Units: mg/L

S1508071-004A (08/05/15 15:15) RunNo: 124670

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Total Dissolved Solids (180)	1770	10	1760	0.452		20	

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **MBLK** Units: mg/L

MB-10569 (08/06/15 17:43) RunNo: 124594 PrepDate: 08/06/15 6:15 BatchID: 10569

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Iron	ND	0.05					
Manganese	ND	0.02					

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **LCS** Units: mg/L

LCS-10569 (08/06/15 17:46) RunNo: 124594 PrepDate: 08/06/15 6:15 BatchID: 10569

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qu
Iron	0.49	0.05	0.5		98.6	85 - 115	
Manganese	0.19	0.02	0.2		97.0	85 - 115	

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **MS** Units: mg/L

S1508063-002DS (08/06/15 18:15) RunNo: 124594 PrepDate: 08/06/15 6:15 BatchID: 10569

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Iron	2.45	0.05	0.5	1.97	94.7	70 - 130	
Manganese	0.24	0.02	0.2	0.05	96.6	70 - 130	

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **MSD** Units: mg/L

S1508063-002DMSD (08/06/15 18:17) RunNo: 124594 PrepDate: 08/06/15 6:15 BatchID: 10569

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Iron	2.44	0.05	2.45	0.186	93.8	20	
Manganese	0.24	0.02	0.24	0.371	96.1	20	

pH Water Sample Type **LCS** Units: s.u.

ATQC (08/10/15 15:35) RunNo: 124703

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
pH	8.8	0.1	8.6		102	90 - 110	

pH Water Sample Type **DUP** Units: s.u.

S1508070-005A (08/07/15 19:36) RunNo: 124664

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
pH	7.6	0.1	7.6	0.00265		20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

Inter-Mountain Labs
Sheridan, WY and Gillette, WY

CHAIN OF CUSTODY RECORD

All shaded fields must be completed.
This is a legal document: any misrepresentation may be construed as fraud.

Page f

162366

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
LIDSTONE & ASSOC.	ANC	John Goin	970-690-2925

Report Address	Contact Name	
4025 Automation Way. Bldg E Fort Collins, Co. 80525	Paul Holdenbrand	
	Email	PRH@lidstone.com
Invoice Address	Phone	970-223-4705
	Purchase Order #	Quote #

ANALYSES / PARAMETERS: See Attached QUOTE — ALL Samples ARE UNFILTERED

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	REMARKS
1	J5G8125-001	8/5	10:12 Am	PW-1/MW-18L	H_2O	7	
2	-002	8/5	2:00 pm	PW-3/MW-20.	H_2O	7	
3	-003	8/5	8:19 pm	PW-5/MW-22	"	7	
4	-004	8/5	5:38 pm	PW-6/MW-23 2.3	"	7	
5	-005	8/5	3:30 pm	PW-8/MW-25.3	"	7	
6	-006	8/6	3:40 pm	PW-9/MW-26 1	"	7	
7	-007	8/6	10:40 Am	PW-10/MW-27	"	7	
8	-008	8/6	5:03 pm	PW-12/MW-28	"	7	
9							
10	-009	8/6	1:15 pm	MW-12 2.3	"	7	
11							
12							
13							
14							

cooler Temp

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	John Goin	8/6	8:10 pm	Quale Gonzalez	8-7-15	11:49

SHIPPING INFO	MATRIX CODES		TURNAROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☐ UPS	Water	WT	**Check desired service**	Compliance Monitoring? (Y)/N	
☐ Fed Express	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES,...) DEQ	
☐ US Mail	Solid	SD	☐ **RUSH - 5 Working Days**	PWSID / Permit #	
☐ Hand Carried	Filter	FT	☐ **URGENT** - < 2 Working Days	Chlorinated? Y/(N)	
☐ Other _____	Other	OT	***Rush & Urgent Surcharges will be applied***	Sample Disposal: Lab ☒ Client	

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 9/11/2015

CLIENT: Lidstone & Associates Inc
Project: ANC
Lab Order: S1508125

CASE NARRATIVE

Report ID: S1508125001

Samples MW-12, PW-1, PW-10, PW-12, PW-3, PW-5, PW-6, PW-8, and PW-9 were received on August 7, 2015.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition
40 CFR Parts 136 and 141
40 CFR Part 50, Appendices B, J, L, and O
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-001
ClientSample ID: PW-1/MW-18
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 10:12:00 AM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	377	mg/L		5	SM 2320B	08/10/2015 2143	MRL
Alkalinity, Bicarbonate as HCO3	459	mg/L		5	SM 2320B	08/10/2015 2143	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/10/2015 2143	MRL
Chloride	208	mg/L		1	EPA 300.0	08/14/2015 020	AB
Fluoride	1.0	mg/L		0.1	EPA 300.0	08/12/2015 2145	AB
Nitrogen, Nitrate+Nitrite (as N)	ND	mg/L		0.1	EPA 353.2	08/18/2015 1246	AMB
Sulfate	2700	mg/L		1	EPA 300.0	08/18/2015 1152	AB
Calcium	414	mg/L		1	EPA 200.7	08/18/2015 1300	BJ
Magnesium	152	mg/L		1	EPA 200.7	08/18/2015 1300	BJ
Potassium	66	mg/L		1	EPA 200.7	08/18/2015 1300	BJ
Sodium	877	mg/L		1	EPA 200.7	08/18/2015 1300	BJ
Nitrogen, Ammonia (As N)	0.3	mg/L		0.1	EPA 350.1	08/13/2015 1259	AMB
Silica as SiO2	24.5	mg/L		0.1	EPA 200.7	08/10/2015 1552	DG
General Parameters							
pH	8.0	s.u.		0.1	SM 4500 H B	08/10/2015 2143	MRL
Electrical Conductivity	4300	µmhos/cm		5	SM 2510B	08/10/2015 2143	MRL
Total Dissolved Solids (180)	4750	mg/L		10	SM 2540	08/07/2015 1444	TS
Sodium Adsorption Ratio	9.4			0.1	Calculation	08/20/2015 1555	WN
Data Quality							
Cation Sum	73.03	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Anion Sum	69.61	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Cation-Anion Balance (± 5%)	2.39	%		0.01	SM 1030E	08/20/2015 1555	WN
Solids, Total Dissolved (Calc)	4670	mg/L		10	SM 1030E	08/20/2015 1555	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.02	dec. %		0.01	Calculation	08/27/2015 1619	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-001
ClientSample ID: PW-1 /MW-18
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 10:12:00 AM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/10/2015 1552	DG
Arsenic	0.015	mg/L		0.001	EPA 200.8	08/07/2015 2218	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/07/2015 2218	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1552	DG
Boron	0.2	mg/L		0.1	EPA 200.7	08/10/2015 1552	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/07/2015 2218	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1552	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/07/2015 2218	MS
Iron	ND	mg/L		0.05	EPA 200.7	08/10/2015 1552	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/07/2015 2218	MS
Manganese	ND	mg/L		0.02	EPA 200.7	08/10/2015 1552	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/11/2015 1258	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/07/2015 2218	MS
Nickel	ND	mg/L		0.01	EPA 200.7	08/10/2015 1552	DG
Selenium	0.057	mg/L		0.001	EPA 200.8	08/07/2015 2218	MS
Uranium	1.13	mg/L		0.0003	EPA 200.8	08/07/2015 2218	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/07/2015 2218	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/10/2015 1552	DG
Metals - Total							
Iron	0.24	mg/L		0.05	EPA 200.7	08/28/2015 1803	DG
Manganese	0.02	mg/L		0.02	EPA 200.7	08/28/2015 1803	DG

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-001
ClientSample ID: PW-1 /MW-18
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 10:12:00 AM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	269	pCi/L		2	SM 7110B	09/09/2015 1048	WN
Gross Alpha Precision (±)	25.6	pCi/L			SM 7110B	09/09/2015 1048	WN
Gross Beta	223	pCi/L		3	SM 7110B	09/09/2015 1048	WN
Gross Beta Precision (±)	20.9	pCi/L			SM 7110B	09/09/2015 1048	WN
Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	08/21/2015 1801	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/21/2015 1801	MB
Radium 228	ND	pCi/L		1	Ga-Tech	08/28/2015 1858	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/28/2015 1858	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 846	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 846	MB
Thorium 229 Tracer (30-120)	58	%			ACW10	08/24/2015 846	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-002
ClientSample ID: PW-3/MW-20
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 2:00:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	618	mg/L		5	SM 2320B	08/10/2015 2157	MRL
Alkalinity, Bicarbonate as HCO3	734	mg/L		5	SM 2320B	08/10/2015 2157	MRL
Alkalinity, Carbonate as CO3	10	mg/L		5	SM 2320B	08/10/2015 2157	MRL
Chloride	19	mg/L		1	EPA 300.0	08/12/2015 2200	AB
Fluoride	0.5	mg/L		0.1	EPA 300.0	08/12/2015 2200	AB
Nitrogen, Nitrate+Nitrite (as N)	ND	mg/L		0.1	EPA 353.2	08/18/2015 1247	AMB
Sulfate	1530	mg/L		1	EPA 300.0	08/18/2015 1207	AB
Calcium	91	mg/L		1	EPA 200.7	08/18/2015 1309	BJ
Magnesium	50	mg/L		1	EPA 200.7	08/18/2015 1309	BJ
Potassium	18	mg/L		1	EPA 200.7	08/18/2015 1309	BJ
Sodium	794	mg/L		1	EPA 200.7	08/18/2015 1309	BJ
Nitrogen, Ammonia (As N)	1.1	mg/L		0.1	EPA 350.1	08/13/2015 1300	AMB
Silica as SiO2	3.9	mg/L		0.1	EPA 200.7	08/10/2015 1555	DG
General Parameters							
pH	8.3	s.u.		0.1	SM 4500 H B	08/10/2015 2157	MRL
Electrical Conductivity	3310	µmhos/cm		5	SM 2510B	08/10/2015 2157	MRL
Total Dissolved Solids (180)	2920	mg/L		10	SM 2540	08/07/2015 1445	TS
Sodium Adsorption Ratio	16.6			0.1	Calculation	08/20/2015 1555	WN
Data Quality							
Cation Sum	43.74	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Anion Sum	44.76	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Cation-Anion Balance (± 5%)	1.14	%		0.01	SM 1030E	08/20/2015 1555	WN
Solids, Total Dissolved (Calc)	2880	mg/L		10	SM 1030E	08/20/2015 1555	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.01	dec. %		0.01	Calculation	08/27/2015 1619	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-002
ClientSample ID: PW-3 /MW-20
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 2:00:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/10/2015 1555	DG
Arsenic	0.003	mg/L		0.001	EPA 200.8	08/07/2015 2224	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/07/2015 2224	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1555	DG
Boron	0.7	mg/L		0.1	EPA 200.7	08/10/2015 1555	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/07/2015 2224	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1555	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/07/2015 2224	MS
Iron	0.17	mg/L		0.05	EPA 200.7	08/10/2015 1555	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/07/2015 2224	MS
Manganese	0.11	mg/L		0.02	EPA 200.7	08/10/2015 1555	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/11/2015 1300	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/07/2015 2224	MS
Nickel	ND	mg/L		0.01	EPA 200.7	08/10/2015 1555	DG
Selenium	0.001	mg/L		0.001	EPA 200.8	08/07/2015 2224	MS
Uranium	0.0025	mg/L		0.0003	EPA 200.8	08/07/2015 2224	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/07/2015 2224	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/10/2015 1555	DG
Metals - Total							
Iron	1.71	mg/L		0.05	EPA 200.7	08/28/2015 1807	DG
Manganese	0.34	mg/L		0.02	EPA 200.7	08/28/2015 1807	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-002
ClientSample ID: PW-3 /MW-20
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 2:00:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	5.5	pCi/L		2	SM 7110B	08/21/2015 1532	MB
Gross Alpha Precision (±)	3.6	pCi/L			SM 7110B	08/21/2015 1532	MB
Gross Beta	19.6	pCi/L		3	SM 7110B	08/21/2015 1532	MB
Gross Beta Precision (±)	6.3	pCi/L			SM 7110B	08/21/2015 1532	MB
Radium 226	0.6	pCi/L		0.2	SM 7500 Ra-B	08/21/2015 1801	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/21/2015 1801	MB
Radium 228	ND	pCi/L		1	Ga-Tech	08/28/2015 2158	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/28/2015 2158	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 1323	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 1323	MB
Thorium 229 Tracer (30-120)	93	%			ACW10	08/24/2015 1323	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-003
ClientSample ID: PW-5 /MW-22
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 8:19:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	168	mg/L		5	SM 2320B	08/10/2015 2211	MRL
Alkalinity, Bicarbonate as HCO3	205	mg/L		5	SM 2320B	08/10/2015 2211	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/10/2015 2211	MRL
Chloride	61	mg/L		1	EPA 300.0	08/18/2015 1221	AB
Fluoride	0.9	mg/L		0.1	EPA 300.0	08/12/2015 2326	AB
Nitrogen, Nitrate+Nitrite (as N)	0.3	mg/L		0.1	EPA 353.2	08/18/2015 1249	AMB
Sulfate	1950	mg/L		1	EPA 300.0	08/18/2015 1221	AB
Calcium	347	mg/L		1	EPA 200.7	08/18/2015 1311	BJ
Magnesium	94	mg/L		1	EPA 200.7	08/18/2015 1311	BJ
Potassium	38	mg/L		1	EPA 200.7	08/18/2015 1311	BJ
Sodium	474	mg/L		1	EPA 200.7	08/18/2015 1311	BJ
Nitrogen, Ammonia (As N)	0.3	mg/L		0.1	EPA 350.1	08/13/2015 1301	AMB
Silica as SiO2	13.5	mg/L		0.1	EPA 200.7	08/10/2015 1557	DG
General Parameters							
pH	8.2	s.u.		0.1	SM 4500 H B	08/10/2015 2211	MRL
Electrical Conductivity	3040	µmhos/cm		5	SM 2510B	08/10/2015 2211	MRL
Total Dissolved Solids (180)	3180	mg/L		10	SM 2540	08/07/2015 1446	TS
Sodium Adsorption Ratio	5.8			0.1	Calculation	08/20/2015 1555	WN
Data Quality							
Cation Sum	46.67	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Anion Sum	45.66	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Cation-Anion Balance (± 5%)	1.10	%		0.01	SM 1030E	08/20/2015 1555	WN
Solids, Total Dissolved (Calc)	3080	mg/L		10	SM 1030E	08/20/2015 1555	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.03	dec. %		0.01	Calculation	08/27/2015 1619	WN

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-003
ClientSample ID: PW-5 /MW-22
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 8:19:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	1.2	mg/L		0.1	EPA 200.7	08/10/2015 1557	DG
Arsenic	0.004	mg/L		0.001	EPA 200.8	08/07/2015 2229	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/07/2015 2229	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1557	DG
Boron	0.1	mg/L		0.1	EPA 200.7	08/10/2015 1557	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/07/2015 2229	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1557	DG
Copper	0.02	mg/L		0.01	EPA 200.8	08/07/2015 2229	MS
Iron	1.82	mg/L		0.05	EPA 200.7	08/10/2015 1557	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/07/2015 2229	MS
Manganese	0.11	mg/L		0.02	EPA 200.7	08/10/2015 1557	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/11/2015 1302	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/07/2015 2229	MS
Nickel	ND	mg/L		0.01	EPA 200.7	08/10/2015 1557	DG
Selenium	0.068	mg/L		0.001	EPA 200.8	08/07/2015 2229	MS
Uranium	0.117	mg/L		0.0003	EPA 200.8	08/07/2015 2229	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/07/2015 2229	MS
Zinc	0.01	mg/L		0.01	EPA 200.7	08/10/2015 1557	DG
Metals - Total							
Iron	10.9	mg/L		0.05	EPA 200.7	08/28/2015 1821	DG
Manganese	0.27	mg/L		0.02	EPA 200.7	08/28/2015 1821	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-003
ClientSample ID: PW-5 /MW-22
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 8:19:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	63.3	pCi/L		2	SM 7110B	08/21/2015 1532	MB
Gross Alpha Precision (±)	9.0	pCi/L			SM 7110B	08/21/2015 1532	MB
Gross Beta	47.3	pCi/L		3	SM 7110B	08/21/2015 1532	MB
Gross Beta Precision (±)	7.4	pCi/L			SM 7110B	08/21/2015 1532	MB
Radium 226	1.1	pCi/L		0.2	SM 7500 Ra-B	08/21/2015 1801	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/21/2015 1801	MB
Radium 228	ND	pCi/L		1	Ga-Tech	08/29/2015 059	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/29/2015 059	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 1323	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 1323	MB
Thorium 229 Tracer (30-120)	87	%			ACW10	08/24/2015 1323	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
X	Matrix Effect
C	Calculated Value
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-004
ClientSample ID: PW-6 /MW-23
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 5:38:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	287	mg/L		5	SM 2320B	08/10/2015 2224	MRL
Alkalinity, Bicarbonate as HCO3	350	mg/L		5	SM 2320B	08/10/2015 2224	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/10/2015 2224	MRL
Chloride	40	mg/L		1	EPA 300.0	08/14/2015 103	AB
Fluoride	0.8	mg/L		0.1	EPA 300.0	08/12/2015 2340	AB
Nitrogen, Nitrate+Nitrite (as N)	ND	mg/L		0.1	EPA 353.2	08/18/2015 1250	AMB
Sulfate	938	mg/L		1	EPA 300.0	08/14/2015 103	AB
Calcium	241	mg/L		1	EPA 200.7	08/10/2015 1602	DG
Magnesium	50	mg/L		1	EPA 200.7	08/10/2015 1602	DG
Potassium	25	mg/L		1	EPA 200.7	08/10/2015 1602	DG
Sodium	199	mg/L		1	EPA 200.7	08/10/2015 1602	DG
Nitrogen, Ammonia (As N)	0.4	mg/L		0.1	EPA 350.1	08/13/2015 1303	AMB
Silica as SiO2	35.1	mg/L		0.1	EPA 200.7	08/10/2015 1602	DG
General Parameters							
pH	8.1	s.u.		0.1	SM 4500 H B	08/10/2015 2224	MRL
Electrical Conductivity	2030	µmhos/cm		5	SM 2510B	08/10/2015 2224	MRL
Total Dissolved Solids (180)	1860	mg/L		10	SM 2540	08/07/2015 1447	TS
Sodium Adsorption Ratio	3.0			0.1	Calculation	08/20/2015 1555	WN
Data Quality							
Cation Sum	25.44	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Anion Sum	26.41	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Cation-Anion Balance (± 5%)	1.87	%		0.01	SM 1030E	08/20/2015 1555	WN
Solids, Total Dissolved (Calc)	1700	mg/L		10	SM 1030E	08/20/2015 1555	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.09	dec. %		0.01	Calculation	08/27/2015 1619	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-004
ClientSample ID: PW-6/MW-23
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 5:38:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/10/2015 1602	DG
Arsenic	0.007	mg/L		0.001	EPA 200.8	08/07/2015 2257	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/07/2015 2257	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1602	DG
Boron	0.3	mg/L		0.1	EPA 200.7	08/10/2015 1602	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/07/2015 2257	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1602	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/07/2015 2257	MS
Iron	0.51	mg/L		0.05	EPA 200.7	08/10/2015 1602	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/07/2015 2257	MS
Manganese	0.38	mg/L		0.02	EPA 200.7	08/10/2015 1602	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/11/2015 1304	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/07/2015 2257	MS
Nickel	ND	mg/L		0.01	EPA 200.7	08/10/2015 1602	DG
Selenium	0.028	mg/L		0.001	EPA 200.8	08/07/2015 2257	MS
Uranium	0.128	mg/L		0.0003	EPA 200.8	08/07/2015 2257	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/07/2015 2257	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/10/2015 1602	DG
Metals - Total							
Iron	0.55	mg/L		0.05	EPA 200.7	08/28/2015 1823	DG
Manganese	0.43	mg/L		0.02	EPA 200.7	08/28/2015 1823	DG

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-004
ClientSample ID: PW-6 /MW-23
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 5:38:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	122	pCi/L		2	SM 7110B	08/21/2015 1532	MB
Gross Alpha Precision (±)	7.5	pCi/L			SM 7110B	08/21/2015 1532	MB
Gross Beta	52.6	pCi/L		3	SM 7110B	08/21/2015 1532	MB
Gross Beta Precision (±)	4.5	pCi/L			SM 7110B	08/21/2015 1532	MB
Radium 226	1.0	pCi/L		0.2	SM 7500 Ra-B	08/21/2015 1801	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/21/2015 1801	MB
Radium 228	ND	pCi/L		1	Ga-Tech	08/29/2015 400	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/29/2015 400	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 1323	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 1323	MB
Thorium 229 Tracer (30-120)	93	%			ACW10	08/24/2015 1323	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-005
ClientSample ID: PW-8 /MW-25
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 3:30:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	452	mg/L		5	SM 2320B	08/10/2015 2240	MRL
Alkalinity, Bicarbonate as HCO3	551	mg/L		5	SM 2320B	08/10/2015 2240	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/10/2015 2240	MRL
Chloride	139	mg/L		1	EPA 300.0	08/14/2015 243	AB
Fluoride	0.7	mg/L		0.1	EPA 300.0	08/12/2015 2355	AB
Nitrogen, Nitrate+Nitrite (as N)	8.7	mg/L		0.1	EPA 353.2	08/20/2015 1450	AMB
Sulfate	2640	mg/L		1	EPA 300.0	08/14/2015 243	AB
Calcium	463	mg/L		1	EPA 200.7	08/20/2015 332	BJ
Magnesium	204	mg/L		1	EPA 200.7	08/20/2015 332	BJ
Potassium	68	mg/L		1	EPA 200.7	08/20/2015 332	BJ
Sodium	676	mg/L		1	EPA 200.7	08/20/2015 332	BJ
Nitrogen, Ammonia (As N)	0.3	mg/L		0.1	EPA 350.1	08/13/2015 1304	AMB
lica as SiO2	3.8	mg/L		0.1	EPA 200.7	08/10/2015 1615	DG
eneral Parameters							
pH	8.1	s.u.		0.1	SM 4500 H B	08/10/2015 2240	MRL
Electrical Conductivity	4150	µmhos/cm		5	SM 2510B	08/10/2015 2240	MRL
Total Dissolved Solids (180)	4700	mg/L		10	SM 2540	08/07/2015 1448	TS
Sodium Adsorption Ratio	6.6			0.1	Calculation	08/20/2015 1555	WN
Data Quality							
Cation Sum	71.03	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Anion Sum	68.65	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Cation-Anion Balance (± 5%)	1.70	%		0.01	SM 1030E	08/20/2015 1555	WN
Solids, Total Dissolved (Calc)	4500	mg/L		10	SM 1030E	08/20/2015 1555	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.04	dec. %		0.01	Calculation	08/27/2015 1619	WN

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-005
ClientSample ID: PW-8/MW-25
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 3:30:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/10/2015 1615	DG
Arsenic	0.008	mg/L		0.001	EPA 200.8	08/07/2015 2318	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/07/2015 2318	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1615	DG
Boron	ND	mg/L		0.1	EPA 200.7	08/10/2015 1615	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/07/2015 2318	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1615	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/07/2015 2318	MS
Iron	ND	mg/L		0.05	EPA 200.7	08/10/2015 1615	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/07/2015 2318	MS
Manganese	ND	mg/L		0.02	EPA 200.7	08/10/2015 1615	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/11/2015 1306	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/07/2015 2318	MS
Nickel	ND	mg/L		0.01	EPA 200.7	08/10/2015 1615	DG
Selenium	0.074	mg/L		0.001	EPA 200.8	08/07/2015 2318	MS
Uranium	1.44	mg/L		0.0003	EPA 200.8	08/07/2015 2318	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/07/2015 2318	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/10/2015 1615	DG
Metals - Total							
Iron	0.33	mg/L		0.05	EPA 200.7	08/28/2015 1826	DG
Manganese	0.07	mg/L		0.02	EPA 200.7	08/28/2015 1826	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-005
ClientSample ID: PW-8 /MW-25
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/5/2015 3:30:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	583	pCi/L		2	SM 7110B	09/10/2015 729	WN
Gross Alpha Precision (±)	35.6	pCi/L			SM 7110B	09/10/2015 729	WN
Gross Beta	450	pCi/L		3	SM 7110B	09/10/2015 729	WN
Gross Beta Precision (±)	25.0	pCi/L			SM 7110B	09/10/2015 729	WN
Radium 226	0.7	pCi/L		0.2	SM 7500 Ra-B	08/21/2015 1801	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/21/2015 1801	MB
Radium 228	ND	pCi/L		1	Ga-Tech	08/29/2015 701	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/29/2015 701	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 1323	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 1323	MB
Thorium 229 Tracer (30-120)	86	%			ACW10	08/24/2015 1323	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-006
ClientSample ID: PW-9 /MW-26
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 3:40:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	172	mg/L		5	SM 2320B	08/10/2015 2307	MRL
Alkalinity, Bicarbonate as HCO3	206	mg/L		5	SM 2320B	08/10/2015 2307	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/10/2015 2307	MRL
Chloride	13	mg/L		1	EPA 300.0	08/13/2015 009	AB
Fluoride	0.6	mg/L		0.1	EPA 300.0	08/13/2015 009	AB
Nitrogen, Nitrate+Nitrite (as N)	0.4	mg/L		0.1	EPA 353.2	08/18/2015 1308	AMB
Sulfate	544	mg/L		1	EPA 300.0	08/14/2015 257	AB
Calcium	58	mg/L		1	EPA 200.7	08/10/2015 1617	DG
Magnesium	18	mg/L		1	EPA 200.7	08/10/2015 1617	DG
Potassium	15	mg/L		1	EPA 200.7	08/10/2015 1617	DG
Sodium	226	mg/L		1	EPA 200.7	08/10/2015 1617	DG
Nitrogen, Ammonia (As N)	0.3	mg/L		0.1	EPA 350.1	08/13/2015 1305	AMB
Silica as SiO2	10.8	mg/L		0.1	EPA 200.7	08/10/2015 1617	DG
General Parameters							
pH	8.4	s.u.		0.1	SM 4500 H B	08/10/2015 2307	MRL
Electrical Conductivity	1400	µmhos/cm		5	SM 2510B	08/10/2015 2307	MRL
Total Dissolved Solids (180)	1040	mg/L		10	SM 2540	08/07/2015 1449	TS
Sodium Adsorption Ratio	6.7			0.1	Calculation	08/20/2015 1555	WN
Data Quality							
Cation Sum	14.54	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Anion Sum	15.18	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Cation-Anion Balance (± 5%)	2.17	%		0.01	SM 1030E	08/20/2015 1555	WN
Solids, Total Dissolved (Calc)	990	mg/L		10	SM 1030E	08/20/2015 1555	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.05	dec. %		0.01	Calculation	08/27/2015 1619	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-006
ClientSample ID: PW-9 /MW-26
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 3:40:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	0.8	mg/L		0.1	EPA 200.7	08/10/2015 1617	DG
Arsenic	0.001	mg/L		0.001	EPA 200.8	08/07/2015 2324	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/07/2015 2324	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1617	DG
Boron	0.4	mg/L		0.1	EPA 200.7	08/10/2015 1617	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/07/2015 2324	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1617	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/07/2015 2324	MS
Iron	1.19	mg/L		0.05	EPA 200.7	08/10/2015 1617	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/07/2015 2324	MS
Manganese	0.08	mg/L		0.02	EPA 200.7	08/10/2015 1617	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/11/2015 1308	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/07/2015 2324	MS
Nickel	ND	mg/L		0.01	EPA 200.7	08/10/2015 1617	DG
Selenium	0.001	mg/L		0.001	EPA 200.8	08/07/2015 2324	MS
Uranium	0.0044	mg/L		0.0003	EPA 200.8	08/07/2015 2324	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/07/2015 2324	MS
Zinc	0.01	mg/L		0.01	EPA 200.7	08/10/2015 1617	DG
Metals - Total							
Iron	5.94	mg/L		0.05	EPA 200.7	08/28/2015 1828	DG
Manganese	0.09	mg/L		0.02	EPA 200.7	08/28/2015 1828	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-006
ClientSample ID: PW-9 /MW-26
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 3:40:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	5.3	pCi/L		2	SM 7110B	08/21/2015 1532	MB
Gross Alpha Precision (±)	2.0	pCi/L			SM 7110B	08/21/2015 1532	MB
Gross Beta	12.1	pCi/L		3	SM 7110B	08/21/2015 1532	MB
Gross Beta Precision (±)	3.2	pCi/L			SM 7110B	08/21/2015 1532	MB
Radium 226	0.6	pCi/L		0.2	SM 7500 Ra-B	08/21/2015 1801	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/21/2015 1801	MB
Radium 228	ND	pCi/L		1	Ga-Tech	08/29/2015 1002	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/29/2015 1002	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 1323	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 1323	MB
Thorium 229 Tracer (30-120)	94	%			ACW10	08/24/2015 1323	MB

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-007
ClientSample ID: PW-10 /MW-27
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 10:40:00 AM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	694	mg/L		5	SM 2320B	08/10/2015 2320	MRL
Alkalinity, Bicarbonate as HCO3	847	mg/L		5	SM 2320B	08/10/2015 2320	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/10/2015 2320	MRL
Chloride	123	mg/L		1	EPA 300.0	08/18/2015 1250	AB
Fluoride	0.3	mg/L		0.1	EPA 300.0	08/13/2015 023	AB
Nitrogen, Nitrate+Nitrite (as N)	ND	mg/L		0.1	EPA 353.2	08/18/2015 1310	AMB
Sulfate	1350	mg/L		1	EPA 300.0	08/18/2015 1250	AB
Calcium	479	mg/L		1	EPA 200.7	08/18/2015 1315	BJ
Magnesium	101	mg/L		1	EPA 200.7	08/18/2015 1315	BJ
Potassium	35	mg/L		1	EPA 200.7	08/18/2015 1315	BJ
Sodium	221	mg/L		1	EPA 200.7	08/18/2015 1315	BJ
Nitrogen, Ammonia (As N)	0.7	mg/L		0.1	EPA 350.1	08/13/2015 1307	AMB
Silica as SiO2	10.9	mg/L		0.1	EPA 200.7	08/10/2015 1620	DG
General Parameters							
pH	7.9	s.u.		0.1	SM 4500 H B	08/10/2015 2320	MRL
Electrical Conductivity	2880	µmhos/cm		5	SM 2510B	08/10/2015 2320	MRL
Total Dissolved Solids (180)	3000	mg/L		10	SM 2540	08/07/2015 1450	TS
Sodium Adsorption Ratio	2.4			0.1	Calculation	08/20/2015 1555	WN
Data Quality							
Cation Sum	42.76	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Anion Sum	45.43	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Cation-Anion Balance (± 5%)	3.02	%		0.01	SM 1030E	08/20/2015 1555	WN
Solids, Total Dissolved (Calc)	2730	mg/L		10	SM 1030E	08/20/2015 1555	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.10	dec. %		0.01	Calculation	08/27/2015 1619	WN

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-007
ClientSample ID: PW-10 /MW-27
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 10:40:00 AM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	0.2	mg/L		0.1	EPA 200.7	08/10/2015 1620	DG
Arsenic	ND	mg/L		0.001	EPA 200.8	08/07/2015 2329	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/07/2015 2329	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1620	DG
Boron	0.1	mg/L		0.1	EPA 200.7	08/10/2015 1620	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/07/2015 2329	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1620	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/07/2015 2329	MS
Iron	1.70	mg/L		0.05	EPA 200.7	08/10/2015 1620	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/07/2015 2329	MS
Manganese	0.36	mg/L		0.02	EPA 200.7	08/10/2015 1620	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/11/2015 1310	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/07/2015 2329	MS
Nickel	ND	mg/L		0.01	EPA 200.7	08/10/2015 1620	DG
Selenium	ND	mg/L		0.001	EPA 200.8	08/07/2015 2329	MS
Uranium	0.0023	mg/L		0.0003	EPA 200.8	08/07/2015 2329	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/07/2015 2329	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/10/2015 1620	DG
Metals - Total							
Iron	11.4	mg/L		0.05	EPA 200.7	08/28/2015 1830	DG
Manganese	1.16	mg/L		0.02	EPA 200.7	08/28/2015 1830	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-007
ClientSample ID: PW-10 /MW-27
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 10:40:00 AM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	5.6	pCi/L		2	SM 7110B	08/21/2015 1532	MB
Gross Alpha Precision (±)	3.9	pCi/L			SM 7110B	08/21/2015 1532	MB
Gross Beta	19.8	pCi/L		3	SM 7110B	08/21/2015 1532	MB
Gross Beta Precision (±)	6.3	pCi/L			SM 7110B	08/21/2015 1532	MB
Radium 226	4.7	pCi/L		0.2	SM 7500 Ra-B	08/21/2015 1801	MB
Radium 226 Precision (±)	0.3	pCi/L			SM 7500 Ra-B	08/21/2015 1801	MB
Radium 228	4.7	pCi/L		1	Ga-Tech	08/29/2015 1303	MB
Radium 228 Precision (±)	1.2	pCi/L			Ga-Tech	08/29/2015 1303	MB
Thorium 230	ND	pCi/L		0.2	ACW10	08/24/2015 1323	MB
Thorium 230 Precision (±)	NA	pCi/L			ACW10	08/24/2015 1323	MB
Thorium 229 Tracer (30-120)	85	%			ACW10	08/24/2015 1323	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

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- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

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Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-008
ClientSample ID: PW-12 /MW-28
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 5:03:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	671	mg/L		5	SM 2320B	08/10/2015 2335	MRL
Alkalinity, Bicarbonate as HCO3	819	mg/L		5	SM 2320B	08/10/2015 2335	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/10/2015 2335	MRL
Chloride	108	mg/L		1	EPA 300.0	08/14/2015 326	AB
Fluoride	0.5	mg/L		0.1	EPA 300.0	08/13/2015 038	AB
Nitrogen, Nitrate+Nitrite (as N)	7.7	mg/L		0.1	EPA 353.2	08/20/2015 1452	AMB
Sulfate	1670	mg/L		1	EPA 300.0	08/14/2015 326	AB
Calcium	464	mg/L		1	EPA 200.7	08/20/2015 335	BJ
Magnesium	165	mg/L		1	EPA 200.7	08/20/2015 335	BJ
Potassium	47	mg/L		1	EPA 200.7	08/20/2015 335	BJ
Sodium	217	mg/L		1	EPA 200.7	08/20/2015 335	BJ
Nitrogen, Ammonia (As N)	0.1	mg/L		0.1	EPA 350.1	08/13/2015 1308	AMB
Silica as SiO2	13.7	mg/L		0.1	EPA 200.7	08/10/2015 1622	DG
General Parameters							
pH	7.6	s.u.		0.1	SM 4500 H B	08/10/2015 2335	MRL
Electrical Conductivity	3330	µmhos/cm		5	SM 2510B	08/10/2015 2335	MRL
Total Dissolved Solids (180)	3350	mg/L		10	SM 2540	08/07/2015 1452	TS
Sodium Adsorption Ratio	2.2			0.1	Calculation	08/20/2015 1555	WN
Data Quality							
Cation Sum	47.37	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Anion Sum	51.74	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Cation-Anion Balance (± 5%)	4.40	%		0.01	SM 1030E	08/20/2015 1555	WN
Solids, Total Dissolved (Calc)	3100	mg/L		10	SM 1030E	08/20/2015 1555	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.08	dec. %		0.01	Calculation	08/27/2015 1619	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-008
ClientSample ID: PW-12 /MW-28
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 5:03:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/10/2015 1622	DG
Arsenic	0.001	mg/L		0.001	EPA 200.8	08/07/2015 2335	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/07/2015 2335	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1622	DG
Boron	ND	mg/L		0.1	EPA 200.7	08/10/2015 1622	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/07/2015 2335	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1622	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/07/2015 2335	MS
Iron	ND	mg/L		0.05	EPA 200.7	08/10/2015 1622	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/07/2015 2335	MS
Manganese	7.11	mg/L		0.02	EPA 200.7	08/10/2015 1622	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/11/2015 1316	AW
Molybdenum	ND	mg/L		0.02	EPA 200.8	08/07/2015 2335	MS
Nickel	0.14	mg/L		0.01	EPA 200.7	08/10/2015 1622	DG
Selenium	0.012	mg/L		0.001	EPA 200.8	08/07/2015 2335	MS
Uranium	0.837	mg/L		0.0003	EPA 200.8	08/07/2015 2335	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/07/2015 2335	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/10/2015 1622	DG
Metals - Total							
Iron	0.39	mg/L		0.05	EPA 200.7	08/28/2015 1832	DG
Manganese	20.4	mg/L		0.02	EPA 200.7	08/28/2015 1832	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-008
ClientSample ID: PW-12 /MW-28
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 5:03:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	423	pCi/L		2	SM 7110B	08/24/2015 2132	MB
Gross Alpha Precision (±)	22.7	pCi/L			SM 7110B	08/24/2015 2132	MB
Gross Beta	202	pCi/L		3	SM 7110B	08/24/2015 2132	MB
Gross Beta Precision (±)	10.8	pCi/L			SM 7110B	08/24/2015 2132	MB
Radium 226	0.7	pCi/L		0.2	SM 7500 Ra-B	08/21/2015 1801	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/21/2015 1801	MB
Radium 228	1.1	pCi/L		1	Ga-Tech	08/29/2015 1604	MB
Radium 228 Precision (±)	0.9	pCi/L			Ga-Tech	08/29/2015 1604	MB
Thorium 230	0.6	pCi/L		0.2	ACW10	08/24/2015 1323	MB
Thorium 230 Precision (±)	0.3	pCi/L			ACW10	08/24/2015 1323	MB
Thorium 229 Tracer (30-120)	40	%			ACW10	08/24/2015 1323	MB

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:

B	Analyte detected in the associated Method Blank	C	Calculated Value
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-009
ClientSample ID: MW-12
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 1:15:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO3)	407	mg/L		5	SM 2320B	08/10/2015 2348	MRL
Alkalinity, Bicarbonate as HCO3	496	mg/L		5	SM 2320B	08/10/2015 2348	MRL
Alkalinity, Carbonate as CO3	ND	mg/L		5	SM 2320B	08/10/2015 2348	MRL
Chloride	158	mg/L		1	EPA 300.0	08/18/2015 1318	AB
Fluoride	0.3	mg/L		0.1	EPA 300.0	08/13/2015 052	AB
Nitrogen, Nitrate+Nitrite (as N)	ND	mg/L		0.1	EPA 353.2	08/18/2015 1313	AMB
Sulfate	1600	mg/L		1	EPA 300.0	08/18/2015 1318	AB
Calcium	553	mg/L		1	EPA 200.7	08/18/2015 1320	BJ
Magnesium	85	mg/L		1	EPA 200.7	08/18/2015 1320	BJ
Potassium	31	mg/L		1	EPA 200.7	08/18/2015 1320	BJ
Sodium	203	mg/L		1	EPA 200.7	08/18/2015 1320	BJ
Nitrogen, Ammonia (As N)	0.5	mg/L		0.1	EPA 350.1	08/13/2015 1309	AMB
ica as SiO2	9.1	mg/L		0.1	EPA 200.7	08/10/2015 1624	DG
eneral Parameters							
pH	7.8	s.u.		0.1	SM 4500 H B	08/10/2015 2348	MRL
Electrical Conductivity	2930	µmhos/cm		5	SM 2510B	08/10/2015 2348	MRL
Total Dissolved Solids (180)	3220	mg/L		10	SM 2540	08/07/2015 1453	TS
Sodium Adsorption Ratio	2.1			0.1	Calculation	08/20/2015 1555	WN
Data Quality							
Cation Sum	44.23	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Anion Sum	45.85	meq/L		0.01	SM 1030E	08/20/2015 1555	WN
Cation-Anion Balance (± 5%)	1.79	%		0.01	SM 1030E	08/20/2015 1555	WN
Solids, Total Dissolved (Calc)	2880	mg/L		10	SM 1030E	08/20/2015 1555	WN
Calculated TDS/TDS Ratio (0.80-1.20)	1.12	dec. %		0.01	Calculation	08/27/2015 1619	WN

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-009
ClientSample ID: MW-12
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 1:15:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Metals - Dissolved							
Aluminum	ND	mg/L		0.1	EPA 200.7	08/10/2015 1624	DG
Arsenic	0.005	mg/L		0.001	EPA 200.8	08/07/2015 2340	MS
Barium	ND	mg/L		0.1	EPA 200.8	08/07/2015 2340	MS
Beryllium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1624	DG
Boron	ND	mg/L		0.1	EPA 200.7	08/10/2015 1624	DG
Cadmium	ND	mg/L		0.002	EPA 200.8	08/07/2015 2340	MS
Chromium	ND	mg/L		0.01	EPA 200.7	08/10/2015 1624	DG
Copper	ND	mg/L		0.01	EPA 200.8	08/07/2015 2340	MS
Iron	0.42	mg/L		0.05	EPA 200.7	08/10/2015 1624	DG
Lead	ND	mg/L		0.02	EPA 200.8	08/07/2015 2340	MS
Manganese	0.35	mg/L		0.02	EPA 200.7	08/10/2015 1624	DG
Mercury	ND	mg/L		0.001	EPA 245.1	08/11/2015 1323	AW
Molybdenum	0.04	mg/L		0.02	EPA 200.8	08/07/2015 2340	MS
Nickel	0.02	mg/L		0.01	EPA 200.7	08/10/2015 1624	DG
Selenium	ND	mg/L		0.001	EPA 200.8	08/07/2015 2340	MS
Uranium	5.61	mg/L		0.0003	EPA 200.8	08/07/2015 2340	MS
Vanadium	ND	mg/L		0.02	EPA 200.8	08/07/2015 2340	MS
Zinc	ND	mg/L		0.01	EPA 200.7	08/10/2015 1624	DG
Metals - Total							
Iron	2.37	mg/L		0.05	EPA 200.7	08/28/2015 1835	DG
Manganese	1.05	mg/L		0.02	EPA 200.7	08/28/2015 1835	DG

These results apply only to the samples tested. **RL - Reporting Limit**

Qualifiers:
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Reviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Sample Analysis Report

Company: Lidstone & Associates Inc
4025 Automation Way Bldg E
Fort Collins, CO 80525

Date Reported 9/11/2015
Report ID S1508125001

ProjectName: ANC
Lab ID: S1508125-009
ClientSample ID: MW-12
COC: 162366

WorkOrder: S1508125
CollectionDate: 8/6/2015 1:15:00 PM
DateReceived: 8/7/2015 11:49:00 AM
FieldSampler: JG
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Dissolved							
Gross Alpha	3320	pCi/L		2	SM 7110B	08/24/2015 2132	MB
Gross Alpha Precision (±)	61.2	pCi/L			SM 7110B	08/24/2015 2132	MB
Gross Beta	1110	pCi/L		3	SM 7110B	08/24/2015 2132	MB
Gross Beta Precision (±)	22.6	pCi/L			SM 7110B	08/24/2015 2132	MB
Radium 226	26.2	pCi/L		0.2	SM 7500 Ra-B	08/21/2015 1801	MB
Radium 226 Precision (±)	0.6	pCi/L			SM 7500 Ra-B	08/21/2015 1801	MB
Radium 228	16.6	pCi/L		1	Ga-Tech	08/29/2015 1905	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	08/29/2015 1905	MB
Thorium 230	0.4	pCi/L		0.2	ACW10	08/24/2015 1323	MB
Thorium 230 Precision (±)	0.2	pCi/L			ACW10	08/24/2015 1323	MB
Thorium 229 Tracer (30-120)	76	%			ACW10	08/24/2015 1323	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect
- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

eviewed by: _____
Wade Nieuwsma, Assistant Laboratory Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Alkalinity Sample Type **MBLK** Units: mg/L

BLANK (08/10/15 15:46) RunNo: 124703

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Alkalinity, Total (As CaCO3)	ND	5					

Alkalinity Sample Type **LCS** Units: mg/L

ATQC (08/10/15 15:35) RunNo: 124703

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Alkalinity, Total (As CaCO3)	602	5	595		101	90 - 110	

Alkalinity Sample Type **DUP** Units: mg/L

S1508125-005A (08/10/15 22:53) RunNo: 124703

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Alkalinity, Bicarbonate as HCO3	513	5	551	7.08		20	
Alkalinity, Carbonate as CO3	ND	5	ND			20	
Alkalinity, Total (As CaCO3)	421	5	452	7.08		20	

Conductivity Sample Type **MBLK** Units: µmhos/cm

BLANK (08/10/15 15:46) RunNo: 124703

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Electrical Conductivity	ND	5					

Conductivity Sample Type **LCS** Units: µmhos/cm

ATQC (08/10/15 15:35) RunNo: 124703

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Electrical Conductivity	1030	5	1060		97.3	90 - 110	

Conductivity Sample Type **DUP** Units: µmhos/cm

S1508125-005A (08/10/15 22:53) RunNo: 124703

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Electrical Conductivity	4150	5	4150	0		20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Dissolved Mercury by EPA 245.1 - Water Sample Type **MBLK** Units: mg/L

LRB (08/11/15 10:52) RunNo: 124742

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Mercury	ND	0.001					

Dissolved Mercury by EPA 245.1 - Water Sample Type **LCS** Units: mg/L

LCS (08/11/15 13:46) RunNo: 124742

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Mercury	0.002	0.001	0.002		85.3	85 - 115	

Dissolved Mercury by EPA 245.1 - Water Sample Type **MS** Units: mg/L

S1508125-008C (08/11/15 13:20) RunNo: 124742

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Mercury	0.002	0.001	0.00197	ND	92.7	70 - 130	

Dissolved Mercury by EPA 245.1 - Water Sample Type **MSD** Units: mg/L

S1508125-008C (08/11/15 13:22) RunNo: 124742

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Mercury	0.002	0.001	0.002	0.714	93.3	20	

ualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **MBLK** Units: mg/L

MBLK DISS/CAT (08/10/15 11:22) RunNo: 124694

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Aluminum	ND	0.1					
Beryllium	ND	0.01					
Boron	ND	0.1					
Chromium	ND	0.01					
Iron	ND	0.05					
Manganese	ND	0.02					
Nickel	ND	0.01					
Zinc	ND	0.01					

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **LCS** Units: mg/L

DISS LCS Q (08/10/15 11:24) RunNo: 124694

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Aluminum	1.0	0.1	1		98.8	85 - 115	
Beryllium	1.01	0.01	1		101	85 - 115	
Boron	1.0	0.1	1		98.8	85 - 115	
Chromium	1.01	0.01	1		101	85 - 115	
Iron	1.00	0.05	1		99.9	85 - 115	
Manganese	1.03	0.02	1		103	85 - 115	
Nickel	1.04	0.01	1		104	85 - 115	
Zinc	0.99	0.01	1		99.4	85 - 115	

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **MS** Units: mg/L

S1508125-004CS (08/10/15 16:04) RunNo: 124694

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Aluminum	0.3	0.1	0.25	ND	92.9	70 - 130	
Beryllium	0.26	0.01	0.25	ND	105	70 - 130	
Boron	0.6	0.1	0.25	0.3	91.3	70 - 130	
Chromium	0.26	0.01	0.25	ND	105	70 - 130	
Iron	0.73	0.05	0.25	0.51	85.7	70 - 130	
Manganese	0.61	0.02	0.25	0.38	90.9	70 - 130	
Nickel	0.26	0.01	0.25	ND	101	70 - 130	
Zinc	0.25	0.01	0.25	ND	98.4	70 - 130	

Dissolved Metals by ICP - EPA 200.7 - Water Sample Type **MSD** Units: mg/L

S1508125-004CSD (08/10/15 16:06) RunNo: 124694

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Aluminum	0.3	0.1	0.3	0.766	92.1	20	
Beryllium	0.26	0.01	0.26	1.17	104	20	
Boron	0.6	0.1	0.6	0.0777	91.5	20	
Chromium	0.26	0.01	0.26	1.55	104	20	
Iron	0.72	0.05	0.73	0.914	83.1	20	
Manganese	0.61	0.02	0.61	0.509	89.6	20	
Nickel	0.25	0.01	0.26	2.13	99.1	20	
Zinc	0.24	0.01	0.25	1.55	96.9	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MBLK** Units: mg/L

MBLK (08/07/15 13:03) RunNo: 124645

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Arsenic	ND	0.005					
Barium	ND	0.1					
Cadmium	ND	0.001					
Copper	ND	0.01					
Lead	ND	0.02					
Molybdenum	ND	0.02					
Selenium	ND	0.001					
Uranium	ND	0.0003					
Vanadium	ND	0.02					

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **LCS** Units: mg/L

LCS (08/07/15 12:57) RunNo: 124645

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Arsenic	0.099	0.005	0.1		99.1	85 - 115	
Barium	0.1	0.1	0.1		100	85 - 115	
Cadmium	0.094	0.001	0.1		94.4	85 - 115	
Copper	0.10	0.01	0.1		99.1	85 - 115	
Lead	0.10	0.02	0.1		98.7	85 - 115	
Molybdenum	0.10	0.02	0.1		97.3	85 - 115	
Selenium	0.100	0.001	0.1		99.9	85 - 115	
Uranium	0.102	0.0003	0.1		102	85 - 115	
Vanadium	0.10	0.02	0.1		100	85 - 115	

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MS** Units: mg/L

S1508125-004CS (08/07/15 23:08) RunNo: 124645

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Arsenic	1.12	0.005	1.1	0.007	101	70 - 130	
Barium	1.2	0.5	1.1	ND	101	70 - 130	
Cadmium	1.05	0.002	1.1	ND	95.1	70 - 130	
Copper	1.12	0.01	1.1	ND	102	70 - 130	
Lead	1.08	0.02	1.1	ND	98.2	70 - 130	
Molybdenum	1.12	0.02	1.1	ND	102	70 - 130	
Selenium	0.996	0.005	1.1	0.028	88.0	70 - 130	
Uranium	1.27	0.0003	1.1	0.128	104	70 - 130	
Vanadium	1.19	0.02	1.1	ND	108	70 - 130	

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MSD** Units: mg/L

S1508125-004CMSD (08/07/15 23:13) RunNo: 124645

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Arsenic	1.11	0.005	1.12	0.984	100	20	
Barium	1.1	0.5	1.2	3.45	97.0	20	
Cadmium	1.05	0.002	1.05	0.287	95.4	20	
Copper	1.11	0.01	1.12	1.23	101	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Dissolved Metals by ICPMS EPA 200.8 - Water Sample Type **MSD** Units: mg/L

S1508125-004CMSD (08/07/15 23:13) RunNo: 124645

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Lead	1.06	0.02	1.08	1.73	96.5	20	
Molybdenum	1.09	0.02	1.12	3.34	98.5	20	
Selenium	0.992	0.005	0.996	0.347	87.6	20	
Uranium	1.24	0.0003	1.27	2.87	101	20	
Vanadium	1.13	0.02	1.19	4.45	103	20	

Gross Alpha, Beta by SM 7110B Sample Type **MBLK** Units: pCi/L

MB-339 (08/21/15 08:58) RunNo: 125254 PrepDate: 08/18/15 0:00 BatchID: R125254

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	ND	2					
Gross Beta (Dissolved)	ND	3					

MB-343 (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	ND	2					
Gross Beta (Dissolved)	ND	3					

Gross Alpha, Beta by SM 7110B Sample Type **LCS** Units: pCi/L

LCS-339 (08/21/15 08:58) RunNo: 125254 PrepDate: 08/18/15 0:00 BatchID: R125254

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qu
Gross Alpha (Dissolved)	53	2	72.6		73.3	59.5 - 130	
Gross Beta (Dissolved)	125	3	118		105	80 - 122	

LCS-343 A (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	77	2	70		109	59.5 - 130	

LCS-343 B (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Beta (Dissolved)	145	3	126		116	84.2 - 125	

Gross Alpha, Beta by SM 7110B Sample Type **MS** Units: pCi/L

S1508155-001F MS (08/21/15 08:58) RunNo: 125254 PrepDate: 08/18/15 0:00 BatchID: R125254

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	89	2	72.6	20	94.9	50 - 150	
Gross Beta (Dissolved)	154	3	118	8	124	61.4 - 150	

S1508462-001D MSA (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Alpha (Dissolved)	158	2	140	3	111	50 - 150	

S1508462-001D MSB (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Gross Beta (Dissolved)	288	3	251	73	85.9	66.1 - 145	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Gross Alpha, Beta by SM 7110B Sample Type **DUP** Units: pCi/L

S1508204-006F DUP (08/21/15 15:32) RunNo: 125254 PrepDate: 08/18/15 0:00 BatchID: R125254

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Gross Alpha (Dissolved)	186	2	152	20.1		20	
Gross Beta (Dissolved)	66	3	69	4.45		20	

S1508462-002D DUP (09/09/15 10:48) RunNo: 125898

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Gross Alpha (Dissolved)	4	2	4	12.0		20	
Gross Beta (Dissolved)	14	3	17	19.9		20	

Anions by ION Chromatography Sample Type **MBLK** Units: mg/L

BLK (08/12/15 09:33) RunNo: 124784

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Chloride	ND	1					
Fluoride	ND	0.1					
Sulfate	ND	1					

Anions by ION Chromatography Sample Type **LCS** Units: mg/L

DIONEX (08/12/15 09:47) RunNo: 124784

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Chloride	31	1	30		102	90 - 110	
Sulfate	147	1	150		98.2	90 - 110	

DIONEX (08/12/15 10:02) RunNo: 124784

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Fluoride	19.1	0.1	20		95.7	90 - 110	

Anions by ION Chromatography Sample Type **MS** Units: mg/L

S1508125-002ASPK (08/12/15 22:28) RunNo: 124784

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Chloride	78	1	54.5	19	108	80 - 120	
Fluoride	28.5	0.1	27.2	0.5	103	80 - 120	
Sulfate	2160	1	409	1780	92.6	80 - 120	

Anions by ION Chromatography Sample Type **MSD** Units: mg/L

S1508125-002ASPK (08/12/15 22:43) RunNo: 124784

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Chloride	78	1	78	0.0499	108	20	
Fluoride	28.6	0.1	28.5	0.357	103	20	
Sulfate	2150	1	2160	0.617	89.4	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Cations by ICP (Method 200.7) Sample Type **MBLK** Units: mg/L

MBLK DISS/CAT (08/10/15 11:22) RunNo: 124691

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	ND	1					
Magnesium	ND	1					
Potassium	ND	1					
Sodium	ND	1					

Cations by ICP (Method 200.7) Sample Type **LCS** Units: mg/L

CAT LCS IML3 (08/19/15 13:39) RunNo: 125058

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	38	1	40		96.1	85 - 115	
Magnesium	40	1	40		99.7	85 - 115	
Potassium	39	1	40		97.8	85 - 115	
Sodium	39	1	40		97.9	85 - 115	

Cations by ICP (Method 200.7) Sample Type **MS** Units: mg/L

S1508119-002AS (08/10/15 14:36) RunNo: 124691

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	87	1	25	57	118	70 - 130	
Magnesium	57	1	25	31	103	70 - 130	
Potassium	29	1	25	4	100	70 - 130	
Sodium	28	1	25	7	84.4	70 - 130	

Cations by ICP (Method 200.7) Sample Type **MSD** Units: mg/L

S1508119-002ASD (08/10/15 14:38) RunNo: 124691

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Calcium	90	1	87	2.92	128	20	
Magnesium	58	1	57	2.63	109	20	
Potassium	29	1	29	0.676	99.2	20	
Sodium	27	1	28	1.98	82.3	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Nitrogen, Ammonia (as N) Sample Type **MBLK** Units: mg/L

BLANK (08/13/15 11:47) RunNo: 124900

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Ammonia (As N)	ND	0.1					

Nitrogen, Ammonia (as N) Sample Type **LCS** Units: mg/L

QC (08/13/15 11:49) RunNo: 124900

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Ammonia (As N)	2.3	0.1	2.5		92.7	90 - 110	

Nitrogen, Ammonia (as N) Sample Type **MS** Units: mg/L

S1508158-001C (08/13/15 12:09) RunNo: 124900

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Ammonia (As N)	4.8	0.1	2.5	2.3	101	90 - 110	

Nitrogen, Ammonia (as N) Sample Type **MSD** Units: mg/L

S1508158-001C (08/13/15 12:11) RunNo: 124900

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Nitrogen, Ammonia (As N)	4.8	0.1	4.8	0.109	101	20	

Nitrogen, Nitrate-Nitrite (as N) Sample Type **MBLK** Units: mg/L

BLANK (08/18/15 08:52) RunNo: 125005

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Nitrate-Nitrite (as N)	ND	0.1					

Nitrogen, Nitrate-Nitrite (as N) Sample Type **LCS** Units: mg/L

QC (08/18/15 08:55) RunNo: 125005

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Nitrate-Nitrite (as N)	16.2	0.1	17.7		91.6	90 - 110	

Nitrogen, Nitrate-Nitrite (as N) Sample Type **MS** Units: mg/L

S1508170-001D (08/18/15 10:08) RunNo: 125005

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Nitrogen, Nitrate-Nitrite (as N)	2.55	0.05	2.5	ND	102	90 - 110	

Nitrogen, Nitrate-Nitrite (as N) Sample Type **MSD** Units: mg/L

S1508170-001D (08/18/15 10:09) RunNo: 125005

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Nitrogen, Nitrate-Nitrite (as N)	2.58	0.05	2.55	1.40	103	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Radium 228 by Ga/Tech Sample Type **MBLK** Units: pCi/L

MB-10645 (08/27/15 15:49) RunNo: 125563 PrepDate: 08/26/15 9:33 BatchID: 10645

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 228 (Dissolved)	ND	1					

Radium 228 by Ga/Tech Sample Type **LCS** Units: pCi/L

LCS-10645 (08/27/15 18:50) RunNo: 125563 PrepDate: 08/26/15 9:33 BatchID: 10645

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 228 (Dissolved)	32	1	39.2		80.5	61.3 - 120	

Radium 228 by Ga/Tech Sample Type **MS** Units: pCi/L

MS-10645 (08/28/15 00:52) RunNo: 125563 PrepDate: 08/18/15 9:00 BatchID: 10645

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 228 (Dissolved)	35	1	39.2	ND	88.0	64.3 - 120	

Radium 228 by Ga/Tech Sample Type **MSD** Units: pCi/L

MSD-10645 (08/28/15 03:53) RunNo: 125563 PrepDate: 08/18/15 9:00 BatchID: 10645

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 228 (Dissolved)	38	1	35	10.7	98.0	20	

Radium 226 in Water - Dissolved Sample Type **MBLK** Units: pCi/L

MB-1499 (08/21/15 14:42) RunNo: 125217 PrepDate: 08/13/15 0:00 BatchID: 10632

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226 (Dissolved)	ND	0.2					

Radium 226 in Water - Dissolved Sample Type **LCS** Units: pCi/L

LCS-1499 (08/21/15 14:42) RunNo: 125217 PrepDate: 08/13/15 0:00 BatchID: 10632

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226 (Dissolved)	4.6	0.2	5.03		91.5	72.5 - 120	

Radium 226 in Water - Dissolved Sample Type **MS** Units: pCi/L

MS-1499 (08/21/15 14:42) RunNo: 125217 PrepDate: 08/13/15 0:00 BatchID: 10632

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226 (Dissolved)	4.8	0.2	5.03	ND	95.1	69.6 - 120	

Radium 226 in Water - Dissolved Sample Type **MSD** Units: pCi/L

MSD-1499 (08/21/15 14:42) RunNo: 125217 PrepDate: 08/13/15 0:00 BatchID: 10632

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226 (Dissolved)	4.9	0.2	4.8	2.91	97.9	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Thorium 230 in Water - Dissolved Sample Type **MBLK** Units: pCi/L

MB-464 (08/24/15 08:45) RunNo: 125247 PrepDate: 08/18/15 0:00 BatchID: R125247

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Thorium 230 (Dissolved)	ND	0.2					

Thorium 230 in Water - Dissolved Sample Type **LCS** Units: pCi/L

LCS-464 (08/24/15 08:45) RunNo: 125247 PrepDate: 08/18/15 0:00 BatchID: R125247

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Thorium 230 (Dissolved)	12	0.2	12		94.3	68 - 146	

Silica as SiO2 Sample Type **MBLK** Units: mg/L

MBLK DISS/CAT (08/10/15 11:22) RunNo: 124697

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Silica as SiO2	ND	0.1					

Silica as SiO2 Sample Type **LCS** Units: mg/L

DISS LCS Q (08/10/15 11:24) RunNo: 124697

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Silica as SiO2	2.1	0.1	2.14		96.7	85 - 115	

Silica as SiO2 Sample Type **MSD** Units: mg/L

S1508125-004CSD (08/10/15 16:06) RunNo: 124697

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Silica as SiO2	33.1	0.1	33.3	0.532		20	

Solids By SM 2540 Sample Type **MBLK** Units: mg/L

DI (08/07/15 13:44) RunNo: 124780

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Dissolved Solids (180)	ND	10					

Solids By SM 2540 Sample Type **LCS** Units: mg/L

CONTROL (08/07/15 13:45) RunNo: 124780

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Dissolved Solids (180)	230	10	226		101	90 - 110	

Solids By SM 2540 Sample Type **DUP** Units: mg/L

S1508125-007A (08/07/15 14:51) RunNo: 124780

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Total Dissolved Solids (180)	3040	10	3000	1.19		20	

ualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

ANALYTICAL QC SUMMARY REPORT

CLIENT: Lidstone & Associates Inc
Work Order: S1508125
Project: ANC

Date: 9/11/2015
Report ID: S1508125001

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **MBLK** Units: mg/L

MB-10578 (08/12/15 16:45) RunNo: 124809 PrepDate: 08/10/15 6:00 BatchID: 10578

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Iron	ND	0.05					
Manganese	ND	0.02					

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **LCS** Units: mg/L

LCS-10578 (08/28/15 18:01) RunNo: 125514 PrepDate: 08/10/15 6:00 BatchID: 10578

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Iron	0.50	0.05	0.5		100	85 - 115	
Manganese	0.20	0.02	0.2		101	85 - 115	

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **MS** Units: mg/L

S1508122-003DS (08/10/15 17:18) RunNo: 124707 PrepDate: 08/10/15 6:00 BatchID: 10578

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Iron	0.48	0.05	0.5	ND	93.3	70 - 130	
Manganese	0.19	0.02	0.2	ND	93.2	70 - 130	

Total (200.2) Metals by EPA 200.7 ICP - Water Sample Type **MSD** Units: mg/L

S1508122-003DMSD (08/10/15 17:21) RunNo: 124707 PrepDate: 08/10/15 6:00 BatchID: 10578

Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Iron	0.48	0.05	0.48	1.32	94.6	20	
Manganese	0.19	0.02	0.19	0.991	94.1	20	

pH Water Sample Type **LCS** Units: s.u.

ATQC (08/10/15 15:35) RunNo: 124703

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
pH	8.8	0.1	8.6		102	90 - 110	

pH Water Sample Type **DUP** Units: s.u.

S1508125-005A (08/10/15 22:53) RunNo: 124703

Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
pH	8.1	0.1	8.1	0.202		20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

September 2015

ANALYTICAL SUMMARY REPORT

October 07, 2015

Lidstone and Associates
4025 Automation Way Unit E
Fort Collins, CO 80525

Work Order: C15090761

Project Name: WY DEQ 104

Energy Laboratories, Inc. Casper WY received the following 10 samples for Lidstone and Associates on 9/23/2015 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C15090761-001	MW-1	09/21/15 11:30	09/23/15	Aqueous	Metals by ICP/ICPMS, Dissolved Metals by ICP/ICPMS, Total Alkalinity Anion - Cation Balance Conductivity Sample Filtering Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Metals Preparation by EPA 200.2 Gross Alpha, Gross Beta Radium 226, Dissolved Radium 228, Dissolved Thorium, Isotopic Solids, Total Dissolved Solids, Total Dissolved - Calculated
C15090761-002	MW-1A	09/21/15 11:30	09/23/15	Aqueous	Same As Above
C15090761-003	PW-10/MW-27	09/21/15 13:26	09/23/15	Aqueous	Same As Above
C15090761-004	MW-3	09/21/15 14:55	09/23/15	Aqueous	Same As Above
C15090761-005	MW-10	09/21/15 16:30	09/23/15	Aqueous	Same As Above
C15090761-006	MW-7	09/21/15 18:05	09/23/15	Aqueous	Same As Above
C15090761-007	MW-17	09/21/15 19:15	09/23/15	Aqueous	Same As Above
C15090761-008	TP2-3	09/22/15 12:30	09/23/15	Aqueous	Same As Above
C15090761-009	PW-14/MW-30	09/22/15 10:15	09/23/15	Aqueous	Same As Above
C15090761-010	MW-5	09/22/15 11:15	09/23/15	Aqueous	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Radiochemistry analyses were performed at Energy Laboratories, Inc., 2325 Kerzell Lane, Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Lidstone and Associates
Project: WY DEQ 104
Work Order: C15090761

Report Date: 10/07/15

CASE NARRATIVE

RADIOCHEMISTRY ANALYSIS
Per client request, results less than MDC (or precision if no MDC), are reported as <MDC (or <precision). Actual instrument results are available by request.

TH230 ANALYSIS
USNRC Regulatory Guide 4.14 provides guidance on Minimum Detectable Concentrations (MDC) that should be achieved in samples for this radionuclide. The sample-specific MDC for this sample could not be achieved due to significant matrix interferences, restricting the volume of sample to be used in the analysis. Please consult with your local regulatory agency prior to using these results for compliance purposes.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-001
Client Sample ID: MW-1

Report Date: 10/07/15
Collection Date: 09/21/15 11:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/23/15 18:12 / wc
Bicarbonate as HCO3	1230	mg/L		5		A2320 B	09/23/15 18:12 / wc
Calcium	488	mg/L		1		E200.7	09/29/15 20:03 / sf
Chloride	279	mg/L	D	5		E300.0	09/23/15 23:03 / wc
Fluoride	3.9	mg/L		0.1		A4500-F C	09/23/15 14:26 / wc
Magnesium	376	mg/L		1		E200.8	09/25/15 18:54 / smm
Nitrogen, Ammonia as N	418	mg/L	D	10		A4500-NH3 G	09/25/15 11:24 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/23/15 12:29 / lr
Potassium	19	mg/L		1		E200.8	09/25/15 18:54 / smm
Silica	19.6	mg/L	D	0.3		E200.7	09/29/15 20:03 / sf
Sodium	393	mg/L		1		E200.8	09/25/15 18:54 / smm
Sulfate	3750	mg/L	D	20		E300.0	09/23/15 23:03 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	8360	umhos/cm		5		A2510 B	09/23/15 13:17 / lmc
pH	6.44	s.u.	H	0.01		A4500-H B	09/23/15 13:17 / lmc
Solids, Total Dissolved TDS @ 180 C	5320	mg/L		100		A2540 C	09/24/15 09:06 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 18:54 / smm
Arsenic	0.014	mg/L		0.001		E200.8	09/25/15 18:54 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 18:54 / smm
Beryllium	0.001	mg/L		0.001		E200.8	09/25/15 18:54 / smm
Boron	ND	mg/L	D	0.2		E200.7	09/29/15 20:03 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 18:54 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 18:54 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 18:54 / smm
Iron	30.9	mg/L		0.03		E200.8	09/25/15 18:54 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 18:54 / smm
Manganese	7.17	mg/L		0.01		E200.8	09/25/15 18:54 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 18:54 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 18:54 / smm
Nickel	0.99	mg/L		0.05		E200.8	09/25/15 18:54 / smm
Selenium	0.011	mg/L		0.001		E200.8	09/25/15 18:54 / smm
Uranium	5.55	mg/L		0.0003		E200.8	09/25/15 18:54 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 18:54 / smm
Zinc	0.04	mg/L		0.01		E200.8	09/25/15 18:54 / smm
METALS - TOTAL							
Iron	34.3	mg/L		0.03		E200.7	09/28/15 21:01 / sf
Manganese	6.96	mg/L		0.01		E200.7	10/01/15 21:45 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-001
Client Sample ID: MW-1

Report Date: 10/07/15
Collection Date: 09/21/15 11:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	4850	pCi/L		23.9		E900.0	09/28/15 22:08 / trs
Gross Alpha precision (±)	943	pCi/L				E900.0	09/28/15 22:08 / trs
Gross Alpha MDC	23.9	pCi/L				E900.0	09/28/15 22:08 / trs
Gross Beta	319	pCi/L		28.4		E900.0	09/28/15 22:08 / trs
Gross Beta precision (±)	34.3	pCi/L				E900.0	09/28/15 22:08 / trs
Gross Beta MDC	28.4	pCi/L				E900.0	09/28/15 22:08 / trs
Radium 226	77	pCi/L		0.15		E903.0	10/05/15 12:21 / dmf
Radium 226 precision (±)	15	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 226 MDC	0.15	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 228	66.6	pCi/L		1.2		RA-05	09/29/15 12:04 / plj
Radium 228 precision (±)	11.8	pCi/L				RA-05	09/29/15 12:04 / plj
Radium 228 MDC	1.2	pCi/L				RA-05	09/29/15 12:04 / plj
Thorium 230	<0.6	pCi/L	U	0.6		E908.0	09/30/15 09:28 / cng
Thorium 230 precision (±)	0.2	pCi/L				E908.0	09/30/15 09:28 / cng
Thorium 230 MDC	0.6	pCi/L				E908.0	09/30/15 09:28 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.74	%				A1030 E	09/30/15 14:40 / sdw
Anions	106	meq/L				A1030 E	09/30/15 14:40 / sdw
Cations	103	meq/L				A1030 E	09/30/15 14:40 / sdw
Solids, Total Dissolved Calculated	5900	mg/L				A1030 E	09/30/15 14:40 / sdw
TDS Balance (0.80 - 1.20)	0.90	unitless				A1030 E	09/30/15 14:40 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-002
Client Sample ID: MW-1A

Report Date: 10/07/15
Collection Date: 09/21/15 11:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/23/15 18:22 / wc
Bicarbonate as HCO3	1240	mg/L		5		A2320 B	09/23/15 18:22 / wc
Calcium	488	mg/L		1		E200.7	09/29/15 20:07 / sf
Chloride	277	mg/L	D	5		E300.0	09/23/15 23:20 / wc
Fluoride	3.4	mg/L		0.1		A4500-F C	09/23/15 14:29 / wc
Magnesium	368	mg/L		1		E200.8	09/25/15 18:59 / smm
Nitrogen, Ammonia as N	424	mg/L	D	10		A4500-NH3 G	09/25/15 11:26 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/23/15 12:31 / lr
Potassium	18	mg/L		1		E200.8	09/25/15 18:59 / smm
Silica	19.7	mg/L	D	0.3		E200.7	09/29/15 20:07 / sf
Sodium	382	mg/L		1		E200.8	09/25/15 18:59 / smm
Sulfate	3720	mg/L	D	20		E300.0	09/23/15 23:20 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	8240	umhos/cm		5		A2510 B	09/23/15 13:21 / lmc
pH	6.44	s.u.	H	0.01		A4500-H B	09/23/15 13:21 / lmc
Solids, Total Dissolved TDS @ 180 C	5250	mg/L		100		A2540 C	09/24/15 09:07 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 18:59 / smm
Arsenic	0.015	mg/L		0.001		E200.8	09/25/15 18:59 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 18:59 / smm
Beryllium	0.001	mg/L		0.001		E200.8	09/25/15 18:59 / smm
Boron	ND	mg/L	D	0.2		E200.7	09/29/15 20:07 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 18:59 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 18:59 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 18:59 / smm
Iron	31.1	mg/L		0.03		E200.8	09/25/15 18:59 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 18:59 / smm
Manganese	7.10	mg/L		0.01		E200.8	09/25/15 18:59 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 18:59 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 18:59 / smm
Nickel	0.95	mg/L		0.05		E200.8	09/25/15 18:59 / smm
Selenium	0.002	mg/L		0.001		E200.8	09/25/15 18:59 / smm
Uranium	5.42	mg/L		0.0003		E200.8	09/25/15 18:59 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 18:59 / smm
Zinc	0.04	mg/L		0.01		E200.8	09/25/15 18:59 / smm
METALS - TOTAL							
Iron	32.5	mg/L		0.03		E200.7	09/28/15 21:05 / sf
Manganese	7.09	mg/L		0.01		E200.7	10/01/15 21:49 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-002
Client Sample ID: MW-1A

Report Date: 10/07/15
Collection Date: 09/21/15 11:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	5230	pCi/L		23.8		E900.0	09/29/15 00:27 / trs
Gross Alpha precision (±)	1020	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Alpha MDC	23.8	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta	326	pCi/L		29.4		E900.0	09/29/15 00:27 / trs
Gross Beta precision (±)	34.9	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta MDC	29.4	pCi/L				E900.0	09/29/15 00:27 / trs
Radium 226	45	pCi/L		0.15		E903.0	10/05/15 12:21 / dmf
Radium 226 precision (±)	8.6	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 226 MDC	0.15	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 228	56.8	pCi/L		1.2		RA-05	09/29/15 12:04 / plj
Radium 228 precision (±)	10.1	pCi/L				RA-05	09/29/15 12:04 / plj
Radium 228 MDC	1.2	pCi/L				RA-05	09/29/15 12:04 / plj
Thorium 230	<0.5	pCi/L	U	0.5		E908.0	09/30/15 09:28 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	09/30/15 09:28 / cng
Thorium 230 MDC	0.5	pCi/L				E908.0	09/30/15 09:28 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.76	%				A1030 E	09/30/15 14:40 / sdw
Anions	106	meq/L				A1030 E	09/30/15 14:40 / sdw
Cations	102	meq/L				A1030 E	09/30/15 14:40 / sdw
Solids, Total Dissolved Calculated	5900	mg/L				A1030 E	09/30/15 14:40 / sdw
TDS Balance (0.80 - 1.20)	0.89	unitless				A1030 E	09/30/15 14:40 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-003
Client Sample ID: PW-10/MW-27

Report Date: 10/07/15
Collection Date: 09/21/15 13:26
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/23/15 18:30 / wc
Bicarbonate as HCO3	459	mg/L		5		A2320 B	09/23/15 18:30 / wc
Calcium	307	mg/L		1		E200.7	09/29/15 20:11 / sf
Chloride	75	mg/L		1		E300.0	09/24/15 00:12 / wc
Fluoride	0.3	mg/L		0.1		A4500-F C	09/23/15 14:31 / wc
Magnesium	62	mg/L		1		E200.8	09/25/15 19:04 / smm
Nitrogen, Ammonia as N	0.31	mg/L		0.05		A4500-NH3 G	09/25/15 11:27 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/23/15 12:34 / lr
Potassium	22	mg/L		1		E200.8	09/25/15 19:04 / smm
Silica	20.1	mg/L		0.2		E200.7	09/29/15 20:11 / sf
Sodium	176	mg/L		1		E200.8	09/25/15 19:04 / smm
Sulfate	1040	mg/L	D	2		E300.0	09/24/15 00:12 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	2500	umhos/cm		5		A2510 B	09/23/15 13:25 / lmc
pH	7.03	s.u.	H	0.01		A4500-H B	09/23/15 13:25 / lmc
Solids, Total Dissolved TDS @ 180 C	2060	mg/L		20		A2540 C	09/24/15 09:07 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 19:04 / smm
Arsenic	0.001	mg/L		0.001		E200.8	09/25/15 19:04 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 19:04 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 19:04 / smm
Boron	0.2	mg/L		0.1		E200.7	09/29/15 20:11 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 19:04 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 19:04 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 19:04 / smm
Iron	0.70	mg/L		0.03		E200.8	09/25/15 19:04 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 19:04 / smm
Manganese	0.51	mg/L		0.01		E200.8	09/25/15 19:04 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 19:04 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 19:04 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 19:04 / smm
Selenium	ND	mg/L		0.001		E200.8	09/25/15 19:04 / smm
Uranium	0.0065	mg/L		0.0003		E200.8	09/25/15 19:04 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 19:04 / smm
Zinc	0.04	mg/L		0.01		E200.8	09/25/15 19:04 / smm
METALS - TOTAL							
Iron	4.86	mg/L		0.03		E200.7	09/28/15 21:09 / sf
Manganese	0.53	mg/L		0.01		E200.7	09/28/15 21:09 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-003
Client Sample ID: PW-10 /MW-27

Report Date: 10/07/15
Collection Date: 09/21/15 13:26
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	56.3	pCi/L		6.7		E900.0	09/29/15 00:27 / trs
Gross Alpha precision (±)	14.1	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Alpha MDC	6.7	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta	36.7	pCi/L		9.2		E900.0	09/29/15 00:27 / trs
Gross Beta precision (±)	6.6	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta MDC	9.2	pCi/L				E900.0	09/29/15 00:27 / trs
Radium 226	7.0	pCi/L		0.15		E903.0	10/05/15 12:21 / dmf
Radium 226 precision (±)	1.4	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 226 MDC	0.15	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 228	7.6	pCi/L		1.2		RA-05	09/29/15 12:04 / plj
Radium 228 precision (±)	1.8	pCi/L				RA-05	09/29/15 12:04 / plj
Radium 228 MDC	1.2	pCi/L				RA-05	09/29/15 12:04 / plj
Thorium 230	<0.2	pCi/L	U	0.2		E908.0	09/30/15 09:28 / cng
Thorium 230 precision (±)	0.1	pCi/L				E908.0	09/30/15 09:28 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	09/30/15 09:28 / cng
DATA QUALITY							
A/C Balance (± 5)	-4.35	%				A1030 E	09/30/15 14:40 / sdw
Anions	31.3	meq/L				A1030 E	09/30/15 14:40 / sdw
Cations	28.7	meq/L				A1030 E	09/30/15 14:40 / sdw
Solids, Total Dissolved Calculated	1900	mg/L				A1030 E	09/30/15 14:40 / sdw
TDS Balance (0.80 - 1.20)	1.07	unitless				A1030 E	09/30/15 14:40 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-004
Client Sample ID: MW-3

Report Date: 10/07/15
Collection Date: 09/21/15 14:55
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/23/15 18:38 / wc
Bicarbonate as HCO3	318	mg/L		5		A2320 B	09/23/15 18:38 / wc
Calcium	234	mg/L		1		E200.7	09/29/15 20:15 / sf
Chloride	26	mg/L		1		E300.0	09/24/15 01:05 / wc
Fluoride	0.3	mg/L		0.1		A4500-F C	09/23/15 14:34 / wc
Magnesium	49	mg/L		1		E200.8	09/25/15 19:09 / smm
Nitrogen, Ammonia as N	0.18	mg/L		0.05		A4500-NH3 G	09/25/15 11:29 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/23/15 12:36 / lr
Potassium	18	mg/L		1		E200.8	09/25/15 19:09 / smm
Silica	20.3	mg/L		0.2		E200.7	09/29/15 20:15 / sf
Sodium	116	mg/L		1		E200.8	09/25/15 19:09 / smm
Sulfate	721	mg/L	D	2		E300.0	09/24/15 01:05 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	1760	umhos/cm		5		A2510 B	09/23/15 13:34 / lmc
pH	7.29	s.u.	H	0.01		A4500-H B	09/23/15 13:34 / lmc
Solids, Total Dissolved TDS @ 180 C	1400	mg/L		10		A2540 C	09/24/15 09:07 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 19:09 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/25/15 19:09 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 19:09 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 19:09 / smm
Boron	0.1	mg/L		0.1		E200.7	09/29/15 20:15 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 19:09 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 19:09 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 19:09 / smm
Iron	0.04	mg/L		0.03		E200.8	09/25/15 19:09 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 19:09 / smm
Manganese	0.17	mg/L		0.01		E200.8	09/25/15 19:09 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 19:09 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 19:09 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 19:09 / smm
Selenium	ND	mg/L		0.001		E200.8	09/25/15 19:09 / smm
Uranium	0.0032	mg/L		0.0003		E200.8	09/25/15 19:09 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 19:09 / smm
Zinc	0.01	mg/L		0.01		E200.8	09/25/15 19:09 / smm
METALS - TOTAL							
Iron	0.11	mg/L		0.03		E200.7	09/28/15 21:14 / sf
Manganese	0.17	mg/L		0.01		E200.7	09/28/15 21:14 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-004
Client Sample ID: MW-3

Report Date: 10/07/15
Collection Date: 09/21/15 14:55
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	25.2	pCi/L		5.2		E900.0	09/29/15 00:27 / trs
Gross Alpha precision (±)	7.4	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Alpha MDC	5.2	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta	25.8	pCi/L		6.6		E900.0	09/29/15 00:27 / trs
Gross Beta precision (±)	4.9	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta MDC	6.6	pCi/L				E900.0	09/29/15 00:27 / trs
Radium 226	6.4	pCi/L		0.15		E903.0	10/05/15 12:21 / dmf
Radium 226 precision (±)	1.3	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 226 MDC	0.15	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 228	3.7	pCi/L		1.4		RA-05	09/29/15 13:38 / plj
Radium 228 precision (±)	1.2	pCi/L				RA-05	09/29/15 13:38 / plj
Radium 228 MDC	1.4	pCi/L				RA-05	09/29/15 13:38 / plj
Thorium 230	<0.5	pCi/L	U	0.5		E908.0	09/30/15 09:28 / cng
Thorium 230 precision (±)	0.2	pCi/L				E908.0	09/30/15 09:28 / cng
Thorium 230 MDC	0.5	pCi/L				E908.0	09/30/15 09:28 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	0.48	%				A1030 E	09/30/15 14:41 / sdw
Anions	21.0	meq/L				A1030 E	09/30/15 14:41 / sdw
Cations	21.2	meq/L				A1030 E	09/30/15 14:41 / sdw
Solids, Total Dissolved Calculated	1300	mg/L				A1030 E	09/30/15 14:41 / sdw
TDS Balance (0.80 - 1.20)	1.04	unitless				A1030 E	09/30/15 14:41 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-005
Client Sample ID: MW-10

Report Date: 10/07/15
Collection Date: 09/21/15 16:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/23/15 18:47 / wc
Bicarbonate as HCO3	787	mg/L		5		A2320 B	09/23/15 18:47 / wc
Calcium	562	mg/L		1		E200.7	09/29/15 20:19 / sf
Chloride	285	mg/L	D	2		E300.0	09/24/15 01:22 / wc
Fluoride	0.1	mg/L		0.1		A4500-F C	09/23/15 14:37 / wc
Magnesium	280	mg/L		1		E200.8	09/25/15 19:14 / smm
Nitrogen, Ammonia as N	76	mg/L	D	2		A4500-NH3 G	09/25/15 11:31 / ljl
Nitrogen, Nitrate+Nitrite as N	15	mg/L	D	1		E353.2	09/23/15 12:39 / lr
Potassium	44	mg/L		1		E200.8	09/25/15 19:14 / smm
Silica	34.6	mg/L		0.2		E200.7	09/29/15 20:19 / sf
Sodium	366	mg/L		1		E200.8	09/25/15 19:14 / smm
Sulfate	2490	mg/L	D	8		E300.0	09/24/15 01:22 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	5400	umhos/cm		5		A2510 B	09/23/15 13:38 / lmc
pH	6.45	s.u.	H	0.01		A4500-H B	09/23/15 13:38 / lmc
Solids, Total Dissolved TDS @ 180 C	4360	mg/L		40		A2540 C	09/24/15 09:08 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 19:14 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/25/15 19:14 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 19:14 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 19:14 / smm
Boron	0.2	mg/L		0.1		E200.7	09/29/15 20:19 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 19:14 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 19:14 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 19:14 / smm
Iron	0.04	mg/L		0.03		E200.8	09/25/15 19:14 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 19:14 / smm
Manganese	11.5	mg/L		0.01		E200.8	09/25/15 19:14 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 19:14 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 19:14 / smm
Nickel	0.33	mg/L		0.05		E200.8	09/25/15 19:14 / smm
Selenium	0.011	mg/L		0.001		E200.8	09/25/15 19:14 / smm
Uranium	2.21	mg/L		0.0003		E200.8	09/25/15 19:14 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 19:14 / smm
Zinc	0.06	mg/L		0.01		E200.8	09/25/15 19:14 / smm
METALS - TOTAL							
Iron	0.09	mg/L		0.03		E200.7	09/28/15 21:18 / sf
Manganese	11.0	mg/L		0.01		E200.7	10/01/15 21:53 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-005
Client Sample ID: MW-10

Report Date: 10/07/15
Collection Date: 09/21/15 16:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	1620	pCi/L		15.5		E900.0	09/29/15 00:27 / trs
Gross Alpha precision (±)	319	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Alpha MDC	15.5	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta	207	pCi/L		23.1		E900.0	09/29/15 00:27 / trs
Gross Beta precision (±)	23.8	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta MDC	23.1	pCi/L				E900.0	09/29/15 00:27 / trs
Radium 226	9.4	pCi/L		0.14		E903.0	10/05/15 12:21 / dmf
Radium 226 precision (±)	1.8	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 226 MDC	0.14	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 228	9.9	pCi/L		1.3		RA-05	09/29/15 13:38 / plj
Radium 228 precision (±)	2.1	pCi/L				RA-05	09/29/15 13:38 / plj
Radium 228 MDC	1.3	pCi/L				RA-05	09/29/15 13:38 / plj
Thorium 230	<0.4	pCi/L	U	0.4		E908.0	09/30/15 09:28 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	09/30/15 09:28 / cng
Thorium 230 MDC	0.4	pCi/L				E908.0	09/30/15 09:28 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-0.04	%				A1030 E	09/30/15 14:41 / sdw
Anions	73.6	meq/L				A1030 E	09/30/15 14:41 / sdw
Cations	73.6	meq/L				A1030 E	09/30/15 14:41 / sdw
Solids, Total Dissolved Calculated	4500	mg/L				A1030 E	09/30/15 14:41 / sdw
TDS Balance (0.80 - 1.20)	0.97	unitless				A1030 E	09/30/15 14:41 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-006
Client Sample ID: MW-7

Report Date: 10/07/15
Collection Date: 09/21/15 18:05
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/23/15 18:54 / wc
Bicarbonate as HCO3	469	mg/L		5		A2320 B	09/23/15 18:54 / wc
Calcium	417	mg/L		1		E200.7	09/29/15 20:23 / sf
Chloride	48	mg/L		1		E300.0	09/24/15 01:40 / wc
Fluoride	0.2	mg/L		0.1		A4500-F C	09/23/15 14:39 / wc
Magnesium	138	mg/L		1		E200.8	09/25/15 19:20 / smm
Nitrogen, Ammonia as N	68	mg/L	D	2		A4500-NH3 G	09/25/15 11:32 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/23/15 12:41 / lr
Potassium	46	mg/L		1		E200.8	09/25/15 19:20 / smm
Silica	16.6	mg/L		0.2		E200.7	09/29/15 20:23 / sf
Sodium	133	mg/L		1		E200.8	09/25/15 19:20 / smm
Sulfate	1730	mg/L	D	4		E300.0	09/24/15 01:40 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	3380	umhos/cm		5		A2510 B	09/23/15 13:41 / lmc
pH	6.79	s.u.	H	0.01		A4500-H B	09/23/15 13:41 / lmc
Solids, Total Dissolved TDS @ 180 C	2660	mg/L		20		A2540 C	09/24/15 09:08 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 19:20 / smm
Arsenic	0.002	mg/L		0.001		E200.8	09/25/15 19:20 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 19:20 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 19:20 / smm
Boron	0.1	mg/L		0.1		E200.7	09/29/15 20:23 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 19:20 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 19:20 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 19:20 / smm
Iron	1.80	mg/L		0.03		E200.8	09/25/15 19:20 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 19:20 / smm
Manganese	6.06	mg/L		0.01		E200.8	09/25/15 19:20 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 19:20 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 19:20 / smm
Nickel	0.05	mg/L		0.05		E200.8	09/25/15 19:20 / smm
Selenium	ND	mg/L		0.001		E200.8	09/25/15 19:20 / smm
Uranium	1.01	mg/L		0.0003		E200.8	09/25/15 19:20 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 19:20 / smm
Zinc	ND	mg/L		0.01		E200.8	09/25/15 19:20 / smm
METALS - TOTAL							
Iron	2.71	mg/L		0.03		E200.7	09/28/15 21:22 / sf
Manganese	5.77	mg/L		0.01		E200.7	10/01/15 21:57 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-006
Client Sample ID: MW-7

Report Date: 10/07/15
Collection Date: 09/21/15 18:05
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	945	pCi/L		6.8		E900.0	09/29/15 00:27 / trs
Gross Alpha precision (±)	186	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Alpha MDC	6.8	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta	93.5	pCi/L		13.2		E900.0	09/29/15 00:27 / trs
Gross Beta precision (±)	10.9	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta MDC	13.2	pCi/L				E900.0	09/29/15 00:27 / trs
Radium 226	6.6	pCi/L		0.14		E903.0	10/05/15 12:21 / dmf
Radium 226 precision (±)	1.3	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 226 MDC	0.14	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 228	8.2	pCi/L		1.4		RA-05	09/29/15 13:38 / plj
Radium 228 precision (±)	1.8	pCi/L				RA-05	09/29/15 13:38 / plj
Radium 228 MDC	1.4	pCi/L				RA-05	09/29/15 13:38 / plj
Thorium 230	<0.6	pCi/L	U	0.6		E908.0	09/30/15 09:28 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	09/30/15 09:28 / cng
Thorium 230 MDC	0.6	pCi/L				E908.0	09/30/15 09:28 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.33	%				A1030 E	09/30/15 14:41 / sdw
Anions	45.2	meq/L				A1030 E	09/30/15 14:41 / sdw
Cations	44.0	meq/L				A1030 E	09/30/15 14:41 / sdw
Solids, Total Dissolved Calculated	2800	mg/L				A1030 E	09/30/15 14:41 / sdw
TDS Balance (0.80 - 1.20)	0.96	unitless				A1030 E	09/30/15 14:41 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-007
Client Sample ID: MW-17

Report Date: 10/07/15
Collection Date: 09/21/15 19:15
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/23/15 19:02 / wc
Bicarbonate as HCO3	284	mg/L		5		A2320 B	09/23/15 19:02 / wc
Calcium	118	mg/L		1		E200.7	09/29/15 20:27 / sf
Chloride	14	mg/L		1		E300.0	09/24/15 01:57 / wc
Fluoride	0.4	mg/L		0.1		A4500-F C	09/23/15 14:42 / wc
Magnesium	32	mg/L		1		E200.8	09/25/15 19:25 / smm
Nitrogen, Ammonia as N	0.60	mg/L		0.05		A4500-NH3 G	09/25/15 11:34 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/23/15 12:44 / lr
Potassium	15	mg/L		1		E200.8	09/25/15 19:25 / smm
Silica	15.5	mg/L		0.2		E200.7	09/29/15 20:27 / sf
Sodium	197	mg/L		1		E200.8	09/25/15 19:25 / smm
Sulfate	563	mg/L	D	2		E300.0	09/24/15 01:57 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	1510	umhos/cm		5		A2510 B	09/23/15 13:46 / lmc
pH	7.60	s.u.	H	0.01		A4500-H B	09/23/15 13:46 / lmc
Solids, Total Dissolved TDS @ 180 C	1100	mg/L		10		A2540 C	09/24/15 09:08 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 19:25 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/25/15 19:25 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 19:25 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 19:25 / smm
Boron	0.3	mg/L		0.1		E200.7	09/29/15 20:27 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 19:25 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 19:25 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 19:25 / smm
Iron	ND	mg/L		0.03		E200.8	09/25/15 19:25 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 19:25 / smm
Manganese	0.18	mg/L		0.01		E200.8	09/25/15 19:25 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 19:25 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 19:25 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 19:25 / smm
Selenium	ND	mg/L		0.001		E200.8	09/25/15 19:25 / smm
Uranium	0.0024	mg/L		0.0003		E200.8	09/25/15 19:25 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 19:25 / smm
Zinc	ND	mg/L		0.01		E200.8	09/25/15 19:25 / smm
METALS - TOTAL							
Iron	0.32	mg/L		0.03		E200.7	09/28/15 21:26 / sf
Manganese	0.17	mg/L		0.01		E200.7	09/28/15 21:26 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-007
Client Sample ID: MW-17

Report Date: 10/07/15
Collection Date: 09/21/15 19:15
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	6.6	pCi/L		4.6		E900.0	09/29/15 00:27 / trs
Gross Alpha precision (±)	4.2	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Alpha MDC	4.6	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta	15.0	pCi/L		5.2		E900.0	09/29/15 00:27 / trs
Gross Beta precision (±)	3.6	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta MDC	5.2	pCi/L				E900.0	09/29/15 00:27 / trs
Radium 226	1.3	pCi/L		0.16		E903.0	10/05/15 12:21 / dmf
Radium 226 precision (±)	0.34	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 226 MDC	0.16	pCi/L				E903.0	10/05/15 12:21 / dmf
Radium 228	1.8	pCi/L		1.5		RA-05	09/29/15 13:38 / plj
Radium 228 precision (±)	0.9	pCi/L				RA-05	09/29/15 13:38 / plj
Radium 228 MDC	1.5	pCi/L				RA-05	09/29/15 13:38 / plj
Thorium 230	<0.6	pCi/L	U	0.6		E908.0	09/30/15 09:28 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	09/30/15 09:28 / cng
Thorium 230 MDC	0.6	pCi/L				E908.0	09/30/15 09:28 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	2.07	%				A1030 E	09/30/15 14:41 / sdw
Anions	16.8	meq/L				A1030 E	09/30/15 14:41 / sdw
Cations	17.5	meq/L				A1030 E	09/30/15 14:41 / sdw
Solids, Total Dissolved Calculated	1100	mg/L				A1030 E	09/30/15 14:41 / sdw
TDS Balance (0.80 - 1.20)	1.00	unitless				A1030 E	09/30/15 14:41 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-008
Client Sample ID: TP2-3

Report Date: 10/07/15
Collection Date: 09/22/15 12:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/23/15 19:10 / wc
Bicarbonate as HCO3	192	mg/L		5		A2320 B	09/23/15 19:10 / wc
Calcium	300	mg/L		1		E200.7	09/29/15 20:31 / sf
Chloride	50	mg/L		1		E300.0	09/24/15 02:14 / wc
Fluoride	0.3	mg/L		0.1		A4500-F C	09/23/15 14:44 / wc
Magnesium	36	mg/L		1		E200.8	09/25/15 19:50 / smm
Nitrogen, Ammonia as N	8.8	mg/L	D	0.2		A4500-NH3 G	09/25/15 11:36 / ljl
Nitrogen, Nitrate+Nitrite as N	0.9	mg/L		0.1		E353.2	09/23/15 12:46 / lr
Potassium	17	mg/L		1		E200.8	09/25/15 19:50 / smm
Silica	15.7	mg/L		0.2		E200.7	09/29/15 20:31 / sf
Sodium	75	mg/L		1		E200.8	09/25/15 19:50 / smm
Sulfate	836	mg/L	D	2		E300.0	09/24/15 02:14 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	1850	umhos/cm		5		A2510 B	09/23/15 13:50 / lmc
pH	7.27	s.u.	H	0.01		A4500-H B	09/23/15 13:50 / lmc
Solids, Total Dissolved TDS @ 180 C	1490	mg/L		20		A2540 C	09/24/15 10:25 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 19:50 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/25/15 19:50 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 19:50 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 19:50 / smm
Boron	ND	mg/L		0.1		E200.7	09/29/15 20:31 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 19:50 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 19:50 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 19:50 / smm
Iron	ND	mg/L		0.03		E200.8	09/25/15 19:50 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 19:50 / smm
Manganese	0.04	mg/L		0.01		E200.8	09/25/15 19:50 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 19:50 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 19:50 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 19:50 / smm
Selenium	0.033	mg/L		0.001		E200.8	09/25/15 19:50 / smm
Uranium	0.843	mg/L		0.0003		E200.8	09/25/15 19:50 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 19:50 / smm
Zinc	0.01	mg/L		0.01		E200.8	09/25/15 19:50 / smm
METALS - TOTAL							
Iron	ND	mg/L		0.03		E200.7	09/28/15 21:30 / sf
Manganese	0.06	mg/L		0.01		E200.7	09/28/15 21:30 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-008
Client Sample ID: TP2-3

Report Date: 10/07/15
Collection Date: 09/22/15 12:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	557	pCi/L		6.3		E900.0	09/29/15 00:27 / trs
Gross Alpha precision (±)	109	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Alpha MDC	6.3	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta	65.2	pCi/L		7.5		E900.0	09/29/15 00:27 / trs
Gross Beta precision (±)	7.4	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta MDC	7.5	pCi/L				E900.0	09/29/15 00:27 / trs
Radium 226	3.4	pCi/L		0.16		E903.0	10/05/15 13:54 / dmf
Radium 226 precision (±)	0.73	pCi/L				E903.0	10/05/15 13:54 / dmf
Radium 226 MDC	0.16	pCi/L				E903.0	10/05/15 13:54 / dmf
Radium 228	3.4	pCi/L		1.5		RA-05	09/29/15 13:38 / plj
Radium 228 precision (±)	1.0	pCi/L				RA-05	09/29/15 13:38 / plj
Radium 228 MDC	1.5	pCi/L				RA-05	09/29/15 13:38 / plj
Thorium 230	<0.2	pCi/L	U	0.2		E908.0	09/30/15 09:28 / cng
Thorium 230 precision (±)	0.08	pCi/L				E908.0	09/30/15 09:28 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	09/30/15 09:28 / cng
DATA QUALITY							
A/C Balance (± 5)	0.35	%				A1030 E	09/30/15 14:42 / sdw
Anions	22.1	meq/L				A1030 E	09/30/15 14:42 / sdw
Cations	22.2	meq/L				A1030 E	09/30/15 14:42 / sdw
Solids, Total Dissolved Calculated	1400	mg/L				A1030 E	09/30/15 14:42 / sdw
TDS Balance (0.80 - 1.20)	1.04	unitless				A1030 E	09/30/15 14:42 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-009
Client Sample ID: PW-14/MW-30

Report Date: 10/07/15
Collection Date: 09/22/15 10:15
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/23/15 19:26 / wc
Bicarbonate as HCO3	427	mg/L		5		A2320 B	09/23/15 19:26 / wc
Calcium	444	mg/L		1		E200.7	09/29/15 20:58 / sf
Chloride	330	mg/L	D	2		E300.0	09/24/15 02:32 / wc
Fluoride	0.2	mg/L		0.1		A4500-F C	09/23/15 14:55 / wc
Magnesium	37	mg/L		1		E200.8	09/25/15 20:11 / smm
Nitrogen, Ammonia as N	ND	mg/L		0.05		A4500-NH3 G	09/25/15 14:39 / ljl
Nitrogen, Nitrate+Nitrite as N	58	mg/L	D	5		E353.2	09/23/15 12:49 / lr
Potassium	13	mg/L		1		E200.8	09/25/15 20:11 / smm
Silica	31.9	mg/L		0.2		E200.7	09/29/15 20:58 / sf
Sodium	518	mg/L		1		E200.8	09/25/15 20:11 / smm
Sulfate	1410	mg/L	D	8		E300.0	09/24/15 02:32 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	4070	umhos/cm		5		A2510 B	09/23/15 13:54 / lmc
pH	7.16	s.u.	H	0.01		A4500-H B	09/23/15 13:54 / lmc
Solids, Total Dissolved TDS @ 180 C	3230	mg/L		40		A2540 C	09/24/15 09:09 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 20:11 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/25/15 20:11 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 20:11 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 20:11 / smm
Boron	0.3	mg/L		0.1		E200.7	09/29/15 20:58 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 20:11 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 20:11 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 20:11 / smm
Iron	ND	mg/L		0.03		E200.7	09/29/15 20:58 / sf
Lead	0.004	mg/L		0.001		E200.8	09/25/15 20:11 / smm
Manganese	0.08	mg/L		0.01		E200.7	09/29/15 20:58 / sf
Mercury	ND	mg/L		0.001		E200.8	09/25/15 20:11 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 20:11 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 20:11 / smm
Selenium	0.090	mg/L		0.001		E200.8	09/25/15 20:11 / smm
Uranium	0.748	mg/L		0.0003		E200.8	09/25/15 20:11 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 20:11 / smm
Zinc	0.01	mg/L		0.01		E200.8	09/25/15 20:11 / smm
METALS - TOTAL							
Iron	0.07	mg/L		0.03		E200.7	09/28/15 21:34 / sf
Manganese	0.07	mg/L		0.01		E200.7	09/28/15 21:34 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-009
Client Sample ID: PW-14 /MW-30

Report Date: 10/07/15
Collection Date: 09/22/15 10:15
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	534	pCi/L		11.9		E900.0	09/29/15 00:27 / trs
Gross Alpha precision (±)	107	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Alpha MDC	11.9	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta	53.6	pCi/L		15.5		E900.0	09/29/15 00:27 / trs
Gross Beta precision (±)	7.9	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta MDC	15.5	pCi/L				E900.0	09/29/15 00:27 / trs
Radium 226	2.4	pCi/L		0.14		E903.0	10/05/15 13:54 / dmf
Radium 226 precision (±)	0.53	pCi/L				E903.0	10/05/15 13:54 / dmf
Radium 226 MDC	0.14	pCi/L				E903.0	10/05/15 13:54 / dmf
Radium 228	4.2	pCi/L		1.4		RA-05	09/29/15 13:38 / plj
Radium 228 precision (±)	1.2	pCi/L				RA-05	09/29/15 13:38 / plj
Radium 228 MDC	1.4	pCi/L				RA-05	09/29/15 13:38 / plj
Thorium 230	<0.3	pCi/L	U	0.3		E908.0	09/30/15 13:50 / cng
Thorium 230 precision (±)	0.2	pCi/L				E908.0	09/30/15 13:50 / cng
Thorium 230 MDC	0.3	pCi/L				E908.0	09/30/15 13:50 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.27	%				A1030 E	09/30/15 14:42 / sdw
Anions	49.3	meq/L				A1030 E	09/30/15 14:42 / sdw
Cations	48.0	meq/L				A1030 E	09/30/15 14:42 / sdw
Solids, Total Dissolved Calculated	3200	mg/L				A1030 E	09/30/15 14:42 / sdw
TDS Balance (0.80 - 1.20)	1.00	unitless				A1030 E	09/30/15 14:42 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-010
Client Sample ID: MW-5

Report Date: 10/07/15
Collection Date: 09/22/15 11:15
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/23/15 19:33 / wc
Bicarbonate as HCO3	238	mg/L		5		A2320 B	09/23/15 19:33 / wc
Calcium	619	mg/L		1		E200.7	09/29/15 21:02 / sf
Chloride	324	mg/L	D	2		E300.0	09/24/15 02:49 / wc
Fluoride	0.1	mg/L		0.1		A4500-F C	09/23/15 15:03 / wc
Magnesium	237	mg/L		1		E200.8	09/25/15 20:16 / smm
Nitrogen, Ammonia as N	55	mg/L	D	2		A4500-NH3 G	09/25/15 11:42 / ljl
Nitrogen, Nitrate+Nitrite as N	94	mg/L	D	5		E353.2	09/23/15 12:56 / lr
Potassium	47	mg/L		1		E200.8	09/25/15 20:16 / smm
Silica	46.9	mg/L		0.2		E200.7	09/29/15 21:02 / sf
Sodium	381	mg/L		1		E200.8	09/25/15 20:16 / smm
Sulfate	2610	mg/L	D	8		E300.0	09/24/15 02:49 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	5670	umhos/cm		5		A2510 B	09/23/15 13:59 / lmc
pH	6.15	s.u.	H	0.01		A4500-H B	09/23/15 13:59 / lmc
Solids, Total Dissolved TDS @ 180 C	4890	mg/L		40		A2540 C	09/24/15 09:10 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 20:16 / smm
Arsenic	0.004	mg/L		0.001		E200.8	09/25/15 20:16 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 20:16 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 20:16 / smm
Boron	0.2	mg/L		0.1		E200.7	09/29/15 21:02 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 20:16 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 20:16 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 20:16 / smm
Iron	ND	mg/L		0.03		E200.8	09/25/15 20:16 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 20:16 / smm
Manganese	8.63	mg/L		0.01		E200.8	09/25/15 20:16 / smm
Mercury	0.001	mg/L		0.001		E200.8	09/25/15 20:16 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 20:16 / smm
Nickel	0.25	mg/L		0.05		E200.8	09/25/15 20:16 / smm
Selenium	0.038	mg/L		0.001		E200.8	09/25/15 20:16 / smm
Uranium	0.606	mg/L		0.0003		E200.8	09/25/15 20:16 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 20:16 / smm
Zinc	0.02	mg/L		0.01		E200.8	09/25/15 20:16 / smm
METALS - TOTAL							
Iron	1.07	mg/L		0.03		E200.7	09/28/15 21:39 / sf
Manganese	11.7	mg/L		0.01		E200.7	09/28/15 21:39 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104
Lab ID: C15090761-010
Client Sample ID: MW-5

Report Date: 10/07/15
Collection Date: 09/22/15 11:15
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	656	pCi/L		17.8		E900.0	09/29/15 00:27 / trs
Gross Alpha precision (±)	133	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Alpha MDC	17.8	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta	91.6	pCi/L		24.9		E900.0	09/29/15 00:27 / trs
Gross Beta precision (±)	14.0	pCi/L				E900.0	09/29/15 00:27 / trs
Gross Beta MDC	24.9	pCi/L				E900.0	09/29/15 00:27 / trs
Radium 226	7.5	pCi/L		0.14		E903.0	10/05/15 13:54 / dmf
Radium 226 precision (±)	1.5	pCi/L				E903.0	10/05/15 13:54 / dmf
Radium 226 MDC	0.14	pCi/L				E903.0	10/05/15 13:54 / dmf
Radium 228	4.2	pCi/L		1.3		RA-05	09/29/15 13:38 / plj
Radium 228 precision (±)	1.2	pCi/L				RA-05	09/29/15 13:38 / plj
Radium 228 MDC	1.3	pCi/L				RA-05	09/29/15 13:38 / plj
Thorium 230	<0.5	pCi/L	U	0.5		E908.0	09/30/15 13:50 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	09/30/15 13:50 / cng
Thorium 230 MDC	0.5	pCi/L				E908.0	09/30/15 13:50 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.68	%				A1030 E	09/30/15 14:42 / sdw
Anions	74.6	meq/L				A1030 E	09/30/15 14:42 / sdw
Cations	72.1	meq/L				A1030 E	09/30/15 14:42 / sdw
Solids, Total Dissolved Calculated	4800	mg/L				A1030 E	09/30/15 14:42 / sdw
TDS Balance (0.80 - 1.20)	1.01	unitless				A1030 E	09/30/15 14:42 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104

Report Date: 10/07/15
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B										Batch: R204516
Lab ID: MBLK	3	Method Blank				Run: MANTECH_150923B				09/23/15 17:02
Alkalinity, Total as CaCO3		ND	mg/L	0.6						
Carbonate as CO3		ND	mg/L	1						
Bicarbonate as HCO3		ND	mg/L	1						
Lab ID: LCS_150317		Laboratory Control Sample				Run: MANTECH_150923B				09/23/15 17:16
Alkalinity, Total as CaCO3		246	mg/L	5.0	98	90	110			
Lab ID: C15090757-001AMS		Sample Matrix Spike				Run: MANTECH_150923B				09/23/15 17:54
Alkalinity, Total as CaCO3		479	mg/L	5.2	100	80	120			
Lab ID: C15090761-008ADUP	3	Sample Duplicate				Run: MANTECH_150923B				09/23/15 19:17
Alkalinity, Total as CaCO3		158	mg/L	5.0				0.1	10	
Carbonate as CO3		ND	mg/L	5.0					10	
Bicarbonate as HCO3		192	mg/L	5.0				0.1	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104

Report Date: 10/07/15
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2510 B										Batch: R204460
Lab ID: SC 2ND 1413		Laboratory Control Sample				Run: PHSC_101-C_150923A				09/23/15 08:50
Conductivity @ 25 C		1400	umhos/cm	5.0	99	90	110			
Lab ID: MBLK		Method Blank				Run: PHSC_101-C_150923A				09/23/15 12:36
Conductivity @ 25 C		1	umhos/cm	1						
Lab ID: C15090761-003ADUP		Sample Duplicate				Run: PHSC_101-C_150923A				09/23/15 13:29
Conductivity @ 25 C		2500	umhos/cm	5.0				0.2	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WY DEQ 104
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C									Batch: TDS150924A	
Lab ID: MB-1_150924A		Method Blank				Run: BAL-18_150924A			09/24/15 09:04	
Solids, Total Dissolved TDS @ 180 C		ND	mg/L	9						
Lab ID: LCS-2_150924A		Laboratory Control Sample				Run: BAL-18_150924A			09/24/15 09:04	
Solids, Total Dissolved TDS @ 180 C		1140	mg/L	11	102	90	110			
Lab ID: C15090761-008A DUP		Sample Duplicate				Run: BAL-18_150924A			09/24/15 09:09	
Solids, Total Dissolved TDS @ 180 C		1490	mg/L	20				0.3	5	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WY DEQ 104
Work Order: C15090761

Analyte		Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**A4500-F C**								Analytical Run: MANTECH_150923A		
Lab ID:	**CCV-8644**		Continuing Calibration Verification Standard							09/23/15 14:13	
Fluoride			1.92	mg/L	0.10	96	90	110			
Lab ID:	**CCV-8644**		Continuing Calibration Verification Standard							09/23/15 14:47	
Fluoride			1.92	mg/L	0.10	96	90	110			
Method:	**A4500-F C**									Batch: R204515	
Lab ID:	**MBLK**		Method Blank				Run: MANTECH_150923A			09/23/15 14:08	
Fluoride			ND	mg/L	0.01						
Lab ID:	**LCS-8595**		Laboratory Control Sample				Run: MANTECH_150923A			09/23/15 14:10	
Fluoride			1.96	mg/L	0.10	98	90	110			
Lab ID:	**C15090756-001AMS**		Sample Matrix Spike				Run: MANTECH_150923A			09/23/15 14:18	
Fluoride			2.00	mg/L	0.10	93	80	120			
Lab ID:	**C15090756-001AMSD**		Sample Matrix Spike Duplicate				Run: MANTECH_150923A			09/23/15 14:21	
Fluoride			2.00	mg/L	0.10	93	80	120	0.0	10	
Lab ID:	**C15090761-009AMS**		Sample Matrix Spike				Run: MANTECH_150923A			09/23/15 14:58	
Fluoride			2.08	mg/L	0.10	93	80	120			
Lab ID:	**C15090761-009AMSD**		Sample Matrix Spike Duplicate				Run: MANTECH_150923A			09/23/15 15:01	
Fluoride			2.08	mg/L	0.10	93	80	120	0.0	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WY DEQ 104
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **A4500-H B**							Analytical Run: PHSC_101-C_150923A			
Lab ID: **pH 6.86**		Initial Calibration Verification Standard							09/23/15 08:34	
pH		6.83	s.u.	0.010	100	98	102			
Method: **A4500-H B**									Batch: R204460	
Lab ID: **C15090761-003ADUP**		Sample Duplicate				Run: PHSC_101-C_150923A			09/23/15 13:29	
pH		7.04	s.u.	0.010				0.1	3	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104

Report Date: 10/07/15
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-NH3 G									Analytical Run: TECHNICON_150925A	
Lab ID: CCV-7		Continuing Calibration Verification Standard								09/25/15 11:21
Nitrogen, Ammonia as N		0.982	mg/L	0.050	98	90	110			
Lab ID: CCV-18		Continuing Calibration Verification Standard								09/25/15 11:39
Nitrogen, Ammonia as N		0.985	mg/L	0.050	99	90	110			
Lab ID: CCV-121		Continuing Calibration Verification Standard								09/25/15 14:31
Nitrogen, Ammonia as N		0.995	mg/L	0.050	100	90	110			
Method: A4500-NH3 G										Batch: R204636
Lab ID: MBLK-1		Method Blank				Run: TECHNICON_150925A				09/25/15 11:11
Nitrogen, Ammonia as N		ND	mg/L	0.01						
Lab ID: LFB-3		Laboratory Fortified Blank				Run: TECHNICON_150925A				09/25/15 11:14
Nitrogen, Ammonia as N		1.98	mg/L	0.050	101	90	110			
Lab ID: C15090609-003CMS		Sample Matrix Spike				Run: TECHNICON_150925A				09/25/15 11:17
Nitrogen, Ammonia as N		3.80	mg/L	0.10	95	90	110			
Lab ID: C15090609-003CMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_150925A				09/25/15 11:19
Nitrogen, Ammonia as N		3.79	mg/L	0.10	95	90	110	0.3	10	
Lab ID: C15090761-010EMS		Sample Matrix Spike				Run: TECHNICON_150925A				09/25/15 11:44
Nitrogen, Ammonia as N		154	mg/L	2.5	102	90	110			
Lab ID: C15090761-010EMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_150925A				09/25/15 11:46
Nitrogen, Ammonia as N		154	mg/L	2.5	102	90	110	0.0	10	
Lab ID: C15090609-003CMS		Sample Matrix Spike				Run: TECHNICON_150925A				09/25/15 14:36
Nitrogen, Ammonia as N		1.95	mg/L	0.050	99	90	110			
Lab ID: C15090609-003CMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_150925A				09/25/15 14:37
Nitrogen, Ammonia as N		1.96	mg/L	0.050	99	90	110	0.5	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104

Report Date: 10/07/15
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Analytical Run: ICP4-C_150928A	
Lab ID: ICV	2	Initial Calibration Verification Standard							09/28/15 11:47	
Iron		4.98	mg/L	0.030	100	95	105			
Manganese		4.82	mg/L	0.010	96	95	105			
Lab ID: ICSA	2	Interference Check Sample A							09/28/15 12:10	
Iron		181	mg/L	0.030	90	80	120			
Manganese		-0.0228	mg/L	0.010						
Lab ID: ICSAB	2	Interference Check Sample AB							09/28/15 12:14	
Iron		181	mg/L	0.030	91	80	120			
Manganese		0.424	mg/L	0.010	85	80	120			
Method: E200.7									Batch: 45813	
Lab ID: MB-45813	2	Method Blank				Run: ICP4-C_150928A			09/28/15 20:38	
Iron		0.007	mg/L	0.003						
Manganese		ND	mg/L	0.002						
Lab ID: LCS3-45813	2	Laboratory Control Sample				Run: ICP4-C_150928A			09/28/15 20:42	
Iron		2.56	mg/L	0.030	102	85	115			
Manganese		2.53	mg/L	0.0012	101	85	115			
Lab ID: C15090761-010CMS3	2	Sample Matrix Spike				Run: ICP4-C_150928A			09/28/15 22:30	
Iron		3.65	mg/L	0.030	103	70	130			
Manganese		13.9	mg/L	0.0058		70	130			A
Lab ID: C15090761-010CMSD	2	Sample Matrix Spike Duplicate				Run: ICP4-C_150928A			09/28/15 22:35	
Iron		3.61	mg/L	0.030	102	70	130	0.9	20	
Manganese		13.6	mg/L	0.0058		70	130	1.9	20	A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104

Report Date: 10/07/15
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Analytical Run: ICP4-C_150929A	
Lab ID: ICV	5	Initial Calibration Verification Standard							09/29/15 11:42	
Boron		1.01	mg/L	0.050	101	95	105			
Calcium		49.0	mg/L	1.0	98	95	105			
Iron		4.92	mg/L	0.030	98	95	105			
Manganese		4.80	mg/L	0.010	96	95	105			
Silicon		9.86	mg/L	0.10	99	95	105			
Lab ID: ICSA	5	Interference Check Sample A							09/29/15 12:06	
Boron		0.00843	mg/L	0.050						
Calcium		454	mg/L	1.0	91	80	120			
Iron		174	mg/L	0.030	87	80	120			
Manganese		-0.0207	mg/L	0.010						
Silicon		-0.0216	mg/L	0.10						
Lab ID: ICSAB	5	Interference Check Sample AB							09/29/15 12:10	
Boron		0.0126	mg/L	0.050						
Calcium		456	mg/L	1.0	91	80	120			
Iron		174	mg/L	0.030	87	80	120			
Manganese		0.425	mg/L	0.010	85	80	120			
Silicon		-0.0123	mg/L	0.10						
Method: E200.7									Batch: R204761	
Lab ID: MB-150929A	5	Method Blank				Run: ICP4-C_150929A			09/29/15 12:30	
Boron		ND	mg/L	0.006						
Calcium		0.02	mg/L	0.003						
Iron		ND	mg/L	0.004						
Manganese		ND	mg/L	0.0003						
Silicon		ND	mg/L	0.02						
Lab ID: LFB-150929A	5	Laboratory Fortified Blank				Run: ICP4-C_150929A			09/29/15 12:34	
Boron		0.957	mg/L	0.050	96	85	115			
Calcium		47.2	mg/L	1.0	94	85	115			
Iron		0.898	mg/L	0.030	90	85	115			
Manganese		0.929	mg/L	0.010	93	85	115			
Silicon		0.456	mg/L	0.10	101	85	115			
Lab ID: C15090761-008BMS2	5	Sample Matrix Spike				Run: ICP4-C_150929A			09/29/15 20:35	
Boron		1.97	mg/L	0.050	93	70	130			
Calcium		383	mg/L	1.0	82	70	130			
Iron		1.88	mg/L	0.030	91	70	130			
Manganese		1.89	mg/L	0.0031	91	70	130			
Silicon		8.02	mg/L	0.10		70	130			A
Lab ID: C15090761-008BMSD	5	Sample Matrix Spike Duplicate				Run: ICP4-C_150929A			09/29/15 20:39	
Boron		1.97	mg/L	0.050	93	70	130	0.0	20	
Calcium		383	mg/L	1.0	82	70	130	0.1	20	
Iron		1.89	mg/L	0.030	92	70	130	0.5	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104

Report Date: 10/07/15
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Batch: R204761	
Lab ID: C15090761-008BMSD	5	Sample Matrix Spike Duplicate				Run: ICP4-C_150929A			09/29/15 20:39	
Manganese		1.90	mg/L	0.0031	91	70	130	0.4	20	
Silicon		8.10	mg/L	0.10		70	130	0.9	20	A
Method: E200.7									Analytical Run: ICP4-C_151001A	
Lab ID: ICV		Initial Calibration Verification Standard							10/01/15 13:30	
Manganese		4.79	mg/L	0.010	96	95	105			
Lab ID: ICSA		Interference Check Sample A							10/01/15 13:53	
Manganese		-0.0225	mg/L	0.010						
Lab ID: ICSAB		Interference Check Sample AB							10/01/15 13:58	
Manganese		0.441	mg/L	0.010	88	80	120			
Method: E200.7									Batch: 45813	
Lab ID: MB-45813		Method Blank				Run: ICP4-C_151001A			10/01/15 21:22	
Manganese		ND	mg/L	0.002						
Lab ID: LCS3-45813		Laboratory Control Sample				Run: ICP4-C_151001A			10/01/15 21:42	
Manganese		2.53	mg/L	0.0012	101	85	115			

Qualifiers:

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MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104

Report Date: 10/07/15
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Analytical Run: ICPMS4-C_150925A	
Lab ID: ICV	20	Initial Calibration Verification Standard							09/25/15 12:49	
Aluminum		0.0494	mg/L	0.0010	99	90	110			
Arsenic		0.0495	mg/L	0.0010	99	90	110			
Barium		0.0480	mg/L	0.0010	96	90	110			
Beryllium		0.0496	mg/L	0.0010	99	90	110			
Cadmium		0.0491	mg/L	0.0010	98	90	110			
Chromium		0.0501	mg/L	0.0010	100	90	110			
Copper		0.0496	mg/L	0.0010	99	90	110			
Iron		0.977	mg/L	0.0010	98	90	110			
Lead		0.0490	mg/L	0.0010	98	90	110			
Magnesium		9.90	mg/L	0.0027	99	90	110			
Manganese		0.0482	mg/L	0.0010	97	90	110			
Mercury		0.00475	mg/L	0.0010	95	90	110			
Molybdenum		0.0480	mg/L	0.0010	96	90	110			
Nickel		0.0498	mg/L	0.0010	100	90	110			
Potassium		10.1	mg/L	0.0041	101	90	110			
Selenium		0.0499	mg/L	0.0010	100	90	110			
Sodium		9.63	mg/L	0.0043	96	90	110			
Uranium		0.0478	mg/L	0.00030	96	90	110			
Vanadium		0.0499	mg/L	0.0010	100	90	110			
Zinc		0.0513	mg/L	0.0010	103	90	110			
Method: E200.8										Batch: R204629
Lab ID: LRB	20	Method Blank				Run: ICPMS4-C_150925A			09/25/15 13:35	
Aluminum		0.002	mg/L	0.0001						
Arsenic		ND	mg/L	5E-05						
Barium		ND	mg/L	9E-06						
Beryllium		ND	mg/L	3E-05						
Cadmium		ND	mg/L	7E-06						
Chromium		0.0001	mg/L	8E-05						
Copper		ND	mg/L	2E-05						
Iron		ND	mg/L	0.0003						
Lead		ND	mg/L	1.0E-05						
Magnesium		0.002	mg/L	0.0009						
Manganese		ND	mg/L	4E-05						
Mercury		4E-05	mg/L	3E-05						
Molybdenum		ND	mg/L	4E-05						
Nickel		ND	mg/L	0.0002						
Potassium		0.07	mg/L	0.02						
Selenium		ND	mg/L	3E-05						
Sodium		ND	mg/L	0.007						
Uranium		8E-06	mg/L	4E-06						
Vanadium		7E-05	mg/L	1E-05						
Zinc		0.0002	mg/L	8E-05						

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates **Report Date:** 10/07/15

Project: WY DEQ 104 **Work Order:** C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R204629
Lab ID: LFB	20	Laboratory Fortified Blank				Run: ICPMS4-C_150925A				09/25/15 13:41
Aluminum		0.0516	mg/L	0.0010	100	85	115			
Arsenic		0.0527	mg/L	0.0010	105	85	115			
Barium		0.0507	mg/L	0.0010	101	85	115			
Beryllium		0.0518	mg/L	0.0010	104	85	115			
Cadmium		0.0518	mg/L	0.0010	104	85	115			
Chromium		0.0525	mg/L	0.0010	105	85	115			
Copper		0.0522	mg/L	0.0010	104	85	115			
Iron		1.28	mg/L	0.0010	102	85	115			
Lead		0.0514	mg/L	0.0010	103	85	115			
Magnesium		12.1	mg/L	0.0027	97	85	115			
Manganese		0.0498	mg/L	0.0010	100	85	115			
Mercury		0.0102	mg/L	0.0010	102	85	115			
Molybdenum		0.0507	mg/L	0.0010	101	85	115			
Nickel		0.0522	mg/L	0.0010	104	85	115			
Potassium		12.4	mg/L	0.0041	98	85	115			
Selenium		0.0558	mg/L	0.0010	112	85	115			
Sodium		12.0	mg/L	0.0043	96	85	115			
Uranium		0.0492	mg/L	0.00030	98	85	115			
Vanadium		0.0526	mg/L	0.0010	105	85	115			
Zinc		0.0532	mg/L	0.0010	106	85	115			
Lab ID: C15090761-008BMS4	20	Sample Matrix Spike				Run: ICPMS4-C_150925A				09/25/15 19:55
Aluminum		0.0506	mg/L	0.030	101	70	130			
Arsenic		0.0574	mg/L	0.0010	114	70	130			
Barium		0.0683	mg/L	0.050	111	70	130			
Beryllium		0.0490	mg/L	0.0010	98	70	130			
Cadmium		0.0533	mg/L	0.0010	107	70	130			
Chromium		0.0559	mg/L	0.0050	111	70	130			
Copper		0.0584	mg/L	0.0050	107	70	130			
Iron		1.35	mg/L	0.030	107	70	130			
Lead		0.0555	mg/L	0.0010	111	70	130			
Magnesium		47.0	mg/L	1.0	88	70	130			
Manganese		0.101	mg/L	0.0010	113	70	130			
Mercury		0.0113	mg/L	0.00010	112	70	130			
Molybdenum		0.0555	mg/L	0.0010	107	70	130			
Nickel		0.0627	mg/L	0.0050	106	70	130			
Potassium		29.2	mg/L	1.0	100	70	130			
Selenium		0.0973	mg/L	0.0010	128	70	130			
Sodium		84.0	mg/L	1.0		70	130			A
Uranium		0.919	mg/L	0.00030		70	130			A
Vanadium		0.0558	mg/L	0.010	111	70	130			
Zinc		0.0669	mg/L	0.010	108	70	130			
Lab ID: C15090761-008BMSD	20	Sample Matrix Spike Duplicate				Run: ICPMS4-C_150925A				09/25/15 20:01
Aluminum		0.0498	mg/L	0.030	100	70	130	1.4	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104

Report Date: 10/07/15
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R204629	
Lab ID: C15090761-008BMSD	20	Sample Matrix Spike Duplicate				Run: ICPMS4-C_150925A			09/25/15 20:01	
Arsenic		0.0572	mg/L	0.0010	114	70	130	0.4	20	
Barium		0.0678	mg/L	0.050	110	70	130	0.7	20	
Beryllium		0.0479	mg/L	0.0010	96	70	130	2.2	20	
Cadmium		0.0528	mg/L	0.0010	106	70	130	1.0	20	
Chromium		0.0548	mg/L	0.0050	109	70	130	1.9	20	
Copper		0.0574	mg/L	0.0050	105	70	130	1.7	20	
Iron		1.30	mg/L	0.030	103	70	130	4.0	20	
Lead		0.0552	mg/L	0.0010	110	70	130	0.5	20	
Magnesium		46.4	mg/L	1.0	84	70	130	1.2	20	
Manganese		0.101	mg/L	0.0010	113	70	130	0.1	20	
Mercury		0.0113	mg/L	0.00010	112	70	130	0.2	20	
Molybdenum		0.0553	mg/L	0.0010	107	70	130	0.4	20	
Nickel		0.0615	mg/L	0.0050	104	70	130	1.9	20	
Potassium		29.1	mg/L	1.0	99	70	130	0.3	20	
Selenium		0.0926	mg/L	0.0010	118	70	130	5.0	20	
Sodium		82.9	mg/L	1.0		70	130	1.4	20	A
Uranium		0.917	mg/L	0.00030		70	130	0.2	20	A
Vanadium		0.0550	mg/L	0.010	110	70	130	1.4	20	
Zinc		0.0658	mg/L	0.010	106	70	130	1.6	20	

Qualifiers:

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MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates **Report Date:** 10/07/15

Project: WY DEQ 104 **Work Order:** C15090761

Analyte		Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**E300.0**									Analytical Run: IC1-C_150925A	
Lab ID:	**ICV**	2	Initial Calibration Verification Standard							09/23/15 14:55	
Chloride			9.94	mg/L	1.0	99	90	110			
Sulfate			40.3	mg/L	1.0	101	90	110			
Lab ID:	**CCV-092315-2**	2	Continuing Calibration Verification Standard							09/23/15 19:34	
Chloride			9.78	mg/L	1.0	98	90	110			
Sulfate			39.7	mg/L	1.0	99	90	110			
Lab ID:	**CCV-092315-3**	2	Continuing Calibration Verification Standard							09/23/15 23:38	
Chloride			9.81	mg/L	1.0	98	90	110			
Sulfate			39.8	mg/L	1.0	99	90	110			
Method:	**E300.0**									Batch: R204670	
Lab ID:	**ICB**	2	Method Blank				Run: IC1-C_150925A			09/23/15 15:12	
Chloride			ND	mg/L	0.03						
Sulfate			0.1	mg/L	0.05						
Lab ID:	**LFB-092315-1**	2	Laboratory Fortified Blank				Run: IC1-C_150925A			09/23/15 15:30	
Chloride			10.0	mg/L	1.0	100	90	110			
Sulfate			40.5	mg/L	1.0	101	90	110			
Lab ID:	**C15090761-003AMS**	2	Sample Matrix Spike				Run: IC1-C_150925A			09/24/15 00:30	
Chloride			128	mg/L	1.0	105	90	110			
Sulfate			1240	mg/L	2.1		90	110			A
Lab ID:	**C15090761-003AMSD**	2	Sample Matrix Spike Duplicate				Run: IC1-C_150925A			09/24/15 00:47	
Chloride			127	mg/L	1.0	103	90	110	1.0	20	
Sulfate			1210	mg/L	2.1		90	110	1.8	20	A
Lab ID:	**C15090764-003AMS**	2	Sample Matrix Spike				Run: IC1-C_150925A			09/24/15 04:34	
Chloride			135	mg/L	1.0	107	90	110			
Sulfate			2700	mg/L	4.2		90	110			A
Lab ID:	**C15090764-003AMSD**	2	Sample Matrix Spike Duplicate				Run: IC1-C_150925A			09/24/15 05:09	
Chloride			135	mg/L	1.0	108	90	110	0.4	20	
Sulfate			2690	mg/L	4.2		90	110	0.2	20	A
Lab ID:	**LFB-092315-3**	2	Laboratory Fortified Blank				Run: IC1-C_150925A			09/24/15 16:07	
Chloride			9.98	mg/L	1.0	100	90	110			
Sulfate			40.4	mg/L	1.0	101	90	110			

Qualifiers:

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ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WY DEQ 104
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E353.2								Analytical Run: TECHNICON_150923A		
Lab ID: CCV-30	Continuing Calibration Verification Standard								09/23/15 12:16	
Nitrogen, Nitrate+Nitrite as N		1.06	mg/L	0.10	106	90	110			
Lab ID: CCV-44	Continuing Calibration Verification Standard								09/23/15 12:51	
Nitrogen, Nitrate+Nitrite as N		1.05	mg/L	0.10	105	90	110			
Method: E353.2									Batch: R204489	
Lab ID: MBLK-1	Method Blank					Run: TECHNICON_150923A			09/23/15 11:04	
Nitrogen, Nitrate+Nitrite as N		0.01	mg/L	0.008						
Lab ID: LFB-3	Laboratory Fortified Blank					Run: TECHNICON_150923A			09/23/15 11:09	
Nitrogen, Nitrate+Nitrite as N		2.12	mg/L	0.10	108	90	110			
Lab ID: C15090757-002EMS	Sample Matrix Spike					Run: TECHNICON_150923A			09/23/15 12:24	
Nitrogen, Nitrate+Nitrite as N		2.20	mg/L	0.10	112	90	110			S
- Matrix spike recoveries outside the acceptance range are considered matrix-related.										
Lab ID: C15090757-002EMSD	Sample Matrix Spike Duplicate					Run: TECHNICON_150923A			09/23/15 12:26	
Nitrogen, Nitrate+Nitrite as N		2.20	mg/L	0.10	112	90	110	0.0	10	S
- Matrix spike recoveries outside the acceptance range are considered matrix-related.										
Lab ID: C15090761-010EMS	Sample Matrix Spike					Run: TECHNICON_150923A			09/23/15 12:59	
Nitrogen, Nitrate+Nitrite as N		196	mg/L	5.0	106	90	110			
Lab ID: C15090761-010EMSD	Sample Matrix Spike Duplicate					Run: TECHNICON_150923A			09/23/15 13:01	
Nitrogen, Nitrate+Nitrite as N		197	mg/L	5.0	107	90	110	0.5	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WY DEQ 104
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E900.0										Batch: GrAB-2133
Lab ID: Th230-GrAB-2133		Laboratory Control Sample				Run: G5000W_150925A			09/29/15 00:27	
Gross Alpha		108	pCi/L		108	80	120			
Lab ID: Sr90-GrAB-2133		Laboratory Control Sample				Run: G5000W_150925A			09/29/15 00:27	
Gross Beta		186	pCi/L		96	80	120			
Lab ID: MB-GrAB-2133	6	Method Blank				Run: G5000W_150925A			09/29/15 00:27	
Gross Alpha		-0.3	pCi/L							U
Gross Alpha precision (±)		0.7	pCi/L							
Gross Alpha MDC		1	pCi/L							
Gross Beta		-0.7	pCi/L							U
Gross Beta precision (±)		2	pCi/L							
Gross Beta MDC		3	pCi/L							
Lab ID: C15090761-004DDUP	6	Sample Duplicate				Run: G5000W_150925A			09/29/15 00:27	
Gross Alpha		33.6	pCi/L					29	64.3	
Gross Alpha precision (±)		8.65	pCi/L							
Gross Alpha MDC		4.73	pCi/L							
Gross Beta		27.8	pCi/L					7.3	45.9	
Gross Beta precision (±)		4.77	pCi/L							
Gross Beta MDC		6.19	pCi/L							
Lab ID: C15090761-007DMS		Sample Matrix Spike				Run: G5000W_150925A			09/29/15 00:27	
Gross Alpha		111	pCi/L		58	70	130			S
- Spike response is outside of the acceptance range for this analysis. Since the LCS and the Duplicate RPD are acceptable the batch is approved.										
Lab ID: C15090761-007DMS		Sample Matrix Spike				Run: G5000W_150925A			09/29/15 00:27	
Gross Beta		354	pCi/L		97	70	130			

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WY DEQ 104

Report Date: 10/07/15
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E900.0									Batch: GrAB-2132	
Lab ID: Th230-GrAB-2132		Laboratory Control Sample				Run: G542M_150925A			09/28/15 22:08	
Gross Alpha		96.4	pCi/L		97	80	120			
Lab ID: Sr90-GrAB-2132		Laboratory Control Sample				Run: G542M_150925A			09/28/15 22:08	
Gross Beta		179	pCi/L		92	80	120			
Lab ID: MB-GrAB-2132	6	Method Blank				Run: G542M_150925A			09/28/15 22:08	
Gross Alpha		-0.3	pCi/L							U
Gross Alpha precision (±)		0.7	pCi/L							
Gross Alpha MDC		1	pCi/L							
Gross Beta		-1	pCi/L							U
Gross Beta precision (±)		2	pCi/L							
Gross Beta MDC		3	pCi/L							
Lab ID: C15090756-001DMS		Sample Matrix Spike				Run: G542M_150925A			09/28/15 22:08	
Gross Alpha		73.7	pCi/L		60	70	130			S
- Spike response is outside of the acceptance range for this analysis. Since the LCS and the Duplicate RPD are acceptable the batch is approved.										
Lab ID: C15090756-001DMS		Sample Matrix Spike				Run: G542M_150925A			09/28/15 22:08	
Gross Beta		194	pCi/L		95	70	130			
Lab ID: C15090759-004CDUP	6	Sample Duplicate				Run: G542M_150925A			09/28/15 22:08	
Gross Alpha		2380	pCi/L					17	48.9	
Gross Alpha precision (±)		462	pCi/L							
Gross Alpha MDC		9.77	pCi/L							
Gross Beta		933	pCi/L					3.5	30.5	
Gross Beta precision (±)		95.6	pCi/L							
Gross Beta MDC		14.3	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WY DEQ 104
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: RA226-7836
Lab ID: LCS-RA226-7836		Laboratory Control Sample				Run: BERTHOLD 770-1_150924A			10/05/15 10:48	
Radium 226		9.7	pCi/L		93	80	120			
Lab ID: MB-RA226-7836	3	Method Blank				Run: BERTHOLD 770-1_150924A			10/05/15 10:48	
Radium 226		0.09	pCi/L							U
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: C15090711-004FMS		Sample Matrix Spike				Run: BERTHOLD 770-1_150924A			10/05/15 10:48	
Radium 226		18	pCi/L		86	70	130			
Lab ID: C15090711-004FMSD		Sample Matrix Spike Duplicate				Run: BERTHOLD 770-1_150924A			10/05/15 10:48	
Radium 226		21	pCi/L		102	70	130	17	49.2	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WY DEQ 104
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E908.0										Batch: RA-TH-ISO-2325
Lab ID: LCS-RA-TH-ISO-2325		Laboratory Control Sample				Run: ALPHANALYST_150924A				09/30/15 09:27
Thorium 230		6.9	pCi/L		104	80	120			
Lab ID: C15090735-001BMS		Sample Matrix Spike				Run: ALPHANALYST_150924A				09/30/15 09:28
Thorium 230		11.9	pCi/L		89	70	130			
Lab ID: C15090735-001BMSD		Sample Matrix Spike Duplicate				Run: ALPHANALYST_150924A				09/30/15 09:28
Thorium 230		12.2	pCi/L		91	70	130	2.4	48	
Lab ID: MB-RA-TH-ISO-2325	3	Method Blank				Run: ALPHANALYST_150924A				09/30/15 13:50
Thorium 230		0.09	pCi/L							U
Thorium 230 precision (±)		0.1	pCi/L							
Thorium 230 MDC		0.2	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WY DEQ 104
Work Order: C15090761

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RA-05										Batch: RA228-5044
Lab ID: LCS-228-RA226-7836		Laboratory Control Sample				Run: TENNELEC-3_150924B				09/29/15 12:04
Radium 228		7.1	pCi/L		95	80	120			
Lab ID: MB-RA226-7836	3	Method Blank				Run: TENNELEC-3_150924B				09/29/15 12:04
Radium 228		0.03	pCi/L							U
Radium 228 precision (±)		0.8	pCi/L							
Radium 228 MDC		1	pCi/L							
Lab ID: C15090756-001DMS		Sample Matrix Spike				Run: TENNELEC-3_150924B				09/29/15 12:04
Radium 228		20	pCi/L		108	70	130			
Lab ID: C15090756-001DMSD		Sample Matrix Spike Duplicate				Run: TENNELEC-3_150924B				09/29/15 12:04
Radium 228		20	pCi/L		109	70	130	1.1	50	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

Work Order Receipt Checklist

Lidstone and Associates

C15090761

Login completed by: Dorian Quis
Reviewed by: BL2000\tparke
Reviewed Date: 9/30/2015

Date Received: 9/23/2015
Received by: amm
Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.4°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

Temperature Blank temperature for Cooler 1 was 3.4°C, Cooler 2 was 6.0°C, Cooler 3 was 6.6°C and Cooler 4 was 5.2°C.

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

PLEASE PRINT (Provide as much information as possible.)

Company Name: Lidstone + Associates	Project Name, PWS, Permit, Etc.: WY DEQ104	Sample Origin State: WY	EPA/State Compliance: Yes ☐ No ☒
Report Mail Address (Required): 4025 Automation Way Bldg E Fort Collins, CO 80525 ☒ No Hard Copy Email: ghs@lidstone.com	Contact Name: Greg Steed Phone/Fax: 970-223-4705 Cell: 970-819-1783		Sampler: (Please Print) JVG
	Invoice Contact & Phone: Melinda Culver mcc@lidstone.com	Purchase Order:	Quote/Bottle Order: 47286
Invoice Address (Required): Same ☐ No Hard Copy Email:			

Special Report/Formats:
☐ DW ☐ POTW/WWTP ☐ State: ☐ Other: ☒ EDD/EDT (Electronic Data) Format: EV ☐ LEVEL IV ☐ NELAC

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: Lab Courier
Cooler ID(s): Various
Receipt Temp: 6.0, 6.6, 3.4, 5.2
On Ice: Y N
Custody Seal: On Bottle Y N; On Cooler Y N
Intact Y N
Signature Match Y N

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	2005 DEQ Guidelines		Dissolved Be		TM 230						SEE ATTACHED	Standard Turnaround (TAT)	RUSH	Comments
1	MW-1	9-21-15	11:30	W	X		X		X									
2	MW-1A	9-21-15	11:30	W	X		X		X									
3	PW-10	9-21-15	13:26	W	X		X		X									
4	MW-3	9-21-15	14:55	W	X		X		X									C15090761
5	MW-10	9-21-15	16:30	W	X		X		X									
6	MW-7	9-21-15	18:05	W	X		X		X									
7	MW-17	9-21-15	19:15	W	X		X		X									
8	TP 2-3	9/22/15	12:30	W	X		X		X									
9	PW-14	9/22/15	10:15	W	X		X		X									
10	MW-5	9/22/15	11:15	W	X		X		X									

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
[illegible]	9-22-15/18:30	Greg Steed	Daniel Lashbrook	9/22/15 18:30	Daniel Lashbrook
Daniel Lashbrook	9/22/15 20:55	Daniel Lashbrook			

Received by Laboratory: [illegible] Date/Time: 9/23/15 8:00 Signature:

Sample Disposal: Return to Client: ☐ Lab Disposal: X

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

ANALYTICAL SUMMARY REPORT

October 07, 2015

Lidstone and Associates
4025 Automation Way Unit E
Fort Collins, CO 80525

Work Order: C15090769
Project Name: WYAML 102

Energy Laboratories, Inc. Casper WY received the following 10 samples for Lidstone and Associates on 9/23/2015 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C15090769-001	ANC-B	09/21/15 12:30	09/23/15	Aqueous	Metals by ICP/ICPMS, Dissolved Metals by ICP/ICPMS, Total Alkalinity Anion - Cation Balance Conductivity Sample Filtering Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Metals Preparation by EPA 200.2 Gross Alpha, Gross Beta Radium 226, Dissolved Radium 228, Dissolved Thorium, Isotopic Solids, Total Dissolved
C15090769-002	R-4	09/21/15 11:50	09/23/15	Aqueous	Metals by ICP/ICPMS, Dissolved Metals by ICP/ICPMS, Total Acidity, Total as CaCO3 Alkalinity Anion - Cation Balance Conductivity Sample Filtering Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Metals Preparation by EPA 200.2 Gross Alpha, Gross Beta Radium 226, Dissolved Radium 228, Dissolved Thorium, Isotopic Solids, Total Dissolved Solids, Total Dissolved - Calculated

ANALYTICAL SUMMARY REPORT

C15090769-003	MW-2	09/21/15 13:00 09/23/15	Aqueous	Metals by ICP/ICPMS, Dissolved Metals by ICP/ICPMS, Total Alkalinity Anion - Cation Balance Conductivity Sample Filtering Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Metals Preparation by EPA 200.2 Gross Alpha, Gross Beta Radium 226, Dissolved Radium 228, Dissolved Thorium, Isotopic Solids, Total Dissolved Solids, Total Dissolved - Calculated
C15090769-004	MW-11	09/21/15 17:55 09/23/15	Aqueous	Same As Above
C15090769-005	MW-4	09/21/15 14:50 09/23/15	Aqueous	Same As Above
C15090769-006	MW-13	09/21/15 16:30 09/23/15	Aqueous	Same As Above
C15090769-007	MW-6	09/21/15 19:15 09/23/15	Aqueous	Same As Above
C15090769-008	MW-14A	09/22/15 15:45 09/23/15	Aqueous	Same As Above
C15090769-009	PW-12 /MW-28	09/22/15 15:30 09/23/15	Aqueous	Same As Above
C15090769-010	PW-13 /MW-29	09/22/15 16:50 09/23/15	Aqueous	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Radiochemistry analyses were performed at Energy Laboratories, Inc., 2325 Kerzell Lane, Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Lidstone and Associates
Project: WYAML 102
Work Order: C15090769

Report Date: 10/07/15

CASE NARRATIVE

RADIOCHEMISTRY ANALYSIS
Per client request, results less than MDC (or precision if no MDC), are reported as <MDC (or <precision). Actual instrument results are available by request.

TH230 ANALYSIS
USNRC Regulatory Guide 4.14 provides guidance on Minimum Detectable Concentrations (MDC) that should be achieved in samples for this radionuclide. The sample-specific MDC for this sample could not be achieved due to significant matrix interferences, restricting the volume of sample to be used in the analysis. Please consult with your local regulatory agency prior to using these results for compliance purposes.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-001
Client Sample ID: ANC-B

Report Date: 10/07/15
Collection Date: 09/21/15 12:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/25/15 15:19 / wc
Bicarbonate as HCO3	ND	mg/L		5		A2320 B	09/25/15 15:19 / wc
Calcium	ND	mg/L		1		E200.7	09/29/15 21:26 / sf
Chloride	ND	mg/L		1		E300.0	09/28/15 14:15 / wc
Fluoride	ND	mg/L		0.1		A4500-F C	09/23/15 15:40 / wc
Magnesium	ND	mg/L		1		E200.8	09/25/15 21:07 / smm
Nitrogen, Ammonia as N	ND	mg/L		0.05		A4500-NH3 G	09/25/15 12:01 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/25/15 12:55 / lr
Potassium	ND	mg/L		1		E200.8	09/25/15 21:07 / smm
Silica	ND	mg/L		0.2		E200.7	09/29/15 21:26 / sf
Sodium	ND	mg/L		1		E200.8	09/25/15 21:07 / smm
Sulfate	ND	mg/L		1		E300.0	09/28/15 14:15 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	ND	umhos/cm		5		A2510 B	09/24/15 09:27 / lmc
pH	6.26	s.u.	H	0.01		A4500-H B	09/29/15 16:05 / mag
Solids, Total Dissolved TDS @ 180 C	ND	mg/L		10		A2540 C	09/24/15 11:20 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 21:07 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/25/15 21:07 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 21:07 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 21:07 / smm
Boron	ND	mg/L		0.1		E200.7	09/29/15 21:26 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 21:07 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 21:07 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 21:07 / smm
Iron	ND	mg/L		0.03		E200.7	09/29/15 21:26 / sf
Lead	ND	mg/L		0.001		E200.8	09/25/15 21:07 / smm
Manganese	ND	mg/L		0.01		E200.8	09/25/15 21:07 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 21:07 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 21:07 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 21:07 / smm
Selenium	ND	mg/L		0.001		E200.8	09/25/15 21:07 / smm
Uranium	ND	mg/L		0.0003		E200.8	09/30/15 17:58 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 21:07 / smm
Zinc	ND	mg/L		0.01		E200.8	09/25/15 21:07 / smm
METALS - TOTAL							
Iron	ND	mg/L		0.03		E200.8	09/28/15 22:19 / smm
Manganese	ND	mg/L		0.01		E200.8	09/28/15 22:19 / smm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
H - Analysis performed past recommended holding time.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-001
Client Sample ID: ANC-B

Report Date: 10/07/15
Collection Date: 09/21/15 12:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	<1.6	pCi/L	U	1.6		E900.0	09/30/15 22:24 / trs
Gross Alpha precision (±)	1	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Alpha MDC	1.6	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Beta	<2.8	pCi/L	U	2.8		E900.0	09/30/15 22:24 / trs
Gross Beta precision (±)	1.7	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Beta MDC	2.8	pCi/L				E900.0	09/30/15 22:24 / trs
Radium 226	0.18	pCi/L		0.13		E903.0	10/05/15 12:50 / dmf
Radium 226 precision (±)	0.11	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 226 MDC	0.13	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 228	<1.3	pCi/L	U	1.3		RA-05	09/30/15 10:07 / plj
Radium 228 precision (±)	0.7	pCi/L				RA-05	09/30/15 10:07 / plj
Radium 228 MDC	1.3	pCi/L				RA-05	09/30/15 10:07 / plj
Thorium 230	<0.2	pCi/L	U	0.2		E908.0	10/05/15 09:56 / cng
Thorium 230 precision (±)	0.1	pCi/L				E908.0	10/05/15 09:56 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	10/05/15 09:56 / cng
DATA QUALITY							
A/C Balance (± 5)	27.9	%				A1030 E	09/30/15 14:44 / sdw
Anions	0.03	meq/L				A1030 E	09/30/15 14:44 / sdw
Cations	0.05	meq/L				A1030 E	09/30/15 14:44 / sdw

- The ion balance is not appropriate for samples having a conductivity less than 300 umhos/cm.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-002
Client Sample ID: R-4

Report Date: 10/07/15
Collection Date: 09/21/15 11:50
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Acidity, Total as CaCO3	968	mg/L		5		A2310 B	09/30/15 12:42 / wc
Carbonate as CO3	ND	mg/L		5		A2320 B	09/25/15 15:31 / wc
Bicarbonate as HCO3	ND	mg/L		5		A2320 B	09/25/15 15:31 / wc
Calcium	428	mg/L		1		E200.7	09/29/15 21:30 / sf
Chloride	243	mg/L	D	5		E300.0	09/28/15 14:34 / wc
Fluoride	0.3	mg/L		0.1		A4500-F C	09/23/15 15:52 / wc
Magnesium	290	mg/L		1		E200.7	09/29/15 21:30 / sf
Nitrogen, Ammonia as N	386	mg/L	D	10		A4500-NH3 G	09/25/15 12:06 / ljl
Nitrogen, Nitrate+Nitrite as N	5.9	mg/L	D	0.5		E353.2	09/25/15 12:56 / lr
Potassium	9	mg/L		1		E200.7	09/29/15 21:30 / sf
Silica	104	mg/L	D	0.3		E200.7	09/29/15 21:30 / sf
Sodium	363	mg/L	D	2		E200.7	09/29/15 21:30 / sf
Sulfate	5390	mg/L	D	20		E300.0	09/28/15 14:34 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	8370	umhos/cm		5		A2510 B	09/24/15 09:31 / lmc
pH	3.91	s.u.	H	0.01		A4500-H B	09/29/15 16:09 / mag
Solids, Total Dissolved TDS @ 180 C	6930	mg/L		100		A2540 C	09/24/15 11:21 / lmc
METALS - DISSOLVED							
Aluminum	118	mg/L		0.1		E200.8	09/25/15 21:12 / smm
Arsenic	0.023	mg/L		0.001		E200.8	09/25/15 21:12 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 21:12 / smm
Beryllium	0.113	mg/L		0.001		E200.8	09/25/15 21:12 / smm
Boron	0.2	mg/L		0.1		E200.7	09/29/15 21:30 / sf
Cadmium	0.070	mg/L		0.005		E200.8	09/25/15 21:12 / smm
Chromium	0.08	mg/L		0.05		E200.8	09/25/15 21:12 / smm
Copper	0.22	mg/L		0.01		E200.8	09/25/15 21:12 / smm
Iron	71.9	mg/L	D	0.05		E200.7	09/29/15 21:30 / sf
Lead	0.008	mg/L		0.001		E200.8	09/25/15 21:12 / smm
Manganese	23.2	mg/L		0.01		E200.8	09/25/15 21:12 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 21:12 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 21:12 / smm
Nickel	1.99	mg/L		0.05		E200.8	09/25/15 21:12 / smm
Selenium	0.148	mg/L		0.001		E200.8	09/25/15 21:12 / smm
Uranium	2.19	mg/L		0.0003		E200.8	09/25/15 21:12 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 21:12 / smm
Zinc	1.83	mg/L		0.01		E200.8	09/25/15 21:12 / smm
METALS - TOTAL							
Iron	75.6	mg/L		0.03		E200.8	09/28/15 22:45 / smm
Manganese	22.9	mg/L		0.01		E200.8	09/28/15 22:45 / smm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-002
Client Sample ID: R-4

Report Date: 10/07/15
Collection Date: 09/21/15 11:50
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	1560	pCi/L		27.2		E900.0	09/30/15 22:24 / trs
Gross Alpha precision (±)	310	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Alpha MDC	27.2	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Beta	540	pCi/L		32.8		E900.0	09/30/15 22:24 / trs
Gross Beta precision (±)	59.5	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Beta MDC	32.8	pCi/L				E900.0	09/30/15 22:24 / trs
Radium 226	25	pCi/L		0.17		E903.0	10/05/15 12:50 / dmf
Radium 226 precision (±)	4.8	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 226 MDC	0.17	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 228	6.1	pCi/L		1.7		RA-05	09/30/15 10:07 / plj
Radium 228 precision (±)	1.5	pCi/L				RA-05	09/30/15 10:07 / plj
Radium 228 MDC	1.7	pCi/L				RA-05	09/30/15 10:07 / plj
Thorium 230	73.2	pCi/L		1		E908.0	10/05/15 09:56 / cng
Thorium 230 precision (±)	13.9	pCi/L				E908.0	10/05/15 09:56 / cng
Thorium 230 MDC	1	pCi/L				E908.0	10/05/15 09:56 / cng
DATA QUALITY							
A/C Balance (± 5)	-5.06	%				A1030 E	10/01/15 08:35 / sdw
Anions	120	meq/L				A1030 E	10/01/15 08:35 / sdw
Cations	108	meq/L				A1030 E	10/01/15 08:35 / sdw
Solids, Total Dissolved Calculated	6900	mg/L				A1030 E	10/01/15 08:35 / sdw
TDS Balance (0.80 - 1.20)	1.01	unitless				A1030 E	10/01/15 08:35 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-003
Client Sample ID: MW-2

Report Date: 10/07/15
Collection Date: 09/21/15 13:00
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/25/15 15:59 / wc
Bicarbonate as HCO3	1570	mg/L		5		A2320 B	09/25/15 15:59 / wc
Calcium	515	mg/L		1		E200.7	09/29/15 21:34 / sf
Chloride	331	mg/L	D	5		E300.0	09/28/15 14:52 / wc
Fluoride	0.6	mg/L		0.1		A4500-F C	09/23/15 15:55 / wc
Magnesium	447	mg/L		1		E200.8	09/25/15 21:17 / smm
Nitrogen, Ammonia as N	350	mg/L	D	5		A4500-NH3 G	09/25/15 12:11 / ljl
Nitrogen, Nitrate+Nitrite as N	0.2	mg/L		0.1		E353.2	09/25/15 12:57 / lr
Potassium	58	mg/L		1		E200.8	09/25/15 21:17 / smm
Silica	21.9	mg/L	D	0.3		E200.7	09/29/15 21:34 / sf
Sodium	389	mg/L		1		E200.8	09/25/15 21:17 / smm
Sulfate	3640	mg/L	D	20		E300.0	09/28/15 14:52 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	8590	umhos/cm		5		A2510 B	09/24/15 09:34 / lmc
pH	6.56	s.u.	H	0.01		A4500-H B	09/29/15 16:12 / mag
Solids, Total Dissolved TDS @ 180 C	5830	mg/L		100		A2540 C	09/24/15 11:21 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 21:17 / smm
Arsenic	0.001	mg/L		0.001		E200.8	09/25/15 21:17 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 21:17 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 21:17 / smm
Boron	0.1	mg/L		0.1		E200.7	09/29/15 21:34 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 21:17 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 21:17 / smm
Copper	0.01	mg/L		0.01		E200.8	09/25/15 21:17 / smm
Iron	1.32	mg/L	D	0.05		E200.7	09/29/15 21:34 / sf
Lead	0.001	mg/L		0.001		E200.8	09/25/15 21:17 / smm
Manganese	14.8	mg/L		0.01		E200.8	09/25/15 21:17 / smm
Mercury	0.001	mg/L		0.001		E200.8	09/25/15 21:17 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 21:17 / smm
Nickel	0.92	mg/L		0.05		E200.8	09/25/15 21:17 / smm
Selenium	0.003	mg/L		0.001		E200.8	09/25/15 21:17 / smm
Uranium	9.08	mg/L		0.0003		E200.8	09/25/15 21:17 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 21:17 / smm
Zinc	0.06	mg/L		0.01		E200.8	09/25/15 21:17 / smm
METALS - TOTAL							
Iron	13.7	mg/L		0.03		E200.8	09/28/15 22:50 / smm
Manganese	14.7	mg/L		0.01		E200.8	09/28/15 22:50 / smm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-003
Client Sample ID: MW-2

Report Date: 10/07/15
Collection Date: 09/21/15 13:00
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	7570	pCi/L		27.0		E900.0	09/30/15 22:24 / trs
Gross Alpha precision (±)	1470	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Alpha MDC	27.0	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Beta	698	pCi/L		33.6		E900.0	09/30/15 22:24 / trs
Gross Beta precision (±)	72.8	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Beta MDC	33.6	pCi/L				E900.0	09/30/15 22:24 / trs
Radium 226	84	pCi/L		0.13		E903.0	10/05/15 12:50 / dmf
Radium 226 precision (±)	16	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 226 MDC	0.13	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 228	61.7	pCi/L		1.4		RA-05	09/30/15 10:07 / plj
Radium 228 precision (±)	11.0	pCi/L				RA-05	09/30/15 10:07 / plj
Radium 228 MDC	1.4	pCi/L				RA-05	09/30/15 10:07 / plj
Thorium 230	0.6	pCi/L		0.6		E908.0	10/05/15 09:56 / cng
Thorium 230 precision (±)	0.5	pCi/L				E908.0	10/05/15 09:56 / cng
Thorium 230 MDC	0.6	pCi/L				E908.0	10/05/15 09:56 / cng
DATA QUALITY							
A/C Balance (± 5)	-2.37	%				A1030 E	09/30/15 14:45 / sdw
Anions	111	meq/L				A1030 E	09/30/15 14:45 / sdw
Cations	106	meq/L				A1030 E	09/30/15 14:45 / sdw
Solids, Total Dissolved Calculated	6200	mg/L				A1030 E	09/30/15 14:45 / sdw
TDS Balance (0.80 - 1.20)	0.94	unitless				A1030 E	09/30/15 14:45 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-004
Client Sample ID: MW-11

Report Date: 10/07/15
Collection Date: 09/21/15 17:55
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/25/15 16:09 / wc
Bicarbonate as HCO3	320	mg/L		5		A2320 B	09/25/15 16:09 / wc
Calcium	472	mg/L		1		E200.7	09/30/15 13:03 / sf
Chloride	141	mg/L		1		E300.0	09/28/15 15:11 / wc
Fluoride	0.3	mg/L		0.1		A4500-F C	09/23/15 15:58 / wc
Magnesium	73	mg/L		1		E200.7	09/29/15 22:26 / sf
Nitrogen, Ammonia as N	0.07	mg/L		0.05		A4500-NH3 G	09/25/15 12:12 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/25/15 12:58 / lr
Potassium	20	mg/L		1		E200.8	09/25/15 23:11 / smm
Silica	21.7	mg/L		0.2		E200.7	09/29/15 22:26 / sf
Sodium	84	mg/L		1		E200.7	09/29/15 22:26 / sf
Sulfate	1250	mg/L	D	4		E300.0	09/28/15 15:11 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	2690	umhos/cm		5		A2510 B	09/24/15 09:38 / lmc
pH	7.55	s.u.	H	0.01		A4500-H B	09/29/15 16:15 / mag
Solids, Total Dissolved TDS @ 180 C	2320	mg/L		20		A2540 C	09/24/15 11:21 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 23:11 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/25/15 23:11 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 23:11 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 23:11 / smm
Boron	ND	mg/L		0.1		E200.7	09/29/15 22:26 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 23:11 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 23:11 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 23:11 / smm
Iron	0.75	mg/L		0.03		E200.8	09/25/15 23:11 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 23:11 / smm
Manganese	0.35	mg/L		0.01		E200.8	09/25/15 23:11 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 23:11 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 23:11 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 23:11 / smm
Selenium	ND	mg/L		0.001		E200.8	09/25/15 23:11 / smm
Uranium	0.0259	mg/L		0.0003		E200.8	09/25/15 23:11 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 23:11 / smm
Zinc	ND	mg/L		0.01		E200.8	09/25/15 23:11 / smm
METALS - TOTAL							
Iron	1.97	mg/L		0.03		E200.8	09/28/15 22:55 / smm
Manganese	0.34	mg/L		0.01		E200.8	09/28/15 22:55 / smm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-004
Client Sample ID: MW-11

Report Date: 10/07/15
Collection Date: 09/21/15 17:55
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	22.6	pCi/L		8.5		E900.0	09/30/15 22:24 / trs
Gross Alpha precision (±)	9.2	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Alpha MDC	8.5	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Beta	26.7	pCi/L		11.6		E900.0	09/30/15 22:24 / trs
Gross Beta precision (±)	7.4	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Beta MDC	11.6	pCi/L				E900.0	09/30/15 22:24 / trs
Radium 226	3.4	pCi/L		0.12		E903.0	10/05/15 12:50 / dmf
Radium 226 precision (±)	0.72	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 226 MDC	0.12	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 228	8.4	pCi/L		1.2		RA-05	09/30/15 10:07 / plj
Radium 228 precision (±)	1.9	pCi/L				RA-05	09/30/15 10:07 / plj
Radium 228 MDC	1.2	pCi/L				RA-05	09/30/15 10:07 / plj
Thorium 230	0.7	pCi/L		0.5		E908.0	10/05/15 09:56 / cng
Thorium 230 precision (±)	0.4	pCi/L				E908.0	10/05/15 09:56 / cng
Thorium 230 MDC	0.5	pCi/L				E908.0	10/05/15 09:56 / cng
DATA QUALITY							
A/C Balance (± 5)	-2.38	%				A1030 E	10/01/15 08:36 / sdw
Anions	35.3	meq/L				A1030 E	10/01/15 08:36 / sdw
Cations	33.7	meq/L				A1030 E	10/01/15 08:36 / sdw
Solids, Total Dissolved Calculated	2200	mg/L				A1030 E	10/01/15 08:36 / sdw
TDS Balance (0.80 - 1.20)	1.04	unitless				A1030 E	10/01/15 08:36 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-005
Client Sample ID: MW-4

Report Date: 10/07/15
Collection Date: 09/21/15 14:50
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/25/15 16:17 / wc
Bicarbonate as HCO3	822	mg/L		5		A2320 B	09/25/15 16:17 / wc
Calcium	494	mg/L		1		E200.7	09/29/15 22:39 / sf
Chloride	248	mg/L	D	5		E300.0	09/28/15 15:29 / wc
Fluoride	1.0	mg/L		0.1		A4500-F C	09/23/15 16:01 / wc
Magnesium	283	mg/L		1		E200.7	09/29/15 22:39 / sf
Nitrogen, Ammonia as N	307	mg/L	D	10		A4500-NH3 G	09/25/15 12:14 / ljl
Nitrogen, Nitrate+Nitrite as N	6.2	mg/L	D	0.2		E353.2	09/25/15 13:01 / lr
Potassium	23	mg/L		1		E200.8	09/25/15 23:16 / smm
Silica	18.8	mg/L		0.2		E200.7	09/29/15 22:39 / sf
Sodium	302	mg/L		1		E200.7	09/29/15 22:39 / sf
Sulfate	3230	mg/L	D	20		E300.0	09/28/15 15:29 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	7110	umhos/cm		5		A2510 B	09/24/15 09:43 / lmc
pH	6.65	s.u.	H	0.01		A4500-H B	09/29/15 16:20 / mag
Solids, Total Dissolved TDS @ 180 C	4760	mg/L		20		A2540 C	09/24/15 11:22 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 23:16 / smm
Arsenic	0.004	mg/L		0.001		E200.8	09/25/15 23:16 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 23:16 / smm
Beryllium	0.002	mg/L		0.001		E200.8	09/25/15 23:16 / smm
Boron	0.1	mg/L		0.1		E200.7	09/29/15 22:39 / sf
Cadmium	0.005	mg/L		0.005		E200.8	09/25/15 23:16 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 23:16 / smm
Copper	0.02	mg/L		0.01		E200.8	09/25/15 23:16 / smm
Iron	16.6	mg/L		0.03		E200.8	09/25/15 23:16 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 23:16 / smm
Manganese	9.56	mg/L		0.01		E200.8	09/25/15 23:16 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 23:16 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 23:16 / smm
Nickel	0.63	mg/L		0.05		E200.8	09/25/15 23:16 / smm
Selenium	0.006	mg/L		0.001		E200.8	09/25/15 23:16 / smm
Uranium	2.33	mg/L		0.0003		E200.8	09/25/15 23:16 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 23:16 / smm
Zinc	0.26	mg/L		0.01		E200.8	09/25/15 23:16 / smm
METALS - TOTAL							
Iron	24.0	mg/L		0.03		E200.8	09/28/15 23:00 / smm
Manganese	14.4	mg/L		0.01		E200.8	09/28/15 23:00 / smm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-005
Client Sample ID: MW-4

Report Date: 10/07/15
Collection Date: 09/21/15 14:50
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	2110	pCi/L		17.1		E900.0	09/30/15 22:24 / trs
Gross Alpha precision (±)	414	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Alpha MDC	17.1	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Beta	180	pCi/L		27.0		E900.0	09/30/15 22:24 / trs
Gross Beta precision (±)	20.7	pCi/L				E900.0	09/30/15 22:24 / trs
Gross Beta MDC	27.0	pCi/L				E900.0	09/30/15 22:24 / trs
Radium 226	26	pCi/L		0.12		E903.0	10/05/15 12:50 / dmf
Radium 226 precision (±)	4.9	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 226 MDC	0.12	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 228	26.4	pCi/L		1.2		RA-05	09/30/15 10:07 / plj
Radium 228 precision (±)	4.9	pCi/L				RA-05	09/30/15 10:07 / plj
Radium 228 MDC	1.2	pCi/L				RA-05	09/30/15 10:07 / plj
Thorium 230	<0.4	pCi/L	U	0.4		E908.0	10/05/15 09:56 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	10/05/15 09:56 / cng
Thorium 230 MDC	0.4	pCi/L				E908.0	10/05/15 09:56 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-2.77	%				A1030 E	09/30/15 14:45 / sdw
Anions	88.3	meq/L				A1030 E	09/30/15 14:45 / sdw
Cations	83.5	meq/L				A1030 E	09/30/15 14:45 / sdw
Solids, Total Dissolved Calculated	5000	mg/L				A1030 E	09/30/15 14:45 / sdw
TDS Balance (0.80 - 1.20)	0.94	unitless				A1030 E	09/30/15 14:45 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-006
Client Sample ID: MW-13

Report Date: 10/07/15
Collection Date: 09/21/15 16:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/25/15 16:26 / wc
Bicarbonate as HCO3	357	mg/L		5		A2320 B	09/25/15 16:26 / wc
Calcium	506	mg/L		1		E200.7	09/29/15 22:43 / sf
Chloride	119	mg/L		1		E300.0	09/28/15 16:24 / wc
Fluoride	0.2	mg/L		0.1		A4500-F C	09/23/15 16:03 / wc
Magnesium	81	mg/L		1		E200.7	09/29/15 22:43 / sf
Nitrogen, Ammonia as N	0.08	mg/L		0.05		A4500-NH3 G	09/25/15 12:16 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/25/15 13:05 / lr
Potassium	21	mg/L		1		E200.8	09/25/15 23:21 / smm
Silica	25.7	mg/L		0.2		E200.7	09/29/15 22:43 / sf
Sodium	90	mg/L		1		E200.7	09/29/15 22:43 / sf
Sulfate	1400	mg/L	D	4		E300.0	09/28/15 16:24 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	2830	umhos/cm		5		A2510 B	09/24/15 09:47 / lmc
pH	7.31	s.u.	H	0.01		A4500-H B	09/29/15 16:23 / mag
Solids, Total Dissolved TDS @ 180 C	2520	mg/L		20		A2540 C	09/24/15 11:23 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 23:21 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/25/15 23:21 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 23:21 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 23:21 / smm
Boron	ND	mg/L		0.1		E200.7	09/29/15 22:43 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 23:21 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 23:21 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 23:21 / smm
Iron	0.04	mg/L		0.03		E200.8	09/25/15 23:21 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 23:21 / smm
Manganese	0.68	mg/L		0.01		E200.8	09/25/15 23:21 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 23:21 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 23:21 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 23:21 / smm
Selenium	ND	mg/L		0.001		E200.8	09/25/15 23:21 / smm
Uranium	0.0022	mg/L		0.0003		E200.8	09/25/15 23:21 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 23:21 / smm
Zinc	ND	mg/L		0.01		E200.8	09/25/15 23:21 / smm
METALS - TOTAL							
Iron	2.90	mg/L		0.03		E200.8	09/28/15 23:06 / smm
Manganese	0.69	mg/L		0.01		E200.8	09/28/15 23:06 / smm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-006
Client Sample ID: MW-13

Report Date: 10/07/15
Collection Date: 09/21/15 16:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	26.1	pCi/L		8.9		E900.0	09/30/15 22:25 / trs
Gross Alpha precision (±)	10	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Alpha MDC	8.9	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Beta	24.5	pCi/L		14.4		E900.0	09/30/15 22:25 / trs
Gross Beta precision (±)	8.6	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Beta MDC	14.4	pCi/L				E900.0	09/30/15 22:25 / trs
Radium 226	6.6	pCi/L		0.12		E903.0	10/05/15 12:50 / dmf
Radium 226 precision (±)	1.3	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 226 MDC	0.12	pCi/L				E903.0	10/05/15 12:50 / dmf
Radium 228	9.6	pCi/L		1.2		RA-05	09/30/15 10:07 / plj
Radium 228 precision (±)	2.2	pCi/L				RA-05	09/30/15 10:07 / plj
Radium 228 MDC	1.2	pCi/L				RA-05	09/30/15 10:07 / plj
Thorium 230	<0.4	pCi/L	U	0.4		E908.0	10/05/15 09:56 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	10/05/15 09:56 / cng
Thorium 230 MDC	0.4	pCi/L				E908.0	10/05/15 09:56 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-2.67	%				A1030 E	09/30/15 14:45 / sdw
Anions	38.4	meq/L				A1030 E	09/30/15 14:45 / sdw
Cations	36.4	meq/L				A1030 E	09/30/15 14:45 / sdw
Solids, Total Dissolved Calculated	2400	mg/L				A1030 E	09/30/15 14:45 / sdw
TDS Balance (0.80 - 1.20)	1.04	unitless				A1030 E	09/30/15 14:45 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-007
Client Sample ID: MW-6

Report Date: 10/07/15
Collection Date: 09/21/15 19:15
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/25/15 16:34 / wc
Bicarbonate as HCO3	692	mg/L		5		A2320 B	09/25/15 16:34 / wc
Calcium	533	mg/L		1		E200.7	09/29/15 22:46 / sf
Chloride	153	mg/L		1		E300.0	09/28/15 17:20 / wc
Fluoride	0.2	mg/L		0.1		A4500-F C	09/23/15 16:06 / wc
Magnesium	94	mg/L		1		E200.7	09/29/15 22:46 / sf
Nitrogen, Ammonia as N	0.08	mg/L		0.05		A4500-NH3 G	09/25/15 12:17 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/25/15 13:06 / lr
Potassium	25	mg/L		1		E200.8	09/25/15 23:26 / smm
Silica	20.8	mg/L		0.2		E200.7	09/29/15 22:46 / sf
Sodium	263	mg/L		1		E200.7	09/29/15 22:46 / sf
Sulfate	1560	mg/L	D	4		E300.0	09/28/15 17:20 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	3610	umhos/cm		5		A2510 B	09/24/15 09:52 / lmc
pH	7.40	s.u.	H	0.01		A4500-H B	09/29/15 16:27 / mag
Solids, Total Dissolved TDS @ 180 C	3080	mg/L		20		A2540 C	09/24/15 11:23 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 23:26 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/25/15 23:26 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 23:26 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 23:26 / smm
Boron	0.2	mg/L		0.1		E200.7	09/29/15 22:46 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 23:26 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 23:26 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 23:26 / smm
Iron	0.60	mg/L		0.03		E200.8	09/25/15 23:26 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 23:26 / smm
Manganese	0.63	mg/L		0.01		E200.8	09/25/15 23:26 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 23:26 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 23:26 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 23:26 / smm
Selenium	ND	mg/L		0.001		E200.8	09/25/15 23:26 / smm
Uranium	0.0622	mg/L		0.0003		E200.8	09/25/15 23:26 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 23:26 / smm
Zinc	ND	mg/L		0.01		E200.8	09/25/15 23:26 / smm
METALS - TOTAL							
Iron	2.51	mg/L		0.03		E200.8	09/28/15 23:11 / smm
Manganese	0.65	mg/L		0.01		E200.8	09/28/15 23:11 / smm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client:	Lidstone and Associates	Report Date:	10/07/15
Project:	WYAML 102	Collection Date:	09/21/15 19:15
Lab ID:	C15090769-007	DateReceived:	09/23/15
Client Sample ID:	MW-6	Matrix:	Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	52.7	pCi/L		12.3		E900.0	09/30/15 22:25 / trs
Gross Alpha precision (±)	16.0	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Alpha MDC	12.3	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Beta	33.3	pCi/L		14.8		E900.0	09/30/15 22:25 / trs
Gross Beta precision (±)	9.1	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Beta MDC	14.8	pCi/L				E900.0	09/30/15 22:25 / trs
Radium 226	5.2	pCi/L		0.11		E903.0	10/05/15 15:18 / dmf
Radium 226 precision (±)	1.1	pCi/L				E903.0	10/05/15 15:18 / dmf
Radium 226 MDC	0.11	pCi/L				E903.0	10/05/15 15:18 / dmf
Radium 228	9.5	pCi/L		1.4		RA-05	09/30/15 11:42 / plj
Radium 228 precision (±)	2.1	pCi/L				RA-05	09/30/15 11:42 / plj
Radium 228 MDC	1.4	pCi/L				RA-05	09/30/15 11:42 / plj
Thorium 230	<0.5	pCi/L	U	0.5		E908.0	10/05/15 09:56 / cng
Thorium 230 precision (±)	0.2	pCi/L				E908.0	10/05/15 09:56 / cng
Thorium 230 MDC	0.5	pCi/L				E908.0	10/05/15 09:56 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.78	%				A1030 E	09/30/15 14:45 / sdw
Anions	48.1	meq/L				A1030 E	09/30/15 14:45 / sdw
Cations	46.4	meq/L				A1030 E	09/30/15 14:45 / sdw
Solids, Total Dissolved Calculated	3000	mg/L				A1030 E	09/30/15 14:45 / sdw
TDS Balance (0.80 - 1.20)	1.03	unitless				A1030 E	09/30/15 14:45 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-008
Client Sample ID: MW-14A

Report Date: 10/07/15
Collection Date: 09/22/15 15:45
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/25/15 16:42 / wc
Bicarbonate as HCO3	317	mg/L		5		A2320 B	09/25/15 16:42 / wc
Calcium	203	mg/L		1		E200.7	09/29/15 22:50 / sf
Chloride	14	mg/L		1		E300.0	09/28/15 17:38 / wc
Fluoride	0.4	mg/L		0.1		A4500-F C	09/23/15 16:09 / wc
Magnesium	40	mg/L		1		E200.7	09/29/15 22:50 / sf
Nitrogen, Ammonia as N	ND	mg/L		0.05		A4500-NH3 G	09/25/15 12:19 / ljl
Nitrogen, Nitrate+Nitrite as N	0.1	mg/L		0.1		E353.2	09/25/15 13:07 / lr
Potassium	19	mg/L		1		E200.8	09/25/15 23:31 / smm
Silica	24.5	mg/L		0.2		E200.7	09/29/15 22:50 / sf
Sodium	108	mg/L		1		E200.7	09/29/15 22:50 / sf
Sulfate	598	mg/L	D	2		E300.0	09/28/15 17:38 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	1610	umhos/cm		5		A2510 B	09/24/15 09:56 / lmc
pH	5.79	s.u.	H	0.01		A4500-H B	09/24/15 09:56 / lmc
Solids, Total Dissolved TDS @ 180 C	1240	mg/L		10		A2540 C	09/24/15 11:23 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 23:31 / smm
Arsenic	0.003	mg/L		0.001		E200.8	09/25/15 23:31 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 23:31 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 23:31 / smm
Boron	0.1	mg/L		0.1		E200.7	09/29/15 22:50 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 23:31 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 23:31 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 23:31 / smm
Iron	ND	mg/L		0.03		E200.8	09/25/15 23:31 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 23:31 / smm
Manganese	0.04	mg/L		0.01		E200.8	09/25/15 23:31 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 23:31 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 23:31 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 23:31 / smm
Selenium	0.005	mg/L		0.001		E200.8	09/25/15 23:31 / smm
Uranium	0.173	mg/L		0.0003		E200.8	09/25/15 23:31 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 23:31 / smm
Zinc	ND	mg/L		0.01		E200.8	09/25/15 23:31 / smm
METALS - TOTAL							
Iron	2.29	mg/L		0.03		E200.8	09/28/15 23:16 / smm
Manganese	0.24	mg/L		0.01		E200.8	09/28/15 23:16 / smm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-008
Client Sample ID: MW-14A

Report Date: 10/07/15
Collection Date: 09/22/15 15:45
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	140	pCi/L		5.0		E900.0	09/30/15 22:25 / trs
Gross Alpha precision (±)	28.6	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Alpha MDC	5.0	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Beta	30.0	pCi/L		6.4		E900.0	09/30/15 22:25 / trs
Gross Beta precision (±)	4.4	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Beta MDC	6.4	pCi/L				E900.0	09/30/15 22:25 / trs
Radium 226	3.2	pCi/L		0.12		E903.0	10/05/15 15:18 / dmf
Radium 226 precision (±)	0.67	pCi/L				E903.0	10/05/15 15:18 / dmf
Radium 226 MDC	0.12	pCi/L				E903.0	10/05/15 15:18 / dmf
Radium 228	3.6	pCi/L		1.5		RA-05	09/30/15 11:42 / plj
Radium 228 precision (±)	1.1	pCi/L				RA-05	09/30/15 11:42 / plj
Radium 228 MDC	1.5	pCi/L				RA-05	09/30/15 11:42 / plj
Thorium 230	<0.5	pCi/L	U	0.5		E908.0	10/05/15 14:29 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	10/05/15 14:29 / cng
Thorium 230 MDC	0.5	pCi/L				E908.0	10/05/15 14:29 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	1.55	%				A1030 E	09/30/15 14:46 / sdw
Anions	18.0	meq/L				A1030 E	09/30/15 14:46 / sdw
Cations	18.6	meq/L				A1030 E	09/30/15 14:46 / sdw
Solids, Total Dissolved Calculated	1200	mg/L				A1030 E	09/30/15 14:46 / sdw
TDS Balance (0.80 - 1.20)	1.06	unitless				A1030 E	09/30/15 14:46 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-009
Client Sample ID: PW-12 /MW-28

Report Date: 10/07/15
Collection Date: 09/22/15 15:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/25/15 16:58 / wc
Bicarbonate as HCO3	775	mg/L		5		A2320 B	09/25/15 16:58 / wc
Calcium	516	mg/L		1		E200.7	09/29/15 22:54 / sf
Chloride	128	mg/L	D	2		E300.0	09/28/15 17:57 / wc
Fluoride	0.3	mg/L		0.1		A4500-F C	09/23/15 16:11 / wc
Magnesium	168	mg/L		1		E200.7	09/29/15 22:54 / sf
Nitrogen, Ammonia as N	52	mg/L	D	2		A4500-NH3 G	09/25/15 12:21 / ljl
Nitrogen, Nitrate+Nitrite as N	10	mg/L	D	1		E353.2	09/25/15 13:08 / lr
Potassium	39	mg/L		1		E200.8	09/25/15 23:36 / smm
Silica	31.1	mg/L		0.2		E200.7	09/29/15 22:54 / sf
Sodium	226	mg/L		1		E200.7	09/29/15 22:54 / sf
Sulfate	1850	mg/L	D	8		E300.0	09/28/15 17:57 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	4240	umhos/cm		5		A2510 B	09/24/15 10:05 / lmc
pH	4.91	s.u.	H	0.01		A4500-H B	09/24/15 10:05 / lmc
Solids, Total Dissolved TDS @ 180 C	3500	mg/L		40		A2540 C	09/24/15 11:24 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 23:36 / smm
Arsenic	0.002	mg/L		0.001		E200.8	09/25/15 23:36 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 23:36 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 23:36 / smm
Boron	0.1	mg/L		0.1		E200.7	09/29/15 22:54 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 23:36 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 23:36 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 23:36 / smm
Iron	ND	mg/L		0.03		E200.8	09/25/15 23:36 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 23:36 / smm
Manganese	16.1	mg/L		0.01		E200.8	09/25/15 23:36 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 23:36 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 23:36 / smm
Nickel	0.33	mg/L		0.05		E200.8	09/25/15 23:36 / smm
Selenium	0.014	mg/L		0.001		E200.8	09/25/15 23:36 / smm
Uranium	0.961	mg/L		0.0003		E200.8	09/25/15 23:36 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 23:36 / smm
Zinc	0.03	mg/L		0.01		E200.8	09/25/15 23:36 / smm
METALS - TOTAL							
Iron	0.42	mg/L		0.03		E200.8	09/28/15 23:21 / smm
Manganese	16.6	mg/L		0.01		E200.8	09/28/15 23:21 / smm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-009
Client Sample ID: PW-12 /MW-28

Report Date: 10/07/15
Collection Date: 09/22/15 15:30
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	619	pCi/L		13.3		E900.0	09/30/15 22:25 / trs
Gross Alpha precision (±)	124	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Alpha MDC	13.3	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Beta	94.5	pCi/L		16.9		E900.0	09/30/15 22:25 / trs
Gross Beta precision (±)	12.4	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Beta MDC	16.9	pCi/L				E900.0	09/30/15 22:25 / trs
Radium 226	1.5	pCi/L		0.12		E903.0	10/05/15 15:18 / dmf
Radium 226 precision (±)	0.35	pCi/L				E903.0	10/05/15 15:18 / dmf
Radium 226 MDC	0.12	pCi/L				E903.0	10/05/15 15:18 / dmf
Radium 228	2.5	pCi/L		1.4		RA-05	09/30/15 11:42 / plj
Radium 228 precision (±)	1.1	pCi/L				RA-05	09/30/15 11:42 / plj
Radium 228 MDC	1.4	pCi/L				RA-05	09/30/15 11:42 / plj
Thorium 230	<0.3	pCi/L	U	0.3		E908.0	10/05/15 14:29 / cng
Thorium 230 precision (±)	0.2	pCi/L				E908.0	10/05/15 14:29 / cng
Thorium 230 MDC	0.3	pCi/L				E908.0	10/05/15 14:29 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.33	%				A1030 E	09/30/15 14:46 / sdw
Anions	55.6	meq/L				A1030 E	09/30/15 14:46 / sdw
Cations	54.1	meq/L				A1030 E	09/30/15 14:46 / sdw
Solids, Total Dissolved Calculated	3400	mg/L				A1030 E	09/30/15 14:46 / sdw
TDS Balance (0.80 - 1.20)	1.03	unitless				A1030 E	09/30/15 14:46 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-010
Client Sample ID: PW-13/MW-29

Report Date: 10/07/15
Collection Date: 09/22/15 16:50
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/25/15 17:06 / wc
Bicarbonate as HCO3	255	mg/L		5		A2320 B	09/25/15 17:06 / wc
Calcium	209	mg/L		1		E200.7	09/29/15 22:58 / sf
Chloride	1	mg/L		1		E300.0	09/28/15 18:15 / wc
Fluoride	0.3	mg/L		0.1		A4500-F C	09/23/15 16:14 / wc
Magnesium	19	mg/L		1		E200.7	09/29/15 22:58 / sf
Nitrogen, Ammonia as N	0.06	mg/L		0.05		A4500-NH3 G	09/25/15 12:22 / ljl
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/25/15 13:09 / lr
Potassium	10	mg/L		1		E200.8	09/25/15 23:41 / smm
Silica	28.5	mg/L		0.2		E200.7	09/29/15 22:58 / sf
Sodium	35	mg/L		1		E200.7	09/29/15 22:58 / sf
Sulfate	463	mg/L	D	2		E300.0	09/28/15 18:15 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	1190	umhos/cm		5		A2510 B	09/24/15 10:09 / lmc
pH	6.18	s.u.	H	0.01		A4500-H B	09/24/15 10:09 / lmc
Solids, Total Dissolved TDS @ 180 C	925	mg/L		10		A2540 C	09/24/15 11:24 / lmc
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/25/15 23:41 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/25/15 23:41 / smm
Barium	ND	mg/L		0.1		E200.8	09/25/15 23:41 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/25/15 23:41 / smm
Boron	ND	mg/L		0.1		E200.7	09/29/15 22:58 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/25/15 23:41 / smm
Chromium	ND	mg/L		0.05		E200.8	09/25/15 23:41 / smm
Copper	ND	mg/L		0.01		E200.8	09/25/15 23:41 / smm
Iron	0.53	mg/L		0.03		E200.8	09/25/15 23:41 / smm
Lead	ND	mg/L		0.001		E200.8	09/25/15 23:41 / smm
Manganese	0.40	mg/L		0.01		E200.8	09/25/15 23:41 / smm
Mercury	ND	mg/L		0.001		E200.8	09/25/15 23:41 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/25/15 23:41 / smm
Nickel	ND	mg/L		0.05		E200.8	09/25/15 23:41 / smm
Selenium	ND	mg/L		0.001		E200.8	09/25/15 23:41 / smm
Uranium	0.0060	mg/L		0.0003		E200.8	09/25/15 23:41 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/25/15 23:41 / smm
Zinc	ND	mg/L		0.01		E200.8	09/25/15 23:41 / smm
METALS - TOTAL							
Iron	1.63	mg/L		0.03		E200.8	09/28/15 23:26 / smm
Manganese	0.39	mg/L		0.01		E200.8	09/28/15 23:26 / smm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102
Lab ID: C15090769-010
Client Sample ID: PW-13/MW-29

Report Date: 10/07/15
Collection Date: 09/22/15 16:50
DateReceived: 09/23/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	15.7	pCi/L		3.6		E900.0	09/30/15 22:25 / trs
Gross Alpha precision (±)	4.8	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Alpha MDC	3.6	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Beta	13.2	pCi/L		4.9		E900.0	09/30/15 22:25 / trs
Gross Beta precision (±)	3.2	pCi/L				E900.0	09/30/15 22:25 / trs
Gross Beta MDC	4.9	pCi/L				E900.0	09/30/15 22:25 / trs
Radium 226	3.2	pCi/L		0.12		E903.0	10/05/15 15:18 / dmf
Radium 226 precision (±)	0.67	pCi/L				E903.0	10/05/15 15:18 / dmf
Radium 226 MDC	0.12	pCi/L				E903.0	10/05/15 15:18 / dmf
Radium 228	1.8	pCi/L		1.5		RA-05	09/30/15 11:42 / plj
Radium 228 precision (±)	0.9	pCi/L				RA-05	09/30/15 11:42 / plj
Radium 228 MDC	1.5	pCi/L				RA-05	09/30/15 11:42 / plj
Thorium 230	0.2	pCi/L		0.2		E908.0	10/05/15 14:29 / cng
Thorium 230 precision (±)	0.1	pCi/L				E908.0	10/05/15 14:29 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	10/05/15 14:29 / cng
DATA QUALITY							
A/C Balance (± 5)	-0.27	%				A1030 E	09/30/15 14:46 / sdw
Anions	13.9	meq/L				A1030 E	09/30/15 14:46 / sdw
Cations	13.8	meq/L				A1030 E	09/30/15 14:46 / sdw
Solids, Total Dissolved Calculated	900	mg/L				A1030 E	09/30/15 14:46 / sdw
TDS Balance (0.80 - 1.20)	1.03	unitless				A1030 E	09/30/15 14:46 / sdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2310 B									Analytical Run: MANTECH_150930A	
Lab ID: ICV-8660		Initial Calibration Verification Standard							09/30/15 12:14	
Acidity, Total as CaCO3		ND	mg/L	5.0		0	0			
Lab ID: CCV-8741		Continuing Calibration Verification Standard							09/30/15 12:17	
Acidity, Total as CaCO3		ND	mg/L	5.0		0	0			
Method: A2310 B									Batch: R204810	
Lab ID: MBLK		Method Blank				Run: MANTECH_150930A			09/30/15 12:11	
Acidity, Total as CaCO3		1	mg/L	0.6						
Lab ID: LCS_150727		Laboratory Control Sample				Run: MANTECH_150930A			09/30/15 12:30	
Acidity, Total as CaCO3		1160	mg/L	5.0	96	80	120			
Lab ID: C15090769-002ADUP		Sample Duplicate				Run: MANTECH_150930A			09/30/15 12:54	
Acidity, Total as CaCO3		988	mg/L	5.0				2.0	20	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B										Batch: R204663
Lab ID: MBLK	3	Method Blank				Run: MANTECH_150925C				09/25/15 14:14
Alkalinity, Total as CaCO3		ND	mg/L	0.6						
Carbonate as CO3		ND	mg/L	1						
Bicarbonate as HCO3		ND	mg/L	1						
Lab ID: LCS_150317		Laboratory Control Sample				Run: MANTECH_150925C				09/25/15 14:28
Alkalinity, Total as CaCO3		241	mg/L	5.0	97	90	110			
Lab ID: C15090768-002AMS		Sample Matrix Spike				Run: MANTECH_150925C				09/25/15 15:48
Alkalinity, Total as CaCO3		744	mg/L	5.2	92	80	120			
Lab ID: C15090769-008ADUP	3	Sample Duplicate				Run: MANTECH_150925C				09/25/15 16:50
Alkalinity, Total as CaCO3		274	mg/L	5.0				5.2	10	
Carbonate as CO3		ND	mg/L	5.0					10	
Bicarbonate as HCO3		334	mg/L	5.0				5.2	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WYAML 102
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2510 B										Batch: R204511
Lab ID: SC 2ND 1413		Laboratory Control Sample				Run: PHSC_101-C_150924A				09/24/15 08:45
Conductivity @ 25 C		1400	umhos/cm	5.0	99	90	110			
Lab ID: MBLK		Method Blank				Run: PHSC_101-C_150924A				09/24/15 09:05
Conductivity @ 25 C		3	umhos/cm	1						
Lab ID: C15090769-008ADUP		Sample Duplicate				Run: PHSC_101-C_150924A				09/24/15 10:00
Conductivity @ 25 C		1610	umhos/cm	5.0				0.0	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WYAML 102
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C										Batch: TDS150924B
Lab ID: MB-1_150924B		Method Blank				Run: BAL-18_150924B				09/24/15 11:18
Solids, Total Dissolved TDS @ 180 C		ND	mg/L	9						
Lab ID: LCS-2_150924B		Laboratory Control Sample				Run: BAL-18_150924B				09/24/15 11:18
Solids, Total Dissolved TDS @ 180 C		1140	mg/L	11	103	90	110			
Lab ID: C15090769-008A DUP		Sample Duplicate				Run: BAL-18_150924B				09/24/15 11:24
Solids, Total Dissolved TDS @ 180 C		1240	mg/L	9.9				0.2	5	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-F C									Analytical Run: MANTECH_150923A	
Lab ID: CCV-8644		Continuing Calibration Verification Standard							09/23/15 15:27	
Fluoride		1.92	mg/L	0.10	96	90	110			
Method: A4500-F C									Batch: R204515	
Lab ID: MBLK		Method Blank				Run: MANTECH_150923A			09/23/15 14:08	
Fluoride		ND	mg/L	0.01						
Lab ID: LCS-8595		Laboratory Control Sample				Run: MANTECH_150923A			09/23/15 14:10	
Fluoride		1.96	mg/L	0.10	98	90	110			
Lab ID: C15090769-001AMS		Sample Matrix Spike				Run: MANTECH_150923A			09/23/15 15:43	
Fluoride		1.89	mg/L	0.10	95	80	120			
Lab ID: C15090769-001AMSD		Sample Matrix Spike Duplicate				Run: MANTECH_150923A			09/23/15 15:45	
Fluoride		1.89	mg/L	0.10	95	80	120	0.0	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte		Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**A4500-H B**								Analytical Run: PHSC_101-C_150924A		
Lab ID:	**pH 6.86**		Initial Calibration Verification Standard							09/24/15 08:29	
pH			6.85	s.u.	0.010	100	98	102			
Lab ID:	**pH 6.86**		Initial Calibration Verification Standard							09/24/15 12:24	
pH			6.92	s.u.	0.010	101	98	102			
Lab ID:	**pH 6.86**		Initial Calibration Verification Standard							09/24/15 16:53	
pH			6.92	s.u.	0.010	101	98	102			
Method:	**A4500-H B**									Batch: R204511	
Lab ID:	**C15090769-008ADUP**		Sample Duplicate				Run: PHSC_101-C_150924A			09/24/15 10:00	
pH			5.70	s.u.	0.010				1.6	3	
Method:	**A4500-H B**								Analytical Run: PHSC_101-C_150929A		
Lab ID:	**pH 6.86**		Initial Calibration Verification Standard							09/29/15 08:27	
pH			6.84	s.u.	0.010	100	98	102			
Lab ID:	**CCV - pH 7**		Continuing Calibration Verification Standard							09/29/15 11:24	
pH			7.01	s.u.	0.010	100	98	102			
Lab ID:	**pH 6.86**		Initial Calibration Verification Standard							09/29/15 15:42	
pH			6.82	s.u.	0.010	99	98	102			
Method:	**A4500-H B**									Batch: R204712	
Lab ID:	**C15090769-007ADUP**		Sample Duplicate				Run: PHSC_101-C_150929A			09/29/15 16:32	
pH			7.38	s.u.	0.010				0.3	3	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-NH3 G									Analytical Run: TECHNICON_150925A	
Lab ID: CCV-18		Continuing Calibration Verification Standard							09/25/15 11:39	
Nitrogen, Ammonia as N		0.985	mg/L	0.050	99	90	110			
Lab ID: CCV-32		Continuing Calibration Verification Standard							09/25/15 12:02	
Nitrogen, Ammonia as N		0.999	mg/L	0.050	100	90	110			
Method: A4500-NH3 G									Batch: R204636	
Lab ID: MBLK-1		Method Blank				Run: TECHNICON_150925A			09/25/15 11:11	
Nitrogen, Ammonia as N		ND	mg/L	0.01						
Lab ID: LFB-3		Laboratory Fortified Blank				Run: TECHNICON_150925A			09/25/15 11:14	
Nitrogen, Ammonia as N		1.98	mg/L	0.050	101	90	110			
Lab ID: C15090769-002EMS		Sample Matrix Spike				Run: TECHNICON_150925A			09/25/15 12:07	
Nitrogen, Ammonia as N		580	mg/L	10	97	90	110			
Lab ID: C15090769-002EMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_150925A			09/25/15 12:09	
Nitrogen, Ammonia as N		579	mg/L	10	97	90	110	0.2	10	
Lab ID: C15090772-002DMS		Sample Matrix Spike				Run: TECHNICON_150925A			09/25/15 12:31	
Nitrogen, Ammonia as N		1.89	mg/L	0.050	96	90	110			
Lab ID: C15090772-002DMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_150925A			09/25/15 12:32	
Nitrogen, Ammonia as N		1.91	mg/L	0.050	97	90	110	1.1	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Analytical Run: ICP4-C_150929A	
Lab ID: ICV	7	Initial Calibration Verification Standard								09/29/15 11:42
Boron		1.01	mg/L	0.050	101	95	105			
Calcium		49.0	mg/L	1.0	98	95	105			
Iron		4.92	mg/L	0.030	98	95	105			
Magnesium		49.2	mg/L	1.0	98	95	105			
Potassium		49.5	mg/L	1.0	99	95	105			
Silicon		9.86	mg/L	0.10	99	95	105			
Sodium		50.2	mg/L	1.0	100	95	105			
Lab ID: ICSA	7	Interference Check Sample A								09/29/15 12:06
Boron		0.00843	mg/L	0.050						
Calcium		454	mg/L	1.0	91	80	120			
Iron		174	mg/L	0.030	87	80	120			
Magnesium		495	mg/L	1.0	99	80	120			
Potassium		0.0101	mg/L	1.0						
Silicon		-0.0216	mg/L	0.10						
Sodium		0.524	mg/L	1.0						
Lab ID: ICSAB	7	Interference Check Sample AB								09/29/15 12:10
Boron		0.0126	mg/L	0.050						
Calcium		456	mg/L	1.0	91	80	120			
Iron		174	mg/L	0.030	87	80	120			
Magnesium		497	mg/L	1.0	99	80	120			
Potassium		0.0152	mg/L	1.0						
Silicon		-0.0123	mg/L	0.10						
Sodium		0.444	mg/L	1.0						
Method: E200.7										Batch: R204761
Lab ID: MB-150929A	7	Method Blank				Run: ICP4-C_150929A				09/29/15 12:30
Boron		ND	mg/L	0.006						
Calcium		0.02	mg/L	0.003						
Iron		ND	mg/L	0.004						
Magnesium		ND	mg/L	0.002						
Potassium		ND	mg/L	0.04						
Silicon		ND	mg/L	0.02						
Sodium		ND	mg/L	0.1						
Lab ID: LFB-150929A	7	Laboratory Fortified Blank				Run: ICP4-C_150929A				09/29/15 12:34
Boron		0.957	mg/L	0.050	96	85	115			
Calcium		47.2	mg/L	1.0	94	85	115			
Iron		0.898	mg/L	0.030	90	85	115			
Magnesium		47.7	mg/L	1.0	95	85	115			
Potassium		50.7	mg/L	1.0	101	85	115			
Silicon		0.456	mg/L	0.10	101	85	115			
Sodium		47.1	mg/L	1.0	94	85	115			

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Batch: R204761	
Lab ID: C15090769-004BMS2	7	Sample Matrix Spike				Run: ICP4-C_150929A			09/29/15 22:30	
Boron		1.97	mg/L	0.050	94	70	130			
Calcium		543	mg/L	1.0		70	130			A
Iron		2.58	mg/L	0.030	89	70	130			
Magnesium		167	mg/L	1.0	93	70	130			
Potassium		114	mg/L	1.0	93	70	130			
Silicon		10.8	mg/L	0.10		70	130			A
Sodium		177	mg/L	1.0	91	70	130			
Lab ID: C15090769-004BMSD	7	Sample Matrix Spike Duplicate				Run: ICP4-C_150929A			09/29/15 22:34	
Boron		1.97	mg/L	0.050	93	70	130	0.3	20	
Calcium		543	mg/L	1.0		70	130	0.1	20	A
Iron		2.59	mg/L	0.030	90	70	130	0.4	20	
Magnesium		167	mg/L	1.0	93	70	130	0.1	20	
Potassium		115	mg/L	1.0	94	70	130	0.8	20	
Silicon		10.7	mg/L	0.10		70	130	0.3	20	A
Sodium		177	mg/L	1.0	91	70	130	0.0	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WYAML 102
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Analytical Run: ICPMS2-C_150930A	
Lab ID: ICV		Initial Calibration Verification Standard							09/30/15 11:43	
Uranium		0.0472	mg/L	0.00030	94	90	110			
Method: E200.8									Batch: R204803	
Lab ID: LRB		Method Blank				Run: ICPMS2-C_150930A			09/30/15 12:32	
Uranium		0.0001	mg/L	8E-06						
Lab ID: LFB		Laboratory Fortified Blank				Run: ICPMS2-C_150930A			09/30/15 12:34	
Uranium		0.0512	mg/L	0.00030	102	85	115			
Lab ID: C15090860-008BMS4		Sample Matrix Spike				Run: ICPMS2-C_150930A			09/30/15 18:03	
Uranium		0.0514	mg/L	0.00030	103	70	130			
Lab ID: C15090860-008BMSD		Sample Matrix Spike Duplicate				Run: ICPMS2-C_150930A			09/30/15 18:05	
Uranium		0.0584	mg/L	0.0010	117	70	130	13	20	

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WYAML 102
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8								Analytical Run: ICPMS4-C_150925A		
Lab ID: ICV	20	Initial Calibration Verification Standard								09/25/15 12:49
Aluminum		0.0494	mg/L	0.0010	99	90	110			
Arsenic		0.0495	mg/L	0.0010	99	90	110			
Barium		0.0480	mg/L	0.0010	96	90	110			
Beryllium		0.0496	mg/L	0.0010	99	90	110			
Cadmium		0.0491	mg/L	0.0010	98	90	110			
Chromium		0.0501	mg/L	0.0010	100	90	110			
Copper		0.0496	mg/L	0.0010	99	90	110			
Iron		0.977	mg/L	0.0010	98	90	110			
Lead		0.0490	mg/L	0.0010	98	90	110			
Magnesium		9.90	mg/L	0.0027	99	90	110			
Manganese		0.0482	mg/L	0.0010	97	90	110			
Mercury		0.00475	mg/L	0.0010	95	90	110			
Molybdenum		0.0480	mg/L	0.0010	96	90	110			
Nickel		0.0498	mg/L	0.0010	100	90	110			
Potassium		10.1	mg/L	0.0041	101	90	110			
Selenium		0.0499	mg/L	0.0010	100	90	110			
Sodium		9.63	mg/L	0.0043	96	90	110			
Uranium		0.0478	mg/L	0.00030	96	90	110			
Vanadium		0.0499	mg/L	0.0010	100	90	110			
Zinc		0.0513	mg/L	0.0010	103	90	110			
Method: E200.8										Batch: R204629
Lab ID: LRB	20	Method Blank				Run: ICPMS4-C_150925A				09/25/15 13:35
Aluminum		0.002	mg/L	0.0001						
Arsenic		ND	mg/L	5E-05						
Barium		ND	mg/L	9E-06						
Beryllium		ND	mg/L	3E-05						
Cadmium		ND	mg/L	7E-06						
Chromium		0.0001	mg/L	8E-05						
Copper		ND	mg/L	2E-05						
Iron		ND	mg/L	0.0003						
Lead		ND	mg/L	1.0E-05						
Magnesium		0.002	mg/L	0.0009						
Manganese		ND	mg/L	4E-05						
Mercury		4E-05	mg/L	3E-05						
Molybdenum		ND	mg/L	4E-05						
Nickel		ND	mg/L	0.0002						
Potassium		0.07	mg/L	0.02						
Selenium		ND	mg/L	3E-05						
Sodium		ND	mg/L	0.007						
Uranium		8E-06	mg/L	4E-06						
Vanadium		7E-05	mg/L	1E-05						
Zinc		0.0002	mg/L	8E-05						

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WYAML 102
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R204629	
Lab ID: LFB	20	Laboratory Fortified Blank				Run: ICPMS4-C_150925A			09/25/15 13:41	
Aluminum		0.0516	mg/L	0.0010	100	85	115			
Arsenic		0.0527	mg/L	0.0010	105	85	115			
Barium		0.0507	mg/L	0.0010	101	85	115			
Beryllium		0.0518	mg/L	0.0010	104	85	115			
Cadmium		0.0518	mg/L	0.0010	104	85	115			
Chromium		0.0525	mg/L	0.0010	105	85	115			
Copper		0.0522	mg/L	0.0010	104	85	115			
Iron		1.28	mg/L	0.0010	102	85	115			
Lead		0.0514	mg/L	0.0010	103	85	115			
Magnesium		12.1	mg/L	0.0027	97	85	115			
Manganese		0.0498	mg/L	0.0010	100	85	115			
Mercury		0.0102	mg/L	0.0010	102	85	115			
Molybdenum		0.0507	mg/L	0.0010	101	85	115			
Nickel		0.0522	mg/L	0.0010	104	85	115			
Potassium		12.4	mg/L	0.0041	98	85	115			
Selenium		0.0558	mg/L	0.0010	112	85	115			
Sodium		12.0	mg/L	0.0043	96	85	115			
Uranium		0.0492	mg/L	0.00030	98	85	115			
Vanadium		0.0526	mg/L	0.0010	105	85	115			
Zinc		0.0532	mg/L	0.0010	106	85	115			
Lab ID: C15090769-003BMS4	20	Sample Matrix Spike				Run: ICPMS4-C_150925A			09/25/15 21:23	
Aluminum		0.519	mg/L	0.030	98	70	130			
Arsenic		0.547	mg/L	0.0010	109	70	130			
Barium		0.542	mg/L	0.050	105	70	130			
Beryllium		0.482	mg/L	0.0010	96	70	130			
Cadmium		0.518	mg/L	0.0010	104	70	130			
Chromium		0.529	mg/L	0.0050	105	70	130			
Copper		0.534	mg/L	0.0050	104	70	130			
Iron		14.2	mg/L	0.030	93	70	130			
Lead		0.532	mg/L	0.0010	106	70	130			
Magnesium		575	mg/L	1.0	102	70	130			
Manganese		15.0	mg/L	0.0010		70	130			A
Mercury		0.110	mg/L	0.00057	109	70	130			
Molybdenum		0.533	mg/L	0.0010	106	70	130			
Nickel		1.43	mg/L	0.0050	102	70	130			
Potassium		184	mg/L	1.0	101	70	130			
Selenium		0.560	mg/L	0.0010	111	70	130			
Sodium		512	mg/L	1.0	99	70	130			
Uranium		9.45	mg/L	0.00030		70	130			A
Vanadium		0.537	mg/L	0.010	107	70	130			
Zinc		0.578	mg/L	0.010	103	70	130			
Lab ID: C15090769-003BMSD	20	Sample Matrix Spike Duplicate				Run: ICPMS4-C_150925A			09/25/15 21:28	
Aluminum		0.519	mg/L	0.030	98	70	130	0.0	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R204629	
Lab ID: C15090769-003BMSD	20	Sample Matrix Spike Duplicate				Run: ICPMS4-C_150925A			09/25/15 21:28	
Arsenic		0.544	mg/L	0.0010	109	70	130	0.5	20	
Barium		0.548	mg/L	0.050	106	70	130	1.1	20	
Beryllium		0.482	mg/L	0.0010	96	70	130	0.0	20	
Cadmium		0.531	mg/L	0.0010	106	70	130	2.5	20	
Chromium		0.524	mg/L	0.0050	104	70	130	1.0	20	
Copper		0.529	mg/L	0.0050	103	70	130	0.9	20	
Iron		14.0	mg/L	0.030	92	70	130	0.8	20	
Lead		0.538	mg/L	0.0010	107	70	130	1.0	20	
Magnesium		565	mg/L	1.0	94	70	130	1.7	20	
Manganese		15.1	mg/L	0.0010		70	130	0.6	20	A
Mercury		0.112	mg/L	0.00057	111	70	130	2.3	20	
Molybdenum		0.549	mg/L	0.0010	109	70	130	2.9	20	
Nickel		1.40	mg/L	0.0050	96	70	130	2.0	20	
Potassium		186	mg/L	1.0	102	70	130	1.0	20	
Selenium		0.560	mg/L	0.0010	111	70	130	0.0	20	
Sodium		506	mg/L	1.0	94	70	130	1.3	20	
Uranium		9.68	mg/L	0.00030		70	130	2.4	20	A
Vanadium		0.531	mg/L	0.010	106	70	130	1.0	20	
Zinc		0.574	mg/L	0.010	103	70	130	0.7	20	
Method: E200.8									Analytical Run: ICPMS4-C_150928A	
Lab ID: ICV	2	Initial Calibration Verification Standard							09/28/15 12:47	
Iron		0.985	mg/L	0.0010	98	90	110			
Manganese		0.0490	mg/L	0.0010	98	90	110			
Method: E200.8									Batch: 45814	
Lab ID: MB-45814	2	Method Blank				Run: ICPMS4-C_150928A			09/28/15 21:58	
Iron		ND	mg/L	0.0002						
Manganese		0.0001	mg/L	7E-05						
Lab ID: LCS3-45814	2	Laboratory Control Sample				Run: ICPMS4-C_150928A			09/28/15 22:03	
Iron		2.49	mg/L	0.030	100	85	115			
Manganese		2.40	mg/L	0.0010	96	85	115			
Lab ID: C15090769-010CMS3	2	Sample Matrix Spike				Run: ICPMS4-C_150928A			09/28/15 23:52	
Iron		4.27	mg/L	0.030	106	70	130			
Manganese		2.80	mg/L	0.0010	96	70	130			
Lab ID: C15090769-010CMSD	2	Sample Matrix Spike Duplicate				Run: ICPMS4-C_150928A			09/28/15 23:57	
Iron		4.45	mg/L	0.030	113	70	130	4.2	20	
Manganese		2.79	mg/L	0.0010	96	70	130	0.3	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates **Report Date:** 10/07/15

Project: WYAML 102 **Work Order:** C15090769

Analyte		Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**E300.0**								Analytical Run: IC2-C_150928A		
Lab ID:	**ICV**	2	Initial Calibration Verification Standard							09/28/15 10:53	
Chloride			9.87	mg/L	1.0	99	90	110			
Sulfate			39.3	mg/L	1.0	98	90	110			
Lab ID:	**CCV-092815-1**	2	Continuing Calibration Verification Standard							09/28/15 11:48	
Chloride			9.72	mg/L	1.0	97	90	110			
Sulfate			38.6	mg/L	1.0	97	90	110			
Lab ID:	**CCV-092815-2**	2	Continuing Calibration Verification Standard							09/28/15 15:48	
Chloride			9.71	mg/L	1.0	97	90	110			
Sulfate			38.7	mg/L	1.0	97	90	110			
Method:	**E300.0**									Batch: R204744	
Lab ID:	**ICB**	2	Method Blank				Run: IC2-C_150928A			09/28/15 11:11	
Chloride			0.02	mg/L	0.01						
Sulfate			0.08	mg/L	0.03						
Lab ID:	**LFB-092815-1**	2	Laboratory Fortified Blank				Run: IC2-C_150928A			09/28/15 11:30	
Chloride			10.7	mg/L	1.0	107	90	110			
Sulfate			42.6	mg/L	1.0	106	90	110			
Lab ID:	**C15090829-001AMS**	2	Sample Matrix Spike				Run: IC2-C_150928A			09/28/15 12:25	
Chloride			14.0	mg/L	1.0	114	90	110			S
Sulfate			67.9	mg/L	1.0	112	90	110			S
- Matrix spike recoveries outside the acceptance range are considered matrix-related.											
Lab ID:	**C15090829-001AMSD**	2	Sample Matrix Spike Duplicate				Run: IC2-C_150928A			09/28/15 12:43	
Chloride			13.9	mg/L	1.0	113	90	110	0.6	20	S
Sulfate			67.8	mg/L	1.0	112	90	110	0.2	20	S
- Matrix spike recoveries outside the acceptance range are considered matrix-related.											
Lab ID:	**C15090769-006AMS**	2	Sample Matrix Spike				Run: IC2-C_150928A			09/28/15 16:43	
Chloride			229	mg/L	1.0	110	90	110			
Sulfate			1810	mg/L	4.2	103	90	110			
Lab ID:	**C15090769-006AMSD**	2	Sample Matrix Spike Duplicate				Run: IC2-C_150928A			09/28/15 17:01	
Chloride			232	mg/L	1.0	113	90	110	1.2	20	S
Sulfate			1820	mg/L	4.2	106	90	110	0.6	20	
- Matrix spike recoveries outside the acceptance range are considered matrix-related.											

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E353.2									Analytical Run: FIA201-C_150925A	
Lab ID: CCV		Continuing Calibration Verification Standard							09/25/15 12:59	
Nitrogen, Nitrate+Nitrite as N		2.03	mg/L	0.10	101	90	110			
Method: E353.2									Batch: R204638	
Lab ID: MBLK		Method Blank				Run: FIA201-C_150925A			09/25/15 12:40	
Nitrogen, Nitrate+Nitrite as N		ND	mg/L	0.007						
Lab ID: LFB		Laboratory Fortified Blank				Run: FIA201-C_150925A			09/25/15 12:41	
Nitrogen, Nitrate+Nitrite as N		1.88	mg/L	0.10	96	90	110			
Lab ID: C15090829-001CMS		Sample Matrix Spike				Run: FIA201-C_150925A			09/25/15 12:47	
Nitrogen, Nitrate+Nitrite as N		1.96	mg/L	0.10	98	90	110			
Lab ID: C15090829-001CMSD		Sample Matrix Spike Duplicate				Run: FIA201-C_150925A			09/25/15 12:48	
Nitrogen, Nitrate+Nitrite as N		1.88	mg/L	0.10	94	90	110	4.2	10	
Lab ID: C15090769-005EMS		Sample Matrix Spike				Run: FIA201-C_150925A			09/25/15 13:02	
Nitrogen, Nitrate+Nitrite as N		9.36	mg/L	0.20	80	90	110			S
- Matrix spike recoveries outside the acceptance range are considered matrix-related.										
Lab ID: C15090769-005EMSD		Sample Matrix Spike Duplicate				Run: FIA201-C_150925A			09/25/15 13:04	
Nitrogen, Nitrate+Nitrite as N		9.38	mg/L	0.20	81	90	110	0.2	10	S
- Matrix spike recoveries outside the acceptance range are considered matrix-related.										

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E900.0										Batch: GrAB-2135
Lab ID: Th230-GrAB-2135		Laboratory Control Sample				Run: G5000W_150929A				09/30/15 22:24
Gross Alpha		107	pCi/L		107	80	120			
Lab ID: Sr90-GrAB-2135		Laboratory Control Sample				Run: G5000W_150929A				09/30/15 22:24
Gross Beta		176	pCi/L		90	80	120			
Lab ID: MB-GrAB-2135	6	Method Blank				Run: G5000W_150929A				09/30/15 22:24
Gross Alpha		0.03	pCi/L							U
Gross Alpha precision (±)		0.7	pCi/L							
Gross Alpha MDC		1	pCi/L							
Gross Beta		-0.1	pCi/L							U
Gross Beta precision (±)		2	pCi/L							
Gross Beta MDC		3	pCi/L							
Lab ID: C15090764-004DMS		Sample Matrix Spike				Run: G5000W_150929A				09/30/15 22:24
Gross Alpha		274	pCi/L		31	70	130			S
- Spike response is outside of the acceptance range for this analysis. Since the LCS and the Duplicate RPD are acceptable the batch is approved.										
Lab ID: C15090764-004DMS		Sample Matrix Spike				Run: G5000W_150929A				09/30/15 22:24
Gross Beta		358	pCi/L		97	70	130			
Lab ID: C15090769-004DDUP	6	Sample Duplicate				Run: G5000W_150929A				09/30/15 22:24
Gross Alpha		18.4	pCi/L					20	102.9	
Gross Alpha precision (±)		9.93	pCi/L							
Gross Alpha MDC		10.6	pCi/L							
Gross Beta		31.4	pCi/L					16	62.4	
Gross Beta precision (±)		7.86	pCi/L							
Gross Beta MDC		11.7	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WYAML 102
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E900.0									Batch: GrAB-2136	
Lab ID: Th230-GrAB-2136		Laboratory Control Sample				Run: G542M_150929B			09/30/15 22:25	
Gross Alpha		113	pCi/L		111	80	120			
Lab ID: Sr90-GrAB-2136		Laboratory Control Sample				Run: G542M_150929B			09/30/15 22:25	
Gross Beta		185	pCi/L		95	80	120			
Lab ID: MB-GrAB-2136	6	Method Blank				Run: G542M_150929B			09/30/15 22:25	
Gross Alpha		1	pCi/L							
Gross Alpha precision (±)		1	pCi/L							
Gross Alpha MDC		1	pCi/L							
Gross Beta		0.1	pCi/L							U
Gross Beta precision (±)		2	pCi/L							
Gross Beta MDC		3	pCi/L							
Lab ID: C15090837-001FDUP	6	Sample Duplicate				Run: G542M_150929B			09/30/15 22:25	
Gross Alpha		22.1	pCi/L					0.2	56.1	
Gross Alpha precision (±)		5.01	pCi/L							
Gross Alpha MDC		1.89	pCi/L							
Gross Beta		7.50	pCi/L					13	55.8	
Gross Beta precision (±)		1.64	pCi/L							
Gross Beta MDC		2.88	pCi/L							
Lab ID: C15090839-001FMS		Sample Matrix Spike				Run: G542M_150929B			09/30/15 22:25	
Gross Alpha		198	pCi/L		87	70	130			
Lab ID: C15090839-001FMS		Sample Matrix Spike				Run: G542M_150929B			09/30/15 22:25	
Gross Beta		201	pCi/L		95	70	130			

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/07/15
Project: WYAML 102
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: RA226-7837
Lab ID: LCS-RA226-7837		Laboratory Control Sample				Run: TENNELEC-3_150924D				10/05/15 12:50
Radium 226		10	pCi/L		98	80	120			
Lab ID: MB-RA226-7837	3	Method Blank				Run: TENNELEC-3_150924D				10/05/15 12:50
Radium 226		0.08	pCi/L							U
Radium 226 precision (±)		0.09	pCi/L							
Radium 226 MDC		0.1	pCi/L							
Lab ID: C15090764-002DMS		Sample Matrix Spike				Run: TENNELEC-3_150924D				10/05/15 12:50
Radium 226		20	pCi/L		89	70	130			
Lab ID: C15090764-002DMSD		Sample Matrix Spike Duplicate				Run: TENNELEC-3_150924D				10/05/15 12:50
Radium 226		20	pCi/L		90	70	130	0.3	49	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E908.0									Batch: RA-TH-ISO-2330	
Lab ID: LCS-RA-TH-ISO-2330		Laboratory Control Sample				Run: EGG-ORTEC_151001A			10/05/15 09:56	
Thorium 230		6.1	pCi/L		91	80	120			
Lab ID: C15090769-010DMS		Sample Matrix Spike				Run: EGG-ORTEC_151001A			10/05/15 14:29	
Thorium 230		14	pCi/L		99	70	130			
Lab ID: C15090769-010DMSD		Sample Matrix Spike Duplicate				Run: EGG-ORTEC_151001A			10/05/15 14:29	
Thorium 230		12	pCi/L		85	70	130	15	48	
Lab ID: MB-RA-TH-ISO-2330	3	Method Blank				Run: EGG-ORTEC_151001A			10/05/15 14:29	
Thorium 230		0.2	pCi/L							U
Thorium 230 precision (±)		0.1	pCi/L							
Thorium 230 MDC		0.2	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYAML 102

Report Date: 10/07/15
Work Order: C15090769

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RA-05										Batch: RA228-5045
Lab ID: LCS-228-RA226-7837		Laboratory Control Sample				Run: TENNELEC-3_150924C				09/30/15 10:07
Radium 228		8.3	pCi/L		94	80	120			
Lab ID: MB-RA226-7837	3	Method Blank				Run: TENNELEC-3_150924C				09/30/15 10:07
Radium 228		1	pCi/L							U
Radium 228 precision (±)		0.8	pCi/L							
Radium 228 MDC		1	pCi/L							
Lab ID: C15090769-001DMS		Sample Matrix Spike				Run: TENNELEC-3_150924C				09/30/15 10:07
Radium 228		14.5	pCi/L		90	70	130			
Lab ID: C15090769-001DMSD		Sample Matrix Spike Duplicate				Run: TENNELEC-3_150924C				09/30/15 10:07
Radium 228		15.1	pCi/L		94	70	130	4.4	53.5	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

Work Order Receipt Checklist

Lidstone and Associates

C15090769

Login completed by: Dorian Quis
Reviewed by: BL2000\tparke
Reviewed Date: 9/30/2015

Date Received: 9/23/2015
Received by: amm
Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.4°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

PLEASE PRINT (Provide as much information as possible.)

Company Name: Lidstone and Associates

Project Name, PWS, Permit, Etc.: WYAML 02

Sample Origin State: WY

EPA/State Compliance: Yes ☐ No ☒

Report Mail Address (Required): 4025 Automation Way Bldg E Fort Collins CO 80525

☒ No Hard Copy Email: gs@lidstone.com

Contact Name: Greg Steed

Phone/Fax: 970-223-4705

Cell: 970-819-1783

Sampler: (Please Print) AEM

Invoice Contact & Phone: melinda culver mcc@lidstone.com

Purchase Order:

Quote/Bottle Order: 47286

Invoice Address (Required): Same

☐ No Hard Copy Email:

Special Report/Formats:
☐ DW
☐ POTW/WWTP
☐ State:
☐ Other:
☒ EDD/EDT (Electronic Data) Format: csv
☐ LEVEL IV
☐ NELAC

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: Lab Courier

Cooler ID(s): various

Receipt Temp 9.5, 4.0 °C 3.4

On Ice: (Y) N

Custody Seal: On Bottle Y (N); On Cooler Y (N)

Intact Y N

Signature Match Y N

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Number of Containers; Sample Type: A W S V B O DW; Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water)	2015 DEQ Guidelines		Dissolved Be		Thorium 230						SEE ATTACHED	Standard Turnaround (TAT)	RUSH	Comments
1	ANC-B	9-21-15	12:30	W	X		X		X									
2	R-4	9-21-15	11:50	W	X		X		X									
3	MW-2	9-21-15	13:00	W	X		X		X									C15090769
4	MW-11	9-21-15	17:55	W	X		X		X									
5	MW-4	9-21-15	14:50	W	X		X		X									
6	MW-13	9-21-15	16:30	W	X		X		X									
7	MW-6	9-21-15	19:15	W	X		X		X									
8	MW-14A	9-22-15	15:45	W	X		X		X									
9	PW-12	9/22/15	15:30	W	X		X		X									
10	PW-13	9/22/15	16:50	W	X		X		X									

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print): Greg Steed Date/Time: 9-22-15/18:30 Signature:

Relinquished by (print): Daniel Lashbrook Date/Time: 9/22/15 20:55 Signature:

Received by (print): Daniel Lashbrook Date/Time: 9/22/15 1840 Signature:

Received by (print): Date/Time: Signature:

Received by Laboratory: Date/Time: 9/23/15 8:00 Signature:

Sample Disposal: Return to Client: Lab Disposal: X

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report. Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

ANALYTICAL SUMMARY REPORT

October 23, 2015

Lidstone and Associates
4025 Automation Way Unit E
Fort Collins, CO 80525

Work Order: C15090859

Project Name: WYDEQ104

Energy Laboratories, Inc. Casper WY received the following 15 samples for Lidstone and Associates on 9/25/2015 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C15090859-001	South Willow Spring	09/23/15 17:05	09/25/15	Aqueous	Metals by ICP/ICPMS, Dissolved Metals by ICP/ICPMS, Total Alkalinity Anion - Cation Balance Conductivity Sample Filtering Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Metals Preparation by EPA 200.2 Gross Alpha, Gross Beta Radium 226, Dissolved Radium 228, Dissolved Thorium, Isotopic Solids, Total Dissolved Solids, Total Dissolved - Calculated
C15090859-002	PW-9/MW-26	09/23/15 9:30	09/25/15	Aqueous	Same As Above
C15090859-003	PW-6/MW-23	09/23/15 9:40	09/25/15	Aqueous	Same As Above
C15090859-004	PW-5/MW-22	09/23/15 11:00	09/25/15	Aqueous	Same As Above
C15090859-005	MW-15	09/23/15 12:30	09/25/15	Aqueous	Same As Above
C15090859-006	MW-16	09/23/15 13:30	09/25/15	Aqueous	Same As Above
C15090859-007	PW-8/MW-25	09/23/15 14:50	09/25/15	Aqueous	Same As Above
C15090859-008	MW-9	09/23/15 18:35	09/25/15	Aqueous	Same As Above
C15090859-009	PW-1/MW-18	09/23/15 17:25	09/25/15	Aqueous	Same As Above
C15090859-010	PW-3/MW-20	09/23/15 18:30	09/25/15	Aqueous	Same As Above

ANALYTICAL SUMMARY REPORT

C15090859-011	MW-12	09/22/15 19:20	09/25/15	Aqueous	Metals by ICP/ICPMS, Dissolved Metals by ICP/ICPMS, Total Alkalinity Anion - Cation Balance Conductivity Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Metals Preparation by EPA 200.2 Gross Alpha, Gross Beta Radium 226, Dissolved Radium 228, Dissolved Thorium, Isotopic Solids, Total Dissolved Solids, Total Dissolved - Calculated
C15090859-012	PW-2/MW-19	09/24/15 9:45	09/25/15	Aqueous	Metals by ICP/ICPMS, Dissolved Metals by ICP/ICPMS, Total Alkalinity Anion - Cation Balance Conductivity Sample Filtering Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Metals Preparation by EPA 200.2 Gross Alpha, Gross Beta Radium 226, Dissolved Radium 228, Dissolved Thorium, Isotopic Solids, Total Dissolved Solids, Total Dissolved - Calculated
C15090859-013	PW-4/MW-21	09/24/15 11:35	09/25/15	Aqueous	Same As Above
C15090859-014	PW-7/MW-24	09/24/15 10:30	09/25/15	Aqueous	Same As Above
C15090859-015	PW-15/MW-31	09/24/15 12:00	09/25/15	Aqueous	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Radiochemistry analyses were performed at Energy Laboratories, Inc., 2325 Kerzell Lane, Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Lidstone and Associates
Project: WYDEQ104
Work Order: C15090859

Report Date: 10/23/15

CASE NARRATIVE

RADIOCHEMISTRY ANALYSIS
Per client request, results less than MDC (or precision if no MDC), are reported as <MDC (or <precision). Actual instrument results are available by request.

TH230 ANALYSIS
USNRC Regulatory Guide 4.14 provides guidance on Minimum Detectable Concentrations (MDC) that should be achieved in samples for this radionuclide. The sample-specific MDC for this sample could not be achieved due to significant matrix interferences, restricting the volume of sample to be used in the analysis. Please consult with your local regulatory agency prior to using these results for compliance purposes.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-001
Client Sample ID: South Willow Spring

Report Date: 10/23/15
Collection Date: 09/23/15 17:05
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 19:53 / wc
Bicarbonate as HCO3	335	mg/L		5		A2320 B	09/28/15 19:53 / wc
Calcium	321	mg/L		1		E200.7	10/02/15 15:18 / sf
Chloride	71	mg/L		1		E300.0	09/29/15 01:00 / wc
Fluoride	0.4	mg/L		0.1		A4500-F C	09/25/15 12:49 / wc
Magnesium	92	mg/L		1		E200.7	10/02/15 15:18 / sf
Nitrogen, Ammonia as N	10.9	mg/L	D	0.2		A4500-NH3 G	09/29/15 12:40 / lr
Nitrogen, Nitrate+Nitrite as N	0.8	mg/L		0.1		E353.2	09/29/15 16:09 / lr
Potassium	34	mg/L		1		E200.8	09/29/15 00:12 / smm
Silica	33.9	mg/L		0.2		E200.7	10/02/15 15:18 / sf
Sodium	173	mg/L		1		E200.7	10/02/15 15:18 / sf
Sulfate	1260	mg/L	D	4		E300.0	09/29/15 01:00 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	2670	umhos/cm		5		A2510 B	09/25/15 12:11 / lmc
pH	7.97	s.u.	H	0.01		A4500-H B	09/25/15 12:11 / lmc
Solids, Total Dissolved TDS @ 180 C	2170	mg/L		20		A2540 C	09/28/15 09:37 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 00:12 / smm
Arsenic	0.009	mg/L		0.001		E200.8	09/29/15 00:12 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 00:12 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 00:12 / smm
Boron	0.1	mg/L		0.1		E200.7	10/02/15 15:18 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 00:12 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 00:12 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 00:12 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 00:12 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 00:12 / smm
Manganese	0.40	mg/L		0.01		E200.8	09/29/15 00:12 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 00:12 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 00:12 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 00:12 / smm
Selenium	0.042	mg/L		0.001		E200.8	09/29/15 00:12 / smm
Uranium	0.200	mg/L		0.0003		E200.8	09/30/15 17:09 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 00:12 / smm
Zinc	ND	mg/L		0.01		E200.8	09/29/15 00:12 / smm
METALS - TOTAL							
Iron	0.04	mg/L		0.03		E200.7	10/01/15 22:09 / sf
Manganese	0.38	mg/L		0.01		E200.7	10/01/15 22:09 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-001
Client Sample ID: South Willow Spring

Report Date: 10/23/15
Collection Date: 09/23/15 17:05
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	179	pCi/L		5.9		E900.0	10/02/15 01:46 / trs
Gross Alpha precision (±)	36.7	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Alpha MDC	5.9	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Beta	47.2	pCi/L		8.9		E900.0	10/02/15 01:46 / trs
Gross Beta precision (±)	7.2	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Beta MDC	8.9	pCi/L				E900.0	10/02/15 01:46 / trs
Radium 226	0.32	pCi/L		0.17		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	0.15	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.17	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	1.1	pCi/L		1.1		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	0.7	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	<0.2	pCi/L	U	0.2		E908.0	10/05/15 11:24 / cng
Thorium 230 precision (±)	0.08	pCi/L				E908.0	10/05/15 11:24 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	10/05/15 11:24 / cng
DATA QUALITY							
A/C Balance (± 5)	-1.74	%				A1030 E	10/06/15 09:39 / sf
Anions	33.9	meq/L				A1030 E	10/06/15 09:39 / sf
Cations	32.7	meq/L				A1030 E	10/06/15 09:39 / sf
Solids, Total Dissolved Calculated	2200	mg/L				A1030 E	10/06/15 09:39 / sf
TDS Balance (0.80 - 1.20)	1.00	unitless				A1030 E	10/06/15 09:39 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-002
Client Sample ID: PW-9/MW-26

Report Date: 10/23/15
Collection Date: 09/23/15 09:30
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 20:01 / wc
Bicarbonate as HCO3	201	mg/L		5		A2320 B	09/28/15 20:01 / wc
Calcium	57	mg/L		1		E200.7	10/02/15 15:22 / sf
Chloride	13	mg/L		1		E300.0	09/29/15 01:55 / wc
Fluoride	0.7	mg/L		0.1		A4500-F C	09/29/15 12:23 / wc
Magnesium	18	mg/L		1		E200.7	10/02/15 15:22 / sf
Nitrogen, Ammonia as N	0.46	mg/L		0.05		A4500-NH3 G	09/29/15 12:45 / lr
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/29/15 16:10 / lr
Potassium	12	mg/L		1		E200.8	09/29/15 00:17 / smm
Silica	11.5	mg/L		0.2		E200.7	10/02/15 15:22 / sf
Sodium	249	mg/L		1		E200.7	10/02/15 15:22 / sf
Sulfate	553	mg/L	D	2		E300.0	09/29/15 01:55 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	1500	umhos/cm		5		A2510 B	09/25/15 12:20 / lmc
pH	7.98	s.u.	H	0.01		A4500-H B	09/25/15 12:20 / lmc
Solids, Total Dissolved TDS @ 180 C	1030	mg/L		10		A2540 C	09/28/15 09:38 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 00:17 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/29/15 00:17 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 00:17 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 00:17 / smm
Boron	0.5	mg/L		0.1		E200.7	10/02/15 15:22 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 00:17 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 00:17 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 00:17 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 00:17 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 00:17 / smm
Manganese	0.12	mg/L		0.01		E200.8	09/29/15 00:17 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 00:17 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 00:17 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 00:17 / smm
Selenium	0.012	mg/L		0.001		E200.8	09/29/15 00:17 / smm
Uranium	0.0072	mg/L		0.0003		E200.8	09/30/15 17:21 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 00:17 / smm
Zinc	ND	mg/L		0.01		E200.8	09/29/15 00:17 / smm
METALS - TOTAL							
Iron	4.68	mg/L		0.03		E200.7	10/01/15 22:13 / sf
Manganese	0.20	mg/L		0.01		E200.7	10/01/15 22:13 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-002
Client Sample ID: PW-9/MW-26

Report Date: 10/23/15
Collection Date: 09/23/15 09:30
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	14.6	pCi/L		2.6		E900.0	10/02/15 01:47 / trs
Gross Alpha precision (±)	3.8	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Alpha MDC	2.6	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Beta	9.7	pCi/L		4.2		E900.0	10/02/15 01:47 / trs
Gross Beta precision (±)	2.8	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Beta MDC	4.2	pCi/L				E900.0	10/02/15 01:47 / trs
Radium 226	1.1	pCi/L		0.22		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	0.32	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.22	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	<1.5	pCi/L	U	1.5		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	0.9	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.5	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	0.3	pCi/L		0.2		E908.0	10/05/15 11:24 / cng
Thorium 230 precision (±)	0.2	pCi/L				E908.0	10/05/15 11:24 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	10/05/15 11:24 / cng
DATA QUALITY							
A/C Balance (± 5)	0.79	%				A1030 E	10/06/15 09:39 / sf
Anions	15.2	meq/L				A1030 E	10/06/15 09:39 / sf
Cations	15.4	meq/L				A1030 E	10/06/15 09:39 / sf
Solids, Total Dissolved Calculated	1000	mg/L				A1030 E	10/06/15 09:39 / sf
TDS Balance (0.80 - 1.20)	1.02	unitless				A1030 E	10/06/15 09:39 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-003
Client Sample ID: PW-6/MW-23

Report Date: 10/23/15
Collection Date: 09/23/15 09:40
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 20:16 / wc
Bicarbonate as HCO3	321	mg/L		5		A2320 B	09/28/15 20:16 / wc
Calcium	269	mg/L		1		E200.7	10/02/15 15:26 / sf
Chloride	45	mg/L		1		E300.0	09/29/15 02:14 / wc
Fluoride	0.8	mg/L		0.1		A4500-F C	09/29/15 12:31 / wc
Magnesium	54	mg/L		1		E200.7	10/02/15 15:26 / sf
Nitrogen, Ammonia as N	0.32	mg/L		0.05		A4500-NH3 G	09/29/15 12:47 / lr
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/29/15 16:11 / lr
Potassium	21	mg/L		1		E200.8	09/29/15 00:22 / smm
Silica	42.3	mg/L		0.2		E200.7	10/02/15 15:26 / sf
Sodium	211	mg/L		1		E200.7	10/02/15 15:26 / sf
Sulfate	980	mg/L	D	2		E300.0	09/29/15 02:14 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	2320	umhos/cm		5		A2510 B	09/25/15 12:24 / lmc
pH	7.07	s.u.	H	0.01		A4500-H B	09/25/15 12:24 / lmc
Solids, Total Dissolved TDS @ 180 C	1860	mg/L		20		A2540 C	09/28/15 09:38 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 00:22 / smm
Arsenic	0.010	mg/L		0.001		E200.8	09/29/15 00:22 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 00:22 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 00:22 / smm
Boron	0.4	mg/L		0.1		E200.7	10/02/15 15:26 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 00:22 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 00:22 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 00:22 / smm
Iron	0.51	mg/L		0.03		E200.8	09/29/15 00:22 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 00:22 / smm
Manganese	0.36	mg/L		0.01		E200.8	09/29/15 00:22 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 00:22 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 00:22 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 00:22 / smm
Selenium	0.006	mg/L		0.001		E200.8	09/29/15 00:22 / smm
Uranium	0.115	mg/L		0.0003		E200.8	09/30/15 17:23 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 00:22 / smm
Zinc	ND	mg/L		0.01		E200.8	09/29/15 00:22 / smm
METALS - TOTAL							
Iron	0.73	mg/L		0.03		E200.7	10/01/15 22:17 / sf
Manganese	0.35	mg/L		0.01		E200.7	10/01/15 22:17 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-003
Client Sample ID: PW-6/MW-23

Report Date: 10/23/15
Collection Date: 09/23/15 09:40
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	96.1	pCi/L		4.4		E900.0	10/02/15 01:47 / trs
Gross Alpha precision (±)	20.2	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Alpha MDC	4.4	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Beta	25.0	pCi/L		7.5		E900.0	10/02/15 01:47 / trs
Gross Beta precision (±)	5.1	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Beta MDC	7.5	pCi/L				E900.0	10/02/15 01:47 / trs
Radium 226	1.1	pCi/L		0.17		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	0.30	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.17	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	2.7	pCi/L		1.1		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	0.9	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	<0.2	pCi/L	U	0.2		E908.0	10/05/15 11:24 / cng
Thorium 230 precision (±)	0.07	pCi/L				E908.0	10/05/15 11:24 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	10/05/15 11:24 / cng
DATA QUALITY							
A/C Balance (± 5)	1.32	%				A1030 E	10/06/15 09:39 / sf
Anions	27.0	meq/L				A1030 E	10/06/15 09:39 / sf
Cations	27.7	meq/L				A1030 E	10/06/15 09:39 / sf
Solids, Total Dissolved Calculated	1800	mg/L				A1030 E	10/06/15 09:39 / sf
TDS Balance (0.80 - 1.20)	1.04	unitless				A1030 E	10/06/15 09:39 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-004
Client Sample ID: PW-5/MW-22

Report Date: 10/23/15
Collection Date: 09/23/15 11:00
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 20:24 / wc
Bicarbonate as HCO3	187	mg/L		5		A2320 B	09/28/15 20:24 / wc
Calcium	428	mg/L		1		E200.7	10/22/15 14:11 / sf
Chloride	81	mg/L		1		E300.0	09/29/15 02:32 / wc
Fluoride	0.9	mg/L		0.1		A4500-F C	09/29/15 12:34 / wc
Magnesium	117	mg/L		1		E200.7	10/02/15 15:30 / sf
Nitrogen, Ammonia as N	0.09	mg/L		0.05		A4500-NH3 G	09/29/15 12:49 / lr
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/29/15 16:13 / lr
Potassium	32	mg/L		1		E200.8	09/29/15 00:28 / smm
Silica	22.6	mg/L		0.2		E200.7	10/02/15 15:30 / sf
Sodium	439	mg/L		1		E200.7	10/02/15 15:30 / sf
Sulfate	2260	mg/L	D	4		E300.0	09/29/15 02:32 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	3990	umhos/cm		5		A2510 B	09/25/15 12:28 / lmc
pH	7.60	s.u.	H	0.01		A4500-H B	09/25/15 12:28 / lmc
Solids, Total Dissolved TDS @ 180 C	3530	mg/L		40		A2540 C	09/28/15 09:39 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 00:28 / smm
Arsenic	0.002	mg/L		0.001		E200.8	09/29/15 00:28 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 00:28 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 00:28 / smm
Boron	0.3	mg/L		0.1		E200.7	10/02/15 15:30 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 00:28 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 00:28 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 00:28 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 00:28 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 00:28 / smm
Manganese	0.29	mg/L		0.01		E200.8	09/29/15 00:28 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 00:28 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 00:28 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 00:28 / smm
Selenium	0.021	mg/L		0.001		E200.8	09/29/15 00:28 / smm
Uranium	0.155	mg/L		0.0003		E200.8	09/30/15 17:26 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 00:28 / smm
Zinc	0.11	mg/L		0.01		E200.8	09/29/15 00:28 / smm
METALS - TOTAL							
Iron	3.25	mg/L		0.03		E200.7	10/01/15 22:37 / sf
Manganese	0.19	mg/L		0.01		E200.7	10/01/15 22:37 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-004
Client Sample ID: PW-5 /MW-22

Report Date: 10/23/15
Collection Date: 09/23/15 11:00
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	121	pCi/L		11.5		E900.0	10/02/15 01:46 / trs
Gross Alpha precision (±)	28.3	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Alpha MDC	11.5	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Beta	34.9	pCi/L		14.7		E900.0	10/02/15 01:46 / trs
Gross Beta precision (±)	8.1	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Beta MDC	14.7	pCi/L				E900.0	10/02/15 01:46 / trs
Radium 226	1.3	pCi/L		0.17		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	0.36	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.17	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	2.0	pCi/L		1.1		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	0.8	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	<0.2	pCi/L	U	0.2		E908.0	10/05/15 11:24 / cng
Thorium 230 precision (±)	0.09	pCi/L				E908.0	10/05/15 11:24 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	10/05/15 11:24 / cng
DATA QUALITY							
A/C Balance (± 5)	-1.54	%				A1030 E	10/23/15 11:01 / sf
Anions	52.5	meq/L				A1030 E	10/23/15 11:01 / sf
Cations	50.9	meq/L				A1030 E	10/23/15 11:01 / sf
Solids, Total Dissolved Calculated	3500	mg/L				A1030 E	10/23/15 11:01 / sf
TDS Balance (0.80 - 1.20)	1.01	unitless				A1030 E	10/23/15 11:01 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-005
Client Sample ID: MW-15

Report Date: 10/23/15
Collection Date: 09/23/15 12:30
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 20:32 / wc
Bicarbonate as HCO3	328	mg/L		5		A2320 B	09/28/15 20:32 / wc
Calcium	468	mg/L		1		E200.7	10/22/15 14:15 / sf
Chloride	106	mg/L		1		E300.0	09/29/15 02:51 / wc
Fluoride	0.4	mg/L		0.1		A4500-F C	09/29/15 12:37 / wc
Magnesium	101	mg/L		1		E200.7	10/02/15 15:34 / sf
Nitrogen, Ammonia as N	ND	mg/L		0.05		A4500-NH3 G	09/29/15 12:50 / lr
Nitrogen, Nitrate+Nitrite as N	1.1	mg/L		0.1		E353.2	09/29/15 16:14 / lr
Potassium	36	mg/L		1		E200.8	09/29/15 00:33 / smm
Silica	55.1	mg/L		0.2		E200.7	10/02/15 15:34 / sf
Sodium	216	mg/L		1		E200.7	10/02/15 15:34 / sf
Sulfate	1680	mg/L	D	4		E300.0	09/29/15 02:51 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	3270	umhos/cm		5		A2510 B	09/25/15 12:33 / lmc
pH	7.23	s.u.	H	0.01		A4500-H B	09/25/15 12:33 / lmc
Solids, Total Dissolved TDS @ 180 C	2890	mg/L		20		A2540 C	09/28/15 09:39 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 00:33 / smm
Arsenic	0.009	mg/L		0.001		E200.8	09/29/15 00:33 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 00:33 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 00:33 / smm
Boron	0.1	mg/L		0.1		E200.7	10/02/15 15:34 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 00:33 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 00:33 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 00:33 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 00:33 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 00:33 / smm
Manganese	ND	mg/L		0.01		E200.8	09/29/15 00:33 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 00:33 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 00:33 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 00:33 / smm
Selenium	0.006	mg/L		0.001		E200.8	09/29/15 00:33 / smm
Uranium	0.323	mg/L		0.0003		E200.8	09/30/15 17:28 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 00:33 / smm
Zinc	ND	mg/L		0.01		E200.8	09/29/15 00:33 / smm
METALS - TOTAL							
Iron	ND	mg/L		0.03		E200.7	10/01/15 22:41 / sf
Manganese	ND	mg/L		0.01		E200.7	10/01/15 22:41 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-005
Client Sample ID: MW-15

Report Date: 10/23/15
Collection Date: 09/23/15 12:30
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	205	pCi/L		7.6		E900.0	10/02/15 01:46 / trs
Gross Alpha precision (±)	42.1	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Alpha MDC	7.6	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Beta	47.2	pCi/L		12.2		E900.0	10/02/15 01:46 / trs
Gross Beta precision (±)	8.6	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Beta MDC	12.2	pCi/L				E900.0	10/02/15 01:46 / trs
Radium 226	1.0	pCi/L		0.17		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	0.28	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.17	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	3.4	pCi/L		1.1		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	1	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	<0.5	pCi/L	U	0.5		E908.0	10/05/15 11:24 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	10/05/15 11:24 / cng
Thorium 230 MDC	0.5	pCi/L				E908.0	10/05/15 11:24 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.63	%				A1030 E	10/23/15 11:01 / sf
Anions	43.4	meq/L				A1030 E	10/23/15 11:01 / sf
Cations	42.0	meq/L				A1030 E	10/23/15 11:01 / sf
Solids, Total Dissolved Calculated	2800	mg/L				A1030 E	10/23/15 11:01 / sf
TDS Balance (0.80 - 1.20)	1.02	unitless				A1030 E	10/23/15 11:01 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-006
Client Sample ID: MW-16

Report Date: 10/23/15
Collection Date: 09/23/15 13:30
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 20:40 / wc
Bicarbonate as HCO3	336	mg/L		5		A2320 B	09/28/15 20:40 / wc
Calcium	409	mg/L		1		E200.7	10/22/15 14:19 / sf
Chloride	90	mg/L		1		E300.0	09/29/15 03:09 / wc
Fluoride	0.4	mg/L		0.1		A4500-F C	09/29/15 12:39 / wc
Magnesium	86	mg/L		1		E200.7	10/02/15 15:38 / sf
Nitrogen, Ammonia as N	ND	mg/L		0.05		A4500-NH3 G	09/29/15 12:52 / lr
Nitrogen, Nitrate+Nitrite as N	4.3	mg/L	D	0.5		E353.2	09/29/15 16:17 / lr
Potassium	32	mg/L		1		E200.8	09/29/15 00:59 / smm
Silica	49.7	mg/L		0.2		E200.7	10/02/15 15:38 / sf
Sodium	193	mg/L		1		E200.7	10/02/15 15:38 / sf
Sulfate	1430	mg/L	D	4		E300.0	09/29/15 03:09 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	2910	umhos/cm		5		A2510 B	09/25/15 12:37 / lmc
pH	7.21	s.u.	H	0.01		A4500-H B	09/25/15 12:37 / lmc
Solids, Total Dissolved TDS @ 180 C	2500	mg/L		20		A2540 C	09/28/15 09:40 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 00:59 / smm
Arsenic	0.010	mg/L		0.001		E200.8	09/29/15 00:59 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 00:59 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 00:59 / smm
Boron	0.1	mg/L		0.1		E200.7	10/02/15 15:38 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 00:59 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 00:59 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 00:59 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 00:59 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 00:59 / smm
Manganese	ND	mg/L		0.01		E200.8	09/29/15 00:59 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 00:59 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 00:59 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 00:59 / smm
Selenium	0.003	mg/L		0.001		E200.8	09/29/15 00:59 / smm
Uranium	0.299	mg/L		0.0003		E200.8	09/30/15 17:31 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 00:59 / smm
Zinc	0.02	mg/L		0.01		E200.8	09/29/15 00:59 / smm
METALS - TOTAL							
Iron	ND	mg/L		0.03		E200.7	10/01/15 22:45 / sf
Manganese	ND	mg/L		0.01		E200.7	10/01/15 22:45 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-006
Client Sample ID: MW-16

Report Date: 10/23/15
Collection Date: 09/23/15 13:30
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	210	pCi/L		6.9		E900.0	10/02/15 01:46 / trs
Gross Alpha precision (±)	42.9	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Alpha MDC	6.9	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Beta	41.8	pCi/L		13.0		E900.0	10/02/15 01:46 / trs
Gross Beta precision (±)	8.1	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Beta MDC	13.0	pCi/L				E900.0	10/02/15 01:46 / trs
Radium 226	1.2	pCi/L		0.17		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	0.32	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.17	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	2.3	pCi/L		1.1		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	0.9	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	<0.6	pCi/L	U	0.6		E908.0	10/05/15 11:24 / cng
Thorium 230 precision (±)	0.2	pCi/L				E908.0	10/05/15 11:24 / cng
Thorium 230 MDC	0.6	pCi/L				E908.0	10/05/15 11:24 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.95	%				A1030 E	10/23/15 11:01 / sf
Anions	38.1	meq/L				A1030 E	10/23/15 11:01 / sf
Cations	36.7	meq/L				A1030 E	10/23/15 11:01 / sf
Solids, Total Dissolved Calculated	2500	mg/L				A1030 E	10/23/15 11:01 / sf
TDS Balance (0.80 - 1.20)	1.00	unitless				A1030 E	10/23/15 11:01 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-007
Client Sample ID: PW-8/MW-25

Report Date: 10/23/15
Collection Date: 09/23/15 14:50
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 20:48 / wc
Bicarbonate as HCO3	462	mg/L		5		A2320 B	09/28/15 20:48 / wc
Calcium	435	mg/L		1		E200.7	10/02/15 15:58 / sf
Chloride	153	mg/L	D	2		E300.0	09/29/15 03:27 / wc
Fluoride	0.6	mg/L		0.1		A4500-F C	09/29/15 12:42 / wc
Magnesium	188	mg/L		1		E200.7	10/02/15 15:58 / sf
Nitrogen, Ammonia as N	ND	mg/L		0.05		A4500-NH3 G	09/29/15 12:54 / lr
Nitrogen, Nitrate+Nitrite as N	7.2	mg/L	D	0.5		E353.2	09/29/15 16:20 / lr
Potassium	51	mg/L		1		E200.8	09/29/15 01:04 / smm
Silica	49.2	mg/L		0.2		E200.7	10/02/15 15:58 / sf
Sodium	651	mg/L		1		E200.7	10/02/15 15:58 / sf
Sulfate	2630	mg/L	D	8		E300.0	09/29/15 03:27 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	5250	umhos/cm		5		A2510 B	09/25/15 12:42 / lmc
pH	7.29	s.u.	H	0.01		A4500-H B	09/25/15 12:42 / lmc
Solids, Total Dissolved TDS @ 180 C	4510	mg/L		40		A2540 C	09/28/15 09:40 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 01:04 / smm
Arsenic	0.008	mg/L		0.001		E200.8	09/29/15 01:04 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 01:04 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 01:04 / smm
Boron	0.6	mg/L		0.1		E200.7	10/02/15 15:58 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 01:04 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 01:04 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 01:04 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 01:04 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 01:04 / smm
Manganese	0.07	mg/L		0.01		E200.8	09/29/15 01:04 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 01:04 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 01:04 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 01:04 / smm
Selenium	0.085	mg/L		0.001		E200.8	09/29/15 01:04 / smm
Uranium	1.42	mg/L	D	0.0005		E200.8	09/30/15 17:33 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 01:04 / smm
Zinc	0.02	mg/L		0.01		E200.8	09/29/15 01:04 / smm
METALS - TOTAL							
Iron	3.54	mg/L		0.03		E200.7	10/01/15 22:49 / sf
Manganese	0.07	mg/L		0.01		E200.7	10/01/15 22:49 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-007
Client Sample ID: PW-8/MW-25

Report Date: 10/23/15
Collection Date: 09/23/15 14:50
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	793	pCi/L		14.0		E900.0	10/02/15 01:46 / trs
Gross Alpha precision (±)	157	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Alpha MDC	14.0	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Beta	103	pCi/L		18.8		E900.0	10/02/15 01:46 / trs
Gross Beta precision (±)	14.2	pCi/L				E900.0	10/02/15 01:46 / trs
Gross Beta MDC	18.8	pCi/L				E900.0	10/02/15 01:46 / trs
Radium 226	1.6	pCi/L		0.18		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	0.39	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.18	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	3.0	pCi/L		1.2		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	1	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.2	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	<0.3	pCi/L	U	0.3		E908.0	10/05/15 11:24 / cng
Thorium 230 precision (±)	0.1	pCi/L				E908.0	10/05/15 11:24 / cng
Thorium 230 MDC	0.3	pCi/L				E908.0	10/05/15 11:24 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-0.34	%				A1030 E	10/06/15 09:40 / sf
Anions	67.3	meq/L				A1030 E	10/06/15 09:40 / sf
Cations	66.8	meq/L				A1030 E	10/06/15 09:40 / sf
Solids, Total Dissolved Calculated	4400	mg/L				A1030 E	10/06/15 09:40 / sf
TDS Balance (0.80 - 1.20)	1.02	unitless				A1030 E	10/06/15 09:40 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-008
Client Sample ID: MW-9

Report Date: 10/23/15
Collection Date: 09/23/15 18:35
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 20:56 / wc
Bicarbonate as HCO3	267	mg/L		5		A2320 B	09/28/15 20:56 / wc
Calcium	220	mg/L		1		E200.7	10/02/15 16:02 / sf
Chloride	17	mg/L		1		E300.0	09/29/15 03:46 / wc
Fluoride	0.4	mg/L		0.1		A4500-F C	09/29/15 12:45 / wc
Magnesium	62	mg/L		1		E200.7	10/02/15 16:02 / sf
Nitrogen, Ammonia as N	0.25	mg/L		0.05		A4500-NH3 G	09/29/15 12:55 / lr
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/29/15 16:22 / lr
Potassium	20	mg/L		1		E200.8	09/29/15 01:09 / smm
Silica	15.8	mg/L		0.2		E200.7	10/02/15 16:02 / sf
Sodium	88	mg/L		1		E200.7	10/02/15 16:02 / sf
Sulfate	697	mg/L	D	2		E300.0	09/29/15 03:46 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	1680	umhos/cm		5		A2510 B	09/25/15 12:45 / lmc
pH	7.33	s.u.	H	0.01		A4500-H B	09/25/15 12:45 / lmc
Solids, Total Dissolved TDS @ 180 C	1320	mg/L		10		A2540 C	09/28/15 09:40 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 01:09 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/29/15 01:09 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 01:09 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 01:09 / smm
Boron	0.3	mg/L		0.1		E200.7	10/02/15 16:02 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 01:09 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 01:09 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 01:09 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 01:09 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 01:09 / smm
Manganese	0.09	mg/L		0.01		E200.8	09/29/15 01:09 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 01:09 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 01:09 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 01:09 / smm
Selenium	ND	mg/L		0.001		E200.8	09/29/15 01:09 / smm
Uranium	0.0025	mg/L		0.0003		E200.8	09/30/15 17:36 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 01:09 / smm
Zinc	ND	mg/L		0.01		E200.8	09/29/15 01:09 / smm
METALS - TOTAL							
Iron	21.3	mg/L		0.03		E200.7	10/01/15 22:53 / sf
Manganese	0.37	mg/L		0.01		E200.7	10/01/15 22:53 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-008
Client Sample ID: MW-9

Report Date: 10/23/15
Collection Date: 09/23/15 18:35
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	15.5	pCi/L		3.6		E900.0	10/02/15 01:47 / trs
Gross Alpha precision (±)	4.3	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Alpha MDC	3.6	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Beta	19.2	pCi/L		5.9		E900.0	10/02/15 01:47 / trs
Gross Beta precision (±)	4.4	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Beta MDC	5.9	pCi/L				E900.0	10/02/15 01:47 / trs
Radium 226	1.7	pCi/L		0.17		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	0.41	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.17	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	3.6	pCi/L		1.1		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	1.2	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	<0.6	pCi/L	U	0.6		E908.0	10/05/15 11:25 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	10/05/15 11:25 / cng
Thorium 230 MDC	0.6	pCi/L				E908.0	10/05/15 11:25 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	2.67	%				A1030 E	10/06/15 09:40 / sf
Anions	19.4	meq/L				A1030 E	10/06/15 09:40 / sf
Cations	20.5	meq/L				A1030 E	10/06/15 09:40 / sf
Solids, Total Dissolved Calculated	1200	mg/L				A1030 E	10/06/15 09:40 / sf
TDS Balance (0.80 - 1.20)	1.06	unitless				A1030 E	10/06/15 09:40 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-009
Client Sample ID: PW-1/MW-18

Report Date: 10/23/15
Collection Date: 09/23/15 17:25
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 21:04 / wc
Bicarbonate as HCO3	423	mg/L		5		A2320 B	09/28/15 21:04 / wc
Calcium	437	mg/L		1		E200.7	10/02/15 16:06 / sf
Chloride	112	mg/L	D	2		E300.0	09/29/15 04:04 / wc
Fluoride	0.8	mg/L		0.1		A4500-F C	09/29/15 12:47 / wc
Magnesium	155	mg/L		1		E200.7	10/02/15 16:06 / sf
Nitrogen, Ammonia as N	ND	mg/L		0.05		A4500-NH3 G	09/29/15 12:57 / lr
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/29/15 16:23 / lr
Potassium	48	mg/L		1		E200.8	09/29/15 01:15 / smm
Silica	58.6	mg/L		0.2		E200.7	10/02/15 16:06 / sf
Sodium	797	mg/L		1		E200.7	10/02/15 16:06 / sf
Sulfate	2890	mg/L	D	8		E300.0	09/29/15 04:04 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	5620	umhos/cm		5		A2510 B	09/25/15 12:49 / lmc
pH	7.36	s.u.	H	0.01		A4500-H B	09/25/15 12:49 / lmc
Solids, Total Dissolved TDS @ 180 C	4850	mg/L		40		A2540 C	09/28/15 09:40 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 01:15 / smm
Arsenic	0.010	mg/L		0.001		E200.8	09/29/15 01:15 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 01:15 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 01:15 / smm
Boron	0.5	mg/L		0.1		E200.7	10/02/15 16:06 / sf
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 01:15 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 01:15 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 01:15 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 01:15 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 01:15 / smm
Manganese	ND	mg/L		0.01		E200.8	09/29/15 01:15 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 01:15 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 01:15 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 01:15 / smm
Selenium	0.036	mg/L		0.001		E200.8	09/29/15 01:15 / smm
Uranium	0.564	mg/L	D	0.0005		E200.8	09/30/15 17:38 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 01:15 / smm
Zinc	ND	mg/L		0.01		E200.8	09/29/15 01:15 / smm
METALS - TOTAL							
Iron	0.64	mg/L		0.03		E200.7	10/01/15 22:57 / sf
Manganese	0.01	mg/L		0.01		E200.7	10/01/15 22:57 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-009
Client Sample ID: PW-1/MW-18

Report Date: 10/23/15
Collection Date: 09/23/15 17:25
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	405	pCi/L		14.3		E900.0	10/02/15 01:47 / trs
Gross Alpha precision (±)	82.7	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Alpha MDC	14.3	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Beta	66.8	pCi/L		19.2		E900.0	10/02/15 01:47 / trs
Gross Beta precision (±)	11.9	pCi/L				E900.0	10/02/15 01:47 / trs
Gross Beta MDC	19.2	pCi/L				E900.0	10/02/15 01:47 / trs
Radium 226	0.50	pCi/L		0.17		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	0.16	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.17	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	1.5	pCi/L		1.1		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	0.9	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	<0.2	pCi/L	U	0.2		E908.0	10/05/15 11:25 / cng
Thorium 230 precision (±)	0.1	pCi/L				E908.0	10/05/15 11:25 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	10/05/15 11:25 / cng
DATA QUALITY							
A/C Balance (± 5)	0.15	%				A1030 E	10/06/15 09:40 / sf
Anions	70.2	meq/L				A1030 E	10/06/15 09:40 / sf
Cations	70.4	meq/L				A1030 E	10/06/15 09:40 / sf
Solids, Total Dissolved Calculated	4700	mg/L				A1030 E	10/06/15 09:40 / sf
TDS Balance (0.80 - 1.20)	1.03	unitless				A1030 E	10/06/15 09:40 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-010
Client Sample ID: PW-3/MW-20

Report Date: 10/23/15
Collection Date: 09/23/15 18:30
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 21:13 / wc
Bicarbonate as HCO3	694	mg/L		5		A2320 B	09/28/15 21:13 / wc
Calcium	39	mg/L		1		E200.7	10/02/15 16:18 / sf
Chloride	21	mg/L		1		E300.0	09/29/15 04:23 / wc
Fluoride	0.6	mg/L		0.1		A4500-F C	09/29/15 12:50 / wc
Magnesium	18	mg/L		1		E200.7	10/02/15 16:18 / sf
Nitrogen, Ammonia as N	1.22	mg/L		0.05		A4500-NH3 G	09/29/15 12:59 / lr
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/29/15 16:24 / lr
Potassium	9	mg/L		1		E200.8	09/29/15 02:48 / smm
Silica	10.9	mg/L		0.2		E200.8	09/29/15 02:48 / smm
Sodium	746	mg/L		1		E200.7	10/02/15 16:18 / sf
Sulfate	1220	mg/L	D	4		E300.0	09/29/15 04:23 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	3360	umhos/cm		5		A2510 B	09/25/15 12:53 / lmc
pH	7.76	s.u.	H	0.01		A4500-H B	09/25/15 12:53 / lmc
Solids, Total Dissolved TDS @ 180 C	2380	mg/L		20		A2540 C	09/28/15 09:41 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 02:48 / smm
Arsenic	0.004	mg/L		0.001		E200.8	09/29/15 02:48 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 02:48 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 02:48 / smm
Boron	1.9	mg/L		0.1		E200.8	09/29/15 02:48 / smm
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 02:48 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 02:48 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 02:48 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 02:48 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 02:48 / smm
Manganese	0.14	mg/L		0.01		E200.8	09/29/15 02:48 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 02:48 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 02:48 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 02:48 / smm
Selenium	ND	mg/L		0.001		E200.8	09/29/15 02:48 / smm
Uranium	0.0045	mg/L		0.0003		E200.8	09/29/15 02:48 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 02:48 / smm
Zinc	0.01	mg/L		0.01		E200.8	09/29/15 02:48 / smm
METALS - TOTAL							
Iron	3.02	mg/L		0.03		E200.7	10/01/15 23:09 / sf
Manganese	0.20	mg/L		0.01		E200.7	10/01/15 23:09 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-010
Client Sample ID: PW-3/MW-20

Report Date: 10/23/15
Collection Date: 09/23/15 18:30
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	11.3	pCi/L		8.7		E900.0	10/02/15 02:11 / trs
Gross Alpha precision (±)	7.8	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Alpha MDC	8.7	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta	<12.4	pCi/L	U	12.4		E900.0	10/02/15 02:11 / trs
Gross Beta precision (±)	6.1	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta MDC	12.4	pCi/L				E900.0	10/02/15 02:11 / trs
Radium 226	0.72	pCi/L		0.18		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	0.20	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.18	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	2.3	pCi/L		1.2		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	0.9	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.2	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	<0.2	pCi/L	U	0.2		E908.0	10/05/15 11:25 / cng
Thorium 230 precision (±)	0.1	pCi/L				E908.0	10/05/15 11:25 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	10/05/15 11:25 / cng
DATA QUALITY							
A/C Balance (± 5)	-1.59	%				A1030 E	10/06/15 09:40 / sf
Anions	37.4	meq/L				A1030 E	10/06/15 09:40 / sf
Cations	36.2	meq/L				A1030 E	10/06/15 09:40 / sf
Solids, Total Dissolved Calculated	2400	mg/L				A1030 E	10/06/15 09:40 / sf
TDS Balance (0.80 - 1.20)	0.99	unitless				A1030 E	10/06/15 09:40 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-011
Client Sample ID: MW-12

Report Date: 10/23/15
Collection Date: 09/22/15 19:20
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 21:20 / wc
Bicarbonate as HCO3	461	mg/L		5		A2320 B	09/28/15 21:20 / wc
Calcium	607	mg/L		1		E200.7	10/01/15 19:03 / sf
Chloride	180	mg/L		1		E300.0	09/29/15 05:36 / wc
Fluoride	0.2	mg/L		0.1		A4500-F C	09/29/15 12:53 / wc
Magnesium	85	mg/L		1		E200.7	10/01/15 19:03 / sf
Nitrogen, Ammonia as N	0.31	mg/L		0.05		A4500-NH3 G	09/29/15 13:04 / lr
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/29/15 16:25 / lr
Potassium	26	mg/L		1		E200.8	09/29/15 02:53 / smm
Silica	22.1	mg/L		0.2		E200.8	09/29/15 02:53 / smm
Sodium	200	mg/L		1		E200.7	10/01/15 19:03 / sf
Sulfate	1700	mg/L	D	4		E300.0	09/29/15 05:36 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	3600	umhos/cm		5		A2510 B	09/25/15 12:57 / lmc
pH	6.56	s.u.	H	0.01		A4500-H B	09/25/15 12:57 / lmc
Solids, Total Dissolved TDS @ 180 C	3220	mg/L		40		A2540 C	09/28/15 09:41 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 02:53 / smm
Arsenic	0.007	mg/L		0.001		E200.8	09/29/15 02:53 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 02:53 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 02:53 / smm
Boron	ND	mg/L		0.1		E200.8	09/29/15 02:53 / smm
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 02:53 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 02:53 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 02:53 / smm
Iron	0.79	mg/L		0.03		E200.8	09/29/15 02:53 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 02:53 / smm
Manganese	0.73	mg/L		0.01		E200.8	09/29/15 02:53 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 02:53 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 02:53 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 02:53 / smm
Selenium	ND	mg/L		0.001		E200.8	09/29/15 02:53 / smm
Uranium	5.94	mg/L		0.0003		E200.8	09/29/15 02:53 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 02:53 / smm
Zinc	ND	mg/L		0.01		E200.8	09/29/15 02:53 / smm
METALS - TOTAL							
Iron	1.16	mg/L		0.03		E200.7	10/01/15 23:13 / sf
Manganese	0.71	mg/L		0.01		E200.7	10/01/15 23:13 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-011
Client Sample ID: MW-12

Report Date: 10/23/15
Collection Date: 09/22/15 19:20
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	3620	pCi/L		12.2		E900.0	10/02/15 02:11 / trs
Gross Alpha precision (±)	703	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Alpha MDC	12.2	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta	562	pCi/L		14.1		E900.0	10/02/15 02:11 / trs
Gross Beta precision (±)	58.0	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta MDC	14.1	pCi/L				E900.0	10/02/15 02:11 / trs
Radium 226	29	pCi/L		0.18		E903.0	10/07/15 06:47 / dmf
Radium 226 precision (±)	5.5	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 226 MDC	0.18	pCi/L				E903.0	10/07/15 06:47 / dmf
Radium 228	27.1	pCi/L		1.2		RA-05	10/02/15 10:56 / plj
Radium 228 precision (±)	5.1	pCi/L				RA-05	10/02/15 10:56 / plj
Radium 228 MDC	1.2	pCi/L				RA-05	10/02/15 10:56 / plj
Thorium 230	<0.5	pCi/L	U	0.5		E908.0	10/05/15 11:25 / cng
Thorium 230 precision (±)	0.3	pCi/L				E908.0	10/05/15 11:25 / cng
Thorium 230 MDC	0.5	pCi/L				E908.0	10/05/15 11:25 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.50	%				A1030 E	10/03/15 15:01 / sec
Anions	48.1	meq/L				A1030 E	10/03/15 15:01 / sec
Cations	46.7	meq/L				A1030 E	10/03/15 15:01 / sec
Solids, Total Dissolved Calculated	3100	mg/L				A1030 E	10/03/15 15:01 / sec
TDS Balance (0.80 - 1.20)	1.05	unitless				A1030 E	10/03/15 15:01 / sec

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-012
Client Sample ID: PW-2 /MW-19

Report Date: 10/23/15
Collection Date: 09/24/15 09:45
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 21:53 / wc
Bicarbonate as HCO3	1360	mg/L		5		A2320 B	09/28/15 21:53 / wc
Calcium	38	mg/L		1		E200.7	10/02/15 16:22 / sf
Chloride	180	mg/L	D	2		E300.0	09/29/15 06:32 / wc
Fluoride	0.6	mg/L		0.1		A4500-F C	09/29/15 13:02 / wc
Magnesium	21	mg/L		1		E200.7	10/02/15 16:22 / sf
Nitrogen, Ammonia as N	1.56	mg/L		0.05		A4500-NH3 G	09/29/15 13:09 / lr
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/29/15 16:26 / lr
Potassium	10	mg/L		1		E200.8	09/29/15 02:58 / smm
Silica	10.0	mg/L		0.2		E200.8	09/29/15 02:58 / smm
Sodium	1190	mg/L		1		E200.7	10/02/15 16:22 / sf
Sulfate	1400	mg/L	D	8		E300.0	09/29/15 06:32 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	5090	umhos/cm		5		A2510 B	09/25/15 13:06 / lmc
pH	7.54	s.u.	H	0.01		A4500-H B	09/25/15 13:06 / lmc
Solids, Total Dissolved TDS @ 180 C	3610	mg/L		40		A2540 C	09/28/15 09:41 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 02:58 / smm
Arsenic	0.001	mg/L		0.001		E200.8	09/29/15 02:58 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 02:58 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 02:58 / smm
Boron	2.3	mg/L		0.1		E200.8	09/29/15 02:58 / smm
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 02:58 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 02:58 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 02:58 / smm
Iron	0.04	mg/L		0.03		E200.8	09/29/15 02:58 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 02:58 / smm
Manganese	0.07	mg/L		0.01		E200.8	09/29/15 02:58 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 02:58 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 02:58 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 02:58 / smm
Selenium	ND	mg/L		0.001		E200.8	09/29/15 02:58 / smm
Uranium	0.0097	mg/L		0.0003		E200.8	09/29/15 02:58 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 02:58 / smm
Zinc	0.03	mg/L		0.01		E200.8	09/29/15 02:58 / smm
METALS - TOTAL							
Iron	4.83	mg/L		0.03		E200.7	10/02/15 00:05 / sf
Manganese	0.11	mg/L		0.01		E200.7	10/02/15 00:05 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-012
Client Sample ID: PW-2 /MW-19

Report Date: 10/23/15
Collection Date: 09/24/15 09:45
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	21.8	pCi/L		15.6		E900.0	10/02/15 02:11 / trs
Gross Alpha precision (±)	14.0	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Alpha MDC	15.6	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta	<18.3	pCi/L	U	18.3		E900.0	10/02/15 02:11 / trs
Gross Beta precision (±)	9.1	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta MDC	18.3	pCi/L				E900.0	10/02/15 02:11 / trs
Radium 226	0.90	pCi/L		0.17		E903.0	10/07/15 08:24 / dmf
Radium 226 precision (±)	0.20	pCi/L				E903.0	10/07/15 08:24 / dmf
Radium 226 MDC	0.17	pCi/L				E903.0	10/07/15 08:24 / dmf
Radium 228	<1.4	pCi/L	U	1.4		RA-05	10/02/15 12:29 / plj
Radium 228 precision (±)	0.9	pCi/L				RA-05	10/02/15 12:29 / plj
Radium 228 MDC	1.4	pCi/L				RA-05	10/02/15 12:29 / plj
Thorium 230	<0.3	pCi/L	U	0.3		E908.0	10/05/15 11:25 / cng
Thorium 230 precision (±)	0.1	pCi/L				E908.0	10/05/15 11:25 / cng
Thorium 230 MDC	0.3	pCi/L				E908.0	10/05/15 11:25 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-0.66	%				A1030 E	10/06/15 09:41 / sf
Anions	56.6	meq/L				A1030 E	10/06/15 09:41 / sf
Cations	55.8	meq/L				A1030 E	10/06/15 09:41 / sf
Solids, Total Dissolved Calculated	3500	mg/L				A1030 E	10/06/15 09:41 / sf
TDS Balance (0.80 - 1.20)	1.03	unitless				A1030 E	10/06/15 09:41 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-013
Client Sample ID: PW-4/MW-21

Report Date: 10/23/15
Collection Date: 09/24/15 11:35
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 22:10 / wc
Bicarbonate as HCO3	222	mg/L		5		A2320 B	09/28/15 22:10 / wc
Calcium	244	mg/L		1		E200.7	10/02/15 16:26 / sf
Chloride	46	mg/L		1		E300.0	09/29/15 06:50 / wc
Fluoride	0.3	mg/L		0.1		A4500-F C	09/29/15 13:05 / wc
Magnesium	69	mg/L		1		E200.7	10/02/15 16:26 / sf
Nitrogen, Ammonia as N	0.34	mg/L		0.05		A4500-NH3 G	09/29/15 13:10 / lr
Nitrogen, Nitrate+Nitrite as N	0.5	mg/L		0.1		E353.2	09/29/15 16:27 / lr
Potassium	27	mg/L		1		E200.8	09/29/15 03:04 / smm
Silica	28.3	mg/L		0.2		E200.8	09/29/15 03:04 / smm
Sodium	270	mg/L		1		E200.7	10/02/15 16:26 / sf
Sulfate	1270	mg/L	D	4		E300.0	09/29/15 06:50 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	2580	umhos/cm		5		A2510 B	09/25/15 13:10 / lmc
pH	6.66	s.u.	H	0.01		A4500-H B	09/25/15 13:10 / lmc
Solids, Total Dissolved TDS @ 180 C	2110	mg/L		20		A2540 C	09/28/15 09:42 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 03:04 / smm
Arsenic	ND	mg/L		0.001		E200.8	09/29/15 03:04 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 03:04 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 03:04 / smm
Boron	0.3	mg/L		0.1		E200.8	09/29/15 03:04 / smm
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 03:04 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 03:04 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 03:04 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 03:04 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 03:04 / smm
Manganese	1.17	mg/L		0.01		E200.8	09/29/15 03:04 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 03:04 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 03:04 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 03:04 / smm
Selenium	ND	mg/L		0.001		E200.8	09/29/15 03:04 / smm
Uranium	0.0065	mg/L		0.0003		E200.8	09/29/15 03:04 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 03:04 / smm
Zinc	0.07	mg/L		0.01		E200.8	09/29/15 03:04 / smm
METALS - TOTAL							
Iron	20.6	mg/L		0.03		E200.7	10/02/15 00:09 / sf
Manganese	1.48	mg/L		0.01		E200.7	10/02/15 00:09 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-013
Client Sample ID: PW-4 /MW-21

Report Date: 10/23/15
Collection Date: 09/24/15 11:35
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	10.2	pCi/L		7.3		E900.0	10/02/15 02:11 / trs
Gross Alpha precision (±)	6.7	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Alpha MDC	7.3	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta	27.6	pCi/L		9.3		E900.0	10/02/15 02:11 / trs
Gross Beta precision (±)	6.5	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta MDC	9.3	pCi/L				E900.0	10/02/15 02:11 / trs
Radium 226	1.3	pCi/L		0.18		E903.0	10/07/15 08:24 / dmf
Radium 226 precision (±)	0.34	pCi/L				E903.0	10/07/15 08:24 / dmf
Radium 226 MDC	0.18	pCi/L				E903.0	10/07/15 08:24 / dmf
Radium 228	1.8	pCi/L		1.4		RA-05	10/02/15 12:29 / plj
Radium 228 precision (±)	0.9	pCi/L				RA-05	10/02/15 12:29 / plj
Radium 228 MDC	1.4	pCi/L				RA-05	10/02/15 12:29 / plj
Thorium 230	<0.2	pCi/L	U	0.2		E908.0	10/05/15 11:25 / cng
Thorium 230 precision (±)	0.1	pCi/L				E908.0	10/05/15 11:25 / cng
Thorium 230 MDC	0.2	pCi/L				E908.0	10/05/15 11:25 / cng
DATA QUALITY							
A/C Balance (± 5)	-1.99	%				A1030 E	10/06/15 09:41 / sf
Anions	31.5	meq/L				A1030 E	10/06/15 09:41 / sf
Cations	30.3	meq/L				A1030 E	10/06/15 09:41 / sf
Solids, Total Dissolved Calculated	2100	mg/L				A1030 E	10/06/15 09:41 / sf
TDS Balance (0.80 - 1.20)	1.01	unitless				A1030 E	10/06/15 09:41 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-014
Client Sample ID: PW-7 /MW-24

Report Date: 10/23/15
Collection Date: 09/24/15 10:30
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 22:27 / wc
Bicarbonate as HCO3	467	mg/L		5		A2320 B	09/28/15 22:27 / wc
Calcium	392	mg/L		1		E200.7	10/02/15 16:30 / sf
Chloride	56	mg/L	D	5		E300.0	09/29/15 07:09 / wc
Fluoride	1.1	mg/L		0.1		A4500-F C	09/29/15 13:13 / wc
Magnesium	345	mg/L		1		E200.7	10/02/15 16:30 / sf
Nitrogen, Ammonia as N	ND	mg/L		0.05		A4500-NH3 G	09/29/15 13:12 / lr
Nitrogen, Nitrate+Nitrite as N	0.3	mg/L		0.1		E353.2	09/29/15 16:28 / lr
Potassium	15	mg/L		1		E200.8	09/29/15 03:09 / smm
Silica	17.3	mg/L		0.2		E200.8	09/29/15 03:09 / smm
Sodium	1280	mg/L	D	2		E200.7	10/02/15 16:30 / sf
Sulfate	4680	mg/L	D	20		E300.0	09/29/15 07:09 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	7850	umhos/cm		5		A2510 B	09/25/15 13:14 / lmc
pH	7.26	s.u.	H	0.01		A4500-H B	09/25/15 13:14 / lmc
Solids, Total Dissolved TDS @ 180 C	7280	mg/L		100		A2540 C	09/28/15 09:42 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 03:09 / smm
Arsenic	0.001	mg/L		0.001		E200.8	09/29/15 03:09 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 03:09 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 03:09 / smm
Boron	1.3	mg/L		0.1		E200.8	09/29/15 03:09 / smm
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 03:09 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 03:09 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 03:09 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 03:09 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 03:09 / smm
Manganese	0.13	mg/L		0.01		E200.8	09/29/15 03:09 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 03:09 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 03:09 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 03:09 / smm
Selenium	0.014	mg/L		0.001		E200.8	09/29/15 03:09 / smm
Uranium	0.0395	mg/L		0.0003		E200.8	09/29/15 03:09 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 03:09 / smm
Zinc	0.05	mg/L		0.01		E200.8	09/29/15 03:09 / smm
METALS - TOTAL							
Iron	1.77	mg/L		0.03		E200.7	10/02/15 00:13 / sf
Manganese	0.15	mg/L		0.01		E200.7	10/02/15 00:13 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-014
Client Sample ID: PW-7/MW-24

Report Date: 10/23/15
Collection Date: 09/24/15 10:30
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	52.5	pCi/L		33.0		E900.0	10/02/15 02:11 / trs
Gross Alpha precision (±)	30.0	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Alpha MDC	33.0	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta	<30.3	pCi/L	U	30.3		E900.0	10/02/15 02:11 / trs
Gross Beta precision (±)	13.0	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta MDC	30.3	pCi/L				E900.0	10/02/15 02:11 / trs
Radium 226	0.94	pCi/L		0.21		E903.0	10/07/15 08:24 / dmf
Radium 226 precision (±)	0.24	pCi/L				E903.0	10/07/15 08:24 / dmf
Radium 226 MDC	0.21	pCi/L				E903.0	10/07/15 08:24 / dmf
Radium 228	<1.7	pCi/L	U	1.7		RA-05	10/02/15 12:29 / plj
Radium 228 precision (±)	1.0	pCi/L				RA-05	10/02/15 12:29 / plj
Radium 228 MDC	1.7	pCi/L				RA-05	10/02/15 12:29 / plj
Thorium 230	<0.3	pCi/L	U	0.3		E908.0	10/05/15 16:36 / cng
Thorium 230 precision (±)	0.1	pCi/L				E908.0	10/05/15 16:36 / cng
Thorium 230 MDC	0.3	pCi/L				E908.0	10/05/15 16:36 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.31	%				A1030 E	10/06/15 09:41 / sf
Anions	107	meq/L				A1030 E	10/06/15 09:41 / sf
Cations	104	meq/L				A1030 E	10/06/15 09:41 / sf
Solids, Total Dissolved Calculated	7000	mg/L				A1030 E	10/06/15 09:41 / sf
TDS Balance (0.80 - 1.20)	1.04	unitless				A1030 E	10/06/15 09:41 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-015
Client Sample ID: PW-15/MW-31

Report Date: 10/23/15
Collection Date: 09/24/15 12:00
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Carbonate as CO3	ND	mg/L		5		A2320 B	09/28/15 22:35 / wc
Bicarbonate as HCO3	363	mg/L		5		A2320 B	09/28/15 22:35 / wc
Calcium	428	mg/L		1		E200.7	10/02/15 16:34 / sf
Chloride	33	mg/L	D	2		E300.0	09/29/15 07:27 / wc
Fluoride	0.5	mg/L		0.1		A4500-F C	09/29/15 13:16 / wc
Magnesium	257	mg/L		1		E200.7	10/02/15 16:34 / sf
Nitrogen, Ammonia as N	0.30	mg/L		0.05		A4500-NH3 G	09/29/15 13:14 / lr
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	09/29/15 16:29 / lr
Potassium	25	mg/L		1		E200.8	09/29/15 03:14 / smm
Silica	18.8	mg/L		0.2		E200.8	09/29/15 03:14 / smm
Sodium	520	mg/L		1		E200.7	10/02/15 16:34 / sf
Sulfate	2900	mg/L	D	8		E300.0	09/29/15 07:27 / wc
PHYSICAL PROPERTIES							
Conductivity @ 25 C	4890	umhos/cm		5		A2510 B	09/25/15 13:17 / lmc
pH	7.32	s.u.	H	0.01		A4500-H B	09/25/15 13:17 / lmc
Solids, Total Dissolved TDS @ 180 C	4510	mg/L		40		A2540 C	09/28/15 09:43 / mag
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/29/15 03:14 / smm
Arsenic	0.005	mg/L		0.001		E200.8	09/29/15 03:14 / smm
Barium	ND	mg/L		0.1		E200.8	09/29/15 03:14 / smm
Beryllium	ND	mg/L		0.001		E200.8	09/29/15 03:14 / smm
Boron	0.7	mg/L		0.1		E200.8	09/29/15 03:14 / smm
Cadmium	ND	mg/L		0.005		E200.8	09/29/15 03:14 / smm
Chromium	ND	mg/L		0.05		E200.8	09/29/15 03:14 / smm
Copper	ND	mg/L		0.01		E200.8	09/29/15 03:14 / smm
Iron	ND	mg/L		0.03		E200.8	09/29/15 03:14 / smm
Lead	ND	mg/L		0.001		E200.8	09/29/15 03:14 / smm
Manganese	3.30	mg/L		0.01		E200.8	09/29/15 03:14 / smm
Mercury	ND	mg/L		0.001		E200.8	09/29/15 03:14 / smm
Molybdenum	ND	mg/L		0.1		E200.8	09/29/15 03:14 / smm
Nickel	ND	mg/L		0.05		E200.8	09/29/15 03:14 / smm
Selenium	ND	mg/L		0.001		E200.8	09/29/15 03:14 / smm
Uranium	0.0170	mg/L		0.0003		E200.8	09/29/15 03:14 / smm
Vanadium	ND	mg/L		0.1		E200.8	09/29/15 03:14 / smm
Zinc	0.01	mg/L		0.01		E200.8	09/29/15 03:14 / smm
METALS - TOTAL							
Iron	1.65	mg/L		0.03		E200.7	10/02/15 00:17 / sf
Manganese	3.42	mg/L		0.01		E200.7	10/02/15 00:17 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104
Lab ID: C15090859-015
Client Sample ID: PW-15/MW-31

Report Date: 10/23/15
Collection Date: 09/24/15 12:00
DateReceived: 09/25/15
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Gross Alpha	15.6	pCi/L		14.9		E900.0	10/02/15 02:11 / trs
Gross Alpha precision (±)	13.0	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Alpha MDC	14.9	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta	19.8	pCi/L		19.4		E900.0	10/02/15 02:11 / trs
Gross Beta precision (±)	11.4	pCi/L				E900.0	10/02/15 02:11 / trs
Gross Beta MDC	19.4	pCi/L				E900.0	10/02/15 02:11 / trs
Radium 226	1.2	pCi/L		0.17		E903.0	10/07/15 08:24 / dmf
Radium 226 precision (±)	0.31	pCi/L				E903.0	10/07/15 08:24 / dmf
Radium 226 MDC	0.17	pCi/L				E903.0	10/07/15 08:24 / dmf
Radium 228	<1.4	pCi/L	U	1.4		RA-05	10/02/15 12:29 / plj
Radium 228 precision (±)	0.8	pCi/L				RA-05	10/02/15 12:29 / plj
Radium 228 MDC	1.4	pCi/L				RA-05	10/02/15 12:29 / plj
Thorium 230	<0.3	pCi/L	U	0.3		E908.0	10/05/15 16:36 / cng
Thorium 230 precision (±)	0.1	pCi/L				E908.0	10/05/15 16:36 / cng
Thorium 230 MDC	0.3	pCi/L				E908.0	10/05/15 16:36 / cng
- See Case Narrative regarding Th230 analysis.							
DATA QUALITY							
A/C Balance (± 5)	-1.11	%				A1030 E	10/06/15 09:42 / sf
Anions	67.3	meq/L				A1030 E	10/06/15 09:42 / sf
Cations	65.8	meq/L				A1030 E	10/06/15 09:42 / sf
Solids, Total Dissolved Calculated	4400	mg/L				A1030 E	10/06/15 09:42 / sf
TDS Balance (0.80 - 1.20)	1.03	unitless				A1030 E	10/06/15 09:42 / sf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/23/15
Project: WYDEQ104
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B										Batch: R204716
Lab ID: MBLK	2	Method Blank				Run: MANTECH_150928B			09/28/15 17:40	
Carbonate as CO3		ND	mg/L	1						
Bicarbonate as HCO3		ND	mg/L	1						
Lab ID: C15090859-002ADUP	2	Sample Duplicate				Run: MANTECH_150928B			09/28/15 20:08	
Carbonate as CO3		ND	mg/L	5.0					10	
Bicarbonate as HCO3		201	mg/L	5.0				0.1	10	
Lab ID: C15090859-012ADUP	2	Sample Duplicate				Run: MANTECH_150928B			09/28/15 22:03	
Carbonate as CO3		ND	mg/L	5.0					10	
Bicarbonate as HCO3		1360	mg/L	5.0				0.0	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/23/15
Project: WYDEQ104
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2510 B								Analytical Run: PHSC_101-C_150925A		
Lab ID: CCV - SC 1413		Continuing Calibration Verification Standard							09/25/15 10:48	
Conductivity @ 25 C		1420	umhos/cm	5.0	100	90	110			
Method: A2510 B									Batch: R204582	
Lab ID: SC 2ND 1413		Laboratory Control Sample				Run: PHSC_101-C_150925A			09/25/15 08:52	
Conductivity @ 25 C		1390	umhos/cm	5.0	98	90	110			
Lab ID: MBLK		Method Blank				Run: PHSC_101-C_150925A			09/25/15 09:17	
Conductivity @ 25 C		1	umhos/cm	1						
Lab ID: C15090859-001ADUP		Sample Duplicate				Run: PHSC_101-C_150925A			09/25/15 12:15	
Conductivity @ 25 C		2670	umhos/cm	5.0				0.0	10	
Lab ID: C15090859-011ADUP		Sample Duplicate				Run: PHSC_101-C_150925A			09/25/15 13:02	
Conductivity @ 25 C		3600	umhos/cm	5.0				0.2	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104

Report Date: 10/23/15
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C									Batch: TDS150928A	
Lab ID: MB-1_150928A		Method Blank				Run: BAL-18_150928A			09/28/15 09:36	
Solids, Total Dissolved TDS @ 180 C		ND	mg/L	9						
Lab ID: LCS-2_150928A		Laboratory Control Sample				Run: BAL-18_150928A			09/28/15 09:36	
Solids, Total Dissolved TDS @ 180 C		1130	mg/L	11	102	90	110			
Lab ID: C15090859-010A DUP		Sample Duplicate				Run: BAL-18_150928A			09/28/15 09:41	
Solids, Total Dissolved TDS @ 180 C		2410	mg/L	20				1.1	5	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104

Report Date: 10/23/15
Work Order: C15090859

Analyte		Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**A4500-F C**									Analytical Run: MANTECH_150925A	
Lab ID:	**CCV-8644**		Continuing Calibration Verification Standard							09/25/15 11:58	
Fluoride			2.00	mg/L	0.10	100	90	110			
Lab ID:	**CCV-8644**		Continuing Calibration Verification Standard							09/25/15 12:51	
Fluoride			2.04	mg/L	0.10	102	90	110			
Method:	**A4500-F C**									Batch: R204621	
Lab ID:	**MBLK**		Method Blank				Run: MANTECH_150925A			09/25/15 09:46	
Fluoride			ND	mg/L	0.01						
Lab ID:	**LCS-8595**		Laboratory Control Sample				Run: MANTECH_150925A			09/25/15 09:49	
Fluoride			2.00	mg/L	0.10	100	90	110			
Lab ID:	**C15090805-006AMS**		Sample Matrix Spike				Run: MANTECH_150925A			09/25/15 12:17	
Fluoride			2.04	mg/L	0.10	99	80	120			
Lab ID:	**C15090805-006AMSD**		Sample Matrix Spike Duplicate				Run: MANTECH_150925A			09/25/15 12:20	
Fluoride			2.00	mg/L	0.10	97	80	120	2.0	10	
Method:	**A4500-F C**									Analytical Run: MANTECH_150929A	
Lab ID:	**CCV-8644**		Continuing Calibration Verification Standard							09/29/15 12:21	
Fluoride			2.04	mg/L	0.10	102	90	110			
Lab ID:	**CCV-8644**		Continuing Calibration Verification Standard							09/29/15 12:55	
Fluoride			2.04	mg/L	0.10	102	90	110			
Method:	**A4500-F C**									Batch: R204749	
Lab ID:	**MBLK**		Method Blank				Run: MANTECH_150929A			09/29/15 12:15	
Fluoride			ND	mg/L	0.01						
Lab ID:	**LCS-8595**		Laboratory Control Sample				Run: MANTECH_150929A			09/29/15 12:18	
Fluoride			2.00	mg/L	0.10	100	90	110			
Lab ID:	**C15090859-002AMS**		Sample Matrix Spike				Run: MANTECH_150929A			09/29/15 12:26	
Fluoride			2.72	mg/L	0.10	103	80	120			
Lab ID:	**C15090859-002AMSD**		Sample Matrix Spike Duplicate				Run: MANTECH_150929A			09/29/15 12:29	
Fluoride			2.67	mg/L	0.10	100	80	120	1.9	10	
Lab ID:	**C15090859-013AMS**		Sample Matrix Spike				Run: MANTECH_150929A			09/29/15 13:08	
Fluoride			2.29	mg/L	0.10	100	80	120			
Lab ID:	**C15090859-013AMSD**		Sample Matrix Spike Duplicate				Run: MANTECH_150929A			09/29/15 13:10	
Fluoride			2.33	mg/L	0.10	102	80	120	1.7	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104

Report Date: 10/23/15
Work Order: C15090859

Analyte		Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**A4500-H B**								Analytical Run: PHSC_101-C_150925A		
Lab ID:	**pH 6.86**	Initial Calibration Verification Standard								09/25/15 08:36	
pH			6.81	s.u.	0.010	99	98	102			
Lab ID:	**CCV - pH 7**	Continuing Calibration Verification Standard								09/25/15 10:45	
pH			7.06	s.u.	0.010	101	98	102			
Lab ID:	**pH 6.86**	Initial Calibration Verification Standard								09/25/15 12:04	
pH			6.91	s.u.	0.010	101	98	102			
Method:	**A4500-H B**										Batch: R204582
Lab ID:	**C15090859-001ADUP**	Sample Duplicate					Run: PHSC_101-C_150925A			09/25/15 12:15	
pH			7.94	s.u.	0.010				0.4	3	
Lab ID:	**C15090859-011ADUP**	Sample Duplicate					Run: PHSC_101-C_150925A			09/25/15 13:02	
pH			6.57	s.u.	0.010				0.2	3	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104

Report Date: 10/23/15
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-NH3 G								Analytical Run: TECHNICON_150929A		
Lab ID: CCV-54		Continuing Calibration Verification Standard							09/29/15 12:37	
Nitrogen, Ammonia as N		1.05	mg/L	0.050	105	90	110			
Lab ID: CCV-68		Continuing Calibration Verification Standard							09/29/15 13:00	
Nitrogen, Ammonia as N		1.01	mg/L	0.050	101	90	110			
Method: A4500-NH3 G										Batch: R204746
Lab ID: MBLK-1		Method Blank				Run: TECHNICON_150929A			09/29/15 11:08	
Nitrogen, Ammonia as N		ND	mg/L	0.01						
Lab ID: LFB-3		Laboratory Fortified Blank				Run: TECHNICON_150929A			09/29/15 11:12	
Nitrogen, Ammonia as N		1.95	mg/L	0.050	99	90	110			
Lab ID: C15090859-001EMS		Sample Matrix Spike				Run: TECHNICON_150929A			09/29/15 11:15	
Nitrogen, Ammonia as N		19.8	mg/L	0.25	101	90	110			
Lab ID: C15090859-001EMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_150929A			09/29/15 11:17	
Nitrogen, Ammonia as N		19.8	mg/L	0.25	101	90	110	0.0	10	
Lab ID: C15090859-011EMS		Sample Matrix Spike				Run: TECHNICON_150929A			09/29/15 11:39	
Nitrogen, Ammonia as N		2.30	mg/L	0.050	102	90	110			
Lab ID: C15090859-011EMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_150929A			09/29/15 11:40	
Nitrogen, Ammonia as N		2.40	mg/L	0.050	107	90	110	4.3	10	
Lab ID: C15090859-001EMS		Sample Matrix Spike				Run: TECHNICON_150929A			09/29/15 12:42	
Nitrogen, Ammonia as N		19.7	mg/L	0.25	92	90	110			
Lab ID: C15090859-001EMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_150929A			09/29/15 12:44	
Nitrogen, Ammonia as N		19.8	mg/L	0.25	93	90	110	0.5	10	
Lab ID: C15090859-011EMS		Sample Matrix Spike				Run: TECHNICON_150929A			09/29/15 13:05	
Nitrogen, Ammonia as N		2.34	mg/L	0.050	104	90	110			
Lab ID: C15090859-011EMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_150929A			09/29/15 13:07	
Nitrogen, Ammonia as N		2.40	mg/L	0.050	106	90	110	2.5	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates **Report Date:** 10/23/15

Project: WYDEQ104 **Work Order:** C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Analytical Run: ICP4-C_151001A	
Lab ID: ICV	5	Initial Calibration Verification Standard							10/01/15 13:30	
Calcium		49.2	mg/L	1.0	98	95	105			
Iron		4.94	mg/L	0.030	99	95	105			
Magnesium		49.4	mg/L	1.0	99	95	105			
Manganese		4.79	mg/L	0.010	96	95	105			
Sodium		49.8	mg/L	1.0	100	95	105			
Lab ID: ICSA	5	Interference Check Sample A							10/01/15 13:53	
Calcium		455	mg/L	1.0	91	80	120			
Iron		174	mg/L	0.030	87	80	120			
Magnesium		498	mg/L	1.0	100	80	120			
Manganese		-0.0225	mg/L	0.010						
Sodium		-0.185	mg/L	1.0						
Lab ID: ICSAB	5	Interference Check Sample AB							10/01/15 13:58	
Calcium		456	mg/L	1.0	91	80	120			
Iron		175	mg/L	0.030	87	80	120			
Magnesium		499	mg/L	1.0	100	80	120			
Manganese		0.441	mg/L	0.010	88	80	120			
Sodium		-0.257	mg/L	1.0						
Method: E200.7										Batch: 45835
Lab ID: MB-45835	2	Method Blank				Run: ICP4-C_151001A				10/01/15 22:01
Iron		ND	mg/L	0.003						
Manganese		ND	mg/L	0.002						
Lab ID: LCS3-45835	2	Laboratory Control Sample				Run: ICP4-C_151001A				10/01/15 22:05
Iron		2.61	mg/L	0.030	104	85	115			
Manganese		2.56	mg/L	0.0012	102	85	115			
Lab ID: C15090859-009CMS3	2	Sample Matrix Spike				Run: ICP4-C_151001A				10/01/15 23:01
Iron		3.16	mg/L	0.030	101	70	130			
Manganese		2.38	mg/L	0.0023	95	70	130			
Lab ID: C15090859-009CMSD	2	Sample Matrix Spike Duplicate				Run: ICP4-C_151001A				10/01/15 23:05
Iron		3.13	mg/L	0.030	100	70	130	1.0	20	
Manganese		2.39	mg/L	0.0023	95	70	130	0.1	20	
Lab ID: C15090866-004BMS3	2	Sample Matrix Spike				Run: ICP4-C_151001A				10/02/15 00:25
Iron		3.23	mg/L	0.030	105	70	130			
Manganese		3.20	mg/L	0.0012	102	70	130			
Lab ID: C15090866-004BMSD	2	Sample Matrix Spike Duplicate				Run: ICP4-C_151001A				10/02/15 00:29
Iron		3.22	mg/L	0.030	104	70	130	0.3	20	
Manganese		3.18	mg/L	0.0012	101	70	130	0.5	20	

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104

Report Date: 10/23/15
Work Order: C15090859

Analyte		Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**E200.7**										Batch: R204876
Lab ID:	**MB-151001A**	3	Method Blank				Run: ICP4-C_151001A				10/01/15 14:17
Calcium			0.01	mg/L	0.003						
Magnesium			ND	mg/L	0.002						
Sodium			ND	mg/L	0.1						
Lab ID:	**LFB-151001A**	3	Laboratory Fortified Blank				Run: ICP4-C_151001A				10/01/15 14:21
Calcium			46.6	mg/L	1.0	93	85	115			
Magnesium			46.8	mg/L	1.0	94	85	115			
Sodium			48.0	mg/L	1.0	96	85	115			
Lab ID:	**C15090839-001AMS2**	3	Sample Matrix Spike				Run: ICP4-C_151001A				10/01/15 18:47
Calcium			105	mg/L	1.0	94	70	130			
Magnesium			100.0	mg/L	1.0	94	70	130			
Sodium			214	mg/L	1.0	90	70	130			
Lab ID:	**C15090839-001AMSD**	3	Sample Matrix Spike Duplicate				Run: ICP4-C_151001A				10/01/15 18:51
Calcium			105	mg/L	1.0	95	70	130	0.6	20	
Magnesium			100	mg/L	1.0	94	70	130	0.4	20	
Sodium			215	mg/L	1.0	91	70	130	0.4	20	
Lab ID:	**C15090939-001CMS2**	3	Sample Matrix Spike				Run: ICP4-C_151001A				10/01/15 21:15
Calcium			224	mg/L	1.0	90	70	130			
Magnesium			175	mg/L	1.0	93	70	130			
Sodium			101	mg/L	1.0	94	70	130			
Lab ID:	**C15090939-001CMSD**	3	Sample Matrix Spike Duplicate				Run: ICP4-C_151001A				10/01/15 21:18
Calcium			225	mg/L	1.0	90	70	130	0.3	20	
Magnesium			175	mg/L	1.0	93	70	130	0.1	20	
Sodium			100	mg/L	1.0	93	70	130	1.0	20	

Qualifiers:

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QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104

Report Date: 10/23/15
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Analytical Run: ICP4-C_151002A	
Lab ID: ICV	4	Initial Calibration Verification Standard							10/02/15 13:19	
Boron		1.02	mg/L	0.050	102	95	105			
Calcium		47.9	mg/L	1.0	96	95	105			
Magnesium		48.1	mg/L	1.0	96	95	105			
Sodium		51.2	mg/L	1.0	102	95	105			
Lab ID: ICSA	4	Interference Check Sample A							10/02/15 13:42	
Boron		0.00659	mg/L	0.050						
Calcium		473	mg/L	1.0	95	80	120			
Magnesium		504	mg/L	1.0	101	80	120			
Sodium		0.641	mg/L	1.0						
Lab ID: ICSAB	4	Interference Check Sample AB							10/02/15 13:47	
Boron		0.0111	mg/L	0.050						
Calcium		477	mg/L	1.0	95	80	120			
Magnesium		508	mg/L	1.0	102	80	120			
Sodium		0.510	mg/L	1.0						
Method: E200.7									Batch: R204948	
Lab ID: MB-151002A	4	Method Blank				Run: ICP4-C_151002A			10/02/15 14:06	
Boron		ND	mg/L	0.006						
Calcium		0.006	mg/L	0.003						
Magnesium		ND	mg/L	0.002						
Sodium		0.1	mg/L	0.1						
Lab ID: LFB-151002A	4	Laboratory Fortified Blank				Run: ICP4-C_151002A			10/02/15 14:10	
Boron		0.934	mg/L	0.050	93	85	115			
Calcium		46.8	mg/L	1.0	94	85	115			
Magnesium		49.2	mg/L	1.0	98	85	115			
Sodium		49.6	mg/L	1.0	99	85	115			
Lab ID: C15090859-009BMS2	4	Sample Matrix Spike				Run: ICP4-C_151002A			10/02/15 16:10	
Boron		5.08	mg/L	0.078	91	70	130			
Calcium		654	mg/L	1.0	85	70	130			
Magnesium		401	mg/L	1.0	97	70	130			
Sodium		997	mg/L	1.2	78	70	130			
Lab ID: C15090859-009BMSD	4	Sample Matrix Spike Duplicate				Run: ICP4-C_151002A			10/02/15 16:14	
Boron		5.10	mg/L	0.078	91	70	130	0.4	20	
Calcium		655	mg/L	1.0	86	70	130	0.2	20	
Magnesium		402	mg/L	1.0	97	70	130	0.3	20	
Sodium		1000	mg/L	1.2	80	70	130	0.5	20	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/23/15
Project: WYDEQ104
Work Order: C15090859

Analyte		Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**E200.7**									Analytical Run: ICP4-C_151022A	
Lab ID:	**ICV**		Initial Calibration Verification Standard								10/22/15 12:13
Calcium			49.8	mg/L	1.0	100	95	105			
Lab ID:	**ICSA**		Interference Check Sample A								10/22/15 12:38
Calcium			460	mg/L	1.0	92	80	120			
Lab ID:	**ICSAB**		Interference Check Sample AB								10/22/15 12:43
Calcium			458	mg/L	1.0	92	80	120			
Lab ID:	**ICSA**		Interference Check Sample A								10/23/15 00:09
Calcium			461	mg/L	1.0	92	80	120			
Lab ID:	**ICSAB**		Interference Check Sample AB								10/23/15 00:14
Calcium			458	mg/L	1.0	92	80	120			
Method:	**E200.7**										Batch: R205689
Lab ID:	**MB-151022A**		Method Blank				Run: ICP4-C_151022A				10/22/15 13:04
Calcium			0.02	mg/L	0.003						
Lab ID:	**LFB-151022A**		Laboratory Fortified Blank				Run: ICP4-C_151022A				10/22/15 13:08
Calcium			47.1	mg/L	1.0	94	85	115			
Lab ID:	**C15090860-002BMS2**		Sample Matrix Spike				Run: ICP4-C_151022A				10/22/15 14:27
Calcium			789	mg/L	1.0	85	70	130			
Lab ID:	**C15090860-002BMSD**		Sample Matrix Spike Duplicate				Run: ICP4-C_151022A				10/22/15 14:31
Calcium			788	mg/L	1.0	85	70	130	0.1	20	
Lab ID:	**C15100677-003BMS2**		Sample Matrix Spike				Run: ICP4-C_151022A				10/22/15 18:36
Calcium			614	mg/L	1.0	89	70	130			
Lab ID:	**C15100677-003BMSD**		Sample Matrix Spike Duplicate				Run: ICP4-C_151022A				10/22/15 18:40
Calcium			618	mg/L	1.0	90	70	130	0.5	20	

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
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QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/23/15
Project: WYDEQ104
Work Order: C15090859

Analyte		Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**E200.8**									Analytical Run: ICPMS2-C_150930A	
Lab ID:	**ICV**		Initial Calibration Verification Standard							09/30/15 11:43	
Uranium			0.0472	mg/L	0.00030	94	90	110			
Method:	**E200.8**									Batch: R204803	
Lab ID:	**LRB**		Method Blank				Run: ICPMS2-C_150930A			09/30/15 12:32	
Uranium			0.0001	mg/L	8E-06						
Lab ID:	**LFB**		Laboratory Fortified Blank				Run: ICPMS2-C_150930A			09/30/15 12:34	
Uranium			0.0512	mg/L	0.00030	102	85	115			
Lab ID:	**C15090859-009BMS4**		Sample Matrix Spike				Run: ICPMS2-C_150930A			09/30/15 17:41	
Uranium			0.845	mg/L	0.00050	113	70	130			
Lab ID:	**C15090859-009BMSD**		Sample Matrix Spike Duplicate				Run: ICPMS2-C_150930A			09/30/15 17:53	
Uranium			0.842	mg/L	0.00050	112	70	130	0.3	20	

Qualifiers:

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MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates **Report Date:** 10/23/15

Project: WYDEQ104 **Work Order:** C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8								Analytical Run: ICPMS4-C_150928A		
Lab ID: ICV	18	Initial Calibration Verification Standard								09/28/15 12:47
Aluminum		0.0498	mg/L	0.0010	100	90	110			
Arsenic		0.0496	mg/L	0.0010	99	90	110			
Barium		0.0488	mg/L	0.0010	98	90	110			
Beryllium		0.0490	mg/L	0.0010	98	90	110			
Cadmium		0.0482	mg/L	0.0010	96	90	110			
Chromium		0.0491	mg/L	0.0010	98	90	110			
Copper		0.0500	mg/L	0.0010	100	90	110			
Iron		0.985	mg/L	0.0010	98	90	110			
Lead		0.0491	mg/L	0.0010	98	90	110			
Manganese		0.0490	mg/L	0.0010	98	90	110			
Mercury		0.00479	mg/L	0.0010	96	90	110			
Molybdenum		0.0477	mg/L	0.0010	95	90	110			
Nickel		0.0507	mg/L	0.0010	101	90	110			
Potassium		10.0	mg/L	0.0041	100	90	110			
Selenium		0.0482	mg/L	0.0010	97	90	110			
Uranium		0.0463	mg/L	0.00030	93	90	110			
Vanadium		0.0495	mg/L	0.0010	99	90	110			
Zinc		0.0496	mg/L	0.0010	99	90	110			
Method: E200.8										Batch: R204691
Lab ID: LRB	18	Method Blank				Run: ICPMS4-C_150928A				09/28/15 13:34
Aluminum		0.0004	mg/L	0.0001						
Arsenic		ND	mg/L	5E-05						
Barium		1E-05	mg/L	9E-06						
Beryllium		ND	mg/L	3E-05						
Cadmium		ND	mg/L	7E-06						
Chromium		ND	mg/L	8E-05						
Copper		3E-05	mg/L	2E-05						
Iron		ND	mg/L	0.0003						
Lead		ND	mg/L	1.0E-05						
Manganese		6E-05	mg/L	4E-05						
Mercury		3E-05	mg/L	3E-05						
Molybdenum		0.0002	mg/L	4E-05						
Nickel		ND	mg/L	0.0002						
Potassium		0.04	mg/L	0.02						
Selenium		ND	mg/L	3E-05						
Uranium		5E-05	mg/L	4E-06						
Vanadium		6E-05	mg/L	1E-05						
Zinc		0.001	mg/L	8E-05						
Lab ID: LFB	18	Laboratory Fortified Blank				Run: ICPMS4-C_150928A				09/28/15 14:04
Aluminum		0.0548	mg/L	0.0010	109	85	115			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates **Report Date:** 10/23/15

Project: WYDEQ104 **Work Order:** C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R204691
Lab ID: LFB	18	Laboratory Fortified Blank				Run: ICPMS4-C_150928A				09/28/15 14:04
Arsenic		0.0528	mg/L	0.0010	106	85	115			
Barium		0.0520	mg/L	0.0010	104	85	115			
Beryllium		0.0537	mg/L	0.0010	107	85	115			
Cadmium		0.0521	mg/L	0.0010	104	85	115			
Chromium		0.0535	mg/L	0.0010	107	85	115			
Copper		0.0534	mg/L	0.0010	107	85	115			
Iron		1.35	mg/L	0.0010	108	85	115			
Lead		0.0514	mg/L	0.0010	103	85	115			
Manganese		0.0534	mg/L	0.0010	107	85	115			
Mercury		0.00918	mg/L	0.0010	91	85	115			
Molybdenum		0.0524	mg/L	0.0010	104	85	115			
Nickel		0.0530	mg/L	0.0010	106	85	115			
Potassium		13.1	mg/L	0.0041	105	85	115			
Selenium		0.0519	mg/L	0.0010	104	85	115			
Uranium		0.0488	mg/L	0.00030	97	85	115			
Vanadium		0.0537	mg/L	0.0010	107	85	115			
Zinc		0.0537	mg/L	0.0010	105	85	115			
Lab ID: C15090859-009BMS4	18	Sample Matrix Spike				Run: ICPMS4-C_150928A				09/29/15 01:20
Aluminum		0.249	mg/L	0.030	91	70	130			
Arsenic		0.282	mg/L	0.0010	109	70	130			
Barium		0.282	mg/L	0.050	107	70	130			
Beryllium		0.228	mg/L	0.0010	91	70	130			
Cadmium		0.256	mg/L	0.0010	102	70	130			
Chromium		0.262	mg/L	0.0050	104	70	130			
Copper		0.257	mg/L	0.0050	102	70	130			
Iron		6.54	mg/L	0.030	105	70	130			
Lead		0.265	mg/L	0.0010	106	70	130			
Manganese		0.258	mg/L	0.0010	101	70	130			
Mercury		0.0528	mg/L	0.00028	106	70	130			
Molybdenum		0.277	mg/L	0.0010	108	70	130			
Nickel		0.256	mg/L	0.0050	101	70	130			
Potassium		108	mg/L	1.0	97	70	130			
Selenium		0.314	mg/L	0.0010	111	70	130			
Uranium		0.822	mg/L	0.00030	129	70	130			
Vanadium		0.273	mg/L	0.010	107	70	130			
Zinc		0.267	mg/L	0.010	104	70	130			
Lab ID: C15090859-009BMSD	18	Sample Matrix Spike Duplicate				Run: ICPMS4-C_150928A				09/29/15 01:25
Aluminum		0.262	mg/L	0.030	96	70	130	4.8	20	
Arsenic		0.283	mg/L	0.0010	109	70	130	0.3	20	
Barium		0.288	mg/L	0.050	109	70	130	2.0	20	

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104

Report Date: 10/23/15
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R204691	
Lab ID: C15090859-009BMSD	18	Sample Matrix Spike Duplicate				Run: ICPMS4-C_150928A			09/29/15 01:25	
Beryllium		0.231	mg/L	0.0010	93	70	130	1.7	20	
Cadmium		0.259	mg/L	0.0010	104	70	130	1.4	20	
Chromium		0.264	mg/L	0.0050	104	70	130	0.9	20	
Copper		0.259	mg/L	0.0050	103	70	130	0.9	20	
Iron		6.57	mg/L	0.030	105	70	130	0.4	20	
Lead		0.264	mg/L	0.0010	106	70	130	0.4	20	
Manganese		0.261	mg/L	0.0010	103	70	130	1.2	20	
Mercury		0.0529	mg/L	0.00028	106	70	130	0.1	20	
Molybdenum		0.279	mg/L	0.0010	108	70	130	0.7	20	
Nickel		0.255	mg/L	0.0050	101	70	130	0.2	20	
Potassium		110	mg/L	1.0	100	70	130	1.6	20	
Selenium		0.308	mg/L	0.0010	109	70	130	2.1	20	
Uranium		0.815	mg/L	0.00030	126	70	130	0.9	20	
Vanadium		0.276	mg/L	0.010	108	70	130	1.1	20	
Zinc		0.266	mg/L	0.010	103	70	130	0.5	20	
Lab ID: C15090860-004BMS4	18	Sample Matrix Spike				Run: ICPMS4-C_150928A			09/29/15 04:01	
Aluminum		0.0542	mg/L	0.030	104	70	130			
Arsenic		0.0606	mg/L	0.0010	110	70	130			
Barium		0.105	mg/L	0.050	110	70	130			
Beryllium		0.0488	mg/L	0.0010	98	70	130			
Cadmium		0.0522	mg/L	0.0010	104	70	130			
Chromium		0.0544	mg/L	0.0050	108	70	130			
Copper		0.0543	mg/L	0.0050	108	70	130			
Iron		1.34	mg/L	0.030	107	70	130			
Lead		0.0533	mg/L	0.0010	107	70	130			
Manganese		0.0590	mg/L	0.0010	104	70	130			
Mercury		0.0109	mg/L	0.00010	109	70	130			
Molybdenum		0.0570	mg/L	0.0010	103	70	130			
Nickel		0.0574	mg/L	0.0050	109	70	130			
Potassium		33.5	mg/L	1.0	105	70	130			
Selenium		0.0606	mg/L	0.0010	115	70	130			
Uranium		0.173	mg/L	0.00030	145	70	130			S
Vanadium		0.0549	mg/L	0.010	109	70	130			
Zinc		0.0554	mg/L	0.010	110	70	130			
Lab ID: C15090860-004BMSD	18	Sample Matrix Spike Duplicate				Run: ICPMS4-C_150928A			09/29/15 04:06	
Aluminum		0.0542	mg/L	0.030	104	70	130	0.1	20	
Arsenic		0.0600	mg/L	0.0010	109	70	130	1.0	20	
Barium		0.104	mg/L	0.050	108	70	130	0.7	20	
Beryllium		0.0484	mg/L	0.0010	97	70	130	0.8	20	
Cadmium		0.0520	mg/L	0.0010	104	70	130	0.3	20	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates **Report Date:** 10/23/15

Project: WYDEQ104 **Work Order:** C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R204691	
Lab ID: C15090860-004BMSD	18	Sample Matrix Spike Duplicate				Run: ICPMS4-C_150928A			09/29/15 04:06	
Chromium		0.0533	mg/L	0.0050	106	70	130	2.1	20	
Copper		0.0536	mg/L	0.0050	106	70	130	1.4	20	
Iron		1.06	mg/L	0.030	84	70	130	24	20	R
Lead		0.0539	mg/L	0.0010	108	70	130	1.1	20	
Manganese		0.0576	mg/L	0.0010	102	70	130	2.3	20	
Mercury		0.0113	mg/L	0.00010	113	70	130	3.4	20	
Molybdenum		0.0566	mg/L	0.0010	102	70	130	0.6	20	
Nickel		0.0562	mg/L	0.0050	107	70	130	2.1	20	
Potassium		33.0	mg/L	1.0	101	70	130	1.4	20	
Selenium		0.0472	mg/L	0.0010	89	70	130	25	20	R
Uranium		0.175	mg/L	0.00030	148	70	130	1.0	20	S
Vanadium		0.0536	mg/L	0.010	107	70	130	2.5	20	
Zinc		0.0535	mg/L	0.010	106	70	130	3.5	20	

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

S - Spike recovery outside of advisory limits.

ND - Not detected at the reporting limit.

R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates **Report Date:** 10/23/15
Project: WYDEQ104 **Work Order:** C15090859

Analyte		Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**E300.0**								Analytical Run: IC2-C_150928A		
Lab ID:	**ICV**	2	Initial Calibration Verification Standard							09/28/15 10:53	
Chloride			9.87	mg/L	1.0	99	90	110			
Sulfate			39.3	mg/L	1.0	98	90	110			
Lab ID:	**CCV-092815-4**	2	Continuing Calibration Verification Standard							09/29/15 00:23	
Chloride			9.71	mg/L	1.0	97	90	110			
Sulfate			38.9	mg/L	1.0	97	90	110			
Lab ID:	**CCV-092815-5**	2	Continuing Calibration Verification Standard							09/29/15 04:41	
Chloride			9.72	mg/L	1.0	97	90	110			
Sulfate			38.9	mg/L	1.0	97	90	110			
Method:	**E300.0**									Batch: R204744	
Lab ID:	**ICB**	2	Method Blank				Run: IC2-C_150928A			09/28/15 11:11	
Chloride			0.02	mg/L	0.01						
Sulfate			0.08	mg/L	0.03						
Lab ID:	**LFB-092815-1**	2	Laboratory Fortified Blank				Run: IC2-C_150928A			09/28/15 11:30	
Chloride			10.7	mg/L	1.0	107	90	110			
Sulfate			42.6	mg/L	1.0	106	90	110			
Lab ID:	**C15090859-001AMS**	2	Sample Matrix Spike				Run: IC2-C_150928A			09/29/15 01:18	
Chloride			175	mg/L	1.0	104	90	110			
Sulfate			1660	mg/L	4.2	98	90	110			
Lab ID:	**C15090859-001AMSD**	2	Sample Matrix Spike Duplicate				Run: IC2-C_150928A			09/29/15 01:37	
Chloride			175	mg/L	1.0	104	90	110	0.2	20	
Sulfate			1640	mg/L	4.2	95	90	110	0.6	20	
Lab ID:	**LFB-092815-2**	2	Laboratory Fortified Blank				Run: IC2-C_150928A			09/29/15 05:18	
Chloride			9.90	mg/L	1.0	99	90	110			
Sulfate			39.6	mg/L	1.0	99	90	110			
Lab ID:	**C15090859-011AMS**	2	Sample Matrix Spike				Run: IC2-C_150928A			09/29/15 05:55	
Chloride			290	mg/L	1.0	110	90	110			
Sulfate			2150	mg/L	4.2		90	110			A
Lab ID:	**C15090859-011AMSD**	2	Sample Matrix Spike Duplicate				Run: IC2-C_150928A			09/29/15 06:14	
Chloride			289	mg/L	1.0	109	90	110	0.5	20	
Sulfate			2130	mg/L	4.2		90	110	0.8	20	A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104

Report Date: 10/23/15
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E353.2									Analytical Run: FIA201-C_150929A	
Lab ID: CCV		Continuing Calibration Verification Standard							09/29/15 15:59	
Nitrogen, Nitrate+Nitrite as N		1.84	mg/L	0.10	92	90	110			
Lab ID: CCV		Continuing Calibration Verification Standard							09/29/15 16:15	
Nitrogen, Nitrate+Nitrite as N		1.98	mg/L	0.10	99	90	110			
Method: E353.2									Batch: R204780	
Lab ID: MBLK		Method Blank				Run: FIA201-C_150929A			09/29/15 15:09	
Nitrogen, Nitrate+Nitrite as N		ND	mg/L	0.007						
Lab ID: LFB		Laboratory Fortified Blank				Run: FIA201-C_150929A			09/29/15 15:10	
Nitrogen, Nitrate+Nitrite as N		1.97	mg/L	0.10	101	90	110			
Lab ID: C15090839-002CMS		Sample Matrix Spike				Run: FIA201-C_150929A			09/29/15 16:03	
Nitrogen, Nitrate+Nitrite as N		1.97	mg/L	0.10	95	90	110			
Lab ID: C15090839-002CMSD		Sample Matrix Spike Duplicate				Run: FIA201-C_150929A			09/29/15 16:04	
Nitrogen, Nitrate+Nitrite as N		2.00	mg/L	0.10	96	90	110	1.5	10	
Lab ID: C15090859-006EMS		Sample Matrix Spike				Run: FIA201-C_150929A			09/29/15 16:18	
Nitrogen, Nitrate+Nitrite as N		13.2	mg/L	0.50	91	90	110			
Lab ID: C15090859-006EMSD		Sample Matrix Spike Duplicate				Run: FIA201-C_150929A			09/29/15 16:19	
Nitrogen, Nitrate+Nitrite as N		13.3	mg/L	0.50	92	90	110	0.8	10	
Lab ID: C15090860-001EMS		Sample Matrix Spike				Run: FIA201-C_150929A			09/29/15 16:34	
Nitrogen, Nitrate+Nitrite as N		1.85	mg/L	0.10	94	90	110			
Lab ID: C15090860-001EMSD		Sample Matrix Spike Duplicate				Run: FIA201-C_150929A			09/29/15 16:35	
Nitrogen, Nitrate+Nitrite as N		1.82	mg/L	0.10	93	90	110	1.6	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104

Report Date: 10/23/15
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E900.0										Batch: GrAB-2141
Lab ID: Th230-GrAB-2141		Laboratory Control Sample				Run: G542M_150930A			10/02/15 02:11	
Gross Alpha		85.6	pCi/L		86	80	120			
Lab ID: Sr90-GrAB-2141		Laboratory Control Sample				Run: G542M_150930A			10/02/15 02:11	
Gross Beta		181	pCi/L		93	80	120			
Lab ID: MB-GrAB-2141	6	Method Blank				Run: G542M_150930A			10/02/15 02:11	
Gross Alpha		-0.5	pCi/L							U
Gross Alpha precision (±)		0.7	pCi/L							
Gross Alpha MDC		1	pCi/L							
Gross Beta		-1	pCi/L							U
Gross Beta precision (±)		2	pCi/L							
Gross Beta MDC		3	pCi/L							
Lab ID: C15090859-013DDUP	6	Sample Duplicate				Run: G542M_150930A			10/02/15 02:11	
Gross Alpha		8.25	pCi/L					22	149.1	
Gross Alpha precision (±)		6.23	pCi/L							
Gross Alpha MDC		7.37	pCi/L							
Gross Beta		29.2	pCi/L					5.6	57.1	
Gross Beta precision (±)		6.88	pCi/L							
Gross Beta MDC		9.72	pCi/L							
Lab ID: C15090860-003DMS		Sample Matrix Spike				Run: G542M_150930A			10/02/15 02:11	
Gross Alpha		101	pCi/L		92	70	130			
Lab ID: C15090860-003DMS		Sample Matrix Spike				Run: G542M_150930A			10/02/15 02:11	
Gross Beta		199	pCi/L		97	70	130			

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/23/15
Project: WYDEQ104
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E900.0									Batch: GrAB-2140	
Lab ID: Th230-GrAB-2140		Laboratory Control Sample				Run: TENNELEC-3_150930A			10/02/15 01:46	
Gross Alpha		99.3	pCi/L		97	80	120			
Lab ID: Sr90-GrAB-2140		Laboratory Control Sample				Run: TENNELEC-3_150930A			10/02/15 01:46	
Gross Beta		188	pCi/L		97	80	120			
Lab ID: MB-GrAB-2140	6	Method Blank				Run: TENNELEC-3_150930A			10/02/15 01:46	
Gross Alpha		2	pCi/L							
Gross Alpha precision (±)		1	pCi/L							
Gross Alpha MDC		1.0	pCi/L							
Gross Beta		-1	pCi/L							U
Gross Beta precision (±)		1	pCi/L							
Gross Beta MDC		2	pCi/L							
Lab ID: C15090859-002DMS		Sample Matrix Spike				Run: TENNELEC-3_150930A			10/02/15 01:47	
Gross Alpha		141	pCi/L		81	70	130			
Lab ID: C15090859-002DMS		Sample Matrix Spike				Run: TENNELEC-3_150930A			10/02/15 01:47	
Gross Beta		320	pCi/L		102	70	130			
Lab ID: C15090859-008DDUP	6	Sample Duplicate				Run: TENNELEC-3_150930A			10/02/15 01:47	
Gross Alpha		16.6	pCi/L					6.9	64.3	
Gross Alpha precision (±)		4.42	pCi/L							
Gross Alpha MDC		3.26	pCi/L							
Gross Beta		16.7	pCi/L					14	57.6	
Gross Beta precision (±)		4.16	pCi/L							
Gross Beta MDC		5.68	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/23/15
Project: WYDEQ104
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: RA226-7844
Lab ID: LCS-RA226-7844		Laboratory Control Sample				Run: G5000W_150929C				10/07/15 06:47
Radium 226		9.8	pCi/L		92	80	120			
Lab ID: MB-RA226-7844	3	Method Blank				Run: G5000W_150929C				10/07/15 06:47
Radium 226		0.3	pCi/L							
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: C15090859-003DMS		Sample Matrix Spike				Run: G5000W_150929C				10/07/15 06:47
Radium 226		20	pCi/L		91	70	130			
Lab ID: C15090859-003DMSD		Sample Matrix Spike Duplicate				Run: G5000W_150929C				10/07/15 06:47
Radium 226		17	pCi/L		78	70	130	15	49.3	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Project: WYDEQ104

Report Date: 10/23/15
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E908.0									Batch: RA-TH-ISO-2327	
Lab ID: LCS-RA-TH-ISO-2327		Laboratory Control Sample				Run: ALPHANALYST_150929B			10/05/15 11:24	
Thorium 230		6.6	pCi/L		100	80	120			
Lab ID: C15090859-015DMS		Sample Matrix Spike				Run: ALPHANALYST_150929B			10/05/15 16:36	
Thorium 230		14	pCi/L		96	70	130			
Lab ID: C15090859-015DMSD		Sample Matrix Spike Duplicate				Run: ALPHANALYST_150929B			10/05/15 16:36	
Thorium 230		14	pCi/L		98	70	130	3.0	48	
Lab ID: MB-RA-TH-ISO-2327	3	Method Blank				Run: ALPHANALYST_150929B			10/05/15 16:36	
Thorium 230		0.02	pCi/L							U
Thorium 230 precision (±)		0.09	pCi/L							
Thorium 230 MDC		0.2	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Lidstone and Associates
Report Date: 10/23/15
Project: WYDEQ104
Work Order: C15090859

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RA-05										Batch: RA228-5049
Lab ID: LCS-228-RA226-7844		Laboratory Control Sample				Run: TENNELEC-3_150929C			10/02/15 10:56	
Radium 228		8.6	pCi/L		108	80	120			
Lab ID: MB-RA226-7844	3	Method Blank				Run: TENNELEC-3_150929C			10/02/15 10:56	
Radium 228		0.5	pCi/L							U
Radium 228 precision (±)		0.8	pCi/L							
Radium 228 MDC		1	pCi/L							
Lab ID: C15090859-004DMS		Sample Matrix Spike				Run: TENNELEC-3_150929C			10/02/15 10:56	
Radium 228		17.9	pCi/L		106	70	130			
Lab ID: C15090859-004DMSD		Sample Matrix Spike Duplicate				Run: TENNELEC-3_150929C			10/02/15 10:56	
Radium 228		16.3	pCi/L		96	70	130	9.4	51.5	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

Work Order Receipt Checklist

Lidstone and Associates

C15090859

Login completed by: Dorian Quis
Reviewed by: BL2000\cwagner
Reviewed Date: 9/29/2015

Date Received: 9/25/2015
Received by: amm
Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.7°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	Not Applicable ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

PLEASE PRINT (Provide as much information as possible.)

Company Name: Lidstone & Assoc

Project Name, PWS, Permit, Etc.: WYDEQ104

Sample Origin State: WY

EPA/State Compliance: Yes ☐ No ☒

Report Mail Address (Required): 4025 Automation Way Bldg E, Fort Collins, CO 80525

☒ No Hard Copy Email: ghs@lidstone.com

Contact Name: Greg Steed

Phone/Fax: 970-223-4705

Cell: 970-819-1783

Sampler: (Please Print) AFM, GHS

Invoice Contact & Phone: Melinda Culver

Purchase Order:

Quote/Bottle Order: 47286

Invoice Address (Required): Same

☐ No Hard Copy Email:

Special Report/Formats:

☐ DW
☐ POTW/WWTP
☐ State:
☐ Other:
☒ EDD/EDT (Electronic Data) Format: CSV
☐ LEVEL IV
☐ NELAC

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: hand

Cooler ID(s): Various

Receipt Temp: 5.0, 3.7, 6.3 °C

On Ice: (Y) N

Custody Seal: On Bottle Y (N); On Cooler Y (N)

Intact Y N

Signature Match Y N

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Number of Containers; Sample Type: A W S V B O DW; Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water)	2005 WEQ Guidelines	Dissolved Be	Thorium 230	SEE ATTACHED	Standard Turnaround (TAT)	RUSH	Comments
1	South Willow Spring	9-23-15	17:05	W	X	X	X				No field filtering
2	~~MW-5~~ PW-9	9-23-15	9:30	W	X	X	X				
3	~~PW-8~~ PW-6	9-23-15	9:40	W	X	X	X				
4	PW-5	9-23-15	11:00	W	X	X	X				
5	MW-15	9-23-15	12:30	W	X	X	X				C15090859
6	MW-16	9-23-15	13:30	W	X	X	X				
7	PW-8	9-23-15	14:50	W	X	X	X				
8	MW-9	9-23-15	18:35	W	X	X	X				
9	PW-1	9-23-15	17:25	W	X	X	X				
10	PW-3	9-23-15	18:30	W	X	X	X				

Custody Record MUST be Signed

Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Greg Steed	9-24-15 / 18:00		Steve Dobos	9/25/15 8:00	
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
			Received by Laboratory:	Date/Time:	Signature:
					9/25/15 8:00

Sample Disposal: Return to Client: Lab Disposal:

LABORATORY USE ONLY

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report. Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

PLEASE PRINT (Provide as much information as possible.)

Company Name: Lidstone and Assoc.	Project Name, PWS, Permit, Etc. WYDEQ104	Sample Origin State: WY	EPA/State Compliance: Yes ☐ No ☒
Report Mail Address (Required): 4025 Automation Way Bldg E Fort Collins, CO 80525 ☐ No Hard Copy Email:	Contact Name: Greg Steed Phone/Fax: 970-223-4705 Cell: 970-819-1783		Sampler: (Please Print) JVG
	Invoice Contact & Phone: Melinda Culver	Purchase Order:	Quote/Bottle Order: 47286
Invoice Address (Required): same ☐ No Hard Copy Email:			

Special Report/Formats:
☐ DW ☐ POTW/WWTP ☐ State: ☐ Other:
☒ EDD/EDT (Electronic Data) Format: CSV ☐ LEVEL IV ☐ NELAC

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

ANALYSIS REQUESTED

Standard Turnaround (TAT) — RUSH

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: hand
Cooler ID(s): various
Receipt Temp: 5.0 3.7 6.3 5.6 °C
On Ice: Y N
Custody Seal On Bottle Y N On Cooler Y N
Intact Y N
Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	NO3 DEQ Guideline 8		Dissolved Be		Thorium 230						SEE ATTACHED			Comments
1	MW-12	9-22-15	19:20	W	X		X		X									field filtered
2	PW-2	9-24-15	9:45	W	X		X		X									Not field filtered
3	PW-4	9-24-15	11:35	W	X		X		X									
4	PW-7	9-24-15	10:30	W	X		X		X									
5	PW-15	9-24-15	12:00	W	X		X		X									
6																		
7																		C15090859
8																		
9																		
10																		

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Greg Steed	9-24-15 / 18:00		Jane Doles	9/24/15 @ 1800	
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
			Received by Laboratory:	Date/Time:	Signature:
				9/25/15	8:00

Sample Disposal: Return to Client: ____ Lab Disposal: X

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This will be clearly noted on your analytical report.

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Project	WYDEQ104	Date	9/21/15
Client	ANC	Technicians	JVG
Well No.	MW-1	Casing Type/Dia.	2" PVC
Measuring Point (MP)	T.O.C.	Pump Depth	100'~
Static Water Level from MP	64.96	Well Volume (WV)	6.575 GAL
Total Well Depth from MP	105.3	Total to Evacuate (WVx3)	19.73 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
11:00 Am	0.75				66.45	increased pump rate
11:03	1.125				67.35	
11:11	"	6.29	12°C	8.52	"	
11:18	"	6.30	11.1°	8.52	67.60'	clear
11:23	1.125	6.34	11.1°	8.56	67.65'	
11:28	"	6.32	11.1°	8.51	67.45'	
11:33	"	6.30	11.1°	8.58		
		Sampled @		11:35		
		TOOK	DUPLICATE	SAMPLE	(2)	
11:45	pump	OFF				

SAMPLE Name: JOHN GOIN Date: 9/21/15 Time: 11:30

Total Minutes Pumped 45
Total Gallons Pumped 49.5

Sample Handling
Type of Analysis

Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Duplicate sample @ 11:30 Am
"MW-1A"

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Project	WYDEQ - 104	Date	9/21/15
Client	WY DEQ	Technicians	AEM
Well No.	MW-2	Casing Type/Dia.	2"
Measuring Point (MP)	Top of casing	Pump Depth	30'
Static Water Level from MP	~~21.46~~ 21.46	Well Volume (WV)	
Total Well Depth from MP	34.98	Total to Evacuate (WVx3)	

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
12:33					21.45	Pump on
12:35	0.125	6.13	22.4	8.08	21.25	0.25 0.25
12:44	0.0820		~~19.4~~	~~8.10~~	~~21.95~~	0.75 1.00
12:48	0.094	6.17	19.4	8.10	21.95	0.37 1.37
12:53	0.137	6.15	20.3	8.28	21.91	0.68 2.05
12:59	0.075	6.15	19.9	8.19	21.79	0.45 2.50
13:05	0.113	6.17	19.9	8.20	21.86	0.67 3.17
	Parameters stable, begin collecting samples					
	Finished collecting samples at 13:20					
	Could handle much higher flow rate, probably ~0.4 → 0.5 gpm					

SAMPLE Name: AEM Date: 9/21/15 Time: 13:00

Total Minutes Pumped 32 min
Total Gallons Pumped 3.17 +

Sample Handling
Type of Analysis

Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. I
Fort Collins, CO 80525

oject: WYDEQ 104
Date: 9/21/15
Client: ANC
Technicians: JVG
Well No.: MW-3
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~ 52'
Static Water Level from MP: 44.40'
Well Volume (WV): 2.54 GAL
Total Well Depth from MP: 60'
Total to Evacuate (WVx3): 7.63 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
2:20	0.31				51.	43.65 w/ pump set
2:28	0.16	7.18	16.4	1929	50.9	Slow to pump slightly
2:33	0.16	7.22	15.9	1916	50.92	clear
2:38	0.16	7.20	15.8	1828	51.22	
2:43	"	7.23	15.5	1808	51.18	
2:50	"	7.22	15.5	1773	51.25	
2:55	"	7.23	15.3	1770	50.9	
~~A A A~~		Sampled	@	2:55 pm		
		Pump	OFF	@ 3:15		

SAMPLE Name: JOHN GOIN Date: 9/21/15 Time: 2:55 pm

Total Minutes Pumped: 55
Total Gallons Pumped: ~ 6.8
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting
4025 Automation Way, Bldg. H
Fort Collins, CO 80525

Project: WYDEQ-104
Date: 9/21/15
Client: WYDEQ
Technicians: AEM
Well No.: MW-4
Casing Type/Dia.: 2"
Measuring Point (MP): TOC
Pump Depth: 45 – 50 ft
Static Water Level from MP: 32.56
Well Volume (WV): 3.25
Total Well Depth from MP: 52.52
Total to Evacuate (WVx3):

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

	Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (~~µS~~ mS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
	~~2T~~ 14:10					32.27	Pump on
	14:12					38.40	water reached surface
	14:14					38.86	H_2O lvl stabilizing
	14:18	0.137	5.96	19.4	6.75	39.25	1.10 1.10
*	14:23	0.125	5.90	17.7	6.67	38.97	0.62 1.72
*	14:27	0.125	5.97	17.4	6.89	39.30	0.50 2.22
*	14:32	0.093	6.06	17.7	6.98	38.71	0.47 2.69
*	14:36	0.063	6.16 ✓	18.8	7.01 ✓	38.01	0.25 2.94
*	14:41	0.100	6.26 ✓	18.5	7.10 ✓	38.06	0.50 3.44
*	14:46	0.125	6.25 ✓	18.7	7.14 ✓	37.68	0.63 4.07
			± 0.1 ✓		~~0.018 chan~~		
					1.8 % change ✓		
	Parameters stable, begin collecting samples						

SAMPLE Name: AEM Date: 9/21/15 Time: 14:50

Total Minutes Pumped: 36
Total Gallons Pumped: 4.07+
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:
* pump setting unchanged, flow rate falling, H_2O level fluctuating
→ The flow rate varied from 0 to 0.125 gpm and the H_2O level varied from 37.68 to 39.30 without any change on the VFD. Flow always recovered within ~ 20 ~~secto~~ secon...

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Project: WY DEQ 104
Date: 9/22/15
Client: WY DEQ
Technicians: AEM GHS
Well No.: MW-5
Casing Type/Dia.: 2"
Measuring Point (MP): TOC
Pump Depth: —
Static Water Level from MP: 28.12
Well Volume (WV): 0.4 gal
Total Well Depth from MP: 30.81
Total to Evacuate (WVx3): 1.2 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	~~Pumping Rate (GPM)~~ Vol	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
10:30	Start bailing w/		12"	bailer		clear
10:45	1.25 qt.	6.29	11.2	6.10 mS		"
10:52	2.5 qt.	6.33	11.0	5.92 mS		"
11:00	1 gal	6.37	10.4	6.04 mS		slightly opaque
11:04	1.25 g	6.34	11.1	6.10 mS		
* Start		sampling	*			

SAMPLE Name: MW-5 Date: 9-22-15 Time: 11:15

Total Minutes Pumped
Total Gallons Pumped

Sample Handling: Bed Hand del.
Type of Analysis: Ra8, Be, Th 230

Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Project: WY DEQ 104
Date: 9/21
Client: WY DEQ
Technicians: AEM
Well No.: MW-6
Casing Type/Dia.: 2"
Measuring Point (MP): TOC
Pump Depth: ~ 35'
Static Water Level from MP: 18.16
Well Volume (WV): 3.56
Total Well Depth from MP: 39.98
Total to Evacuate (WVx3):

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (~~uS~~ mS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
18:54					18.15	Pump On
18:57	0.49	6.78	18.0	3.29	19.81	0.98 0.98 Pump rate ↑
19:00	0.83	6.76	11.8	3.49	20.24	2.49 3.47
19:04	0.83	6.76	10.8	3.49	20.36	3.32 6.79
19:07	0.83	6.75	10.5	3.51	20.43	2.49 9.28
19:10	0.65	6.74	10.4	3.50	20.52	1.95 11.23
Parameters are stable, collecting samples at 9:14						

SAMPLE Name: AEM Date: 9/21 Time: 19:15

Total Minutes Pumped: 20
Total Gallons Pumped: 11.23+
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Project: WYDEQ 104
Date: 9/21/15
Client: ANC
Technicians: JVG
Well No.: MW-7
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~35'
Static Water Level from MP: 26.60'
Well Volume (WV): 2.17 GAL
Total Well Depth from MP: 39.90'
Total to Evacuate (WVx3): 6.5 GAL

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
5:35	0.40	6.65	18.5	3.04	27.30	26.55' w/ pump set
5:42	0.38	6.64	13.3	3.54	27.45	cleaning up
5:48	0.38	6.66	13.2	3.52	27.55	
5:55	"	6.67	12.9	3.59	27.60	
6:02	"	6.65	12.7	3.64	27.67	
6:05	"	6.66	12.5	3.61		
		Sampled @		6:05pm		
		Pump	OFF @	6:15		

SAMPLE Name: JOHN GOIN Date: 9/21/15 Time: 6:05 pm

Total Minutes Pumped: 40
Total Gallons Pumped: ~15 GAL
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

0.038013

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Project: WY DEQ-104
Date: 9/23/15
Client: WY DEQ
Technicians: AEM
Well No.: MW-9
Casing Type/Dia.: 2"
Measuring Point (MP): T.O.C.
Pump Depth: —
Static Water Level from MP: 44.15
Well Volume (WV): 1.02 gal
Total Well Depth from MP: 50.40
Total to Evacuate (WVx3): 3.06 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	~~Drawdown (Depth to Water, nearest 0.01 ft)~~	Comments
16:40	1/3 gal				Cumulative V Rem	4 ft of bailer
16:42	1/3 gal				2/3 gal	"
16:44	1/3 gal				1	"
18:00	1/3 gal				1 1/3	"
18:02	1/3 gal				1 2/3	"
18:04	1/3 gal	7.38	11.3	1688	2	"
18:14	1 gal	7.40	10.3	1614	3	3 more full bailers (4 ft ea.)
	3 casing volumes removed, begin collecting sample					
18:35	final sample collected					

SAMPLE Name: AEM Date: 9/23/15 Time: 18:35

Total Minutes Pumped: —
Total Gallons Pumped: —
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

oject: WYDEQ 104
Client: ANC
Well No.: MW-10
Measuring Point (MP): T.O.C.
Static Water Level from MP: 11.37'
Total Well Depth from MP: 39.82

Date: 9/21/15
Technicians: JVG
Casing Type/Dia.: 2" PVC
Pump Depth: ~35
Well Volume (WV): 4.64 GAL
Total to Evacuate (WVx3): 13.9 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
4:00	0.20	6.34	18.7	5.70	18.3	8.82' w/pump set
4:08	0.09	6.49	17.6	5.61	18.6	
4:15	0.09	6.41	17.4	5.65	19.3	clear
4:20	0.10	6.35	18.5	5.68	20.7	
4:25	"	6.32	18.4	5.68		
4:30	"	6.38	18.2	5.65	21.8	
		Sampled @		4:30		
		Pump	OFF	@ 4:55		

SAMPLE Name: JOHN GOIN Date: 9/21/15 Time: 4:30 pm

Total Minutes Pumped: 55
Total Gallons Pumped: ~6.1 gal
Sample Handling:
Type of Analysis:
Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: Yes / (No)

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering Geology & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Project: WY DEQ-104
Date: 9/21/15
Client: WY DEQ
Technicians: AEM
Well No.: MW-11
Casing Type/Dia.: 2"
Measuring Point (MP): TOC
Pump Depth: ~35 ft
Static Water Level from MP: ~~51.57~~ 25.10
Well Volume (WV): 2.35
Total Well Depth from MP: 39.51
Total to Evacuate (WVx3):

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
17:32	0.675				24.97	Pump On
17:34	0.675	6.92	19.5	2.63	25.60	1.35 1.35 milky
17:38	0.68	7.03	12.8	2.57	25.79	2.72 4.07 clear
17:42	0.75	7.16	12.7	2.63	25.82	3.00 7.07
17:45	0.75	7.07	12.6	2.64	25.84	2.25 9.32
17:48	0.75	7.06	12.9	2.60	25.85	2.25 11.57
17:51	0.75	7.07	12.5	2.62	25.87	2.25 13.82
Parameters	Stable,	collecting	samples			

SAMPLE Name: AEM Date: 9/21/15 Time: 17:55

Total Minutes Pumped: 19
Total Gallons Pumped: 13.82 +
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

2620

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. E
Fort Collins, CO 80525

Project	WYDEQ 104	Date	9/22/15
Client	ANC	Technicians	JVG, AEM
Well No.	MW-12	Casing Type/Dia.	2" PVC
Measuring Point (MP)	T.O.C.	Pump Depth	38'
Static Water Level from MP	32.10'	Well Volume (WV)	1.65 GAL
Total Well Depth from MP	42.22'	Total to Evacuate (WVx3)	4.95 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
18:52	0.94				32.09	
18:56	0.84	6.72	19.4	3.01	33.80'	foggy
18:58	0.94	6.60	11.8	3.80	33.88'	
19:01	0.94	6.56	11.0	3.84	33.96'	
19:04		6.58	10.7	3.85	33.99'	
19:09		6.57	10.7	3.48	34.02'	still foggy
19:14		6.52	10.6	3.85		
19:20						
	**	* sampled @		19:20		
		pump	OFF @	19:35		

SAMPLE Name: JOHN GOIN Date: 9/22/15 Time: 19:20

Total Minutes Pumped 43
Total Gallons Pumped 40.4 GAL

Sample Handling
Type of Analysis

Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes No

Comments / Notes:
field filtered radionuclides bottles & dissolved metals bottle

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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Fort Collins, CO 80525

Project: WYDEQ 104
Date: 9/21/15
Client: WY DEQ
Technicians: AEM
Well No.: MW-13
Casing Type/Dia.: 2"
Measuring Point (MP): TOC
Pump Depth: ~55'
Static Water Level from MP: 32.67
Well Volume (WV): 4.20
Total Well Depth from MP: 58.42
Total to Evacuate (WVx3):

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (~~uS~~ mS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
15:53					31.78	Very red (rust colored H_2O)
16:05	0.187	6.68	17.8	2.88	38.2	0.93 0.93
16:11	0.137	6.70	15.8	2.94	38.25	0.83 1.76
16:16	0.136	6.78	17.0	2.80	38.45	0.68 2.44
16:20	0.137	6.81	16.6	2.84	38.75	0.55 2.99
16:29	0.14	6.78	16.8	2.82		0.56 3.55 H_2O quality much improved light muddy color
Parameters are stable, begin collecting samples						
The red color in initial H_2O draw was due to precipitate residing at the well bottom.						
The H_2O quality improved greatly once the precipitate was removed from the H_2O column.						
Set the pump well above the well bottom.						

SAMPLE Name: AEM Date: 9/21/15 Time: 16:30

Total Minutes Pumped: 29
Total Gallons Pumped: 3.55+
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

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Fort Collins, CO 80525

Project	WY DEQ 104	Date	9/22/15
Client	WY DEQ	Technicians	AEM GHS
Well No.	MW-14a	Casing Type/Dia.	2"
Measuring Point (MP)	TOC	Pump Depth	
Static Water Level from MP	34.14	Well Volume (WV)	0.92 gal
Total Well Depth from MP	39.8	Total to Evacuate (WVx3)	2.76 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	~~Drawdown (Depth to Water, nearest 0.01 ft)~~	Comments
10:00	large bailer				Cumulative	
10:15	1.25 g	7.24	9.9	1654 µS	H_2O Removed	5 bailers > ½ full
10:18		7.29	10.4	1670		↳ 5th bailer - slightly milky
13:10	0.6 g	7.04	13.4	1520	1.85 gal	2 Bailers
13:28	0.28 g	7.20	10.7	1574	2.45 gal	1 full, 2 partial bailers
15:34	0.35	7.12	11.1	1584	2.80 gal	1 full, 1 partial bailer
3 Casing volumes removed, collecting samples						
16:08		7.22	11.2	1650		

SAMPLE Name: AEM Date: 9/22/15 Time: 15:40

Total Minutes Pumped	—	Sample Handling		Method:	Bailer / Pump / Grab
Total Gallons Pumped	2.80	Type of Analysis		Bailed/Pumped Dry?:	Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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4025 Automation Way, Bldg. F
Fort Collins, CO 80525

Project: WY DEQ - 104
Date: 9/23/15
Client: WY DEQ
Technicians: AEM
Well No.: MW-15
Casing Type/Dia.: 2"
Measuring Point (MP): TOC
Pump Depth: 25'
Static Water Level from MP: 17.25
Well Volume (WV): 2.37
Total Well Depth from MP: 31.78
Total to Evacuate (WVx3):

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
12:03	~~0.8~~				17.22	Pump on
12:05						H_2O reached surface
12:06	0.8	7.19	19.9	3.23 mS	18.97	0.8 – cloudy
12:10	0.65	7.25	13.9	3.20	18.97	2.6 3.4 milky
12:13	0.65	7.28	13.0	3.18	18.99	1.95 5.35 clear
12:16	0.65	7.25	12.8	3.16	19.02	1.95 7.30
12:19	0.65	7.27	12.6	3.16	19.02	1.95 9.25
12:22	Parameters stable, begin collecting samples					

SAMPLE Name: AEM Date: 9/23/15 Time: 12:30

Total Minutes Pumped: 16 + sampling
Total Gallons Pumped: 9.25 + sampling
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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4025 Automation Way, Bldg. L
Fort Collins, CO 80525

oject: WY DEQ - 104
Client: WY DEQ
Well No.: MW - 16
Measuring Point (MP): TOC
Static Water Level from MP: 28.07
Total Well Depth from MP: 36.22

Date: 9/23/15
Technicians: AEM
Casing Type/Dia.: 2"
Pump Depth: 33 ft
Well Volume (WV): 1.33 gal
Total to Evacuate (WVx3): 4.0

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
~~to~~ 13:04					28.01	Pump On
13:05					28.09	H_2O reached surface
13:06	0.14	7.25	21.0	2.87 mS	~~28.45~~	0.14 — Clear
13:12	0.15	7.31	19.1	2.86	28.45	0.62 0.76
13:15	0.21	7.31	18.4	2.83	28.52	0.62 1.38
13:18	0.29	7.26	17.2	2.82	28.71	0.87 2.25
13:22	0.31	7.31	15.9	2.81	28.76	1.24 3.49
13:25	Parameters stable, begin collecting samples					
13:34	Final sample collected, pump off					

SAMPLE Name: AEM Date: 9/23/15 Time: 1:30

Total Minutes Pumped: 18+ samples
Total Gallons Pumped: 3.49+ samples
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

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Fort Collins, CO 80525

Project: WYDEQ 104
Date: 9/2/15
Client: ANC
Technicians: JVG
Well No.: MW-17
Casing Type/Dia.: 2" PVC in 5" surface casing
Measuring Point (MP): T.O. surface casing
Pump Depth: ~29'
Static Water Level from MP: 18.18
Well Volume (WV): 2.85 GAL
Total Well Depth from MP: 35.65
Total to Evacuate (WVx3): 8.54 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
6:55	1.22					18.18 w/ pump set
6:58	1.17	7.37	11.3	1551	20.38	slow to pump
7:02	1.125	7.32	10.6	1563	20.60'	cleared up
7:05	1.125	7.33	10.5	1560	20.67'	
7:08	"	7.31	10.4	1560	20.70'	
7:12	"	7.30	10.4	1556	20.72'	
☆	☆ ☆	Sample	D @	7:15 pm	☆ ☆	
		Pump	off @	7:20 pm		

SAMPLE Name: JOHN GOIN Date: 9/2/15 Time: 7:15 pm

Total Minutes Pumped: 25
Total Gallons Pumped: ~28 GAL
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

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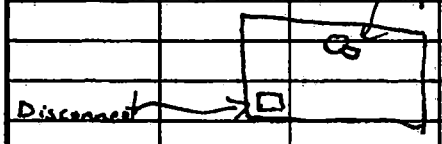
oject: WYDEQ 104
Date: 9/21/15
Client: DEQ
Technicians: AEM & GS
Well No.: R-4
Casing Type/Dia.: 8"
Measuring Point (MP): TOC
Pump Depth:
Static Water Level from MP: 53.70
Well Volume (WV):
Total Well Depth from MP: Cannot measure b/c pump
Total to Evacuate (WVx3):

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
11:14	0.5					- -
11:16	0.32	~~5.46~~ 3.47	16.7	5.50		0.64 0.64
11:22	0.19	3.56	14.7	8.14	53.95	1.14 1.78
11:27	0.06	3.56	14.5	8.04 ~~7.84~~		0.30 2.08
11:32	0.11	3.56	12.9	8.17	53.88	0.55 2.63
11:35	0.11	3.57	12.9	8.13	53.84	0.33 2.96
Parameters stable, begin sample collection						
Flow died at 11:36, pump off at 11:38						
11:51	Pump on, samples collected					
11:54	Pump off					
Note:	Pump operates off of pump disconnect in the SE corner of pumphouse					



SAMPLE Name: AEM Date: 9/21/15 Time: ~~11:40~~ 11:50

Total Minutes Pumped: 40
Total Gallons Pumped: 2.96+
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Surface Water Sampling
Field Data Sheet

Project: WYDEQ104	**Site Name:** North Willow Spring	**Technician:** GHS, ABM
Location Description:		

SAMPLE RETRIEVAL

Sample Name: N/A	Time: 12:40	Date: 9-24-15
Sampling Description (i.e. grab/pump/decant/filter, etc): DRY		

FIELD PARAMETERS

pH:	Temperature:
Specific Conductance:	DO:
Turbidity:	Other (specify):
Discharge (units and method of measurement):	Other (specify):

STREAMS (circle all that apply)

Location	Wading	Bank	Station Gage: at / above / below				
	Bridge: upstream / downstream		Side Bridge ____ ft/mile		Boat	Ice	
	Other (specify):						
Sampling Site	Pool	Riffle	Open	Braided	Backwater		
	Sample Type:						
Bottom	Bedrock	Rock	Cobble	Gravel	Sand	Mud	Concrete
Stage Conditions	Not Determined		Stable: normal / low / high				
	Falling	Rising	Peak	Other (specify):			
Hydraulic Event	Routine Sampling		Regular Flow				
	Snowmelt	Flood	Drought	Spill			
	Ice Cover: Thickness _____ inches		Other (specify):				
Stream Color	Brown	Clear	Green	Blue	Gray		
	Other (specify):						
Stream Mixing/Flow Type: Turbulent / Laminar / Stagnant	Excellent	Good	Fair	Poor			

SPRINGS/SEEPS (circle all that apply)

Sampling Site	Pool	Riffle	Braided	Backwater		
Bottom	Bedrock	Rock	Cobble	Gravel	Sand	Mud
Stage Conditions	Not Determined		Stable: normal / low / high			
Water Color(s)	Brown	Clear	Green	Blue	Gray	
	Other (specify):					
Spring Water Mixing and Sample Location Distance from Source	Excellent	Good	Fair	Poor		

IMPOUNDMENTS / PITS / LAKES (circle all that apply)

Sampling Site	Locale	Distance from bank:	Other:			
Bottom	Bedrock	Rock	Cobble	Gravel	Sand	Mud
Stage Conditions	Not Determined	Surveyed BS monument =	SWL=			
Water Color(s)	Brown	Clear	Green	Blue	Gray	
	Other (specify):					

Notes:

Surface Water Sampling
Field Data Sheet

Project: WYDEQ104	**Site Name:** South willow spring	**Technician:** AEM
Location Description:		

SAMPLE RETRIEVAL

Sample Name: South willow Spring	Time: 17:05	Date: 9/23/15
Sampling Description (i.e. grab/pump/decant/filter, etc): Grab into bottles out small ~1' head cut drop, downstream of bridge		

FIELD PARAMETERS

pH: 8.01	Temperature: 16.5 °C
Specific Conductance: 2.54 mS/cm	DO:
Turbidity: 1.67 NTU	Other (specify):
Discharge (units and method of measurement): < 1 gpm Visual	Other (specify):

STREAMS (circle all that apply)

Location	Wading	Bank	Station Gage: at / above / below N/A		
	Bridge: upstream / downstream		Side Bridge ____ ft/mile	Boat	Ice
	Other (specify):				
Sampling Site	Pool	Riffle	Open	Braided	Backwater
	Sample Type: Small <1' head cut & pool				
Bottom	Bedrock	Rock	Cobble	Gravel	Sand / Mud / Concrete
Stage Conditions	Not Determined		Stable: normal / low / high		
	Falling	Rising	Peak	Other (specify):	
Hydraulic Event	Routine Sampling		Regular Flow		
	Snowmelt	Flood	Drought	Spill	
	Ice Cover: Thickness ____ inches		Other (specify):		
Stream Color	Brown	Clear	Green	Blue	Gray
	Other (specify):				
Stream Mixing/Flow Type: Turbulent / Laminar / Stagnant	Excellent	Good	Fair	Poor	

SPRINGS/SEEPS (circle all that apply)

Sampling Site	Pool	Riffle	Braided	Backwater	
Bottom	Bedrock	Rock	Cobble	Gravel	Sand / Mud
Stage Conditions	Not Determined		Stable: normal / low / high		
Water Color(s)	Brown	Clear	Green	Blue	Gray
	Other (specify):				
Spring Water Mixing and Sample Location Distance from Source	Excellent	Good	Fair	Poor	

IMPOUNDMENTS / PITS / LAKES (circle all that apply)

Sampling Site	Locale	Distance from bank:	Other:		
Bottom	Bedrock	Rock	Cobble	Gravel	Sand / Mud
Stage Conditions	Not Determined	Surveyed BS monument =	SWL=		
Water Color(s)	Brown	Clear	Green	Blue	Gray
	Other (specify):				

Notes:

Ground Water Field Sampling Sheet

Project: WYDEQ 104
Date: 9-21-15
Client: WY DEQ
Technicians: GHS
Well No.: N/A
Casing Type/Dia.:
Measuring Point (MP):
Pump Depth:
Static Water Level from MP:
Well Volume (WV):
Total Well Depth from MP:
Total to Evacuate (WVx3):

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Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
	Blank					
		ANC-B				

SAMPLE Name: ANC-B Date: 9-21-15 Time: 12:30

Total Minutes Pumped:
Total Gallons Pumped:
Sample Handling: 2005 G8
Type of Analysis: Hand Deliver
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:
Blank Sample

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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4025 Automation Way, Bldg. 1
Fort Collins, CO 80525

oject: WYDEQ104
Date: 9-23-15
Client: ANC wells - DEQ
Technicians: GHS, JVG
Well No.: PW-1/MW-18
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: 33'
Static Water Level from MP: 28.41
Well Volume (WV): 1.44 Gal
Total Well Depth from MP: 37.25
Total to Evacuate (WVx3): 4.32 Gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
5:01	1.5				28.85	Pump @ max
5:05	"	7.58	15.8	5.37 mS	28.85	
5:09	1.80					
5:13	1.80	7.68	10.4	5.92 mS	28.90	
5:16	1.80	7.68	10.5	5.91 mS	28.90	
5:19	"	7.69	10.5	5.87 mS	28.90	
5:21	"	7.71	10.3	5.94 mS		
5:25	"	7.73	10.3	5.87 mS		
	*** Sampled @ 5:25pm ***					
- closed valves on pump discharge & turned off pump, did not pull pump						

10 s					28.45	3m	28.45
20 s					28.35	4m	28.45
30 s					28.28	5m	28.45
40 s					28.2[illegible]		
50 s					28.20		
60 s					28.35		
75 s					28.40		
90 s					28.41		
115 s					28.43		
2 m					28.45		

SAMPLE Name: PW-1 Date: 9/23/15 Time: 17:25

Total Minutes Pumped: 24
Total Gallons Pumped: 42 Gal
Sample Handling: Hand Deliver
Type of Analysis: Guideline 8
Method: Bailer (Pump) Grab
Bailed/Pumped Dry?: Yes (No)

Comments / Notes: Water in pump line held by weak suction at head manifold but is likely leaking down into the well

Ground Water Field Sampling Sheet

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Fort Collins, CO 80525

Project: WY DEQ 104
Date: 9-24-15
Client: WY DEQ
Technicians: GHS JVG
Well No.: PW-2 /MW-19
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~116'
Static Water Level from MP: 95.14
Well Volume (WV): 4.34 Gal
Total Well Depth from MP: 121.75
Total to Evacuate (WVx3): 13.0 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
9:12					97.5	slightly dirty
9:14	0.66				99.0	turned pump down
9:15	0.56				99.5	turned pump down
9:16		7.76	12.7	5.30 mS	99.8	clearing up
9:18	0.41	7.73	12.0	5.28 mS	100.7	
9:21	0.4	7.71	12.1	5.35 mS	102.05	
9:24	0.4	7.72	12.1	5.40 mS	103.2	dirty grey water
9:27	0.375	7.71	12.4	5.43 mS	103.95	cleared up
**	Sampled					
9:35	Pump	off			105.9	

SAMPLE Name: PW-2 Date: 9-24-15 Time: 9:45

Total Minutes Pumped _____
Total Gallons Pumped _____

Sample Handling: Hand deliver
Type of Analysis: 68 (DEQ - 2005)

Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

roject WYDEQ IDU

Client ANC/DEQ

Well No. PW-3 /MW-20

Measuring Point (MP) TOC

Static Water Level from MP 26.16

Total Well Depth from MP 62.45

Date 9-23-15

Technicians GHS, JVG

Casing Type/Dia. 2" PVC

Pump Depth 55'

Well Volume (WV) 5.9 gal

Total to Evacuate (WVx3) 17.7 gal

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Fort Collins, CO 80525

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
18:10						Pump on
18:12	0.5	8.00	16.6	3.64 mS	31.6	
18:16	0.375	8.06	13.6	3.62 mS	36.1	
18:19	0.375	8.05	13.0	3.62 mS	40.03	Slightly Cloudy
18:22	0.31	8.09	12.9	3.64 mS	42.7	
18:26	0.31	8.08	13.0	3.64 mS	43.5	
***	* Sampled					
18:32						Pump off

SAMPLE Name: PW-3 Date: 9-23-15 Time: 18:30

Total Minutes Pumped _____
Total Gallons Pumped _____

Sample Handling Hand deliver
Type of Analysis 6-8

Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: Yes / (No)

Comments / Notes:

1.70
2.5
1.64
1.68
3.95

Ground Water Field Sampling Sheet

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Engineering, Geology, & Water Resource Consulting
4025 Automation Way, Bldg. 1
Fort Collins CO 80525

Project: WYDEQ 104
Date: 9-24-15
Client: ~~[illegible]~~ DEQ
Technicians: GHS, JVG
Well No.: PW-4 /MW-21
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: 34'
Static Water Level from MP: 25.89
Well Volume (WV): 1.81 GAL
Total Well Depth from MP: 36.98
Total to Evacuate (WVx3): 5.42 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
11:15					26.07	turned pump up
11:17	.69				27.35	turned pump down
11:18	0.50	7.20	15.2	2.73 mS	28.1	turned pump down
11:20					28.28	
11:22	0.41	7.16	13.1	2.75 mS	28.75	
11:24	0.41	7.14	12.4	2.76 mS	29.6	turned pump down
11:26	0.28	7.06	12.2	2.76 mS	30.0	
11:29	0.28	6.94	12.8	2.76 mS	30.27	*Temp increase due to
11:32	0.25	6.90	13.5	2.76 mS	tape @ top of pump	longer time in hose in
11:35	0.25	6.86	13.5	2.79 mS		turned pump down
**	Sampled					
11:47	Pump off					

SAMPLE Name: PW-4 Date: 9-24-15 Time: 11:35

Total Minutes Pumped: 32
Total Gallons Pumped: 11 GAL
Sample Handling: Hand del.
Type of Analysis: G8
Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: Yes / (No)

Comments / Notes:

Ground Water Field Sampling Sheet

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Fort Collins, CO 80525

Project	WY DEQ 104	Date	9/23/15
Client	WY DEQ	Technicians	AEM
Well No.	PW-5 /MW-22	Casing Type/Dia.	2"
Measuring Point (MP)	TOC	Pump Depth	35 ft
Static Water Level from MP	28.09	Well Volume (WV)	2.11 gal
Total Well Depth from MP	41.08	Total to Evacuate (WVx3)	

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
10:13					27.71	Pump on
10:22	0.25	7.33	20.3	3.47 mS	30.25	0.75 — 3 minutes of flow
10:26	0.08	7.57	15.9	3.87	TOP of Pump	0.32 1.03 Slowed to near stop
10:34	0.03	7.66	17.5	3.86	31.63	0.25 1.32
10:41	0.03	7.65	18.3	3.89	31.73	0.22 1.54 Pump ↓ 1 ft
10:43	Parameters stable, begin collecting samples					TOP = Top of Pump
						BoP = Bottom of Pump
10:48					31.71	TOP = 32.45 BoP = 36.45
10:54					31.71	ToP = 32.45 BoP = 36.45 ~~WV = 0.75 gal~~
10:58					31.71	ToP = 33.61 BoP = 37.61
11:06					32.03	WV = 1.46 gal
11:15					33.02	

SAMPLE Name: AEM Date: 9/23/15 Time: 11:00

Total Minutes Pumped 30 + Sampling
Total Gallons Pumped 1.54 + Sampling
Sample Handling
Type of Analysis
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Project: WY DEQ 104
Date: 9/23/15
Client: WY DEQ
Technicians: AEM
Well No.: PW-6 /MW-23
Casing Type/Dia.: 2"
Measuring Point (MP): TOC
Pump Depth: ~15 ft
Static Water Level from MP: 6.45
Well Volume (WV): 2.59
Total Well Depth from MP: 22.37
Total to Evacuate (WVx3): 7.78

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Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
9:22					6.30	Pump on
9:23					11.6	H_2O reaches surface
9:26	0.25	7.05	15.2	2.28 mS	11.65	~~3.75~~ 2.25 – Cloudy
9:29	0.25	7.04	13.1	2.27	12.90	~~3.75~~ 2.25 ~~7.50~~ 4.50 H_2O clearing
9:32	0.56	7.06	13.5	2.25	11.97	1.68 6.18
9:36	0.56	7.03	13.1	2.25	12.12	2.34 8.42 H_2O clear
9:40	Parameters stable, collecting samples					
10						
~~9:40~~ off	1 hour					

SAMPLE Name: AEM Date: 9/23/15 Time: 9:40

Total Minutes Pumped: 24
Total Gallons Pumped: 8.42
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

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oject: WYDEQ 104
Date: 9-24-15
Client: ANC/DEQ
Technicians: GHS, JVG
Well No.: PW-7 /MW-24
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: 25'
Static Water Level from MP: 21.70
Well Volume (WV): 0.84 Gal
Total Well Depth from MP: 26.85
Total to Evacuate (WVx3): 2.5 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
10:03					21.65	
10:05	.06				below top of pump	turned pump down
10:08	0.125					
10:10	0.125	7.57	16.2	8.14 mS		
10:13	0.125	7.60	14.8	8.06 mS		
10:17	0.125	7.57	14.8	8.07 mS		Clearing up
10:22	0.18	7.56	14.2	8.08 mS		
10:26	0.19	7.58	13.7	7.99 mS		
10:28	** Sampled					
10:40	Pump off					
						1.75 GAL

SAMPLE Name: PW-7 Date: 9-24-15 Time: 10:50

Total Minutes Pumped: 39
Total Gallons Pumped: 6.0 GAL
Sample Handling: Hand del.
Type of Analysis:
Method: Bailer / (Pump) / Grab
Bailed/Pumped Dry?: Yes / (No)

Comments / Notes:

Ground Water Field Sampling Sheet

Project: WY DEQ-104
Date: 9/23
Client: WY DEQ
Technicians: AEM
Well No.: PW-8/MW-25
Casing Type/Dia.: 2"
Measuring Point (MP): TOC
Pump Depth: 40 ft
Static Water Level from MP: 31.96
Well Volume (WV): 1.86
Total Well Depth from MP: 43.40
Total to Evacuate (WVx3): 5.59

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Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
14:18					31.83	Pump on
14:19						H_2O reached surface
14:21	0.56	7.43	16.5	3.36 mS	34.65	1.12 — Very milky
14:25	0.56	7.32	13.5	4.32	35.2	2.24 3.36
14:28	0.56	7.32	13.1	4.78	35.67	1.68 5.04
14:31	0.62	7.31	13.1	4.83	36.39	1.86 6.90
14:34	0.62	7.30	13.5	4.84	36.68	1.86 8.76
14:37	Parameters stable collecting samples					1.86 10.62
14:55	Final sample collected, pump off					
	Sample H_2O cloudy with a light yellowish hue					

SAMPLE Name: AEM Date: 9/23/15 Time: 14 50

Total Minutes Pumped: 19 + Sampling
Total Gallons Pumped: 10.62 + Sampling
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

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Project	WY DEQ 104 / ANC 102	Date	9-23-15
Client	ANC	Technicians	GHS, AEM
Well No.	PW-9 / MW-26	Casing Type/Dia.	2" PVC
Measuring Point (MP)	T.O.C.	Pump Depth	~~58' 60'~~ 59'
Static Water Level from MP	54.30	Well Volume (WV)	1.32
Total Well Depth from MP	62.41	Total to Evacuate (WVx3)	3.96

43.63 reading note D.V.2

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
9:00					44.8	
9:04	0.665	7.91	16.5	1465	48.6	2.66 -
9:07	0.45	8.07	13.2	1388	51.3	1.35 4.01
9:10	0.337	7.94	13.0	1371	53.1	1.01 5.02
9:17	0.25	7.90	13.3	1464	55.68	1.75 6.77
9:21	0.25	7.93	13.3	1411	56.45	1.00 7.77
9:24	All Parameters stable, collecting samples					

SAMPLE Name: GHS, AEM Date: 9/23/15 Time: ~~9:50~~ 9:30

Total Minutes Pumped 21
Total Gallons Pumped 7.77

Sample Handling
Type of Analysis

Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Project: WYDEQ104
Date: 9/21/15
Client: ANC
Technicians: JVG
Well No.: PW-10 /MW-27
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~72
Static Water Level from MP: 39.75'
Well Volume (WV): 7.57 gal
Total Well Depth from MP: 86.2'
Total to Evacuate (WVx3): 22.7

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Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
12:35						38.8' w/ pump set
12:40	0.04	7.16	20.2	1964	42.6'	42.6' cloudy
12:45	0.04				42.3'	42.3'
12:49	0.25	7.14	15.7°	2.26	43.05	Increased pump rate
12:55	0.14	7.08	15.8°	2.28	45.60'	Very Dirty
1:02	0.08	6.95	17.8°	2.47	45.00'	
1:09	0.14	6.87	17.4	2.58	44.0'	Increased pump rate slightly
1:16	0.125	6.90	15.6	2.67	45.1'	
1:23	0.10	6.88	17.1	2.69	44.1'	
☆☆☆ samples @			1:26	pm ☆☆		
		Pump	OFF	@ 1:42		

SAMPLE Name: John Goin Date: 9/21/15 Time: 1:26 pm

Total Minutes Pumped: 67
Total Gallons Pumped: ~ 7.2
Sample Handling:
Type of Analysis:
Method: Bailer (Pump) Grab
Bailed/Pumped Dry?: Yes (No)

Comments / Notes:

Ground Water Field Sampling Sheet

Project: WYDEQ104
Date: 9/22/15
Client: ANC
Technicians: JVG
Well No.: PW-12 /MW-28
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~48'
Static Water Level from MP: 40.87'
Well Volume (WV): 2.50 GAL
Total Well Depth from MP: 56.20'
Total to Evacuate (WVx3): 7.50 GAL

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Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
3:10	0.75	6.26	17.1	4.44	41.38'	Initial Rate
3:15	1.31	6.34	11.5	4.60		
3:20	1.31	6.31	11.4	4.51	41.41'	
3:25	1.31	6.32	11.1	4.59	41.40'	clear
3:30	1.31	6.31	11.1	4.55		
	***	Sampled		@ 3:30 pm		
		Pump OFF @		3:38		

SAMPLE Name: JOHN GOIN Date: 9/22/15 Time: 3:30 pm

Total Minutes Pumped: 28
Total Gallons Pumped: 33.9 GAL
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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Fort Collins, CO 80525

Project: WYDEQ104
Date: 9/22/~~[illegible]~~
Client: ANC
Technicians: JVG
Well No.: ~~[illegible]~~ - PW-13 /MW-29
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~ 75'
Static Water Level from MP: 67.13
Well Volume (WV): 2.31 GAL
Total Well Depth from MP: 81.30
Total to Evacuate (WVx3): 6.93 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
4:25	1.125	7.06	18.4	1244	69.45	66.96' w/ pump
4:30	1.125	7.13	12.0	1265	69.85	increased flow
4:33	1.31	7.07	11.7	1250	70.32	very dirty (gray)
4:38	1.31	7.03	11.5	1247	70.53	
4:42	1.31	7.02	11.5	1246	70.57	
4:47	1.31	7.01	11.5	1247	70.62	still dirty
4:50	1.31	7.01	11.5	1241	70.67	clearing a little
		samples @	4:50			
			Pump increased to 100% flow @		5:05	
					5:15	still @ 70.71
					Pump OFF	@ 5:20 @ 70.71

Time	H_2O Lvl	Time	H_2O Lvl		
5:24	69:01	5:39	67.20	~~69.01~~	Well off, 200 ft x 3/8 inch hose flowed back into well before this point
5:25	68:15	5:44	67.19	~~68.15~~	
5:26	67.81	5:49	67.18	~~67.81~~	
5:27	67.60	5:54	67.17	~~67.60~~	
5:28	67.46	5:59	67.165	~~67.46~~	
5:29	67.38	6:04	67.16	~~67.38~~	
5:30	67.34	6:09	67.165	~~67.34~~	
5:32	67.29	6:14	67.15		
5:34	67.25	6:19	67.15		
5:36	67.22	6:24	67.15		

SAMPLE Name: JOHN GOHN Date: 9/22/15 Time: 4:50 pm

Total Minutes Pumped: 40
Total Gallons Pumped: 52.4 GAL
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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Fort Collins, CO 80525

oject: WYDEQ104
Date: 9/22/15
Client: ANC
Technicians: JVG
Well No.: PW-14 /MW-30
Casing Type/Dia.: 2" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~74
Static Water Level from MP: 65.34'
Well Volume (WV): 2.61 GAL
Total Well Depth from MP: 81.33'
Total to Evacuate (WVx3): 7.82 GAL

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
9:50	0.69	6.91	13.1	4.14	65.82	
9:56	0.81	6.92	11.1	4.30	66.00'	increased pump rate slightly
10:02	0.81	6.94	10.9	4.33	66.03'	cleared up
10:06	"	6.92	10.8	4.33	66.11'	
10:12	"	6.95	10.9	4.34	66.15'	
	~~	Samples @		10:15 am	~~~~	
		Pump	OFF @	10:23 am		

SAMPLE Name: JOHN GOIN Date: 9/22/15 Time: 10:15 AM

Total Minutes Pumped: 33
Total Gallons Pumped: ~26 GAL
Sample Handling:
Type of Analysis:
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Lidstone and Associates, Inc.
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Fort Collins, CO 80525

Project: WY DEQ - 104
Date: 9/24
Client: WY DEQ
Technicians: AEM
Well No.: PW-15 /MW-31
Casing Type/Dia.: 2"
Measuring Point (MP): TOC
Pump Depth: —
Static Water Level from MP: 23.26
Well Volume (WV): 1.48 gal
Total Well Depth from MP: 32.32
Total to Evacuate (WVx3): 4.43 gal

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
10:35						
10:52	3/4 g				~24.05	
10:53					24.45	3½ bailers
10:55	5.75 gt.			mS	24.80	
11:06	6 gt	6.89	12.2	4.20 ~~mS~~		@ 1 casing volume
11:13						full bailer
11:14						Mostly full
11:15	3 gal					Mostly full
11:16		6.97	11.5	4.21	25.31	
11:25	4 gal	7.13	10.9	4.46		Production ↓ 4, ½ full bailers in a row
11:33	4.5 gal			~~4.2~~		3 casing volumes
11:34					27.99	
11:38		7.23	11.7	4.57	1st slug from 1st sample bailer	Bailer's 1/3 full
11:41	3 casing volumes removed, begin sampling					
12:01	Final sample collected					
12:03		7.40	11.3	5.21		Left over slug from final bailer

SAMPLE Name: PW-15 Date: 9/24 Time: 12:01

Total Minutes Pumped: —
Total Gallons Pumped: —
Sample Handling: —
Type of Analysis: —
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Ground Water Field Sampling Sheet

Project: WYDEQ104
Date: 9/22/15
Client: ANC
Technicians: JVG
Well No.: TP2-3
Casing Type/Dia.: 5" PVC
Measuring Point (MP): T.O.C.
Pump Depth: ~125'
Static Water Level from MP: 107.48'
Well Volume (WV): 84.43 Gal
Total Well Depth from MP: 190.25'
Total to Evacuate (WVx3): 253.28 Gal

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Fort Collins, CO 80525

Volume factor: 2" 0.163 gal/ft
4" 0.653 gal/ft
5" 1.02 gal/ft
6" 1.5 gal/ft
1 L = 1000 ml = 0.2642 gal

EVACUATION/STABILIZATION TEST DATA

Time	Pumping Rate (GPM)	pH (±0.1)	Temp (°C) (±1°)	Specific Conductance (uS/cm) (±3%)	Drawdown (Depth to Water, nearest 0.01 ft)	Comments
~~11:12~~						
11:25	0.56					Increased flow rate
11:28	1.03	7.18	12.4	1675	107.72	
11:33	0.98	7.21	11.6	1686	107.75'	Increased " " slightly
11:37	1.17	7.22	11.5	1689	107.80'	
11:42	1.17	7.19	11.5	1695	107.81'	clear
11:47	0.81	7.20	11.5	1732	107.75'	flow slowed ??
11:51			Flow	stopped		
~~1:07~~						
13:56					107.44	Static H_2O
14:05					107.47	Pump on
14:07	~~0.28~~	7.19		1684		flow reached surface
14:14		7.19	13.4	1597		
14:18		7.18	13.4	1790		
14:22		7.10	12.4	1931	107.80'	changed pH/cond meter
14:26		7.07	13.6	1938		
14:30	0.44	7.19	13.2	1666		
14:34	0.44	7.18	13.6	1680		
14:37		7.19	13.8	1737		
14:47	0.41	7.12	14.0	18.94	107.65	

SAMPLE Name: JOHN GOIN Date: 9/22/15 Time:

Total Minutes Pumped
Total Gallons Pumped
Sample Handling
Type of Analysis
Method: Bailer / Pump / Grab
Bailed/Pumped Dry?: Yes / No

Comments / Notes:

Appendix G

Well Recovery Test Analysis Report

Lidstone and Associates, Inc.
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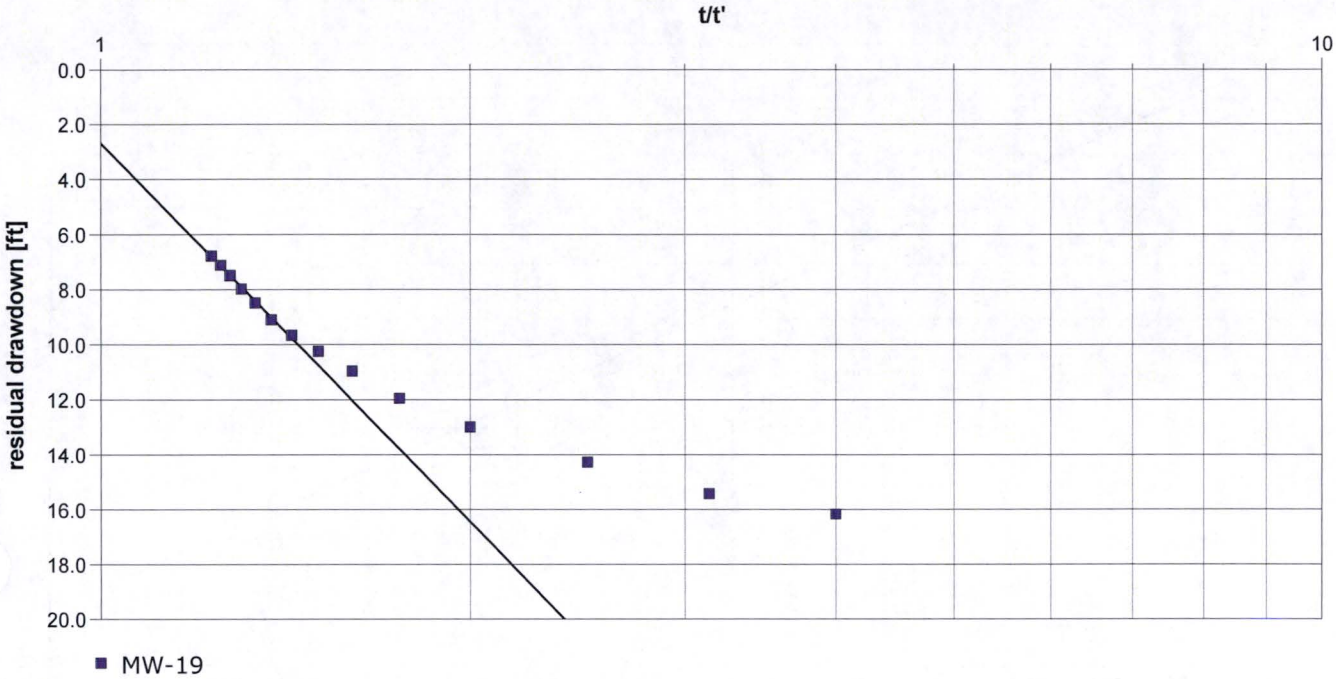
Lidstone and Associates, Inc. A Wenck Company 4025 Automation Way, Bldg. E Fort Collins, CO 80525 www.lidstone.com	**Pumping Test Analysis Report**
	Project: ANC Tailings
	Number: WYDEQ104
	Client: Wyoming Department of Environmental Quality

Location: Gas Hills, WY	Pumping Test: MW-19 Recovery Test	Pumping Well: MW-19
Test Conducted by: John Goin		Test Date: 8/4/2015
Analysis Performed by: M. Stacy	Theis Recovery	Analysis Date: 8/24/2015
Aquifer Thickness:	Discharge: variable, average rate 1.03 [U.S. gal/min]	

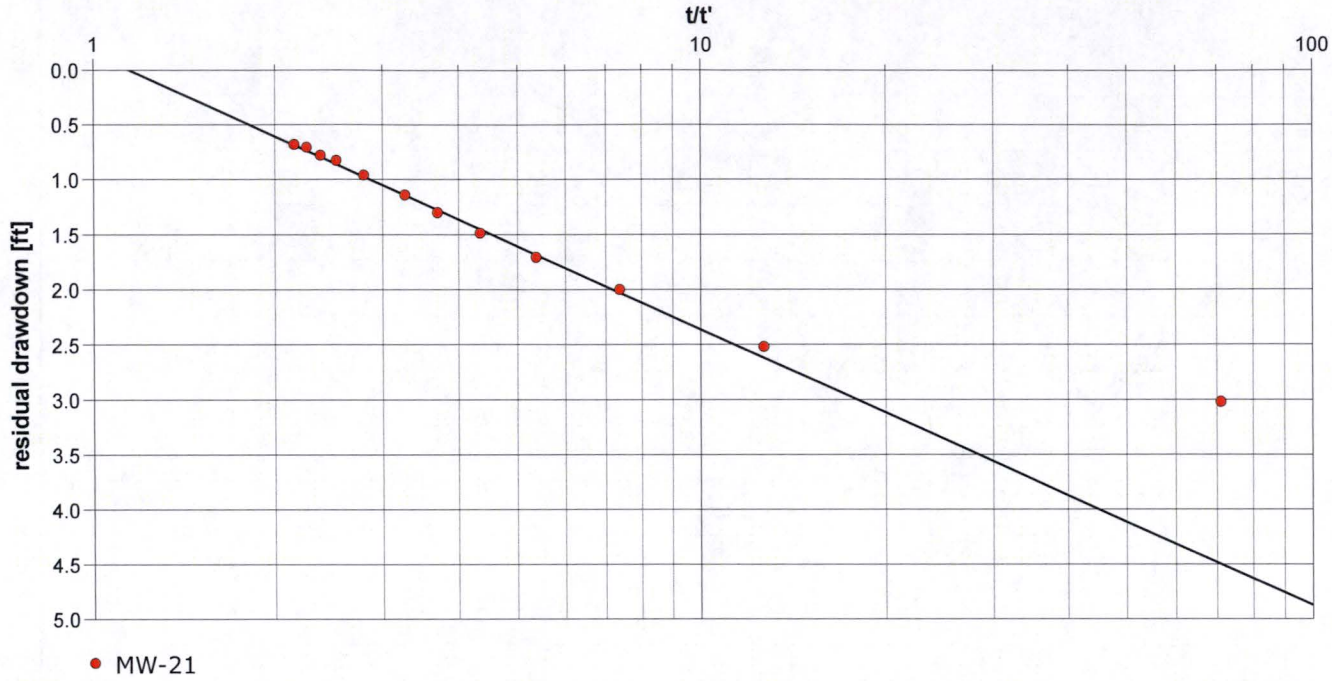


Calculation using THEIS & JACOB

Observation Well	Transmissivity [U.S. gal/d-ft]	Radial Distance to PW [m]	
MW-19	5.94×10^0	0.03	

Lidstone and Associates, Inc. A Wenck Company 4025 Automation Way, Bldg. E Fort Collins, CO 80525 www.lidstone.com	**Pumping Test Analysis Report**
	Project: ANC Tailings
	Number: WYDEQ104
	Client: Wyoming Department of Environmental Quality

Location: Gas Hills, WY	Pumping Test: MW-21 Recovery Test	Pumping Well: MW-21
Test Conducted by: John Goin		Test Date: 8/4/2015
Analysis Performed by: M. Stacy	Theis Recovery	Analysis Date: 8/24/2015
Aquifer Thickness: 6.71 ft	Discharge: variable, average rate 0.14 [U.S. gal/min]	

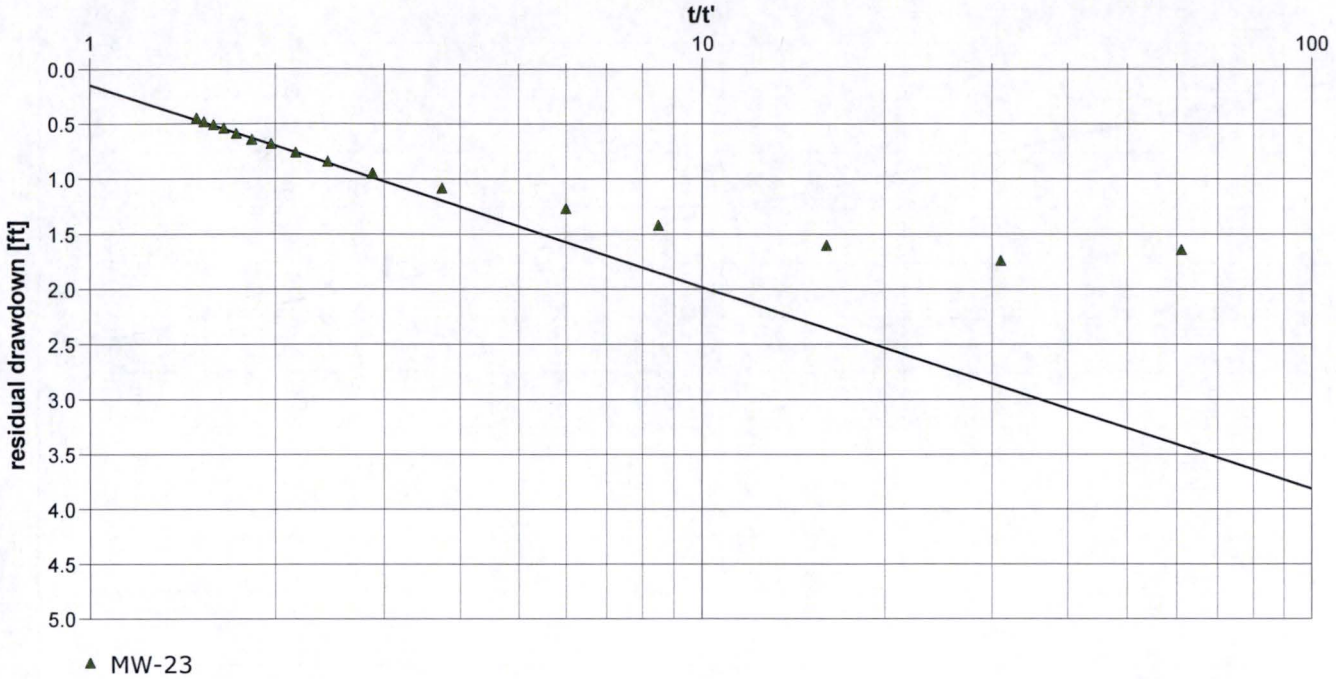


Calculation using THEIS & JACOB

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Radial Distance to PW [m]	
MW-21	1.47×10^{1}	2.19×10^{0}	0.03	

Lidstone and Associates, Inc. A Wenck Company 4025 Automation Way, Bldg. E Fort Collins, CO 80525 www.lidstone.com	**Pumping Test Analysis Report**
	Project: ANC Tailings
	Number: WYDEQ104
	Client: Wyoming Department of Environmental Quality

Location: Gas Hills, WY	Pumping Test: MW-23 Recovery Test	Pumping Well: MW-23
Test Conducted by: John Goin		Test Date: 8/5/2015
Analysis Performed by: M. Stacy	Theis Recovery	Analysis Date: 8/24/2015
Aquifer Thickness: 7.75 ft	Discharge: variable, average rate 0.56 [U.S. gal/min]	

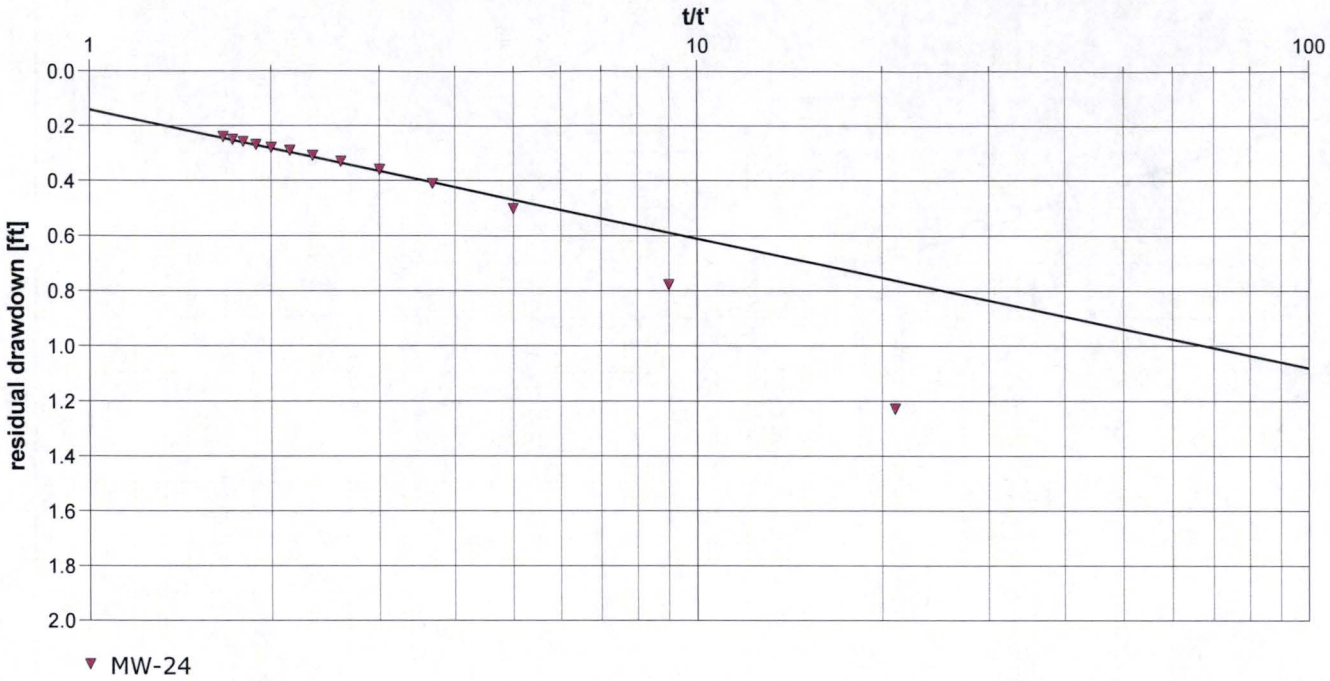


Calculation using THEIS & JACOB

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Radial Distance to PW [m]	
MW-23	8.06×10^1	1.04×10^1	0.03	

Lidstone and Associates, Inc. A Wenck Company 4025 Automation Way, Bldg. E Fort Collins, CO 80525 www.lidstone.com	**Pumping Test Analysis Report**
	Project: ANC Tailings
	Number: WYDEQ104
	Client: Wyoming Department of Environmental Quality

Location: Gas Hills, WY	Pumping Test: MW-24 Recovery Test	Pumping Well: MW-24
Test Conducted by: John Goin		Test Date: 8/4/2015
Analysis Performed by: M. Stacy	Theis Recovery	Analysis Date: 8/24/2015
Aquifer Thickness: 2.07 ft	Discharge: variable, average rate 0.28 [U.S. gal/min]	

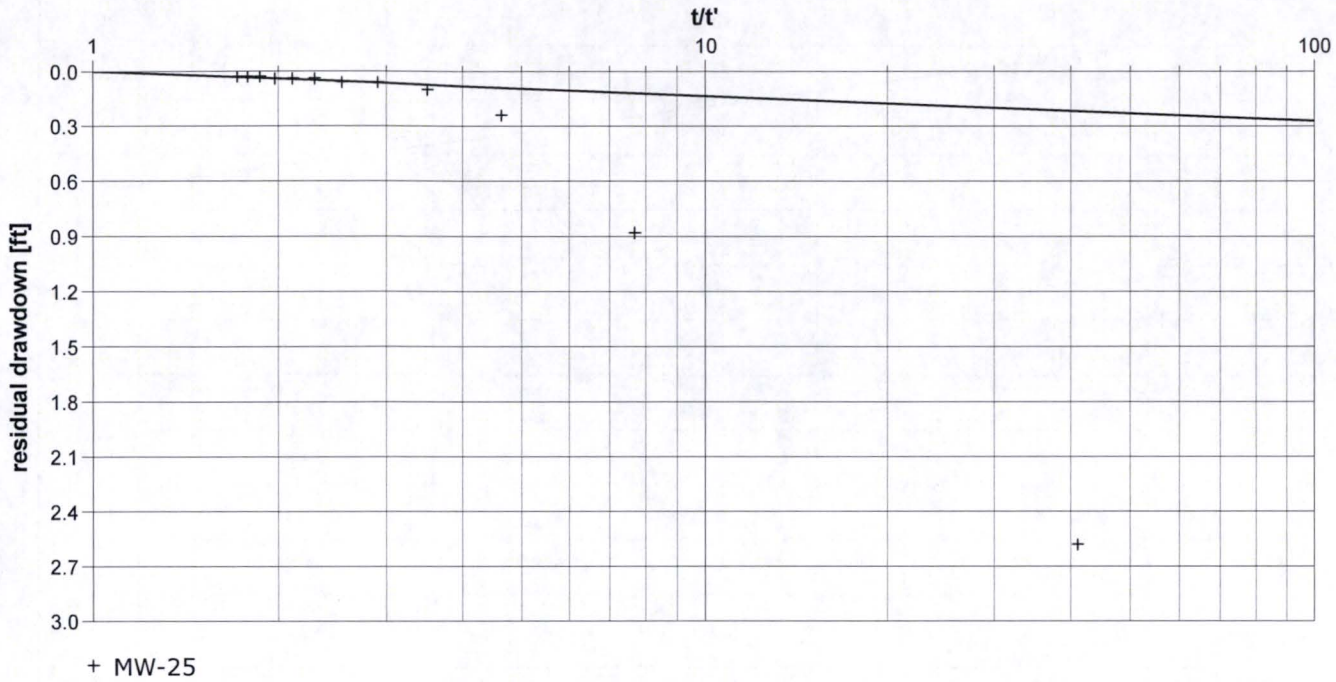


Calculation using THEIS & JACOB

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Radial Distance to PW [m]	
MW-24	1.57×10^2	7.59×10^1	0.03	

Lidstone and Associates, Inc. A Wenck Company 4025 Automation Way, Bldg. E Fort Collins, CO 80525 www.lidstone.com	**Pumping Test Analysis Report**
	Project: ANC Tailings
	Number: WYDEQ104
	Client: Wyoming Department of Environmental Quality

Location: Gas Hills, WY	Pumping Test: MW-25 Recovery Test	Pumping Well: MW-25
Test Conducted by: John Goin		Test Date: 8/5/2015
Analysis Performed by: M. Stacy	Theis Recovery	Analysis Date: 8/24/2015
Aquifer Thickness: 8.98 ft	Discharge: variable, average rate 0.44 [U.S. gal/min]	

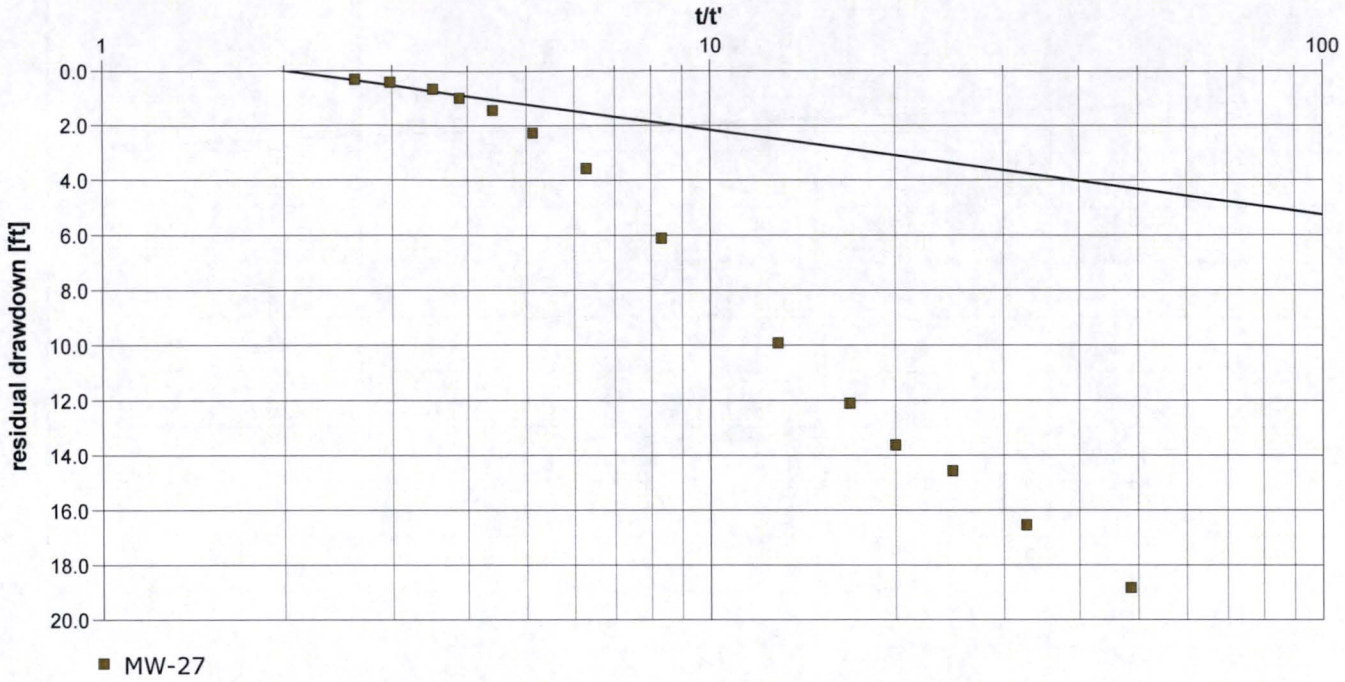


Calculation using THEIS & JACOB

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Radial Distance to PW [m]	
MW-25	8.46×10^2	9.43×10^1	0.03	

Lidstone and Associates, Inc. A Wenck Company 4025 Automation Way, Bldg. E Fort Collins, CO 80525 www.lidstone.com	**Pumping Test Analysis Report**
	Project: ANC Tailings
	Number: WYDEQ104
	Client: Wyoming Department of Environmental Quality

Location: Gas Hills, WY	Pumping Test: MW-27 Recovery Test	Pumping Well: MW-27
Test Conducted by: John Goin		Test Date: 8/6/2015
Analysis Performed by: M. Stacy	Theis Recovery	Analysis Date: 8/24/2015
Aquifer Thickness: 13.00 ft	Discharge: variable, average rate 0.5 [U.S. gal/min]	

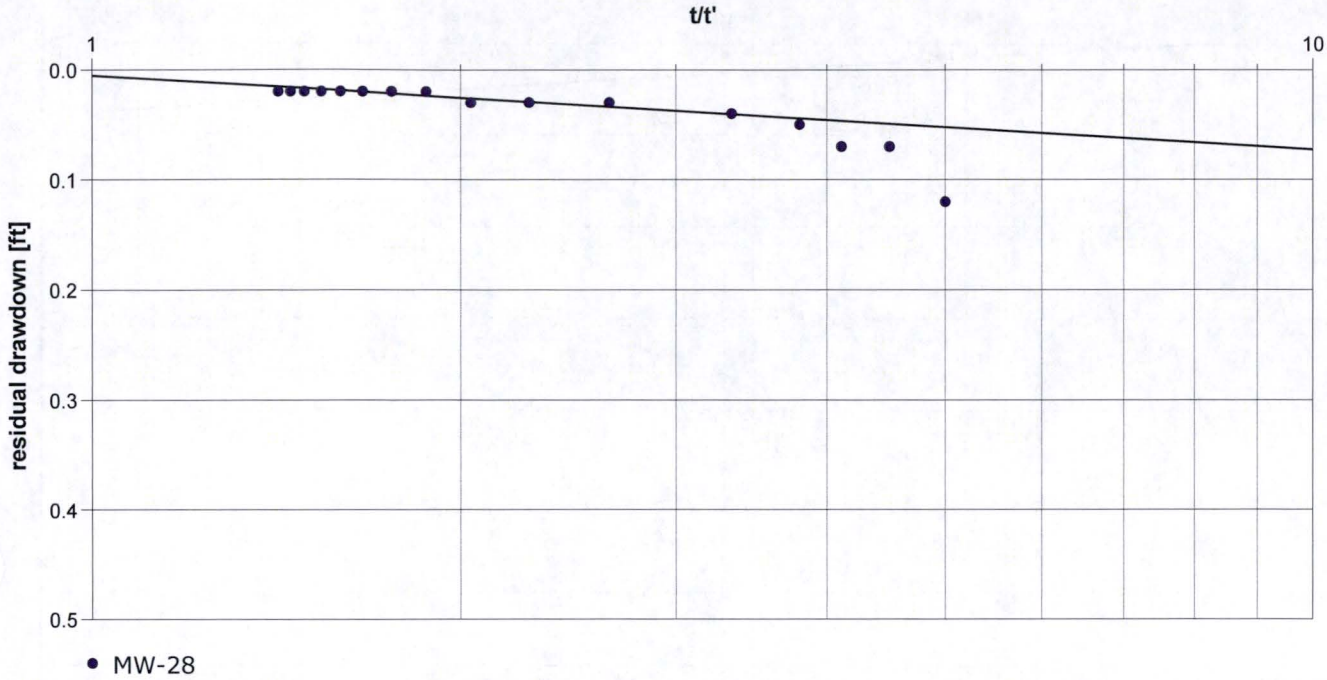


Calculation using THEIS & JACOB

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Radial Distance to PW [m]	
MW-27	4.26×10^{1}	3.28×10^{0}	0.03	

Lidstone and Associates, Inc. A Wenck Company 4025 Automation Way, Bldg. E Fort Collins, CO 80525 www.lidstone.com	**Pumping Test Analysis Report**
	Project: ANC Tailings
	Number: WYDEQ104
	Client: Wyoming Department of Environmental Quality

Location: Gas Hills, WY	Pumping Test: MW-28 Recovery Test	Pumping Well: MW-28
Test Conducted by: John Goin		Test Date: 8/6/2015
Analysis Performed by: M. Stacy	Theis Recovery	Analysis Date: 8/24/2015
Aquifer Thickness: 20.00 ft	Discharge: variable, average rate 1.125 [U.S. gal/min]	

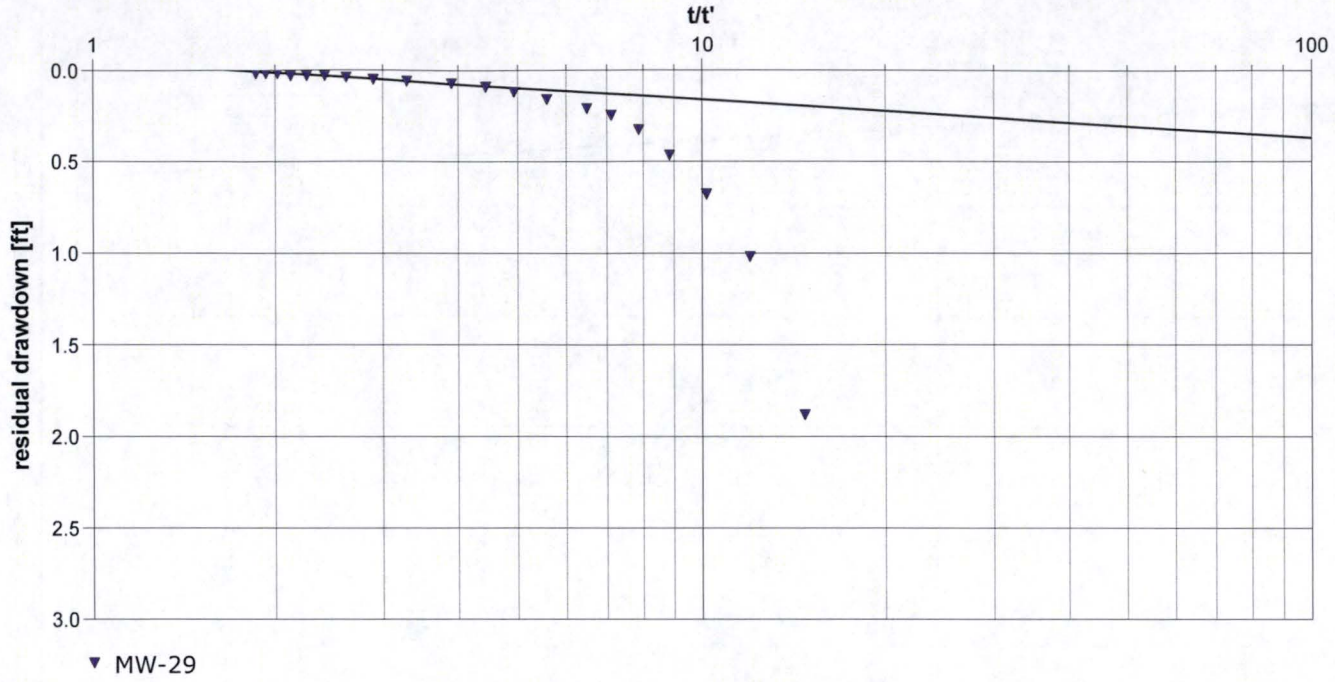


Calculation using THEIS & JACOB

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Radial Distance to PW [m]	
MW-28	4.37×10^3	2.19×10^2	0.03	

Lidstone and Associates, Inc. A Wenck Company 4025 Automation Way, Bldg. E Fort Collins, CO 80525 www.lidstone.com	**Pumping Test Analysis Report**
	Project: ANC Tailings
	Number: WYDEQ104
	Client: Wyoming Department of Environmental Quality

Location: Gas Hills, WY	Pumping Test: MW-29 Recovery Test	Pumping Well: MW-29
Test Conducted by: John Goin		Test Date: 9/22/2015
Analysis Performed by: M. Stacy	Recovery Test	Analysis Date: 9/29/2015
Aquifer Thickness: 15.12 ft	Discharge: variable, average rate 1.31 [U.S. gal/min]	

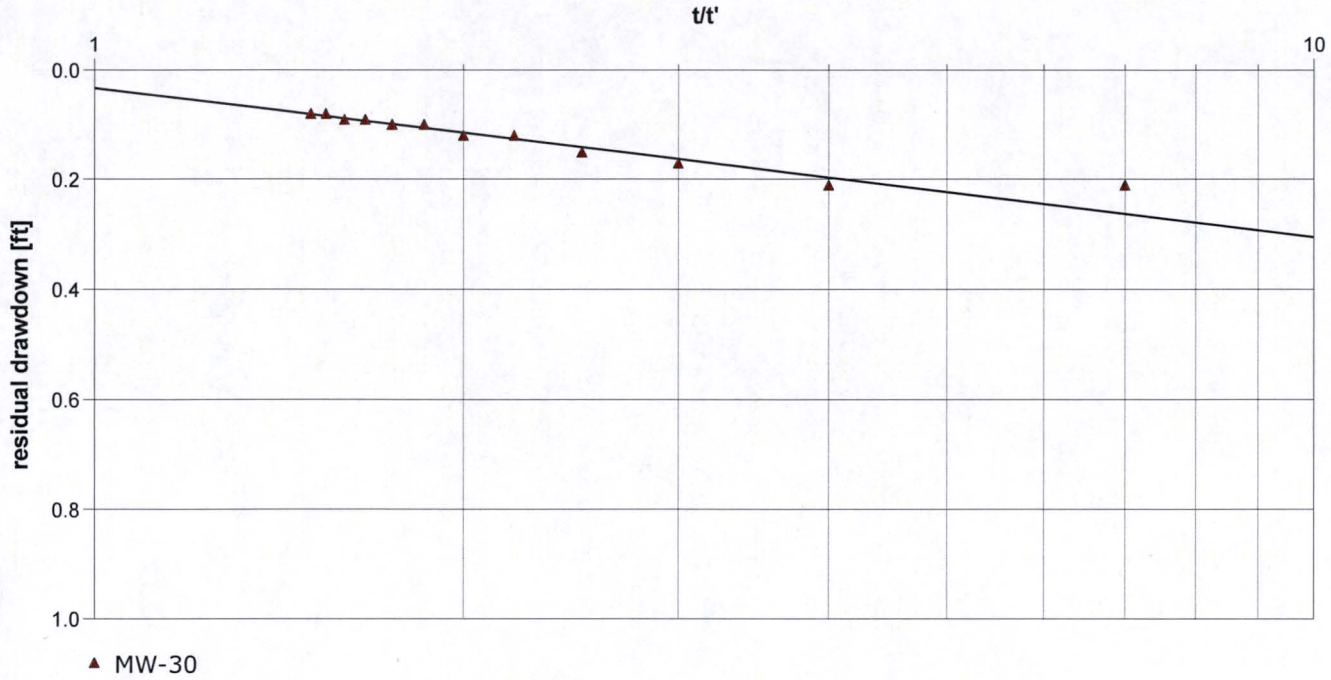


Calculation using THEIS & JACOB

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Radial Distance to PW [m]	
MW-29	1.64×10^3	1.08×10^2	0.03	

Lidstone and Associates, Inc. A Wenck Company 4025 Automation Way, Bldg. E Fort Collins, CO 80525 www.lidstone.com	**Pumping Test Analysis Report**
	Project: ANC Tailings
	Number: WYDEQ104
	Client: Wyoming Department of Environmental Quality

Location: Gas Hills, WY	Pumping Test: MW-30 Recovery Test	Pumping Well: MW-30
Test Conducted by: John Goin		Test Date: 8/3/2015
Analysis Performed by: M. Stacy	Theis Recovery	Analysis Date: 8/25/2015
Aquifer Thickness: 16.53 ft	Discharge: variable, average rate 0.875 [U.S. gal/min]	



Calculation using THEIS & JACOB

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Radial Distance to PW [m]	
MW-30	8.50×10^2	5.14×10^1	0.03	