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**CLEARWELL PROCESS WATER RELEASE AT  
UNITS 1&2 PIPELINE DRAIN POND  
CLEANUP REPORT**

**CVID 23695**

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# **CLEARWELL PROCESS WATER RELEASE AT UNITS 1&2 PIPELINE DRAIN POND CLEANUP REPORT**

**CVID 23695**

## **1.0 INTRODUCTION**

At about 0930 on December 3, 2021, Talen Montana, LLC Colstrip Steam Electric Station (Colstrip SES) operators identified a spill of water from the Units 1&2 Pipeline Drain Pond (1&2 Pipeline Drain Pond). The 1&2 Pipeline Drain Pond is an HDPE lined pond with a capacity of approximately 1 million gallons used to hold water when pipeline maintenance is necessary.

Water accumulated in the 1&2 Pipeline Drain Pond when a valve was accidentally left open during operations to remove water from B Cell at the 1&2 Stage Two Evaporation Pond (STEP). Operators were in the process of removing the water from B Cell in anticipation of upcoming STEP closure activities. The drain valve on the pipeline had been opened in preparation for winter layup. The pipeline was placed into service not recognizing that the drain valve was open. Water flowed from the open drain valve and eventually overflowed the Pipeline Drain Pond.

Water from STEP B Cell that was released is a combination of captured groundwater, decant water, and precipitation that was characterized by a pH of 4.4 and a specific electrical conductance (SC) of 36,591  $\mu\text{mhos/cm}$ , as measured and recorded in the field on the day of the overflow.

The pipeline was shut down upon discovery of this situation, the drain valve was closed, the drain pond level was lowered, and cleanup of spilled water was conducted. Berms/sandbags were placed in the area where the Pipeline Drain Pond was overflowing to contain the spill as soon as possible.

Work was initiated immediately to collect pooled water into trucks and transport it to lined process ponds. It is estimated that 175,000 gallons of process water was recovered from the Pipeline Drain Pond overflow. This estimate was made based on the capacity and number of truckloads of water that were recovered during response activities.

This report was prepared at the request of Montana Department of Environmental Quality (MDEQ) to summarize events surrounding the incident, the immediate actions taken in response to the spill, and results of the assessment of potential impacts the spill may have had on local groundwater and surface water (MDEQ, January 2022). MDEQ assigned identification number CVID 23695 to the 1&2 Pipeline Drain Pond release. The report is organized according to MDEQ Enforcement Program Standardized Cleanup Report for Spills or Releases that Impact Soil (MDEQ, June 2021). Site contact information is found in Section 2.0. Site Description and Site History are found in Sections 3.0 and 4.0, respectively. The Hydrogeologic Conditions surrounding the 1&2 Pipeline Drain Pond, including Geology and Hydrology are described in Section 5.0. Assessment, Remedial, and Sampling Activities conducted in response to the release are described in Section 6.0; while results of the sampling analysis are found in Section 7.0. Results of the assessment are further summarized in Section 8.0, before providing Conclusions and Recommendations in Section 9.0.

As described herein, the conclusion reached at the end of preliminary assessment and remedial activities is that no impacts to surface water are attributable to the release. Impacts to groundwater are apparent but variable based on monitoring well/piezometer depth and proximity to the 1&2 Pipeline Drain Pond release. Temporary groundwater capture by pumping at 917A will be initiated on 2/10/22 in response to moderate but notable increasing sulfate and boron concentrations observed at this well. Pumping at 917A will take advantage of a preferential subsurface flow path that is thought to exist since no overland flow from the release reached 917A. Aside from pumping at 917A, no additional actions other than those prescribed by MDEQ (January 2022) are recommended for the 1&2 Pipeline Drain Pond release site. Actions that are planned in follow up to MDEQ correspondence and assessment actions described in this report are outlined in Section 9.0.

Tables and Figures used to support the discussion provided in this cleanup report are listed at end of each section, where applicable. Maps produced as prescribed in the Standardized Cleanup Report Format (MDEQ, June 2021) are referenced throughout this report and are detailed in Section 10.0. A description of photos taken during the cleanup response is provided in Section 11.0. Supporting documentation, including soil boring logs and the complete laboratory analytical reports, are provided as Appendices A and B, correspondingly.

## 2.0 SITE CONTACT INFORMATION

The responsible party for the 1&2 Pipeline Drain Pond Release described in this report is:

Talen Montana  
PO Box 38  
Colstrip, Montana 59323

The contact person for the 1&2 Pipeline Drain Pond Release described in this report is:

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The release occurred on land owned by Talen Montana, Puget Sound Energy, Portland General Electric, Northwestern Energy, Avista, and PacifiCorp. A portion of the release flowed onto the Burlington Northern Railroad right-of-way. The landowners are joint owners of the Colstrip Power Plant. Units 1&2 are owned by Talen Montana and Puget Sound Energy and facilities such as the Units 1&2 Pipeline Drain Pond are operated in support of those Units.

### 3.0 SITE DESCRIPTION

The 1&2 Pipeline Drain Pond release occurred approximately one mile north of the City of Colstrip in Rosebud County, Montana. The highway nearest to the release is Montana State Highway 39; the release occurred east of the highway near mile marker 24. The release occurred primarily from the northwest and southwest corners of the 1&2 Pipeline Drain Pond, which is in Township 20 North, Range 41 East, Section 28 NENE. Coordinates of the 1&2 Pipeline Drain Pond release are as follows:

Release Location	Latitude (decimal degrees)	Longitude (decimal degrees)
1&2 Pipeline Drain Pond SW Corner	N 45.9017285°	E -106.6322655°
1&2 Pipeline Drain Pond NW Corner	N 45.9019830°	E -106.6324248°

Coordinates were estimated by pinning approximate locations of the southwest and northwest corners of the 1&2 Pipeline Drain Pond in the Google Earth Pro user interface. A detailed depiction of the extent of the surface flows that occurred due to the release is provided in Site Map 1.



## 4.0 SITE HISTORY

The incident occurred at the 1&2 Pipeline Drain Pond, which is a water holding structure that is operated as part of the process water circuit at the Colstrip SES. However, this pond is in a pasture and isolated from other parts of the facility. Aside from the 1&2 Pipeline Drain Pond, the pasture is vacant.

## **5.0 HYDROGEOLOGIC CONDITIONS**

### **5.1 GEOLOGY**

Geology at the release site consists of alluvial deposits of East Fork Armells Creek. The alluvium generally consists of various mixtures of clay, silt, sand, and gravel, commonly in a fining-upward depositional sequence. That is, basal gravels typically overlie Fort Union Bedrock, and sediments grade upward into poorly sorted sands, silts, and clays. Near surface deposits include silty clay to clayey silt. Representative lithology from soil boring/well logs is included for three monitoring wells completed in the area of the release (P-11, P-12, and 917A) in Appendix A.

Note that the soil boring logs indicate the presence of silt/clay in approximately the top 10-12 feet of alluvium. Fine-grained sediments (clay and silt), coupled with potentially frozen subsurface conditions likely limited infiltration and allowed for the response team to recover most of water that was released from the ground surface. The response is further described in Section 6.0.

### **5.2 HYDROLOGY**

East Fork Armells Creek (EFAC) flows from south to north and is located approximately 500 feet east of the 1&2 Pipeline Drain Pond release. There are gaining and losing reaches in the Creek suggesting that groundwater is contributing to the flow in some areas and receiving recharge from the Creek in other areas. Based on recent stream flows recorded during a synoptic run that is conducted annually on EFAC each spring, it is typical for the reach adjacent to the 1&2 Pipeline Drain Pond (from AR-1NF to AR-8) to be a gaining reach. Flow estimates made on 12/9/2021 were indicative of gaining conditions. A flow of 123 gpm was estimated at upstream site AR-1NF, and a flow of 571 gpm was estimated at AR-8 on 12/9/2021. However, due to freezing conditions that prevailed during the release response, the ability to obtain an accurate stream flow was impacted by ice jams on 12/9/2021, particularly at the downstream site (AR-8). EFAC was completely covered with ice and snow during a monitoring event conducted on 1/10/2022; thus, no stream flows were recorded. Stream flows were measured and recorded during a subsequent monitoring event on 1/18/2022. Technicians accessed the

stream at AR1-NF by drilling holes through the ice; and the ice jam at AR-8 had relieved itself naturally by this time. Flows estimated on 1/18/2022 were 240 gpm at upstream site AR1-NF and 269 gpm at downstream site AR-8.

The nearest groundwater wells to the 1&2 Pipeline Drain Pond release are shallow piezometers and monitoring wells completed on land owned by Colstrip SES, as described previously in Section 3.0. Talen routinely monitors piezometers SPN, SPS, SP3, and well 917A as part of their water resources monitoring program. Wells P-11 and P-12 are owned and monitored, less frequently, by the Montana Bureau of Mines and Geology. The depth to groundwater was measured and recorded at these six (6) wells/piezometers near the release site in December 2021. The location of wells/piezometers used for water level and groundwater quality monitoring is shown in Site Map 2. A summary of groundwater monitoring well locations, depths to groundwater, and groundwater level elevations is shown in Table 5-1. Groundwater in EFAC alluvium near the 1&2 Pipeline Drain Pond is shallow. Depths to groundwater ranged from 2.37 feet below ground surface (ft-bgs) at SPN to 9.94 ft-bgs at 917A on December 8, 2021. Groundwater levels recorded after the release are within the historical range of the hydrograph at each of the monitoring wells/piezometers. However, water levels at shallow piezometers SPS, SPN, and SP3 have declined since the release as a result of successive purging for groundwater sample collection. Water levels are very slow to recover in piezometers completed in the near surface clay and silt deposits. Hydrographs of the monitored groundwater wells/piezometers are included in Figure 5-1.

The presence of groundwater in the vicinity of the spill is characterized by two different depth intervals. Shallow perched groundwater may be present in silty clay to clayey silt near ground surface. Vertical flow from this interval is restricted by the fine-grained nature of the surficial sediments and topsoil. Frozen conditions existed at the time of the release that further restricted vertical infiltration/percolation of water to deeper horizons. Coarser alluvial deposits underlie the fine-grained surficial sediments. The vast majority of shallow groundwater in the spill area is conveyed in the gravel unit. Flow in the alluvium is northward and is contained within the valley margins near East Fork Armells Creek. Although the water table is suggestive of connection between the shallow and deeper alluvial deposits, the shallow units contribute only

miniscule amounts to groundwater flow. This can be demonstrated by the extremely low yield exhibited by the shallow piezometers, which suggests very low hydraulic conductivity. However, it is possible that an increased hydraulic connection between shallow fine-grained sediments and deeper water-bearing gravels exists along buried utility corridors. Trenches dug to install underground utilities may extend vertically across the silt/gravel contact leading to a pronounced vertical connection; and incomplete compaction around buried pipelines can create a horizontal conduit for groundwater flow. Such pipelines are buried in the area of the release, trending north to south parallel to Highway 39.

Groundwater flow in the alluvium follows the EFAC drainage, generally flowing north/northwest at a gradient that is consistent with the topographical gradient. A potentiometric map of groundwater level elevations recorded shortly after the 1&2 Pipeline Drain Pond release at monitoring wells and piezometers completed in EFAC alluvium is shown in Site Map 3.

## 6.0 ASSESSMENT, REMEDIAL, AND SAMPLING ACTIVITIES

Cleanup began immediately after the overflow was discovered, with a crew of 25 workers, 4 vacuum trucks, collection pumps, 3 water trucks, a loader, a road grader, and other miscellaneous equipment. The cleanup activity continued until dark on December 3, then resumed at daylight on Saturday December 4 with 20 workers and similar equipment. Work continued Saturday until dark, then resumed at daylight on Sunday December 5 with 20 workers and similar equipment to finish cleanup activities. By Sunday December 5th, all surface water from the spill had been collected and transported to the 1&2 STEP B Cell or the 1&2 B Pond at the Plant Site. STEP B Cell and 1&2 B Pond are double-lined ponds, with underdrain collection, designed and permitted to hold facility process water. Approximately 175,000 gallons of water from the spill was collected and returned to those lined ponds. Overland flow of process water did not visibly enter or impact the nearby EFAC, which was verified by visibly inspecting the area several times daily during the response.

No soil excavation or removal was conducted at the site of the release; thus, no pre-excavation soil sampling or soil sampling was conducted or required (pers. Comm., Sarah Seitz of MDEQ and Gordon Criswell, Talen MT, LLC, January 2022).

The prompt cleanup action taken, coupled with low permeability silty clayey soils and frozen ground conditions, is expected to minimize infiltration and percolation of released process water to the deeper alluvial system. As previously described, groundwater levels were recorded at six monitoring wells in the area of the release (Site Map 3); these wells were also selected as sites for groundwater quality sample collection to evaluate potential impacts from this event. Surface water samples were collected at two sites: AR-1NF, which is located upstream of the 1&2 Pipeline Drain Pond release; and AR-8, which is located downstream of the 1&2 Pipeline Drain Pond Release. All sampling is conducted using methods and procedures described in Talen's Water Resources Monitoring Plan (WRMP, Talen 2020). Sample collection took place in three separate monitoring events on the following dates: 1.) December 8 and 9, 2021; 2.) January 10, 2022; and 3.) January 18, 2022. Sample collection was conducted as follows:

- SPS – Piezometer SPS was bailed dry on 12/8/21 after removing approximately two gallons of groundwater. The piezometer did not recover sufficiently to yield a groundwater sample on a return visit on 12/9/21; thus, no groundwater quality sample was collected from SPS during the initial post-release sampling event. The groundwater level had recovered, and a sample was collected on 1/10/22. A second sample was collected on 1/18/22. Note that SPS was purged dry after approximately 0.5 gallons during the 1/10/22 and 1/18/22 sampling events.
- SPN – Piezometer SPN was bailed dry on 12/8/21 after removing approximately 1.5 gallons of groundwater. A groundwater quality sample was collected on a return visit to SPN on 12/9/21, after allowing the purged well to recover overnight. SPN was sampled after purging dry (~ 0.5 gallons of water removed) on 1/10/22 and 1/18/22.
- SP3 – Piezometer SP3 was bailed dry on 12/8/21 after removing approximately 0.75 gallons of groundwater. A groundwater quality sample was collected on a return visit to SP3 on 12/9/21, after allowing the purged well to recover overnight. SP3 was sampled after purging dry (~ 0.5 gallons of water removed) on 1/10/22 and 1/18/22.
- 917A – Well 917A was sampled using a 12-volt environmental sampling pump at a rate of approximately two gpm in each of the three post-release sampling events. Well 917A was not purged dry during any of the three sampling events but three well casing volumes were removed during each.
- P-11 – Well P-11 was sampled using a 12-volt environmental sampling pump at a rate of approximately two gpm. Samples were collected during each of the 12/8/21, 1/10/22, and 1/18/22 sampling events after purging three well casing volumes.
- P-12 – Well P-12 was sampled using a 12-volt environmental sampling pump at a rate of approximately two gpm. Samples were collected during each of the 12/8/21, 1/10/22, and 1/18/22 sampling events after purging three well casing volumes.

- AR-1NF – A grab sample was collected on 12/8/21 from upstream of a Parshall flume that has been installed in EFAC at this location. A streamflow of 123 gpm was estimated by taking the product of stream surface velocity and flume geometry. AR-1NF was frozen over when visited on 1/10/22; so, a stream flow was not estimated and a sample was not collected. An ice auger was used to access flowing water beneath the ice on 1/18/22. A surface water sample (grab sample) was collected, and flows were recorded using a Marsh-McBirney flow meter through the ice. A flow of 240 gpm was recorded at the time of sampling on 1/18/22.
- AR-8 – A grab sample was collected from AR-8 on 12/9/21. AR-8 is located at a two-foot diameter culvert on EFAC. Stream velocity and submerged culvert cross-sectional area were used to estimate a flow of 571 gpm. As noted above, an ice jam above the culvert at AR-8 accelerated stream velocity and made it difficult to get an accurate volumetric flow. AR-8 was completely covered in snow and ice when the site was visited on 1/10/22, making it inaccessible to sample collection and flow measurement. Open flowing water was observed upstream of the AR-8 culvert on 1/18/22. A grab sample was collected of the flowing water; and a flow of 269 gpm was recorded using a Marsh-McBirney.

Groundwater and surface water quality analytical methodology and results are discussed in Section 7.0 of this report.

An investigation into this event was conducted and corrective actions were identified and implemented to prevent this from occurring in the future. The event was caused by a lack of communication regarding the position of the pipeline drain valve that led to putting the pipeline into service without first checking the position of the drain valve. The drain valve was opened, and the pipeline drained in preparation for winter layup by one crew, then the pipeline was placed into service by a different crew not recognizing the drain valve was open. A review of the procedure for placing the pipeline into service was conducted with all parties involved along with an emphasis on better communication between crews. Appropriate actions were

taken reinforcing the need to follow proper procedures. As an additional precaution, the drain valve has been locked with Operations management controlling the lock to help ensure it is operated properly.



## 7.0 SAMPLE ANALYTICAL RESULTS

Groundwater and surface water quality samples were analyzed by Energy Labs in Billings, MT according to standard methods listed in Table 7-1. The list of constituents included in the initial post-release water quality analyses (samples collected on 12/8/21, 12/9/21, and 1/10/22) is consistent with that commonly used in the STEP area in association with water resources monitoring and includes constituents of concern (COC) identified through the Risk Assessment process (Marietta Canty, LLC, December 2018) as part of the Administrative Order on Consent (AOC) for the STEP. COCs in groundwater at the STEP are boron, sulfate, cobalt, lithium, selenium, and manganese. Cleanup criteria (CC) established for COCs (Marietta Canty, LLC, December 2018) are presented alongside the groundwater quality results in Table 7-1. Note that the parameter list was expanded to include all constituents listed in MDEQ's East Fork Armells Creek Water Quality Sampling and Analysis Plan (MDEQ, May 2021) for a follow up sampling event conducted on January 18, 2022. A summary of results of the three post-release sampling events is as follows:

- SPS – As noted previously, insufficient recovery limited the ability to collect a groundwater quality sample from SPS during the initial (12/8/21 and 12/9/21) post-release sampling event; thus, no results are presented for SPS for this event in Table 7-1. However, results of samples collected at SPS in January 2022 are consistent with groundwater quality observed at SPS prior to the release (Table 7-1). Trend plots of common process water indicator parameters (SC, total dissolved solids [TDS], sulfate, and boron) at SPS, including results from January 2022, are included in Figure 7-1. During the period of record from 2002 to 2021, SC has ranged from 3300 to 6780  $\mu\text{mhos/cm}$ . The most recent fall/winter SC observed at SPS was 4,770  $\mu\text{mhos/cm}$  in November 2020, as compared to SC results of 4,440  $\mu\text{mhos/cm}$  and 4,410  $\mu\text{mhos/cm}$  recorded on 1/10/22 and 1/28/22. The two most recent sulfate concentrations observed upgradient of 1&2 Pipeline Drain Pond at SPS before the release were 2,990 mg/L and 2,710 mg/L in November 2020 and June 2021, respectively. Sulfate concentrations observed after the release at SPS were 3,000 mg/L and 2,930 mg/L. Boron concentrations reported at SPS before the release range from 0.8 to 1.5 mg/L but were

most recently 1.3 mg/L in June 2021. Boron concentrations reported for samples collected after the release were 1.2 mg/L (1/10/22) and 1.3 mg/L (1/18/22).

- SPN – Analytical results from the SPN samples collected on 12/9/21, 1/10/22, and 1/18/22 are found in Table 7-1. The results are also included on a trend plot of SPN data for the period of record from 2002 to 2021 (Figure 7-2). Concentrations of constituents of concern recorded at SPN on 12/9/21 are consistent with (or slightly lower than) those reported prior to the release. The most recent sample collected prior to the release was on 6/16/2021. Sulfate and boron concentrations recorded in June 2021 were 2,320 mg/L and 1.3 mg/L, respectively. Sulfate and boron concentrations recorded in the 12/9/21 sample were 2,310 mg/L and 1.3 mg/L, respectively. Sulfate concentrations increased to 2,450 mg/L and 3,380 mg/L in subsequent samples collected on 1/10/22 and 1/18/22, while boron concentrations remained at 1.3 mg/L or below. The sulfate concentration reported most recently at SPN (3,380 mg/L) is marginally above the CC of 3,000 mg/L; however, the boron concentration (1.3 mg/L) remains below the CC of 4 mg/L. Although greater than the cleanup criteria for alluvium in the STEP area, manganese concentrations at SPN decreased mildly between the spring 2020 sampling event (Mn = 1.17 mg/L) and the 12/9/21 sampling event (Mn = 0.92 mg/L). Manganese concentrations were 1.68 mg/L and 1.31 mg/L in follow up sampling events conducted on 1/10/22 and 1/18/22. Cobalt was not detected (<0.005 mg/L) in the 12/9/21 sample at SPN but was found at concentrations consistent with those observed before the release in the two January samples. A cobalt concentration of 0.007 mg/L was detected in June 2021, which is consistent with the 1/18/22 cobalt result of 0.007 mg/L. Equal lithium concentrations in all three post-release samples (0.11 mg/L) are less than CC of 0.12 mg/L.
- SP3 – Groundwater at SP3 has locally variable concentrations of COCs, when compared to results at other nearby wells/piezometers. This is true of analytical results reported for the post-release samples (Table 7-1) and results in prior samples. The sulfate concentration at SP3 in June 2021 was 5,730 mg/L, which was the only sulfate concentration in the monitoring well network around the 1&2 Pipeline Drain Pond above the CC of 3,000 mg/L at the time of the release. However, sulfate concentrations

decreased in subsequent samples collected after the release to a concentration of 4,020 mg/L on 1/18/22. Similarly, the range of boron concentrations observed at SP3 after the release was 0.9 mg/L to 1.3 mg/L, which is within the range of historical boron observations that span from 0.5 to 1.8 mg/L. Manganese concentrations are locally high at SP3 but have exhibited a consistent decline since this constituent was added to the parameter list in 2020. Manganese concentrations decreased from 16.9 mg/L on 12/8/20 to 5.91 mg/L on 1/18/22. The 12/9/21 cobalt concentration at SP3 was 0.012 mg/L, which is equal to the cobalt CC for alluvium at the STEP and less than the maximum cobalt concentration of 0.016 mg/L recorded in December 2020. Cobalt was non-detect (< 0.005 mg/L) in both the 1/10/22 and 1/18/22 sampling events at SP3. The lithium concentration reported in all three post-release samples at SP3 was 0.08 mg/L, which is less than the STEP CC for lithium in alluvium (0.12 mg/L). While some concentrations of COCs are elevated at SP3 (sulfate and manganese) it is worth noting that they are apparently localized to this site and not resultant from the December 2021 1&2 Pipeline Drain Pond Release. Recall that piezometer SP3 is a low yield well that is bailed dry (after 0.5 to 0.75 gallons) each time it is purged for sampling.

- 917A – Analytical results of samples collected from well 917A on 12/8/21, 1/10/22, and 1/18/22 are included on Table 7-1. The recent results are included on trend plots in Figure 7-4. None of the COCs at 917A exceeded CC for alluvium in the STEP area after the release; however, concentrations of COCs (boron and sulfate) exhibited moderate but notable increases. The sulfate concentration at 917A rose from 1,290 mg/L in a sample collected on 9/16/21 to 2,650 mg/L on 1/18/22. The CC for sulfate in STEP alluvium is 3,000 mg/L. Boron and lithium concentrations reported in December 2021 were identical to concentrations of these two constituents reported in June 2021; boron was reported at 0.9 mg/L and lithium was reported at 0.08 mg/L in consecutive monitoring events. Boron increased to 1.29 mg/L and lithium increased to 0.09 mg/L on 1/18/22. Cobalt was non-detect (< 0.005 mg/L) in all three post-release samples, as it has been since it was added to the parameter list in spring 2020. Increases in some COCs at 917A, while still below CC, could indicate that there is a conduit for process water from the 1&2 Pipeline Drain Pond release to reach the deeper

hydraulically conductive gravel. This is especially likely given that similar impacts from the release were not observed at all the shallow piezometers (i.e. SP3). Since the source of the release has been removed (i.e. collection and removal of process water to 1&2 B Pond), temporary groundwater capture by pumping at well 917A could accelerate flow along the preferential subsurface pathway and collect released water that has percolated to the deeper gravel.

- P-11 – As noted previously, Talen does not routinely sample well P-11. The sample collected after the 1&2 Pipeline Drain Pond release on 12/8/21 was the first collected by Talen at P-11 since 2009. Results of the P-11 samples collected after the release on 12/9/21, 1/10/22, and 1/18/22 are summarized in Table 7-1. Post-release sample results are included on time series plots with the limited data collected at P-11 in Figure 7-5. The sulfate concentration was moderately higher in the 12/8/21 post-release sample (1,700 mg/L) than the 2009 sample (1,310 mg/L); but both results are well below cleanup criteria of 3,000 mg/L. Subsequent sulfate concentrations recorded on 1/10/22 and 1/18/22 were both 1,390 mg/L. The boron concentration reported in the 12/8/21 sample was 0.8 mg/L, as compared to the 2009 concentration of 1.0 mg/L and the cleanup criteria of 4 mg/L. Subsequent boron concentrations recorded on 1/10/22 and 1/18/22 were 0.9 mg/L and 0.83 mg/L. Manganese was marginally above the cleanup criteria, (0.624 mg/L compared to 0.61 mg/L), in the 12/8/21 sample but at or below the CC in the 1/10/22 and 1/18/22 samples (0.61 mg/L and 0.582 mg/L). Cobalt was not detected (< 0.005 mg/L) in any of the post-release samples collected at P-11. Note that P-11 is cross-gradient of the release, and no overland flow was observed in the direction of this well; so, it is not anticipated that any impacts from the release would be present at P-11.
- P-12 – Results of the post-release samples collected at P-12 are included in trend plots of historical data for COCs and select indicator parameters in Figure 7-6. Complete analytical results from P-12 for the 12/8/21, 1/10/22, and 1/18/22 samples are included in Table 7-1. The concentration of sulfate in the post-release sample was 2,330 mg/L, which is near the low end of the historical range and is less than the cleanup criteria of 3,000 mg/L. However, a sulfate concentration of 3,240 mg/L was recorded on 1/18/22.

It is unclear as to whether the recent rise in sulfate above the CC is attributable to the 1&2 Pipeline Drain Pond release or if it is caused by natural variability, as concentrations of other COCs did not trend upward at P-12 after the release. The boron concentration at P-12 on 12/8/21 (2 mg/L) is the highest on record, but is half of the cleanup criteria of 4 mg/L. Further, the boron concentration of 1.8 mg/L recorded on 1/18/22 was equal to the most recent result recorded prior to the 1&2 Pipeline Drain Pond release on 10/13/2009. Manganese was reported at concentrations of 0.76 mg/L, 0.86 mg/L, and 0.74 mg/L in 12/8/21, 1/10/22, and 1/18/22 samples. These concentrations are marginally above the cleanup criteria of 0.61 mg/L but much less than the high of 1.55 mg/L reported in 1981 and are not trending upward. Lithium was detected at a concentration equal to the cleanup criteria for EFAC alluvium (0.12 mg/L) in the 12/8/21 and 1/10/22 samples; but was detected at 0.1 mg/L in the most recent sample collected on 1/18/22. No prior lithium results are available at P-12 for comparison. Cobalt was non-detect (< 0.005 or <0.001) in the post-release samples collected from P-12.

- AR-1NF – Samples of surface water upstream of the 1&2 Pipeline Drain Pond release were collected at site AR-1NF on 12/9/21 and 1/18/22. Water quality samples are typically collected from this site as part of a larger synoptic run sampling event that is conducted annually on EFAC in spring; however, less frequent water quality observations from summer, fall, or winter, are also present in the AR-1NF dataset. Results of the 12/9/21 and 1/18/22 samples collected from AR-1NF are presented in Table 7-2. Note that cleanup criteria are not reported in the table, as constituents of concern were not identified for surface water in the AOC Risk Assessment (Marietta Canty, LLC, December 2018). Sample results are included in historical trend plots for site AR-1NF in Figure 7-7. Concentrations of sulfate, boron, manganese, and lithium were all within the historical ranges after the 1&2 Pipeline Drain Pond release at surface water site AR-1NF on 12/9/21 and 1/18/22. Cobalt and selenium were non-detect (< 0.005 mg/L and < 0.001 mg/L) in the AR-1NF surface water samples.

- AR-8 – Analytical results of the water quality samples collected on 12/9/21 and 1/18/22 downstream of the 1&2 Pipeline Drain Pond release are shown in Table 7-2 and generally exhibit consistency with the upstream sample results (AR-1NF). On 12/9/21, the sulfate concentration in the downstream sample was 2,210 mg/L, as compared to the upstream concentration of 2,100 mg/L. In the follow up sample event conducted on 1/18/22, the sulfate concentration was 2,000 mg/L downstream (at AR-8) but 2,410 mg/L upstream (at AR-1NF). TDS in the downstream AR-8 sample had slightly lower concentrations (3,260 mg/L and 3,130 mg/L) than the upstream sample (3,300 mg/L and 3,290 mg/L) on 12/9/21 and 1/18/22. Concentrations of total boron, lithium, and cobalt at downstream site AR-8 on 12/9/21 were identical to those reported in the surface water sample collected at upstream site AR-1NF. Total boron, lithium, and cobalt concentrations at the two sites were 1.4 mg/L, 0.1 mg/L, and non-detect (< 0.005 mg/L), respectively. The concentration of boron in the sample collected at AR-8 on 1/18/22 was 1.3 mg/L, as compared to the upstream concentration recorded at AR-1NF (boron = 1.44 mg/L). Upstream (AR-1NF) and downstream (AR-8) lithium concentrations were 0.1 mg/L and 0.09 mg/L, respectively, on 1/18/22. Cobalt was non-detect (< 0.005 mg/L) at AR-8 and AR-1NF on 1/18/22. Water quality analytical results at AR-8 are not only consistent with those observed at the upstream site (AR-1NF) but are also consistent with the historical range of observations. AR-8 results from the 12/9/21 and 1/18/21 samples are plotted with data from the period of record in Figure 7-8.

Selenium was only detected in one groundwater sample collected in response to the 1&2 Pipeline Drain Pond release; a concentration of 0.006 mg/L was reported for the sample collected 1/18/22 from well 917A. Selenium was below detection limits (< 0.005 mg/L or < 0.001 mg/L) in all other groundwater and surface water samples collected on 12/8/21 & 12/9/21, 1/10/22, and 1/18/22.

The complete laboratory analytical data packages for the post-release groundwater and surface water quality sampling events conducted on December 8 and 9, 2021, January 10, 2022, and January 18, 2022 are included as Appendix B.

## 8.0 SUMMARY

No petroleum hydrocarbons are associated with the 1&2 Pipeline Drain Pond release. As previously discussed, the release was a mixture of captured groundwater and decant water, which is characterized by potentially high levels of dissolved inorganic constituents. Remedial activities conducted in response to the 1&2 Pipeline Drain Pond release included immediately placing berms/sandbags in the area where the Pipeline Drain Pond was overflowing to contain the spill, quickly lowering the level of the Drain Pond by pumping water out of the Pond into water trucks and hauling it to the 1&2 B Pond. A crew of 20 to 25 workers was deployed with vacuum trucks, collection pumps, water trucks, a loader, a road grader, and other miscellaneous equipment and worked for two days to collect surface water from the release area and take it to the double-lined STEP B Cell and 1&2 B Pond. STEP B Cell and 1&2 B Pond are designed and permitted to hold facility process water. Approximately 175,000 gallons of water from the spill was collected and transferred to those lined ponds.

Groundwater quality upgradient and downgradient of the release was assessed in three sampling events conducted on 12/8/21 & 12/9/21, 1/10/22, and 1/18/22. Concentrations of COCs at SP3 (e.g. manganese and sulfate at SP3) are greater than CC that have been established at the site; however, it is apparent based on historical data for this piezometer and current concentration trends that these concentrations are not attributable to the 12/3/2021 release. The sulfate concentration increased sequentially to 3,380 mg/L at SPN after the release and is currently above the CC of 3,000 mg/L. Concentrations of other COCs (boron, lithium, selenium, and cobalt) have not exhibited an increasing trend at SPN. Due to the low permeability of the fine-grained sediments in the area of the 1&2 Pipeline Drain Pond, impacts at SPN are likely limited in extent and volume. Potential impacts to groundwater in the gravel interval, as indicated by increasing concentrations of sulfate and boron at 917A, suggest a more conductive flow path for groundwater impacted by the release.

Surface water quality in EFAC upstream and downstream of the release was assessed in two sampling events on 12/8/21 & 12/9/21 and 1/18/22. Samples were not collected from EFAC on 1/10/22 due to frozen conditions. Results of the post release sampling events are not indicative of any impacts to surface water that would be attributable to the 1&2 Pipeline Drain Pond release.



## 9.0 CONCLUSIONS AND RECOMMENDATIONS

Initial analytical results from the post-release sampling events (including six piezometers/monitoring wells and two surface water sites) are provided in this report. Conclusions are as follows:

- Preliminary results of surface water samples collected shortly after the 1&2 Pipeline Drain Pond release indicate that no impacts to surface water are attributable to the release.
- Impacts to groundwater in the shallow subsurface are likely, as evidenced by sulfate analytical results in samples collected from piezometer SPN. However, low permeability of the fine-grained upper sediments limits the extent of impacts and practical groundwater capture techniques. Concentrations of COCs at SP3 (e.g. manganese and sulfate at SP3) are greater than CC that have been established at the site; however, it is apparent based on historical data for this piezometer and current concentration trends that these concentrations are not attributable to the 12/3/2021 release. Ongoing monitoring is recommended for the shallow piezometers, including upgradient piezometer SPS.
- Impacts to groundwater from the 1&2 Pipeline Drain Pond release are apparent in the deeper gravel interval at well 917A, based on increasing concentrations of sulfate and boron, and to a lesser extent at well P-12, based on an increasing sulfate concentration. Impacts at P-12 are likely the result of vertical migration since overland flow from the release was observed at this wellhead. However, since there was no overland flow of released process water to 917A, a subsurface preferential flow path (possibly along a buried pipeline) is expected. Temporary groundwater capture by pumping at 917A will be initiated on 2/10/22. Groundwater collected at the well will be routed through the existing capture system pipeline to the Groundwater Capture Storage Pond, a double-lined pond with leak detection, on the Plant Site. Rates and volumes of captured groundwater will be closely tracked and reported to MDEQ.

Site closure is recommended, in that no additional monitoring or actions, other than those described above or those prescribed by MDEQ (January 2022) that have yet to be completed, should be taken. Remaining actions to follow this report are as follows:

- During Spring High Runoff 2022:
  - The same six groundwater monitoring wells (917A, SP3, SPN, SPS, P-11, and P-12) will be sampled for a parameter list to include the COCs.
  - Results of the follow up groundwater samples will be summarized within 45-days after the sampling event, as was done in this report, to evaluate potential impacts from the 1&2 Pipeline Drain Pond release.
  - The same upstream and downstream surface water sites (AR-1NF and AR-8) on EFAC will be sampled for the groundwater COCs and parameters typically included in the Work Plan for the East Fork Armells Creek Synoptic Run.
  - Results of the follow up surface water samples will be summarized within 45-days after the sampling event, as was done in this report, to evaluate potential impacts from the 1&2 Pipeline Drain Pond release.

## 10.0 SITE MAPS

The following maps were prepared to support assessment of the 1&2 Pipeline Drain Pond release, as referenced throughout the preceding sections of this report.

- **Site Map 1** is a general site location map of the 1&2 Pipeline Drain Pond release. The map is drawn to scale and includes the locations of buildings, roads, waterways and other features in in relationship to the release. The extent of the spill is shaded yellow on the map. No water from this spill reached Armells Creek. Visual observations/monitoring of the extent of the spill and Armells Creek were conducted daily during the cleanup to verify the extent of overland flow of the release.
- **Site Map 2** is a map of the water quality sample and groundwater level monitoring locations, which includes six wells/piezometers (SPN, SPS, SP3, 917A, P-11, and P-12) and two surface water monitoring sites (AR-1NF and AR-8) that were sampled in response to the 1&2 Pipeline Drain Pond spill. No soil was excavated and no soil samples were collected in response to this spill.
- **Site Map 3** is a groundwater elevation map constructed of water level elevations recorded on 12/8/21, five days after the 1&2 Pipeline Drain Pond release. As described, potentiometric contours indicate a groundwater flow direction to the north/northwest, consistent with that of EFAC and the prevailing topography.

## **11.0 PHOTOGRAPHS**

Photographs were taken at the 1&2 Pipeline Drain Pond release site during the response. Eighteen (18) photos were submitted to Sarah Seitz of MDEQ via a file transfer protocol (ftp) site on December 7, 2021.

## 12.0 REFERENCE

Marietta Canty, LLC, 2018. Revised Cleanup Criteria and Risk Assessment Report Wastewater Facilities Comprising the Closed-Loop System Units 1&2 Stage 1and II Evaporation Ponds Area Colstrip Steam Electric Station Colstrip, Montana. December 20, 2018.

Montana Department of Environmental Quality (MDEQ), May 2021. East Fork Armells Creek Water Quality Monitoring: 2021 Sampling and Analysis Plan. Document ID: WQDMASSAP-26. May 2021.

Montana Department of Environmental Quality (MDEQ), June 2021. Enforcement Program Standardized Cleanup Report for Spills or Releases the Impact Soil. June 2021.

Montana Department of Environmental Quality (MDEQ), January 2022. Letter from Sarah Seitz to Gordon Criswell, Dated January 13, 2022, RE: December 3, 2021, Clearwell Process Water Release at Units 1&2 Pipeline Drain Pond near Highway 39 and East Fork Armells Creek, Colstrip MT [CVID 23695] – Warning.

Talen Montana, LLC, 2020. Colstrip Power Plant Water Resources Monitoring Plan (WRMP). Rev.7, December 8, 2020

## **TABLES**

TABLE 5-1. SUMMARY OF GROUNDWATER MONITORING SITES AND WATER LEVEL ELEVATIONS.

Well ID	Latitude (N, Decimal Degrees)	Longitude (E, Decimal Degrees)	Distance to Release* (feet)	Measuring Point Elevation (ft-amsl)	Ground Surface Elevation (ft-amsl)	Depth to Water <sup>†</sup> (ft-bmp)	Depth to Water <sup>†</sup> (ft-bgs)	Static Water Level Elevation (ft-amsl)	Description
SPS	45.9009481	-106.6327338	230	3193.49	3191.2	8.09	5.8	3185.4	Talen well/point piezometer, upgradient of release
SPN	45.9022581	-106.6334827	0	3187.73	3183.6	6.5	2.37	3181.23	Talen well/point piezometer, downgradient of release
SP3	45.902992	-106.6334281	80	3188.1	3186.9	8.47	7.27	3179.63	Talen well/point piezometer, downgradient of release
917A	45.9056396	-106.6350833	70	3183.66	3182	11.6	9.94	3172.06	Talen monitoring well, downgradient of release
P-11	45.9024109	-106.6316038	140	3191.3	3189.9	6.57	5.17	3184.73	MBMG well, cross gradient between release and EFAC
P-12	45.9017733	-106.6327726	0	3189.39	3188.7	4.61	3.92	3184.78	MBMG well, downgradient of release

\*Approximate distance from nearest observed standing water from the release.

<sup>†</sup> All water levels recorded on 12/8/20201

TABLE 7-1. GROUNDWATER QUALITY ANALYTICAL RESULTS.

Site Code			Analytical Method	Cleanup Criteria (mg/L)	917A	917A	917A	P-11	P-11	P-11	P-12	P-12	P-12	SP3	SP3	SP3	SPN	SPN	SPN	SPS
Sample Date					12/8/2021	1/10/2022	1/18/2022	12/8/2021	1/10/2022	1/18/2022	12/8/2021	1/10/2022	1/18/2022	12/9/2021	1/10/2022	1/18/2022	12/9/2021	1/10/2022	1/18/2022	12/9/2021
Sample Time					12:36	12:00	11:07	12:26	12:40	12:23	13:46	13:00	12:00	10:00	12:10	11:25	9:35	11:25	10:00	9:30
Field ID					TLN-2112-106	TLN-2201-106	TLN-2201-206	TLN-2112-103	TLN-2201-107	TLN-2201-207	TLN-2112-102	TLN-2201-108	TLN-2201-208	TLN-2112-105	TLN-2201-105	TLN-2201-205	TLN-2112-104	TLN-2201-104	TLN-2201-204	DRY
Lab ID			B21120957-004	B22010459-004	B22011141-004	B21120957-003	B22010459-005	B22011141-005	B21120957-002	B22010459-006	B22011141-006	B21120957-005	B22010459-003	B22011141-003	B21120957-001	B22010459-002	B22011141-002			
Depth To Water Level	ft	NM	Field	--	11.6	11.74	11.55	6.57	6.75	6.65	4.61	4.96	4.79	8.47	9.34	9.36	6.5	7.57	7.92	--
pH - Fld	s.u.	NM	Field	--	7.16	7.17	7.14	7.15	7.22	7.12	7.18	7.17	6.94	6.2	6.36	6.82	6.99	6.77	7.02	--
pH- Lab	s.u.	NM	A4500-H B	--	7.4	7.1	7.4	7.4	7.1	7.4	7.4	7.1	7.4	4.7	5.4	5.6	7.1	7	7	--
Sc (Umhos/Cm At 25 C)	umhos/cm	NM	A2510 B	--	2,640	3,340	3,450	2,890	2,680	2,670	3,900	4,080	3,930	5,260	4,770	4,300	3,710	3,940	4,340	--
Sc (Umhos/Cm At 25 C) (Fld)	umhos/cm	NM	Field	--	2,615	2,968	3,557	2,860	2,363	2,790	3,833	3,492	4,253	5,836	3,938	4,760	3,795	3,468	5,225	--
TDS (Measured At 180 °C)	mg/L	NM	A2540 C	--	2,250	2,940	3,150	2,500	2,220	2,290	3,430	3,660	3,580	6,370	5,660	5,030	3,330	3,460	4,130	--
Water Temperature (Fld)	°C	NM	Field	--	10.6	10.7	8.9	10.1	9.9	9.3	10.5	11	9.3	10	9	4.9	8.6	8.9	6	--
Bicarbonate Alk As Hco3	mg/L	NM	A2320 B	--	483	476	474	478	438	438	468	478	471	<4	<4	5	337	328	338	--
Bromide (Br)	mg/L	NM	E300.0	--	<0.5	12.4	22.6	<0.5	<0.5	<0.5	2.4	4.4	4.5	<0.5	0.5	<0.5	<0.5	3.2	14	--
Carbonate As Co3	mg/L	NM	A2320 B	--	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	--
Chloride (Cl)	mg/L	NM	E300.0	--	47	57	85	26	27	27	36	37	51	52	57	49	34	41	68	--
Sulfate (So4)	mg/L	NM	E300.0	3000	1,660	1,830	2,650	1,700	1,390	1,390	2,330	2,310	3,240	4,410	4,650	4,020	2,310	2,540	3,380	--
Total Alkalinity As Caco3	mg/L	NM	A2320 B	--	396	390	389	392	359	359	384	392	387	<4	<4	4	276	269	278	--
Total Hardness As Caco3	mg/L	NM	A2340 B	--	1,450	1,880	1,980	1,490	1,340	1,330	2,080	2,120	2,070	1,170	1,040	1,090	1,870	2,020	2,990	--
Calcium (Ca)	mg/L	DIS	E200.7	--	241	293	308	193	169	167	244	251	244	268	228	236	255	305	460	--
Magnesium (Mg)	mg/L	DIS	E200.7	--	206	279	294	245	222	222	356	362	354	123	115	122	300	306	447	--
Potassium (K)	mg/L	DIS	E200.7	--	10	10	11	13	11	11	15	14	14	13	7	7	15	12	15	--
Sodium (Na)	mg/L	DIS	E200.7	--	147	161	167	224	181	180	290	284	281	262	174	196	278	252	304	--
Boron (B)	mg/L	DIS	E200.7	4	0.9	1.2	1.29	0.8	0.9	0.83	2	1.9	1.8	1.3	0.9	1.1	1.3	1.2	1.3	--
Cobalt (Co)	mg/L	DIS	E200.8	0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005	0.005	0.007	--
Lithium (Li)	mg/L	DIS	E200.7	0.12	0.08	0.09	0.09	0.08	0.07	0.07	0.12	0.12	0.1	0.08	0.08	0.08	0.11	0.11	0.11	--
Manganese (Mn)	mg/L	DIS	E200.8	0.61	0.111	0.153	0.151	0.624	0.61	0.582	0.76	0.862	0.738	9.05	7.48	5.91	0.92	1.68	1.31	--
Selenium (Se)	mg/L	DIS	E200.8	0.05	<0.005	<0.005	0.006	<0.005	<0.005	<0.001	<0.005	<0.005	<0.001	<0.005	<0.005	<0.001	<0.005	<0.005	<0.001	--

Analytical methods from *Standard Methods for the Examination of Water and Wastewater 22nd Edition* (A) (APHA 2012), *Methods for Chemical Analysis of Water and Waste March* (E) (EPA 600/4-79/020) (US EPA March 1983), or *Radiochemistry Procedures Manual* (EPA 520/5-84-006) (RA-05) (US EPA June 1984).

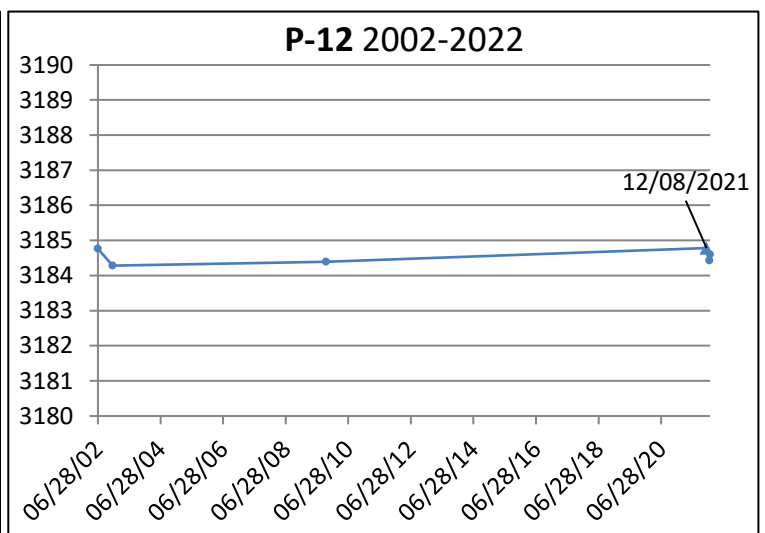
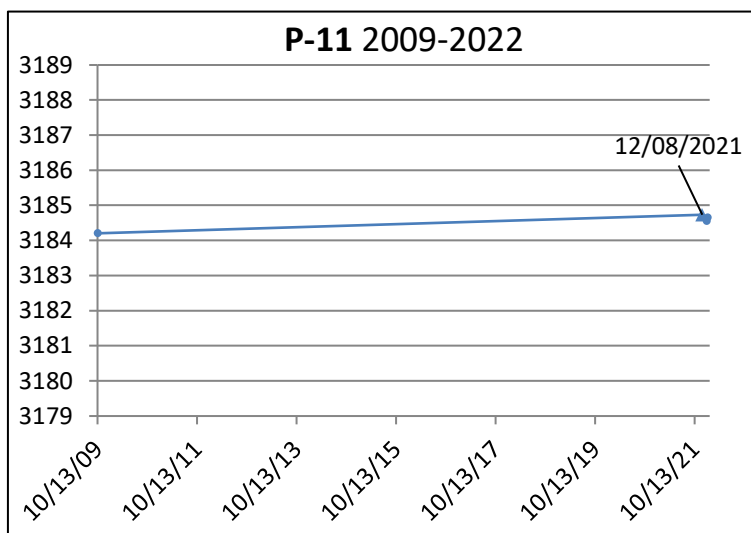
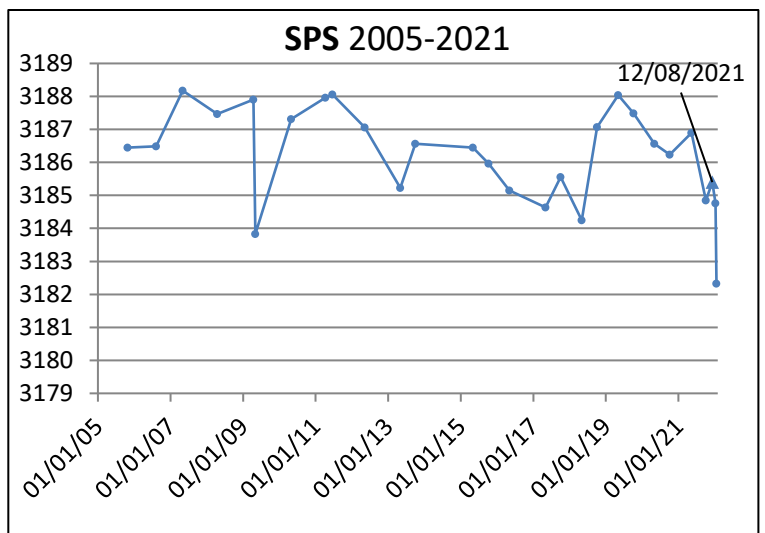
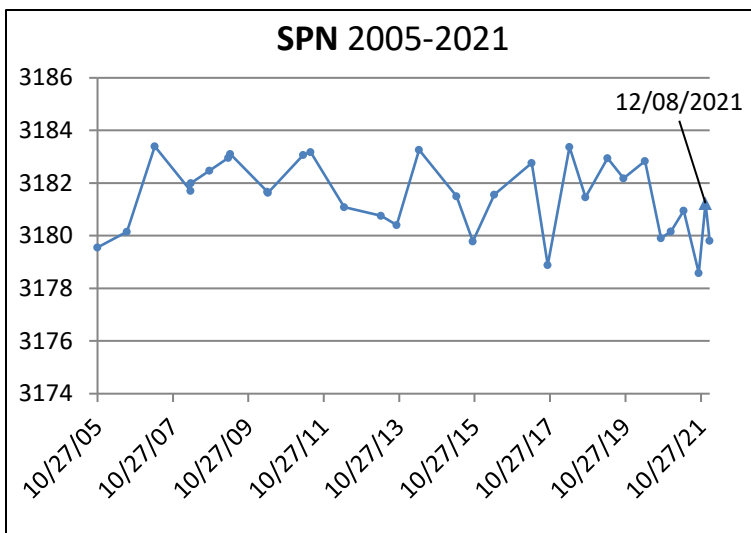
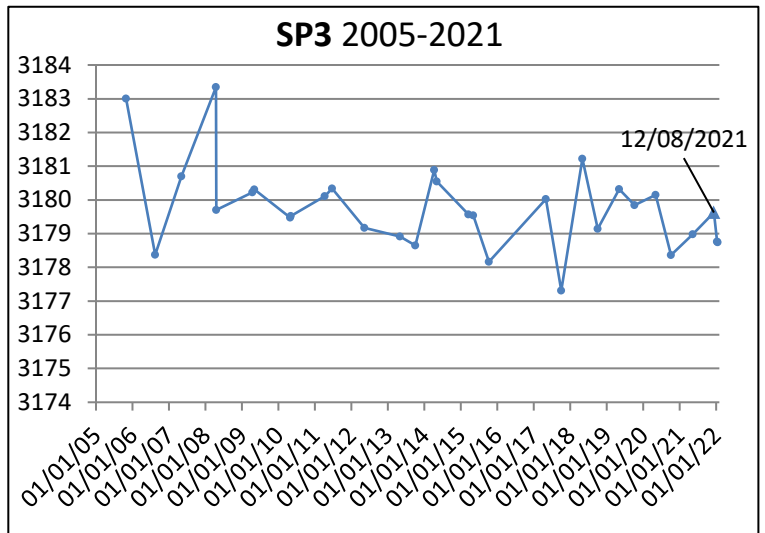
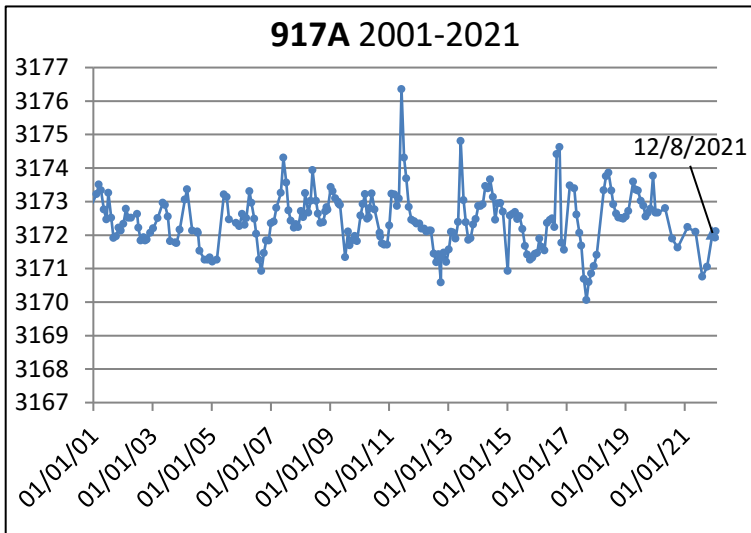


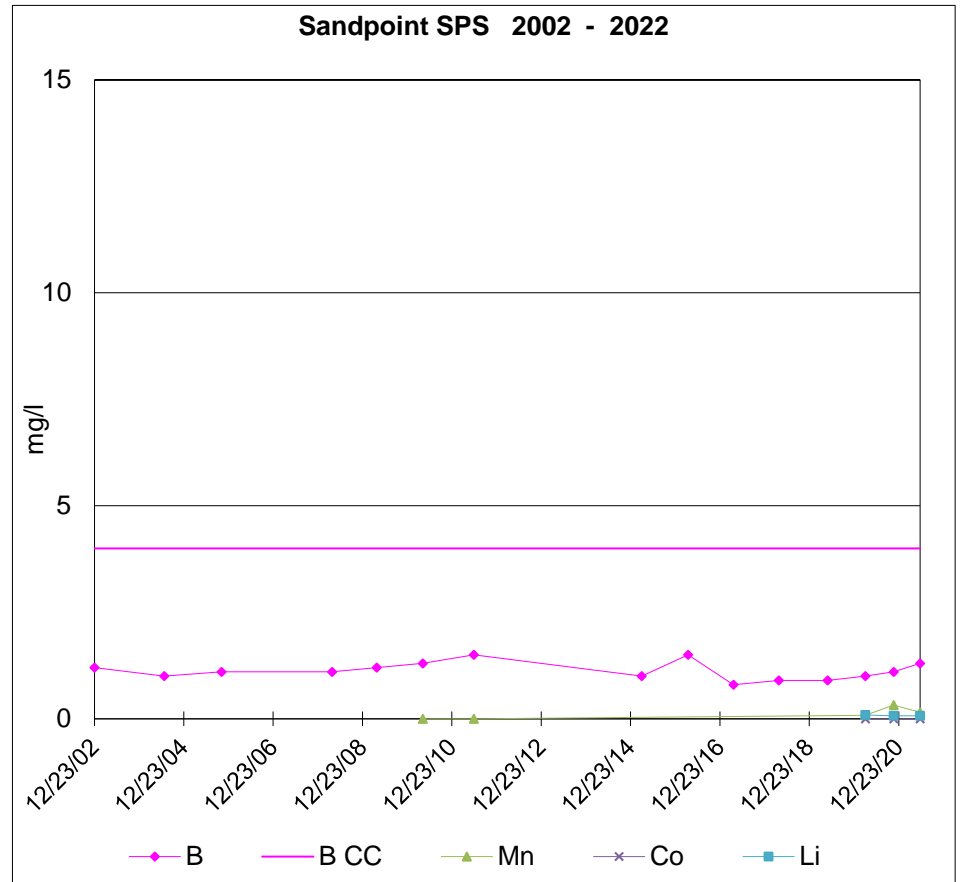
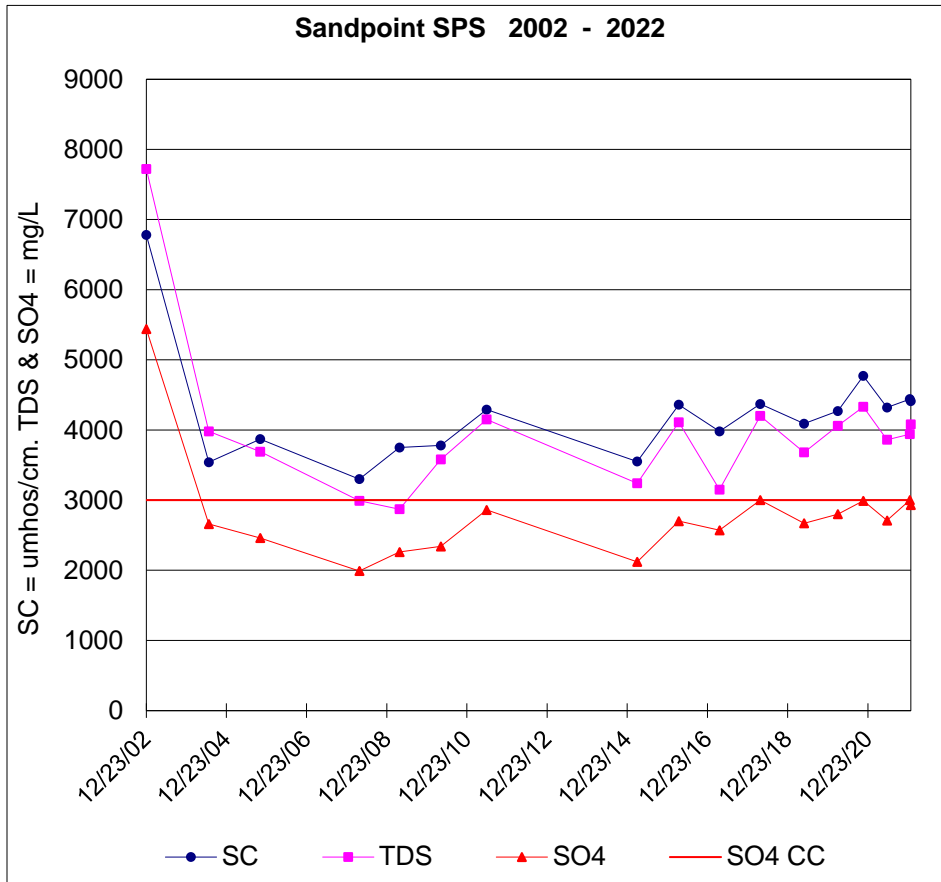
**TABLE 7-2. SURFACE WATER QUALITY ANALYTICAL RESULTS**

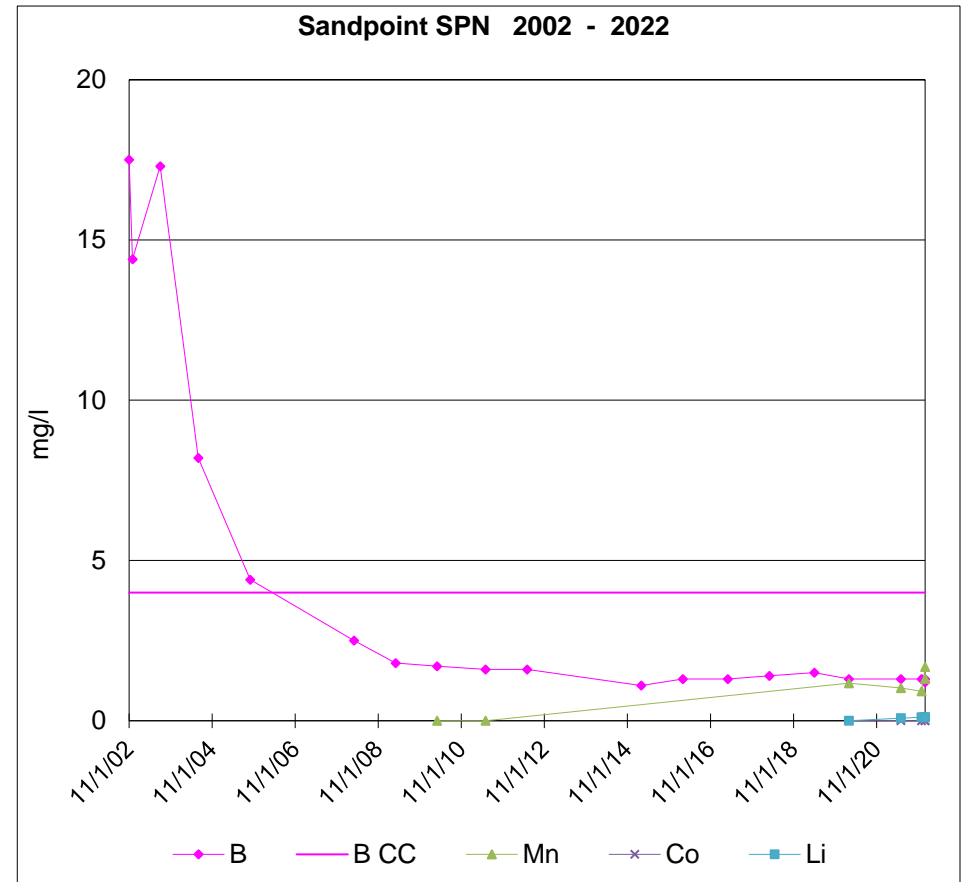
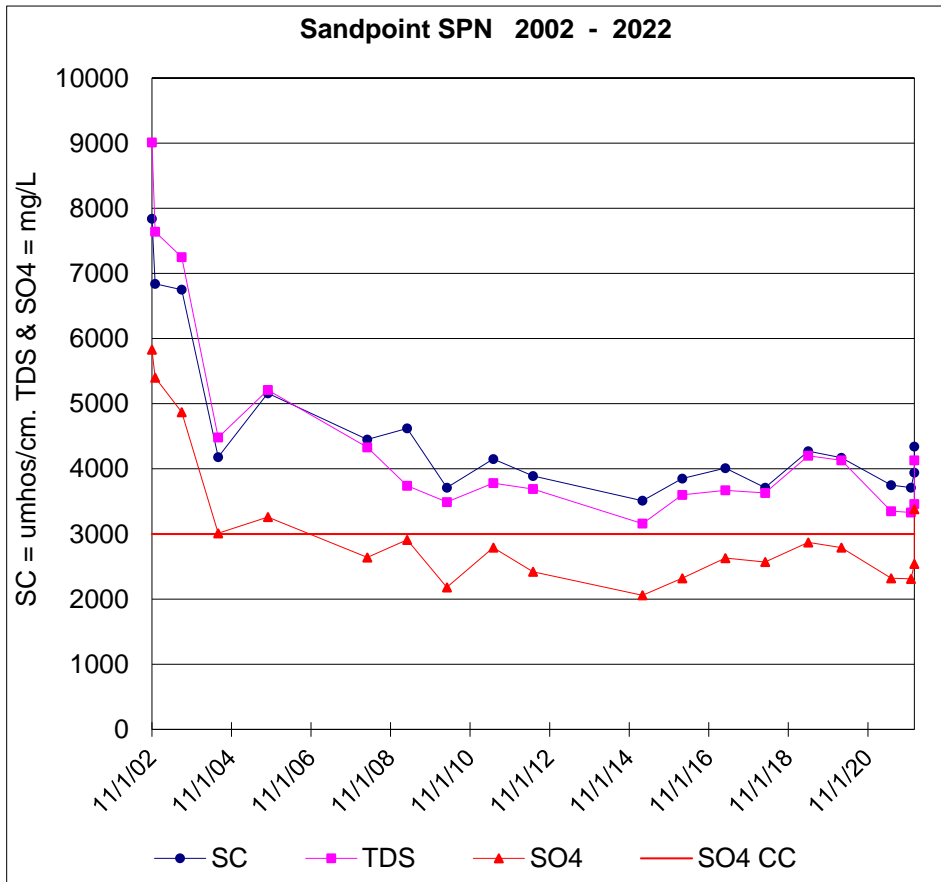
Site Code			*Analytical Method	AR-1NF	AR-1NF	AR-1NF	AR-8	AR-8	AR-8
Sample Date				12/9/2021	1/10/2022	1/18/2022	12/9/2021	1/10/2022	1/18/2022
Sample Time				12:25	10:50	12:40	13:00	10:35	10:30
Field ID				TLN-2112-107	FROZEN	TLN-2201-209	TLN-2112-108	FROZEN	TLN-2201-210
Lab ID				B21120960-001		B22011142-001	B21120960-002		B22011142-002
pH - Fld	s.u.	NM	Field	7.76	--	7.34	7.9	--	7.18
pH- Lab	s.u.	NM	A4500-H B	7.9	--	7.9	8	--	8
Sc (Umhos/Cm At 25 C)	umhos/cm	NM	A2510 B	3,750	--	3,750	3,730	--	3,530
Sc (Umhos/Cm At 25 C) (Fld)	umhos/cm	NM	Field	3,858	--	4,048	3,783	--	3,669
TDS (Measured At 180 °C)	mg/L	NM	A2540 C	3,300	--	3,290	3,260	--	3,130
Water Temperature (Fld)	°C	NM	Field	1.4	--	0.2	0.1	--	1.3
Bicarbonate Alk As Hco3	mg/L	NM	A2320 B	620	--	606	618	--	583
Bromide (Br)	mg/L	NM	E300.0	0.6	--	0.7	0.6	--	0.5
Carbonate As Co3	mg/L	NM	A2320 B	<4	--	<4	<4	--	<4
Chloride (Cl)	mg/L	NM	E300.0	86	--	104	86	--	82
Sulfate (So4)	mg/L	NM	E300.0	2,100	--	2,410	2,210	--	2,000
Total Alkalinity As Caco3	mg/L	NM	A2320 B	508	--	497	507	--	478
Total Hardness As Caco3	mg/L	NM	A2320 B	2,190	--	2,130	2,230	--	1,990
Calcium (Ca)	mg/L	DIS	E200.7	310	--	298	313	--	278
Calcium (Ca)	mg/L	TOT	E200.7	315	--	309	309	--	283
Magnesium (Mg)	mg/L	DIS	E200.7	345	--	336	351	--	314
Magnesium (Mg)	mg/L	TOT	E200.7	352	--	347	347	--	315
Potassium (K)	mg/L	DIS	E200.7	14	--	13	14	--	13
Potassium (K)	mg/L	TOT	E200.7	14	--	13	14	--	13
Sodium (Na)	mg/L	DIS	E200.7	222	--	211	232	--	202
Sodium (Na)	mg/L	TOT	E200.7	222	--	221	226	--	207
Boron (B)	mg/L	DIS	E200.7	1.5	--	1.3	1.4	--	1.23
Boron (B)	mg/L	TOT	E200.7	1.4	--	1.44	1.4	--	1.3
Cobalt (Co)	mg/L	DIS	E200.8	<0.005	--	<0.005	<0.005	--	<0.005
Cobalt (Co)	mg/L	TOT	E200.8	<0.005	--	<0.005	<0.005	--	<0.005
Lithium (Li)	mg/L	DIS	E200.7	0.09	--	0.11	0.09	--	0.09
Lithium (Li)	mg/L	TOT	E200.7	0.1	--	0.1	0.1	--	0.09
Manganese (Mn)	mg/L	DIS	E200.8	0.794	--	1.5	0.215	--	0.944
Manganese (Mn)	mg/L	TOT	E200.8	0.839	--	1.97	0.221	--	1.02
Selenium (Se)	mg/L	DIS	E200.8	<0.005	--	<0.001	<0.005	--	<0.001
Selenium (Se)	mg/L	TOT	E200.8	<0.005	--	<0.001	<0.005	--	<0.001

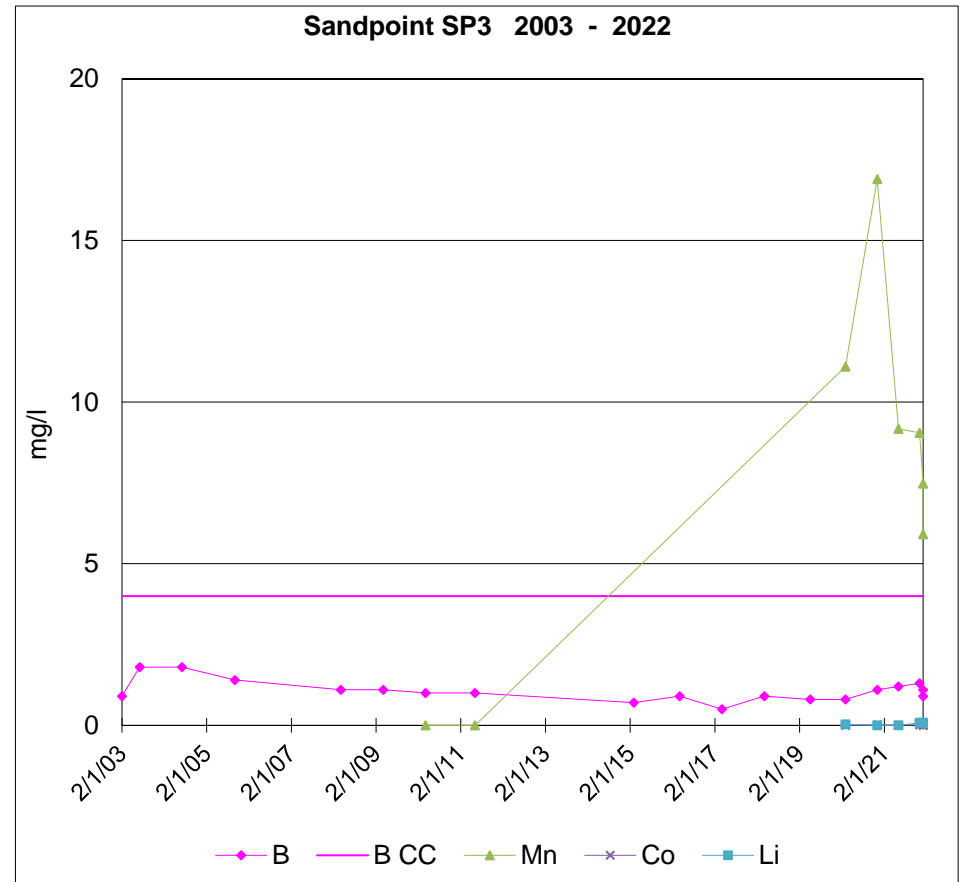
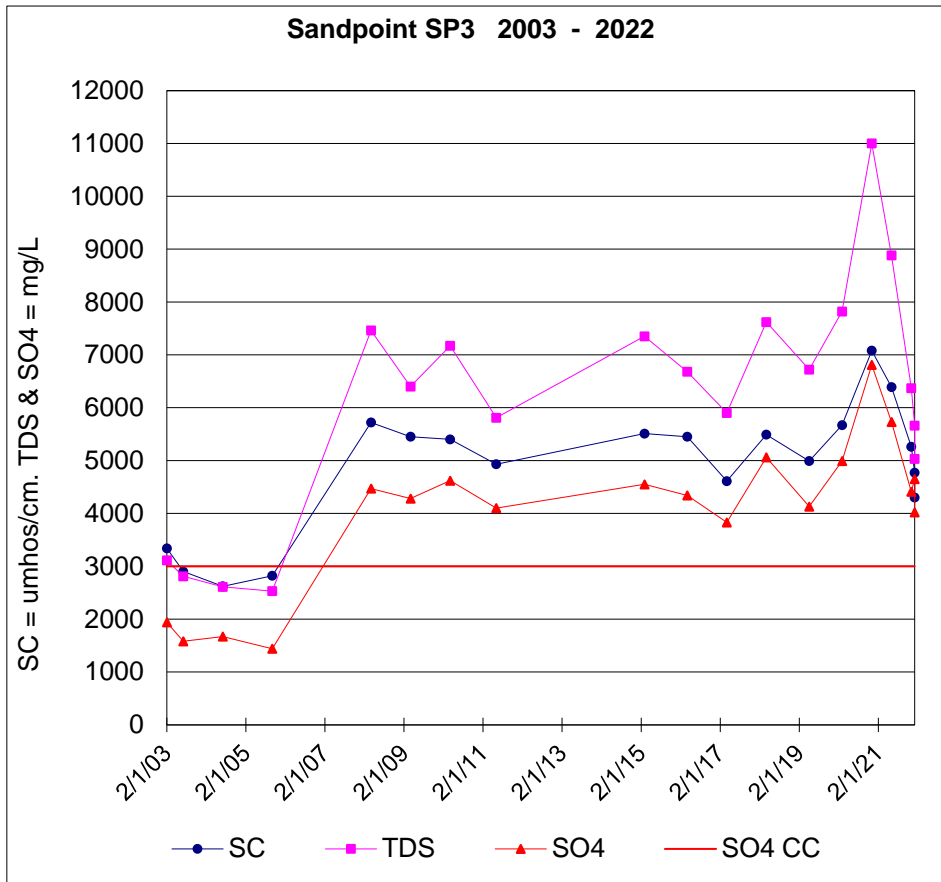
\*Analytical methods from *Standard Methods for the Examination of Water and Wastewater 22nd Edition (A)* (APHA 2012), *Methods for Chemical Analysis of Water and Waste March (E)* (EPA 600/4-79/020) (US EPA March 1983), or *Radiochemistry Procedures Manual (RA-05)* (US EPA June 1984).

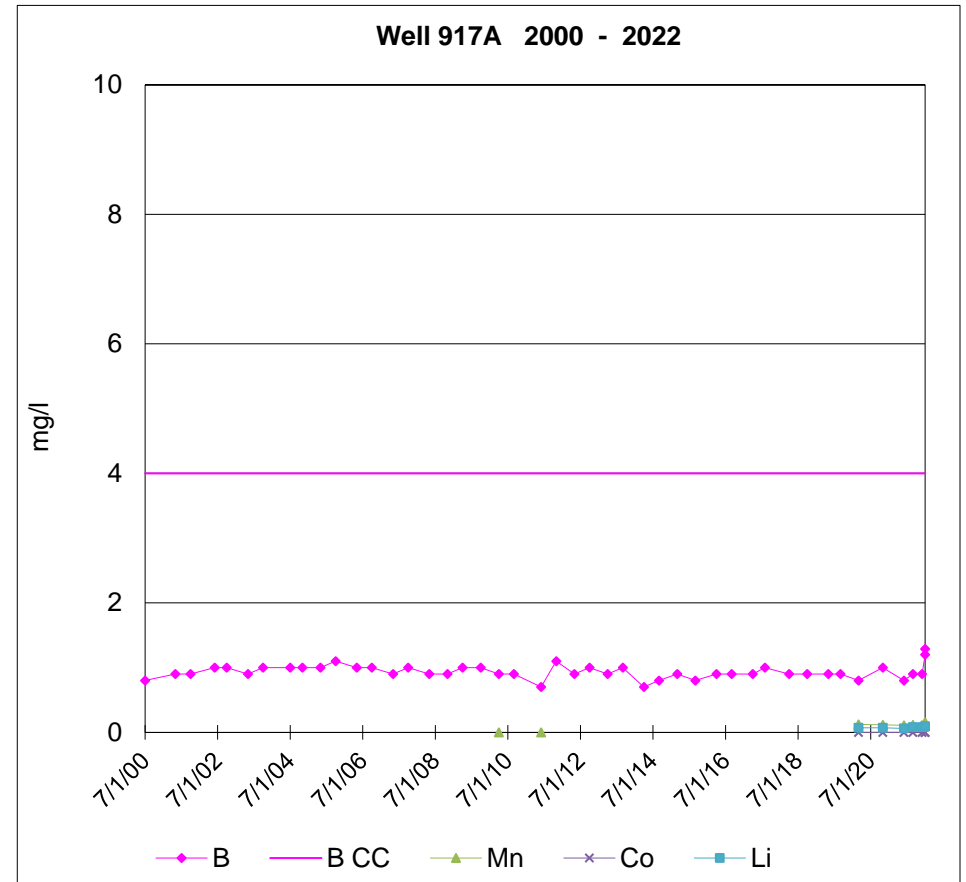
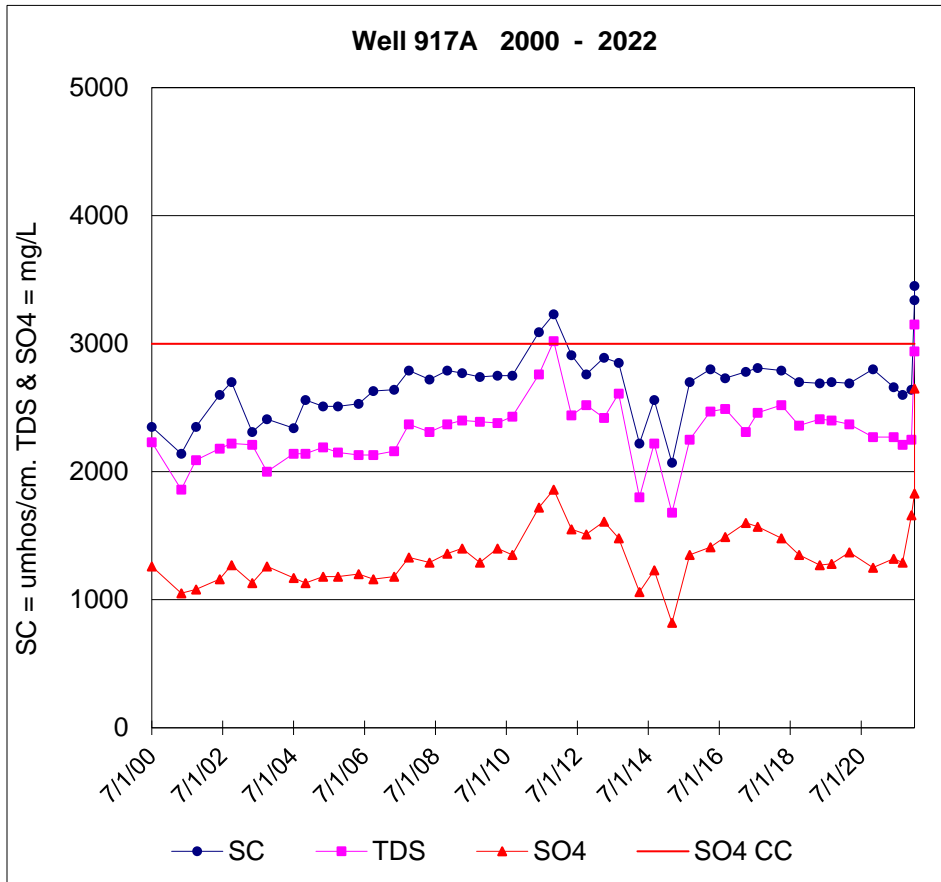
## **FIGURES**

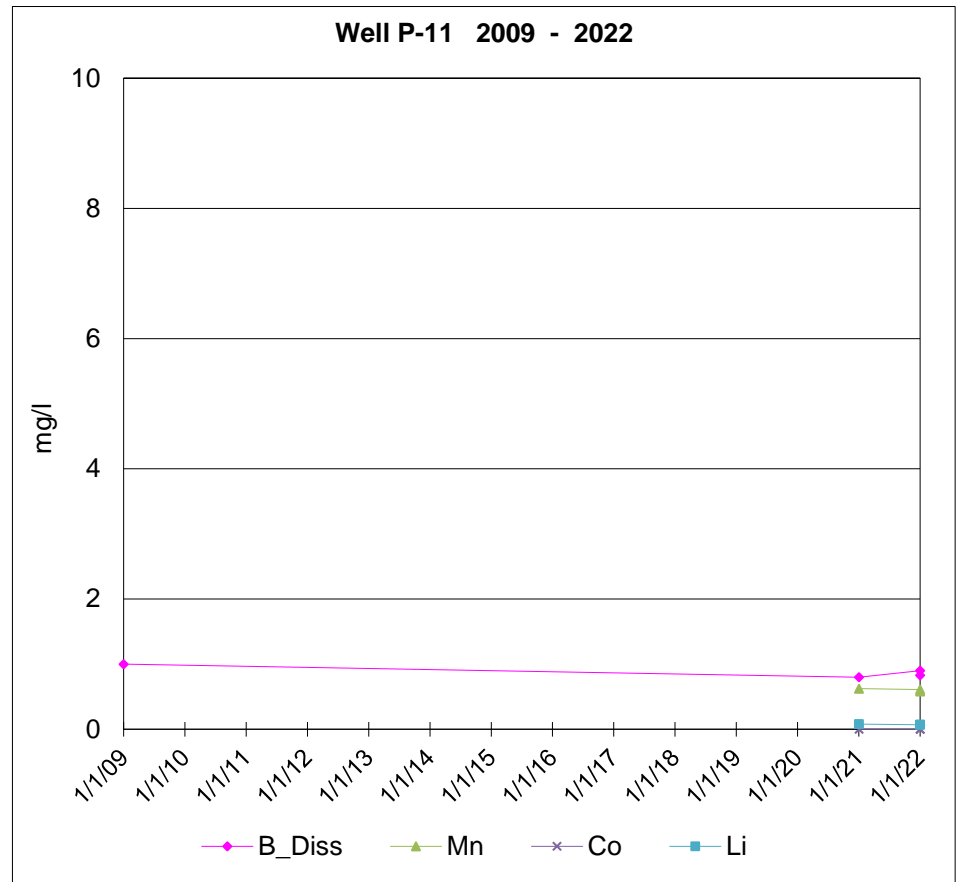
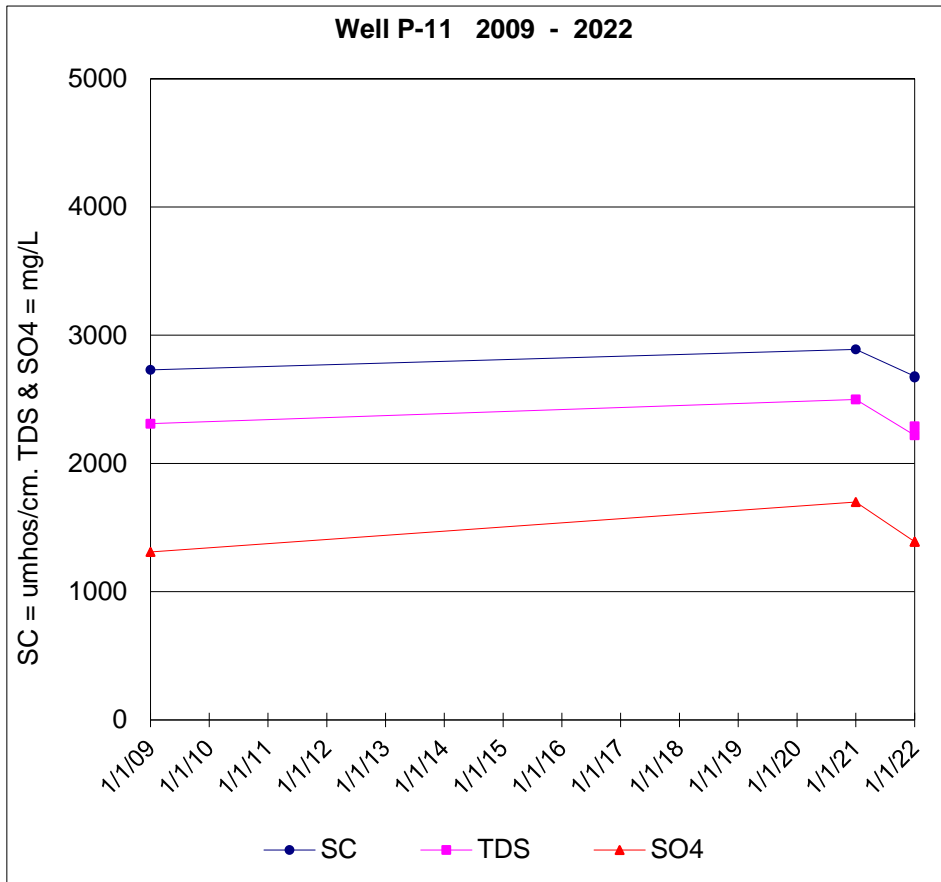




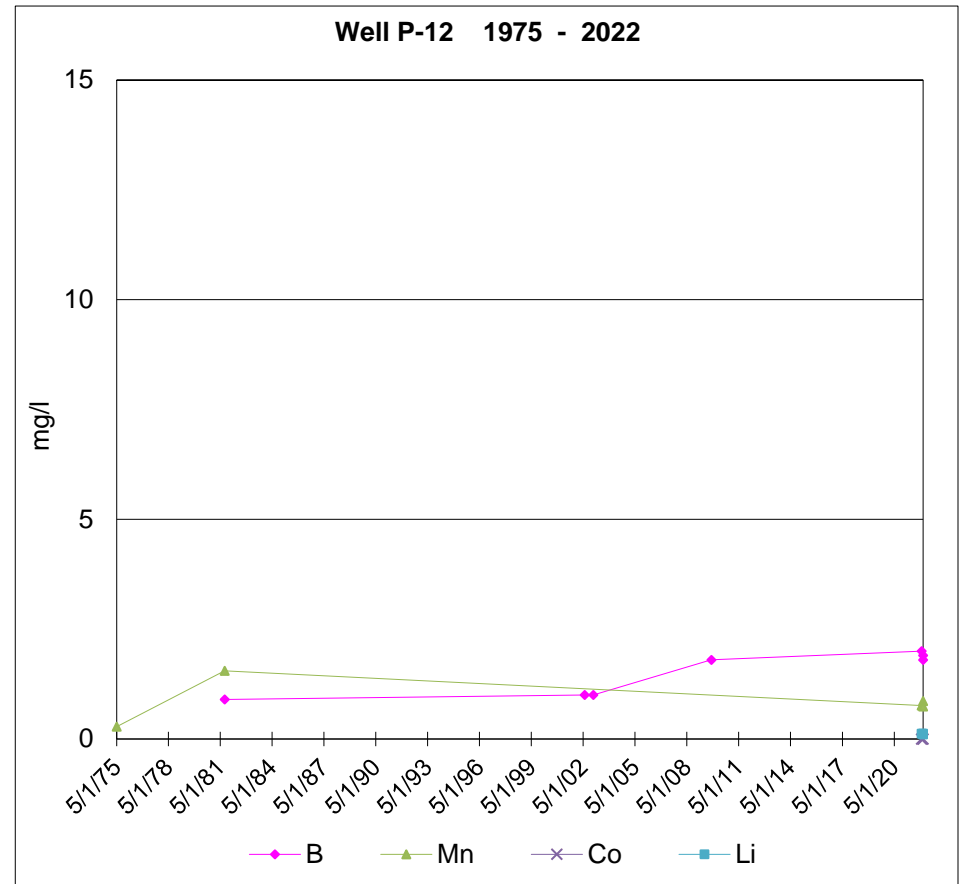
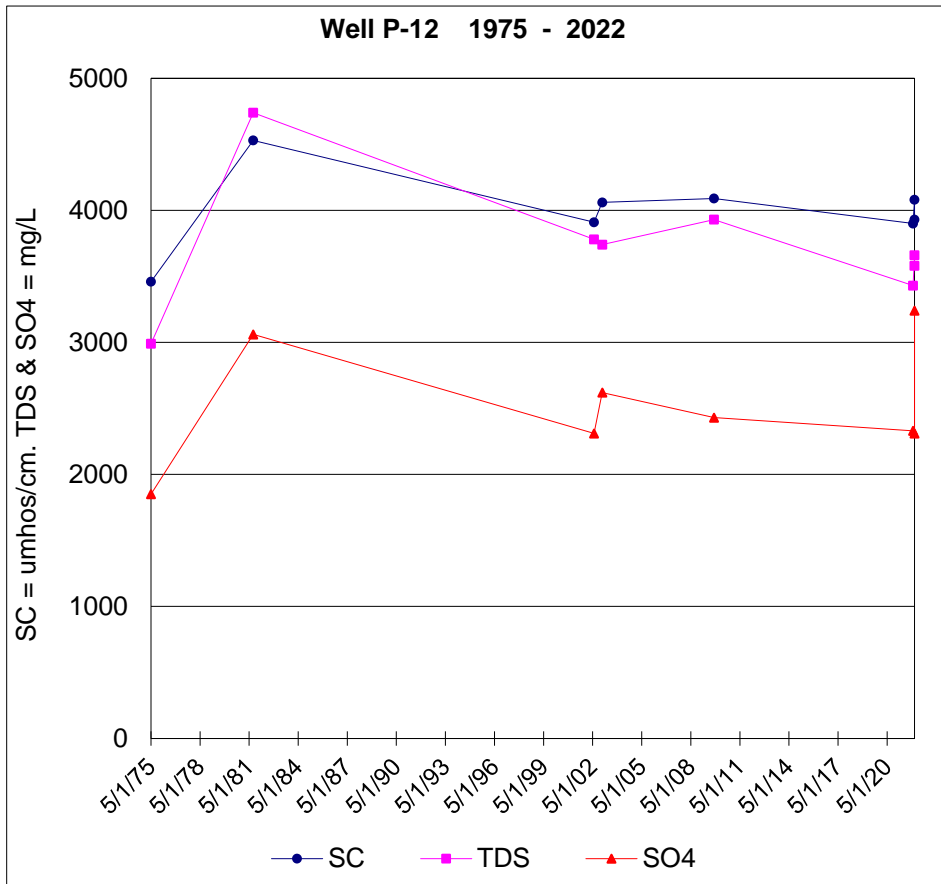


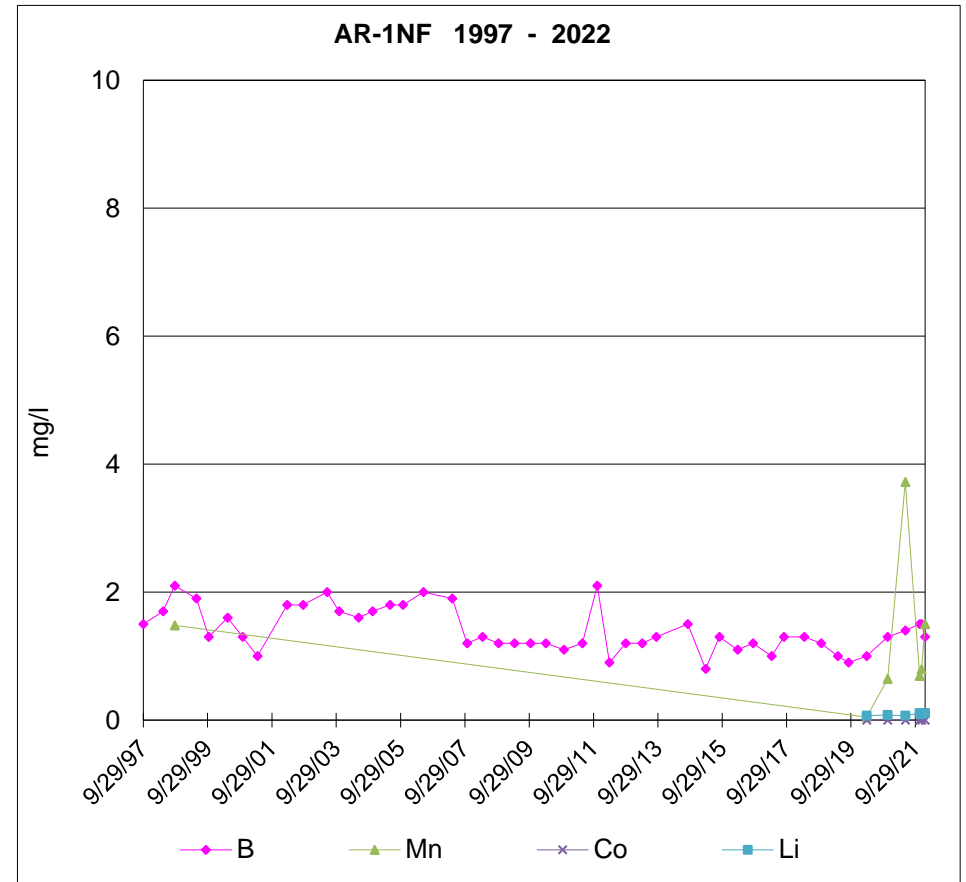
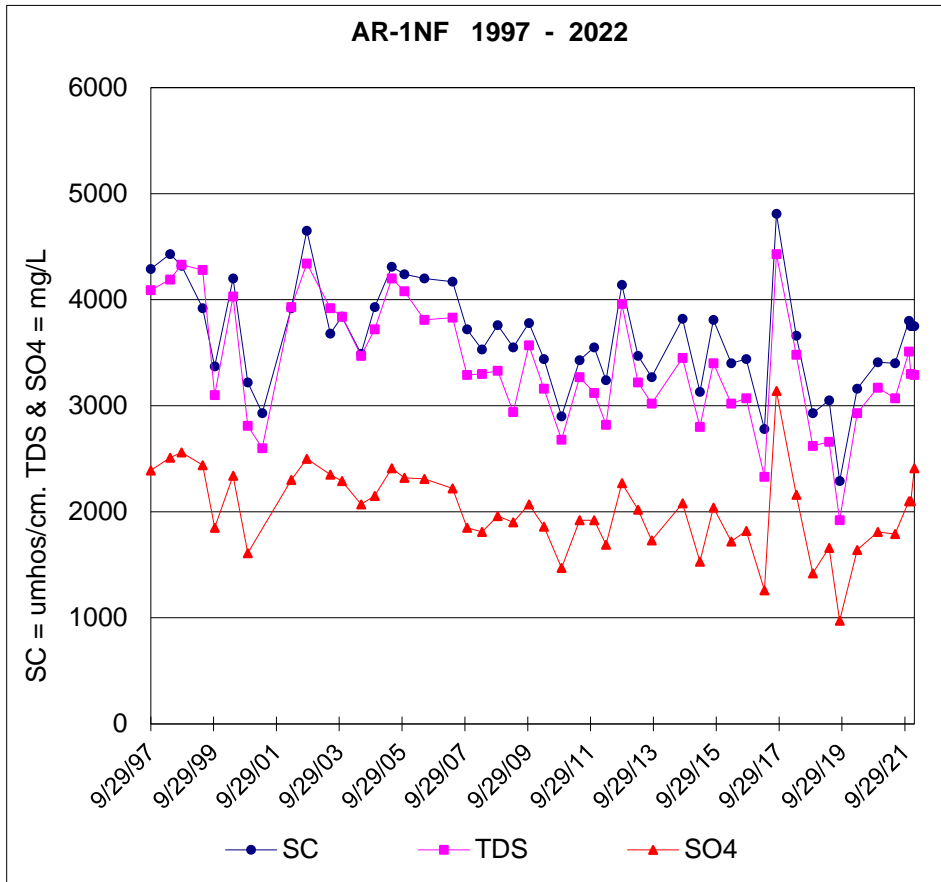


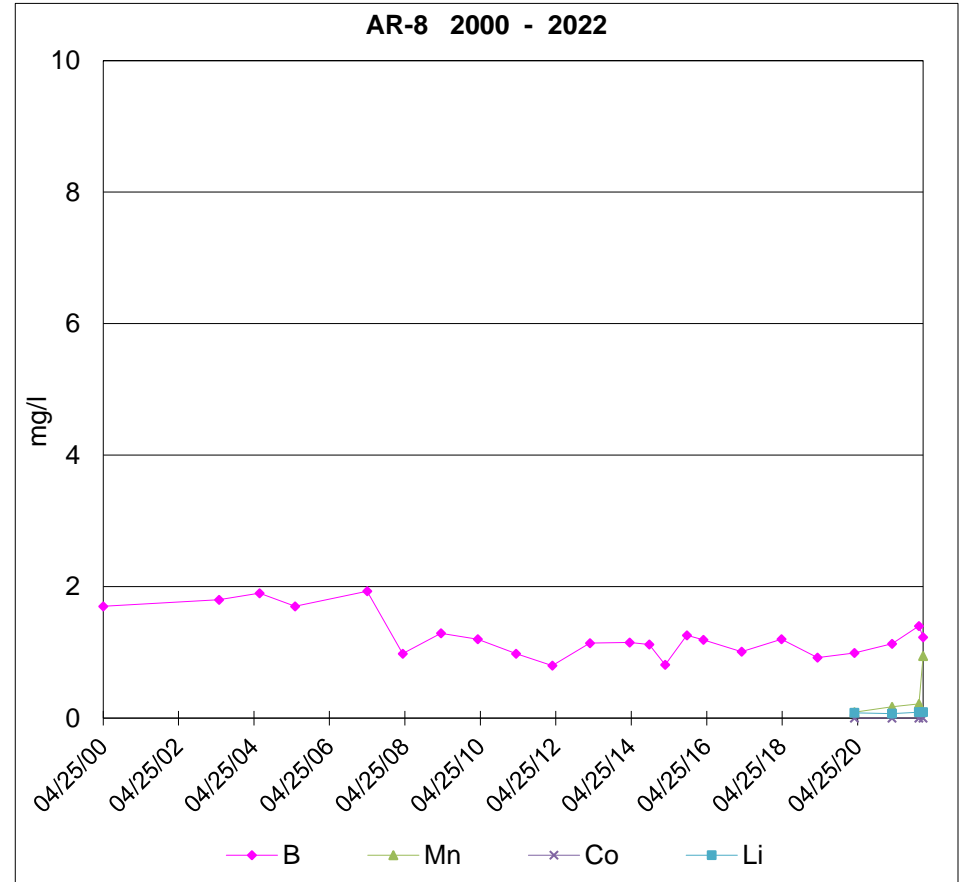
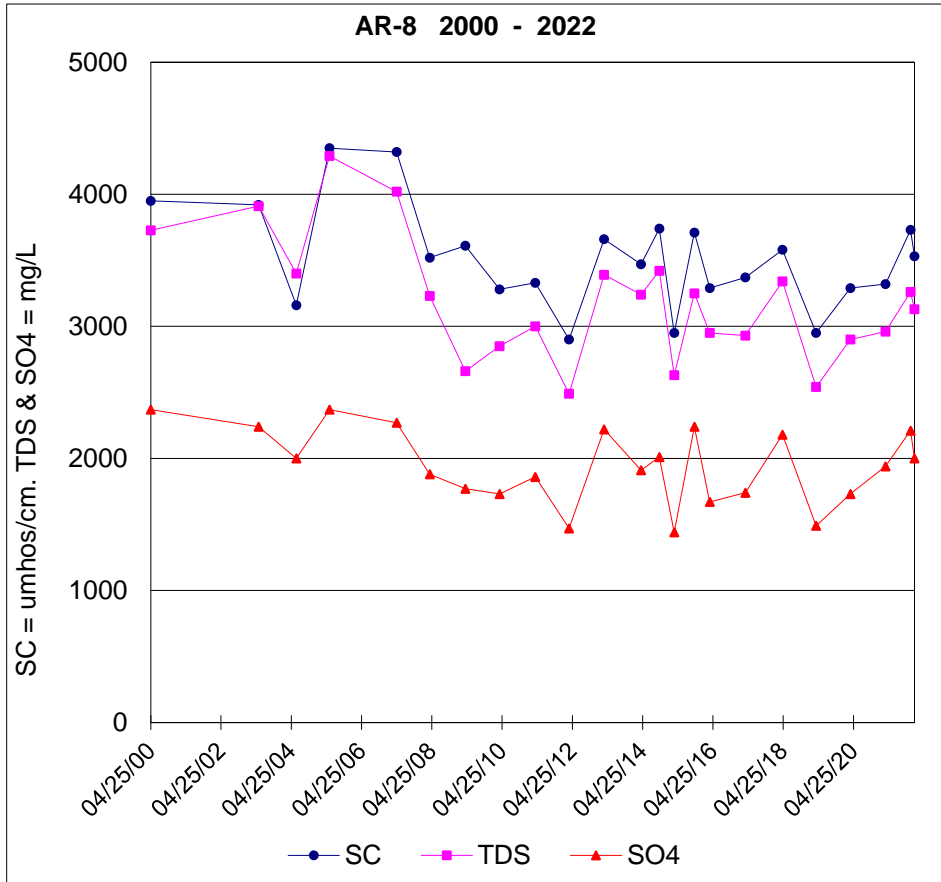




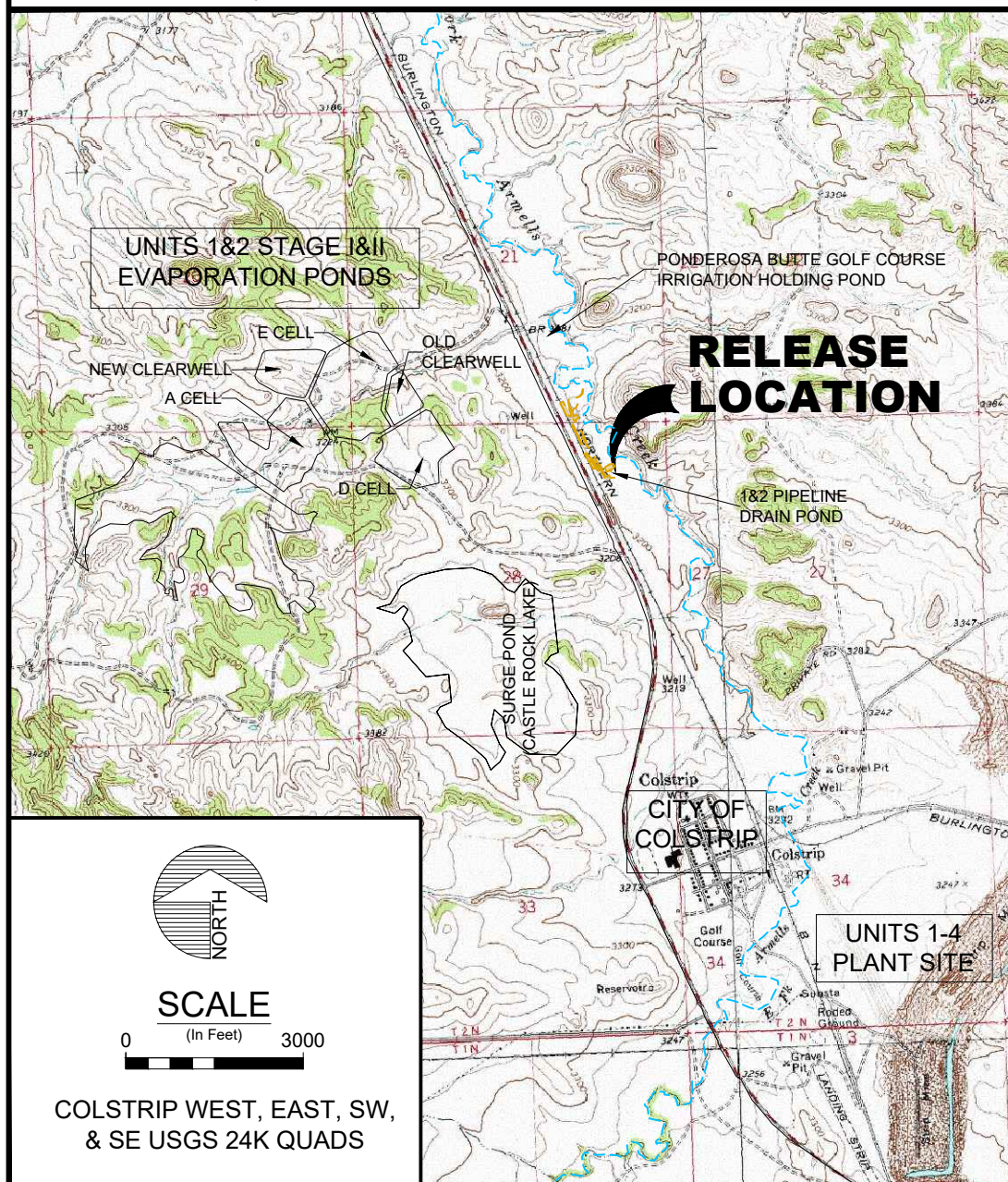








## **SITE MAPS**



**SCALE**  
(In Feet)  
0 240

**LEGEND**

- 917A ● MONITORING WELL
- SP 3 ⊕ PIEZOMETER
- AR-8 ▲ SURFACE WATER MONITORING SITE
- [Yellow Box] APPROXIMATE LOCATION OF 1&2 PIPELINE DRAIN RELEASE
- [Blue Dashed Line] EAST FORK ARMELLS CREEK

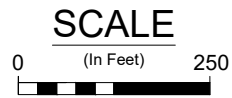
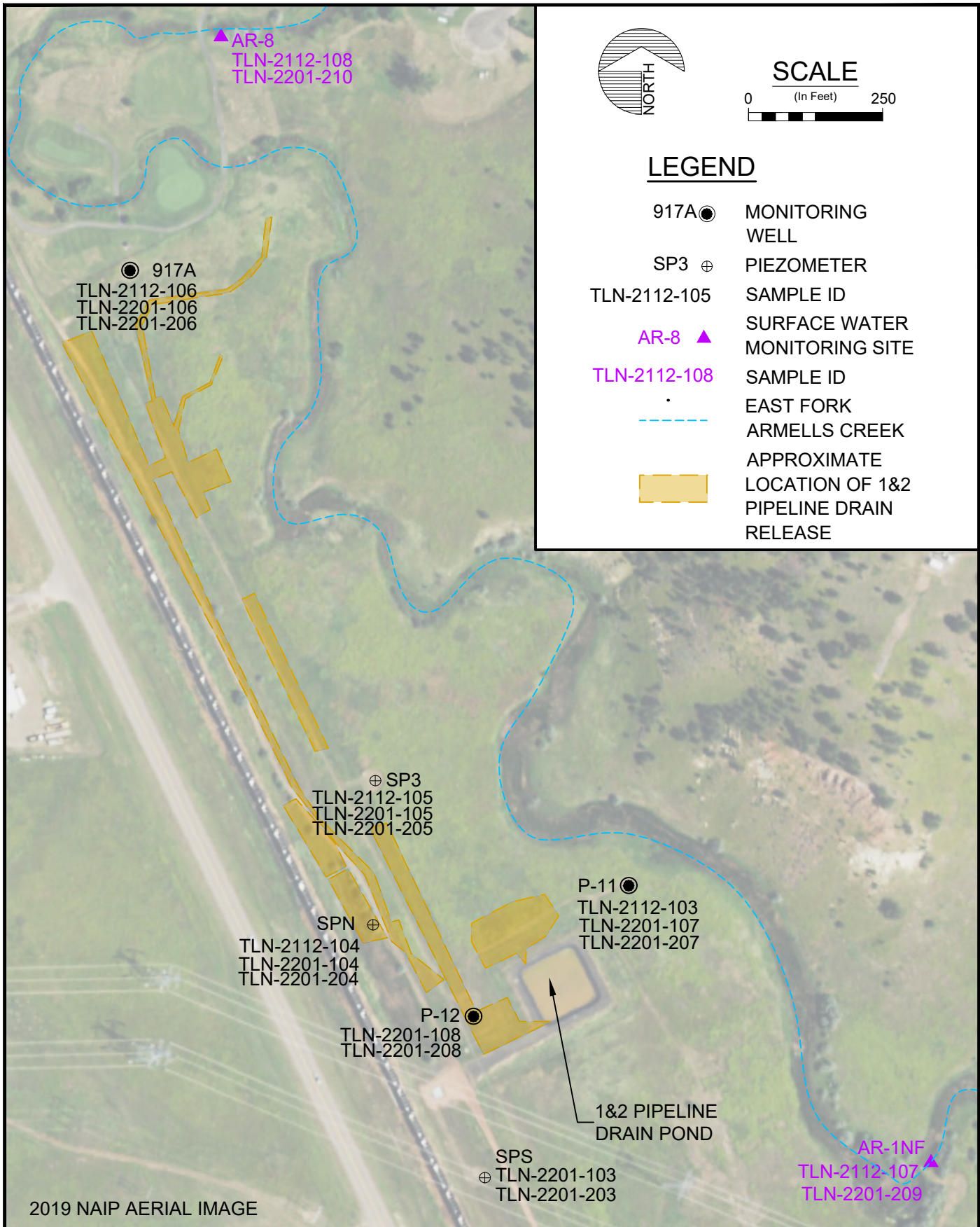
2019 NAIP AERIAL IMAGE

COLSTRIP WEST, EAST, SW, & SE USGS 24K QUADS

CLEARWELL PROCESS WATER RELEASE AT UNITS 1&2 PIPELINE DRAIN POND CLEANUP REPORT

GENERAL SITE LOCATION

MAP  
**1**



**LEGEND**

- 917A ● MONITORING WELL
- SP3 ⊕ PIEZOMETER
- TLN-2112-105 SAMPLE ID
- AR-8 ▲ SURFACE WATER MONITORING SITE
- TLN-2112-108 SAMPLE ID
- EAST FORK ARMELLS CREEK
- APPROXIMATE LOCATION OF 1&2 PIPELINE DRAIN RELEASE

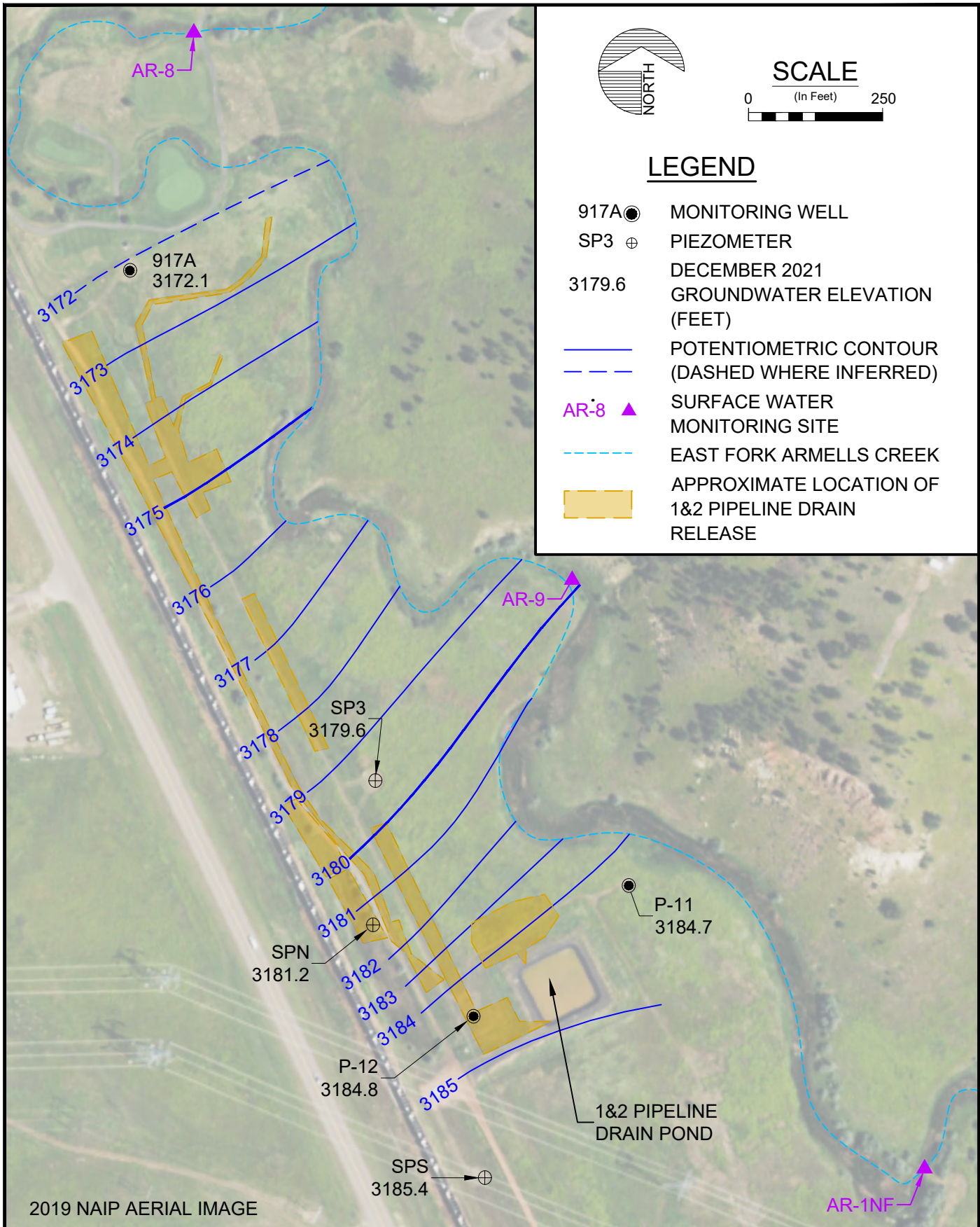
2019 NAIP AERIAL IMAGE

CLEARWELL PROCESS WATER RELEASE  
AT UNITS 1&2 PIPELINE DRAIN POND  
CLEANUP REPORT

**SAMPLE COLLECTION  
LOCATION MAP**

MAP

**2**



CLEARWELL PROCESS WATER RELEASE  
AT UNITS 1&2 PIPELINE DRAIN POND  
CLEANUP REPORT

**GROUNDWATER ELEVATION MAP  
(DECEMBER 2021)**

MAP

**3**

# **APPENDIX A SOIL BORING LOGS**





**HYDROMETRICS INC.**  
 Consulting Scientists and Engineers  
 Billings, Montana

Monitor Well Log

Hole Name: 9:17A

Date Hole Started: 7-25-00 Date Hole Finished: 7-25-00

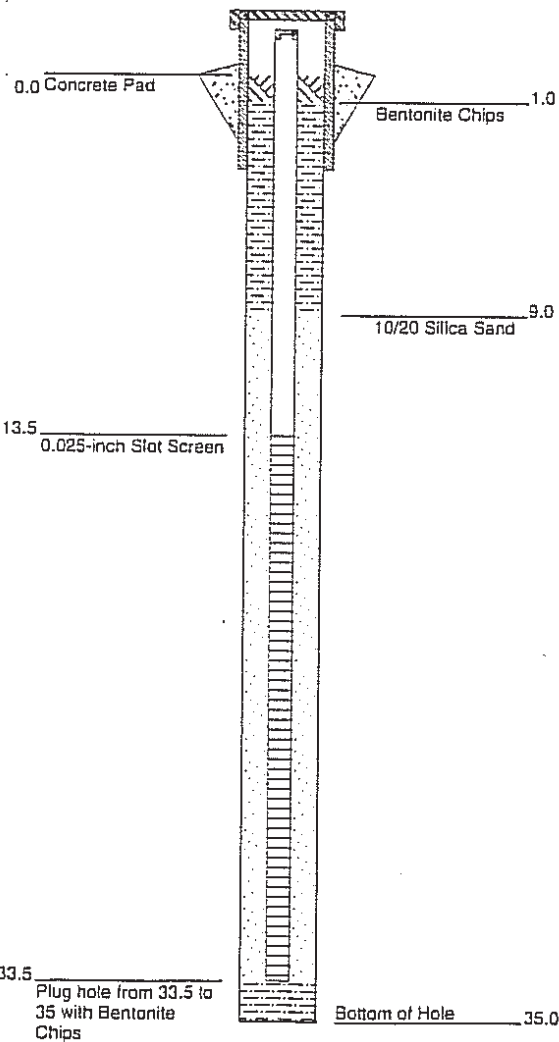
Client: PPL Montana, LLC  
 Project: 0831  
 County: Rosebud State: Montana  
 Legal Description: DC Sec. 21 T2N R41E  
 Property Owner: PPL Montana, LLC (915A & 917A); Pine Butte Golf Course, Colstrip (916A, 918A, & 919D)  
 Descriptive Location: -20' south of southern fence line of golf course  
 N:616986.38 E:2697367.76 NAD83  
 Recorded By: CCVS  
 Drilling Company: Askin Drilling  
 Driller: Ron and Doug Askin  
 Drilling Method: Air Rotary  
 Drilling Fluids Used: City Water  
 Purpose of Hole: Install Monitor Well  
 Target Aquifer: Shallow Alluvial  
 Hole Diameter (in): 6 1/4 & 9 3/4  
 Total Depth Drilled (ft): 35

WELL COMPLETION	Y/N	DESCRIPTION	INTERVAL
Well Installed?	Y	4.5-inch, bell and collar, Sch 40, PVC	0-33.5'
Surface Casing Used?	Y	6" x 5' steel	+2-3'
Screen/Perforations?	Y	0.025-inch slot, Sch 40 PVC	13.5-33.5'
Sand Pack?	Y	10/20 silica sand	9-33.5'
Annular Seal?	Y	Bentonite Chips	1-9'
Surface Seal?	Y	Concrete	0-1'
DEVELOPMENT/SAMPLING			
Well Developed?	Y	Air Lift, Pumped	
Water Samples Taken?	Y	Samples Taken	
Boring Samples Taken?	N		

Static Water Level Below MP: 11.44  
 Date: 7-26-00  
 MP Description: Top of Steel  
 MP Height Above or Below Ground (ft): **+1.66**  
 Surface Casing Height (ft): -2  
 Riser Height (ft): **+1.66**  
 Ground Surface Elevation (ft): **3182.0**  
 MP Elevation (ft): **3183.66**

Remarks: All soil descriptions based on field observations. Pilot hole to 35' below ground surface (bgs) with 6 1/4" Drag Bit, Ream with 9 1/4" Rock Bit to 33.5' bgs, set 8" steel to 33.5' bgs. Plugged pilot hole with bentonite chips from 35' to 33.5' bgs.

**WELL CONSTRUCTION**



GRAPHICS

**GEOLOGICAL DESCRIPTION**

0.0 - 0.5'	TOPSOIL/SOD-
0.5 - 3.0'	Silty CLAY w/ Sand- moist, yellowish brown, soft, plastic, some very fine-grained sand [Alluvium/Colluvium]
3.0 - 12.0'	Silty CLAY w/ Sand- very moist to wet, yellowish brown, soft, plastic, some very fine-grained sand [Alluvium/Colluvium]
12.0 - 32.0'	Sandy GRAVEL- wet, red and yellow, loose, angular to rounded, 1/8" to 2" (mostly 1/2" to 1"), platy, clean, clinker and sandstone composition, minor gray siltstone and fine to coarse grained sand [Alluvium]
32.0 - 35.0'	Interbedded CLAYSTONE and SILTSTONE- light olive gray to gray, weak, weathered, with minor coal layer at bottom of hole [Fort Union Formation]

STANDARD 0831EFAC.GPJ HYD-TUC.GDT 9/7/00





**APPENDIX B**  
**LABORATORY REPORTS**



# ANALYTICAL SUMMARY REPORT

December 30, 2021

Talen Energy Supply LLC  
PO Box 38  
Colstrip, MT 59323-0038

Work Order: B21120957      Quote ID: B5242

Project Name: STEP 1&2 Semi-annual Analysis

Energy Laboratories Inc Billings MT received the following 5 samples for Talen Energy Supply LLC on 12/10/2021 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B21120957-001	21F-TLN-2112-104	12/09/21 9:35	12/10/21	Ground Water	Metals by ICP/ICPMS, Dissolved Alkalinity Anion - Cation Balance Conductivity Hardness Anions by Ion Chromatography pH Preparation for TDS A2540 C Solids, Total Dissolved
B21120957-002	21F-TLN-2112-102	12/08/21 13:46	12/10/21	Ground Water	Same As Above
B21120957-003	21F-TLN-2112-103	12/08/21 12:26	12/10/21	Ground Water	Same As Above
B21120957-004	21F-TLN-2112-106	12/08/21 12:36	12/10/21	Ground Water	Same As Above
B21120957-005	21F-TLN-2112-105	12/09/21 10:00	12/10/21	Ground Water	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B21120957-001  
**Client Sample ID:** 21F-TLN-2112-104

SPN

**Report Date:** 12/30/21  
**Collection Date:** 12/09/21 09:35  
**Date Received:** 12/10/21  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.1	s.u.	H	0.1		A4500-H B	12/10/21 17:27 / ftk
pH Measurement Temp	14.5	°C		1.0		A4500-H B	12/10/21 17:27 / ftk
Conductivity @ 25 C	3710	umhos/cm		5		A2510 B	12/10/21 17:27 / ftk
Solids, Total Dissolved TDS @ 180 C	3330	mg/L	D	100		A2540 C	12/13/21 08:51 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	276	mg/L		4		A2320 B	12/15/21 14:16 / ftk
Bicarbonate as HCO3	337	mg/L		4		A2320 B	12/15/21 14:16 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	12/15/21 14:16 / ftk
Chloride	34	mg/L	D	5		E300.0	12/28/21 04:36 / car
Sulfate	2310	mg/L	D	10		E300.0	12/28/21 04:36 / car
Bromide	ND	mg/L		0.5		E300.0	12/28/21 04:36 / car
Hardness as CaCO3	1870	mg/L		1		A2340 B	12/13/21 17:40 / klc
<b>METALS, DISSOLVED</b>							
Boron	1.3	mg/L		0.1		E200.7	12/13/21 17:40 / rlh
Calcium	255	mg/L		1		E200.7	12/13/21 17:40 / rlh
Cobalt	ND	mg/L		0.005		E200.8	12/13/21 22:34 / srh
Lithium	0.11	mg/L	D	0.02		E200.7	12/13/21 17:40 / rlh
Magnesium	300	mg/L		1		E200.7	12/13/21 17:40 / rlh
Manganese	0.920	mg/L		0.001		E200.8	12/13/21 22:34 / srh
Potassium	15	mg/L		1		E200.7	12/13/21 17:40 / rlh
Selenium	ND	mg/L		0.005		E200.8	12/13/21 22:34 / srh
Sodium	278	mg/L		1		E200.7	12/13/21 17:40 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-4.47	%				A1030 E	12/29/21 19:10 / klc
TDS Ratio	0.99			0.01		A1030 E	12/29/21 19:10 / klc

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B21120957-002  
**Client Sample ID:** 21F-TLN-2112-102

P12

**Report Date:** 12/30/21  
**Collection Date:** 12/08/21 13:46  
**Date Received:** 12/10/21  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.4	s.u.	H	0.1		A4500-H B	12/10/21 17:29 / ftk
pH Measurement Temp	14.6	°C		1.0		A4500-H B	12/10/21 17:29 / ftk
Conductivity @ 25 C	3900	umhos/cm		5		A2510 B	12/10/21 17:29 / ftk
Solids, Total Dissolved TDS @ 180 C	3430	mg/L	D	100		A2540 C	12/13/21 08:51 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	384	mg/L		4		A2320 B	12/15/21 14:23 / ftk
Bicarbonate as HCO3	468	mg/L		4		A2320 B	12/15/21 14:23 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	12/15/21 14:23 / ftk
Chloride	36	mg/L	D	5		E300.0	12/28/21 05:21 / car
Sulfate	2330	mg/L	D	10		E300.0	12/28/21 05:21 / car
Bromide	2.4	mg/L		0.5		E300.0	12/28/21 05:21 / car
Hardness as CaCO3	2080	mg/L		1		A2340 B	12/23/21 12:47 / klc
<b>METALS, DISSOLVED</b>							
Boron	2.0	mg/L		0.1		E200.7	12/23/21 12:47 / rlh
Calcium	244	mg/L	D	3		E200.7	12/23/21 12:47 / rlh
Cobalt	ND	mg/L		0.005		E200.8	12/13/21 22:40 / srh
Lithium	0.12	mg/L	D	0.03		E200.7	12/23/21 12:47 / rlh
Magnesium	356	mg/L		1		E200.7	12/23/21 12:47 / rlh
Manganese	0.76	mg/L	D	0.01		E200.7	12/23/21 12:47 / rlh
Potassium	15	mg/L		1		E200.7	12/23/21 12:47 / rlh
Selenium	ND	mg/L		0.005		E200.8	12/13/21 22:40 / srh
Sodium	290	mg/L	D	3		E200.7	12/23/21 12:47 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-2.46	%				A1030 E	12/29/21 19:12 / klc
TDS Ratio	0.98			0.01		A1030 E	12/29/21 19:12 / klc

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B21120957-003  
**Client Sample ID:** 21F-TLN-2112-103

P11

**Report Date:** 12/30/21  
**Collection Date:** 12/08/21 12:26  
**Date Received:** 12/10/21  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.4	s.u.	H	0.1		A4500-H B	12/10/21 17:32 / ftk
pH Measurement Temp	14.8	°C		1.0		A4500-H B	12/10/21 17:32 / ftk
Conductivity @ 25 C	2890	umhos/cm		5		A2510 B	12/10/21 17:32 / ftk
Solids, Total Dissolved TDS @ 180 C	2500	mg/L	D	40		A2540 C	12/13/21 08:51 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	392	mg/L		4		A2320 B	12/15/21 14:30 / ftk
Bicarbonate as HCO3	478	mg/L		4		A2320 B	12/15/21 14:30 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	12/15/21 14:30 / ftk
Chloride	26	mg/L	D	2		E300.0	12/21/21 12:20 / caa
Sulfate	1700	mg/L	D	5		E300.0	12/21/21 12:20 / caa
Bromide	ND	mg/L		0.5		E300.0	12/21/21 12:20 / caa
Hardness as CaCO3	1490	mg/L		1		A2340 B	12/13/21 22:46 / bak
<b>METALS, DISSOLVED</b>							
Boron	0.8	mg/L		0.1		E200.7	12/13/21 17:49 / rlh
Calcium	193	mg/L		1		E200.8	12/13/21 22:46 / srh
Cobalt	ND	mg/L		0.005		E200.8	12/13/21 22:46 / srh
Lithium	0.08	mg/L	D	0.02		E200.7	12/13/21 17:49 / rlh
Magnesium	245	mg/L		1		E200.7	12/13/21 17:49 / rlh
Manganese	0.624	mg/L		0.001		E200.8	12/13/21 22:46 / srh
Potassium	13	mg/L		1		E200.7	12/13/21 17:49 / rlh
Selenium	ND	mg/L		0.005		E200.8	12/13/21 22:46 / srh
Sodium	224	mg/L		1		E200.7	12/13/21 17:49 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-4.84	%				A1030 E	12/22/21 13:28 / bap
TDS Ratio	0.95			0.01		A1030 E	12/22/21 13:28 / bap

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time





### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B21120957-004  
**Client Sample ID:** 21F-TLN-2112-106

917A

**Report Date:** 12/30/21  
**Collection Date:** 12/08/21 12:36  
**Date Received:** 12/10/21  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.4	s.u.	H	0.1		A4500-H B	12/10/21 17:34 / ftk
pH Measurement Temp	14.8	°C		1.0		A4500-H B	12/10/21 17:34 / ftk
Conductivity @ 25 C	2640	umhos/cm		5		A2510 B	12/10/21 17:34 / ftk
Solids, Total Dissolved TDS @ 180 C	2250	mg/L	D	40		A2540 C	12/13/21 08:51 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	396	mg/L		4		A2320 B	12/15/21 14:36 / ftk
Bicarbonate as HCO3	483	mg/L		4		A2320 B	12/15/21 14:36 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	12/15/21 14:36 / ftk
Chloride	47	mg/L	D	2		E300.0	12/21/21 12:38 / caa
Sulfate	1660	mg/L	D	5		E300.0	12/21/21 12:38 / caa
Bromide	ND	mg/L		0.5		E300.0	12/21/21 12:38 / caa
Hardness as CaCO3	1450	mg/L		1		A2340 B	12/13/21 22:52 / klc
<b>METALS, DISSOLVED</b>							
Boron	0.9	mg/L		0.1		E200.7	12/13/21 18:01 / rlh
Calcium	241	mg/L		1		E200.8	12/13/21 22:52 / srh
Cobalt	ND	mg/L		0.005		E200.8	12/13/21 22:52 / srh
Lithium	0.08	mg/L	D	0.02		E200.7	12/14/21 18:51 / rlh
Magnesium	206	mg/L		1		E200.7	12/13/21 18:01 / rlh
Manganese	0.111	mg/L		0.001		E200.8	12/13/21 22:52 / srh
Potassium	10	mg/L		1		E200.7	12/13/21 18:01 / rlh
Selenium	ND	mg/L		0.005		E200.8	12/13/21 22:52 / srh
Sodium	147	mg/L		1		E200.7	12/13/21 18:01 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-10.4	%				A1030 E	12/29/21 19:14 / klc
TDS Ratio	0.88			0.01		A1030 E	12/29/21 19:14 / klc

- The Balance was confirmed by re-analysis of anions, cations, and alkalinity.

<b>Report Definitions:</b>	RL - Analyte Reporting Limit	MCL - Maximum Contaminant Level
	QCL - Quality Control Limit	ND - Not detected at the Reporting Limit (RL)
	D - Reporting Limit (RL) increased due to sample matrix	H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B21120957-005  
**Client Sample ID:** 21F-TLN-2112-105

SP3

**Report Date:** 12/30/21  
**Collection Date:** 12/09/21 10:00  
**Date Received:** 12/10/21  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	4.7	s.u.	H	0.1		A4500-H B	12/10/21 17:37 / ftk
pH Measurement Temp	14.9	°C		1.0		A4500-H B	12/10/21 17:37 / ftk
Conductivity @ 25 C	5260	umhos/cm		5		A2510 B	12/10/21 17:37 / ftk
Solids, Total Dissolved TDS @ 180 C	6370	mg/L	D	100		A2540 C	12/13/21 08:52 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	ND	mg/L		4		A2320 B	12/15/21 14:43 / ftk
Bicarbonate as HCO3	ND	mg/L		4		A2320 B	12/15/21 14:43 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	12/15/21 14:43 / ftk
Chloride	52	mg/L	D	5		E300.0	12/28/21 05:51 / car
Sulfate	4410	mg/L	D	10		E300.0	12/28/21 05:51 / car
Bromide	ND	mg/L		0.5		E300.0	12/28/21 05:51 / car
Hardness as CaCO3	1170	mg/L		1		A2340 B	12/13/21 18:14 / klc
<b>METALS, DISSOLVED</b>							
Boron	1.3	mg/L		0.1		E200.7	12/13/21 18:14 / rlh
Calcium	268	mg/L	D	3		E200.7	12/13/21 18:14 / rlh
Cobalt	0.012	mg/L		0.005		E200.8	12/13/21 22:59 / srh
Lithium	0.08	mg/L	D	0.03		E200.7	12/14/21 19:03 / rlh
Magnesium	123	mg/L		1		E200.7	12/13/21 18:14 / rlh
Manganese	9.05	mg/L	D	0.01		E200.7	12/13/21 18:14 / rlh
Potassium	13	mg/L		1		E200.7	12/13/21 18:14 / rlh
Selenium	ND	mg/L		0.005		E200.8	12/13/21 22:59 / srh
Sodium	262	mg/L	D	3		E200.7	12/13/21 18:14 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	3.07	%				A1030 E	12/29/21 19:17 / klc
TDS Ratio	1.24			0.01		A1030 E	12/29/21 19:17 / klc

Cation/Anion Balance includes selected metals

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120957

**Report Date:** 12/30/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: A2320 B</b> <span style="float: right;">Batch: R371708</span>										
<b>Lab ID: MBLK</b>		Method Blank								
Alkalinity, Total as CaCO3		ND	mg/L	4						Run: METROHM 2_211214A 12/14/21 09:34
<b>Lab ID: MBLK</b>		Method Blank								
Alkalinity, Total as CaCO3		ND	mg/L	4						Run: METROHM 2_211214A 12/15/21 11:45
<b>Lab ID: LCS</b>		Laboratory Control Sample								
Alkalinity, Total as CaCO3		102	mg/L	4.0	102	90	110			Run: METROHM 2_211214A 12/15/21 11:59
<b>Lab ID: B21112144-002ADUP</b>	3	Sample Duplicate								
Alkalinity, Total as CaCO3		165	mg/L	4.0				0.3	10	Run: METROHM 2_211214A 12/15/21 13:06
Bicarbonate as HCO3		201	mg/L	4.0				0.3	10	
Carbonate as CO3		ND	mg/L	4.0					10	
<b>Lab ID: B21121120-006ADUP</b>	3	Sample Duplicate								
Alkalinity, Total as CaCO3		58.5	mg/L	4.0				0.3	10	Run: METROHM 2_211214A 12/15/21 14:03
Bicarbonate as HCO3		71.3	mg/L	4.0				0.3	10	
Carbonate as CO3		ND	mg/L	4.0					10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120957

**Report Date:** 12/30/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A2510 B										Batch: R371527
<b>Lab ID:</b> SC 2nd 1413		Laboratory Control Sample					Run: PHSC _101-B_211210A			12/10/21 10:01
Conductivity @ 25 C	1410	umhos/cm		5.0	100	90	110			
<b>Lab ID:</b> MBLK		Method Blank					Run: PHSC _101-B_211210A			12/10/21 16:50
Conductivity @ 25 C	ND	umhos/cm		5						
<b>Lab ID:</b> B21120914-005ADUP		Sample Duplicate					Run: PHSC _101-B_211210A			12/10/21 16:55
Conductivity @ 25 C	86.0	umhos/cm		5.0				0.0	10	
<b>Lab ID:</b> B21120953-009BDUP		Sample Duplicate					Run: PHSC _101-B_211210A			12/10/21 17:24
Conductivity @ 25 C	216	umhos/cm		5.0				0.0	10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120957

**Report Date:** 12/30/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A2540 C										Batch: 162107
<b>Lab ID:</b> MB-162107		Method Blank								Run: BAL #30_211213A 12/13/21 08:47
Solids, Total Dissolved TDS @ 180 C		ND	mg/L							
<b>Lab ID:</b> LCS-162107		Laboratory Control Sample								Run: BAL #30_211213A 12/13/21 08:47
Solids, Total Dissolved TDS @ 180 C		1050	mg/L	10	105	90	110			
<b>Lab ID:</b> B21120940-011A DUP		Sample Duplicate								Run: BAL #30_211213A 12/13/21 08:48
Solids, Total Dissolved TDS @ 180 C		196	mg/L	10				1.5	5	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120957

**Report Date:** 12/30/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method:</b> A4500-H B		Analytical Run: PHSC _101-B_211210A									
<b>Lab ID:</b> pH 8	2	Initial Calibration Verification Standard								12/10/21 09:48	
pH		8.0	s.u.	0.1	100	98	102				
pH Measurement Temp		19.0	°C	1.0							
<b>Method:</b> A4500-H B		Batch: R371527									
<b>Lab ID:</b> B21120914-005ADUP	2	Sample Duplicate								Run: PHSC _101-B_211210A	12/10/21 16:55
pH		6.9	s.u.	0.1				0.6	3		
pH Measurement Temp		16.5	°C	1.0							
<b>Lab ID:</b> B21120953-009BDUP	2	Sample Duplicate								Run: PHSC _101-B_211210A	12/10/21 17:24
pH		8.1	s.u.	0.1				0.1	3		
pH Measurement Temp		16.0	°C	1.0							

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120957

**Report Date:** 12/30/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.7</b>		Analytical Run: ICP204-B_211213A									
<b>Lab ID: ICV</b>	7	Continuing Calibration Verification Standard							12/13/21 10:39		
Boron		2.47	mg/L	0.10	99	95	105				
Calcium		25.4	mg/L	1.0	101	95	105				
Lithium		1.28	mg/L	0.10	103	95	105				
Magnesium		25.5	mg/L	1.0	102	95	105				
Manganese		2.43	mg/L	0.010	97	95	105				
Potassium		25.7	mg/L	1.0	103	95	105				
Sodium		25.7	mg/L	1.0	103	95	105				
<b>Method: E200.7</b>		Batch: R371636									
<b>Lab ID: MB-7400DIS211213A</b>	7	Method Blank							Run: ICP204-B_211213A 12/13/21 09:51		
Boron		ND	mg/L	0.01							
Calcium		ND	mg/L	0.3							
Lithium		ND	mg/L	0.003							
Magnesium		ND	mg/L	0.02							
Manganese		ND	mg/L	0.001							
Potassium		ND	mg/L	0.1							
Sodium		ND	mg/L	0.3							
<b>Lab ID: LFB-7400DIS211213A</b>	7	Laboratory Fortified Blank							Run: ICP204-B_211213A 12/13/21 09:59		
Boron		1.01	mg/L	0.10	101	85	115				
Calcium		50.3	mg/L	1.0	101	85	115				
Lithium		1.04	mg/L	0.10	104	85	115				
Magnesium		51.5	mg/L	1.0	103	85	115				
Manganese		4.85	mg/L	0.010	97	85	115				
Potassium		52.1	mg/L	1.0	104	85	115				
Sodium		51.0	mg/L	1.0	102	85	115				
<b>Lab ID: B21120957-004BMS2</b>	7	Sample Matrix Spike							Run: ICP204-B_211213A 12/13/21 18:05		
Boron		6.13	mg/L	0.065	104	70	130				
Calcium		492	mg/L	1.5	105	70	130				
Lithium		5.85	mg/L	0.10	115	70	130				
Magnesium		481	mg/L	1.0	110	70	130				
Manganese		24.7	mg/L	0.0052	98	70	130				
Potassium		292	mg/L	1.0	112	70	130				
Sodium		423	mg/L	1.5	110	70	130				
<b>Lab ID: B21120957-004BMSD</b>	7	Sample Matrix Spike Duplicate							Run: ICP204-B_211213A 12/13/21 18:10		
Boron		5.90	mg/L	0.065	99	70	130	3.9	20		
Calcium		481	mg/L	1.5	101	70	130	2.3	20		
Lithium		5.51	mg/L	0.10	109	70	130	6.0	20		
Magnesium		471	mg/L	1.0	106	70	130	2.1	20		
Manganese		23.6	mg/L	0.0052	94	70	130	4.3	20		
Potassium		277	mg/L	1.0	107	70	130	5.2	20		
Sodium		408	mg/L	1.5	104	70	130	3.6	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



## QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120957

**Report Date:** 12/30/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method:</b> E200.7										Analytical Run: ICP204-B_211214A	
<b>Lab ID:</b> ICV		Continuing Calibration Verification Standard								12/14/21 13:52	
Lithium		1.29	mg/L	0.10	103	95	105				
<b>Method:</b> E200.7										Batch: R371750	
<b>Lab ID:</b> MB-7400DIS211214A		Method Blank								Run: ICP204-B_211214A	12/14/21 14:00
Lithium		ND	mg/L	0.003							
<b>Lab ID:</b> LFB-7400DIS211214A		Laboratory Fortified Blank								Run: ICP204-B_211214A	12/14/21 14:09
Lithium		1.01	mg/L	0.10	101	85	115				
<b>Lab ID:</b> B21120957-004BMS2		Sample Matrix Spike								Run: ICP204-B_211214A	12/14/21 18:55
Lithium		5.04	mg/L	0.10	99	70	130				
<b>Lab ID:</b> B21120957-004BMSD		Sample Matrix Spike Duplicate								Run: ICP204-B_211214A	12/14/21 18:59
Lithium		5.04	mg/L	0.10	99	70	130	0.1	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)





# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120957

**Report Date:** 12/30/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.7</b>		Analytical Run: ICP204-B_211223A									
<b>Lab ID: ICV</b>	7	Continuing Calibration Verification Standard							12/23/21 10:33		
Boron		2.45	mg/L	0.10	98	95	105				
Calcium		25.9	mg/L	1.0	104	95	105				
Lithium		1.31	mg/L	0.10	104	95	105				
Magnesium		25.7	mg/L	1.0	103	95	105				
Manganese		2.42	mg/L	0.010	97	95	105				
Potassium		26.1	mg/L	1.0	104	95	105				
Sodium		26.1	mg/L	1.0	104	95	105				
<b>Method: E200.7</b>		Batch: R372293									
<b>Lab ID: MB-7400DIS211223A</b>	7	Method Blank							Run: ICP204-B_211223A 12/23/21 10:42		
Boron		ND	mg/L	0.01							
Calcium		ND	mg/L	0.3							
Lithium		ND	mg/L	0.003							
Magnesium		ND	mg/L	0.02							
Manganese		ND	mg/L	0.001							
Potassium		ND	mg/L	0.1							
Sodium		ND	mg/L	0.3							
<b>Lab ID: LFB-7400DIS211223A</b>	7	Laboratory Fortified Blank							Run: ICP204-B_211223A 12/23/21 10:50		
Boron		1.00	mg/L	0.10	100	85	115				
Calcium		51.1	mg/L	1.0	102	85	115				
Lithium		1.07	mg/L	0.10	107	85	115				
Magnesium		51.6	mg/L	1.0	103	85	115				
Manganese		4.82	mg/L	0.010	96	85	115				
Potassium		52.9	mg/L	1.0	106	85	115				
Sodium		53.0	mg/L	1.0	106	85	115				
<b>Lab ID: B21121766-001BMS2</b>	7	Sample Matrix Spike							Run: ICP204-B_211223A 12/23/21 13:29		
Boron		2.94	mg/L	0.050	98	70	130				
Calcium		103	mg/L	1.0	101	70	130				
Lithium		2.02	mg/L	0.10	99	70	130				
Magnesium		102	mg/L	1.0	101	70	130				
Manganese		9.48	mg/L	0.0021	95	70	130				
Potassium		101	mg/L	1.0	100	70	130				
Sodium		476	mg/L	1.0	92	70	130				
<b>Lab ID: B21121766-001BMSD</b>	7	Sample Matrix Spike Duplicate							Run: ICP204-B_211223A 12/23/21 13:33		
Boron		2.94	mg/L	0.050	98	70	130	0.2	20		
Calcium		103	mg/L	1.0	101	70	130	0.1	20		
Lithium		2.05	mg/L	0.10	101	70	130	1.6	20		
Magnesium		102	mg/L	1.0	101	70	130	0	20		
Manganese		9.43	mg/L	0.0021	94	70	130	0.5	20		
Potassium		102	mg/L	1.0	101	70	130	0.6	20		
Sodium		478	mg/L	1.0	94	70	130	0.3	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120957

**Report Date:** 12/30/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E200.8</b>		Analytical Run: ICPMS207-B_211213A								
<b>Lab ID: QCS</b>	4	Initial Calibration Verification Standard							12/13/21 15:39	
Calcium		2.61	mg/L	0.50	104	90	110			
Cobalt		0.0513	mg/L	0.010	103	90	110			
Manganese		0.259	mg/L	0.010	104	90	110			
Selenium		0.0543	mg/L	0.0050	109	90	110			
<b>Method: E200.8</b>		Batch: R371660								
<b>Lab ID: LRB</b>	4	Method Blank							Run: ICPMS207-B_211213A 12/13/21 12:51	
Calcium		ND	mg/L	0.03						
Cobalt		ND	mg/L	0.00002						
Manganese		ND	mg/L	0.00005						
Selenium		ND	mg/L	0.00007						
<b>Lab ID: LFB</b>	4	Laboratory Fortified Blank							Run: ICPMS207-B_211213A 12/13/21 12:57	
Calcium		47.6	mg/L	0.50	95	85	115			
Cobalt		0.0509	mg/L	0.010	102	85	115			
Manganese		0.0521	mg/L	0.010	104	85	115			
Selenium		0.0511	mg/L	0.0050	102	85	115			
<b>Lab ID: B21120956-007AMS</b>	4	Sample Matrix Spike							Run: ICPMS207-B_211213A 12/13/21 22:04	
Calcium		134	mg/L	1.0	90	70	130			E
Cobalt		0.0496	mg/L	0.0050	99	70	130			
Manganese		0.0522	mg/L	0.0010	100	70	130			
Selenium		0.0521	mg/L	0.0010	104	70	130			
<b>Lab ID: B21120956-007AMSD</b>	4	Sample Matrix Spike Duplicate							Run: ICPMS207-B_211213A 12/13/21 22:10	
Calcium		137	mg/L	1.0	97	70	130	2.7	20	E
Cobalt		0.0510	mg/L	0.0050	102	70	130	2.6	20	
Manganese		0.0515	mg/L	0.0010	98	70	130	1.4	20	
Selenium		0.0504	mg/L	0.0010	100	70	130	3.5	20	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

E - Estimated value - result exceeds the instrument upper quantitation limit



# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B21120957

Report Date: 12/30/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E300.0</b>		Analytical Run: IC METROHM 2_211216A								
<b>Lab ID: ICV</b>	3	Initial Calibration Verification Standard							12/17/21 14:45	
Chloride		26.1	mg/L	1.0	104	90	110			
Sulfate		105	mg/L	1.0	105	90	110			
Bromide		1.29	mg/L	0.50	103	90	110			
<b>Method: E300.0</b>		Batch: R371954								
<b>Lab ID: B21120857-001AMS</b>	3	Sample Matrix Spike							Run: IC METROHM 2_211216A 12/18/21 15:34	
Chloride		299	mg/L	2.6	108	90	110			
Sulfate		2230	mg/L	5.3	105	90	110			
Bromide		14.4	mg/L	0.50	115	90	110			S
<b>Lab ID: B21120857-001AMSD</b>	3	Sample Matrix Spike Duplicate							Run: IC METROHM 2_211216A 12/18/21 15:51	
Chloride		299	mg/L	2.6	108	90	110	0	20	
Sulfate		2220	mg/L	5.3	104	90	110	0.7	20	
Bromide		14.5	mg/L	0.50	116	90	110	0.5	20	S
<b>Lab ID: ICB</b>	3	Method Blank							Run: IC METROHM 2_211216A 12/17/21 00:44	
Chloride		ND	mg/L	0.06						
Sulfate		ND	mg/L	0.3						
Bromide		ND	mg/L	0.007						
<b>Lab ID: LFB</b>	3	Laboratory Fortified Blank							Run: IC METROHM 2_211216A 12/17/21 01:36	
Chloride		26	mg/L	1.0	105	90	110			
Sulfate		110	mg/L	1.0	107	90	110			
Bromide		1.4	mg/L	0.50	109	90	110			
<b>Lab ID: B21120957-001AMS</b>	3	Sample Matrix Spike							Run: IC METROHM 2_211216A 12/20/21 11:40	
Chloride		594	mg/L	5.3	112	90	110			S
Sulfate		4450	mg/L	11	107	90	110			
Bromide		25.6	mg/L	0.50	101	90	110			
<b>Lab ID: B21120957-001AMSD</b>	3	Sample Matrix Spike Duplicate							Run: IC METROHM 2_211216A 12/20/21 11:57	
Chloride		595	mg/L	5.3	112	90	110	0.2	20	S
Sulfate		4520	mg/L	11	110	90	110	1.6	20	
Bromide		25.5	mg/L	0.50	101	90	110	0.4	20	
<b>Lab ID: B21120957-001AMS</b>	3	Sample Matrix Spike							Run: IC METROHM 2_211216A 12/21/21 11:28	
Chloride		496	mg/L	5.3	90	90	110			
Sulfate		4100	mg/L	11	89	90	110			S
Bromide		21.3	mg/L	0.50	83	90	110			S
<b>Lab ID: B21120957-001AMSD</b>	3	Sample Matrix Spike Duplicate							Run: IC METROHM 2_211216A 12/21/21 11:46	
Chloride		511	mg/L	5.3	93	90	110	3.0	20	
Sulfate		4140	mg/L	11	91	90	110	0.9	20	
Bromide		22.0	mg/L	0.50	85	90	110	3.1	20	S

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits



## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B21120957

Report Date: 12/30/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E300.0</b>		Analytical Run: IC METROHM 2_211228A								
<b>Lab ID: ICV</b>	3	Initial Calibration Verification Standard							12/27/21 16:05	
Chloride		25.5	mg/L	1.0	102	90	110			
Sulfate		103	mg/L	1.0	103	90	110			
Bromide		1.21	mg/L	0.50	97	90	110			
<b>Method: E300.0</b>		Batch: R372401								
<b>Lab ID: ICB</b>	3	Method Blank							Run: IC METROHM 2_211228A 12/27/21 16:22	
Chloride		ND	mg/L	0.06						
Sulfate		ND	mg/L	0.3						
Bromide		ND	mg/L	0.007						
<b>Lab ID: LFB</b>	3	Laboratory Fortified Blank							Run: IC METROHM 2_211228A 12/27/21 17:49	
Chloride		25.6	mg/L	1.0	102	90	110			
Sulfate		103	mg/L	1.0	103	90	110			
Bromide		1.17	mg/L	0.50	94	90	110			
<b>Lab ID: B21120957-001AMS</b>	3	Sample Matrix Spike							Run: IC METROHM 2_211228A 12/28/21 04:51	
Chloride		548	mg/L	5.3	103	90	110			
Sulfate		4250	mg/L	11	97	90	110			
Bromide		23.7	mg/L	0.50	94	90	110			
<b>Lab ID: B21120957-001AMSD</b>	3	Sample Matrix Spike Duplicate							Run: IC METROHM 2_211228A 12/28/21 05:06	
Chloride		550	mg/L	5.3	103	90	110	0.5	20	
Sulfate		4240	mg/L	11	97	90	110	0.2	20	
Bromide		23.8	mg/L	0.50	94	90	110	0.5	20	
<b>Lab ID: B21120944-001BDUP</b>	3	Sample Duplicate							Run: IC METROHM 2_211228A 12/28/21 16:52	
Chloride		221	mg/L	1.0				13	20	
Sulfate		165	mg/L	1.0				6.5	20	
Bromide		0.208	mg/L	0.50					20	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# Work Order Receipt Checklist

Talen Energy Supply LLC

B21120957

Login completed by: Richard L. Shular

Date Received: 12/10/2021

Reviewed by: BL2000\gmccartney

Received by: rs4

Reviewed Date: 12/16/2021

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	°C On Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input type="checkbox"/>

## 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.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

## Contact and Corrective Action Comments:

The Temperature Blank temperature for shipping container 1 was 2.6°C and shipping container 2 was 3.4°C.





# ANALYTICAL SUMMARY REPORT

December 29, 2021

Talen Energy Supply LLC  
PO Box 38  
Colstrip, MT 59323-0038

Work Order: B21120960 Quote ID: B5242

Project Name: STEP 1&2 Semi-annual Analysis

Energy Laboratories Inc Billings MT received the following 2 samples for Talen Energy Supply LLC on 12/10/2021 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B21120960-001	TLN-2112-107	12/09/21 12:25	12/10/21	Ground Water	Metals by ICP/ICPMS, Dissolved Metals by ICP/ICPMS, Total Alkalinity Anion - Cation Balance Conductivity Hardness Anions by Ion Chromatography pH Metals Digestion by E200.2 Preparation for TDS A2540 C Solids, Total Dissolved
B21120960-002	TLN-2112-108	12/09/21 13:00	12/10/21	Ground Water	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B21120960-001  
**Client Sample ID:** TLN-2112-107

**Report Date:** 12/29/21  
**Collection Date:** 12/09/21 12:25  
**Date Received:** 12/10/21  
**Matrix:** Ground Water

## AR1-NF

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.9	s.u.	H	0.1		A4500-H B	12/10/21 17:39 / ftk
pH Measurement Temp	15.3	°C		1.0		A4500-H B	12/10/21 17:39 / ftk
Conductivity @ 25 C	3750	umhos/cm		5		A2510 B	12/10/21 17:39 / ftk
Solids, Total Dissolved TDS @ 180 C	3300	mg/L	D	100		A2540 C	12/13/21 08:53 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	508	mg/L		4		A2320 B	12/16/21 13:52 / ftk
Bicarbonate as HCO3	620	mg/L		4		A2320 B	12/16/21 13:52 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	12/16/21 13:52 / ftk
Chloride	86	mg/L	D	5		E300.0	12/28/21 06:06 / car
Sulfate	2100	mg/L	D	10		E300.0	12/28/21 06:06 / car
Bromide	0.6	mg/L		0.5		E300.0	12/28/21 06:06 / car
Hardness as CaCO3	2190	mg/L		1		A2340 B	12/13/21 18:18 / klc
<b>METALS, DISSOLVED</b>							
Boron	1.5	mg/L		0.1		E200.7	12/13/21 18:18 / rlh
Calcium	310	mg/L		1		E200.7	12/13/21 18:18 / rlh
Cobalt	ND	mg/L		0.005		E200.8	12/14/21 20:35 / srh
Lithium	0.09	mg/L	D	0.02		E200.7	12/14/21 19:08 / rlh
Magnesium	345	mg/L		1		E200.7	12/13/21 18:18 / rlh
Manganese	0.794	mg/L	D	0.005		E200.7	12/13/21 18:18 / rlh
Potassium	14	mg/L		1		E200.7	12/13/21 18:18 / rlh
Selenium	ND	mg/L		0.005		E200.8	12/14/21 20:35 / srh
Sodium	222	mg/L		1		E200.7	12/13/21 18:18 / rlh
<b>METALS, TOTAL</b>							
Boron	1.4	mg/L		0.1		E200.7	12/15/21 05:48 / rlh
Calcium	315	mg/L		1		E200.7	12/15/21 05:48 / rlh
Cobalt	ND	mg/L		0.005		E200.8	12/16/21 07:33 / srh
Lithium	0.10	mg/L	D	0.04		E200.7	12/15/21 05:48 / rlh
Magnesium	352	mg/L		1		E200.7	12/15/21 05:48 / rlh
Manganese	0.839	mg/L	D	0.004		E200.7	12/15/21 05:48 / rlh
Potassium	14	mg/L		1		E200.7	12/15/21 05:48 / rlh
Selenium	ND	mg/L		0.005		E200.8	12/16/21 07:33 / srh
Sodium	222	mg/L	D	2		E200.7	12/15/21 05:48 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-2.19	%				A1030 E	12/29/21 19:21 / klc
TDS Ratio	0.98			0.01		A1030 E	12/29/21 19:21 / klc

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time





## LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B21120960-002  
**Client Sample ID:** TLN-2112-108

# AR-8

**Report Date:** 12/29/21  
**Collection Date:** 12/09/21 13:00  
**Date Received:** 12/10/21  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	8.0	s.u.	H	0.1		A4500-H B	12/10/21 17:42 / ftk
pH Measurement Temp	15.5	°C		1.0		A4500-H B	12/10/21 17:42 / ftk
Conductivity @ 25 C	3730	umhos/cm		5		A2510 B	12/10/21 17:42 / ftk
Solids, Total Dissolved TDS @ 180 C	3260	mg/L	D	100		A2540 C	12/13/21 08:53 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	507	mg/L		4		A2320 B	12/16/21 14:04 / ftk
Bicarbonate as HCO3	618	mg/L		4		A2320 B	12/16/21 14:04 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	12/16/21 14:04 / ftk
Chloride	86	mg/L	D	5		E300.0	12/21/21 14:23 / caa
Sulfate	2210	mg/L	D	10		E300.0	12/21/21 14:23 / caa
Bromide	0.6	mg/L		0.5		E300.0	12/21/21 14:23 / caa
Hardness as CaCO3	2230	mg/L		1		A2340 B	12/13/21 18:22 / bap
<b>METALS, DISSOLVED</b>							
Boron	1.4	mg/L		0.1		E200.7	12/13/21 18:22 / rlh
Calcium	313	mg/L		1		E200.7	12/13/21 18:22 / rlh
Cobalt	ND	mg/L		0.005		E200.8	12/14/21 20:47 / srh
Lithium	0.09	mg/L	D	0.02		E200.7	12/14/21 19:12 / rlh
Magnesium	351	mg/L		1		E200.7	12/13/21 18:22 / rlh
Manganese	0.215	mg/L	D	0.005		E200.7	12/13/21 18:22 / rlh
Potassium	14	mg/L		1		E200.7	12/13/21 18:22 / rlh
Selenium	ND	mg/L		0.005		E200.8	12/14/21 20:47 / srh
Sodium	232	mg/L		1		E200.7	12/13/21 18:22 / rlh
<b>METALS, TOTAL</b>							
Boron	1.4	mg/L		0.1		E200.7	12/15/21 05:52 / rlh
Calcium	309	mg/L		1		E200.7	12/15/21 05:52 / rlh
Cobalt	ND	mg/L		0.005		E200.8	12/16/21 07:37 / srh
Lithium	0.10	mg/L	D	0.04		E200.7	12/15/21 05:52 / rlh
Magnesium	347	mg/L		1		E200.7	12/15/21 05:52 / rlh
Manganese	0.221	mg/L	D	0.004		E200.7	12/15/21 05:52 / rlh
Potassium	14	mg/L		1		E200.7	12/15/21 05:52 / rlh
Selenium	ND	mg/L		0.005		E200.8	12/16/21 07:37 / srh
Sodium	226	mg/L	D	2		E200.7	12/15/21 05:52 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-3.20	%				A1030 E	12/22/21 13:30 / bap
TDS Ratio	0.92			0.01		A1030 E	12/22/21 13:30 / bap

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120960

**Report Date:** 12/29/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: A2320 B</b> <span style="float: right;">Batch: R371878</span>										
<b>Lab ID: MBLK</b>		Method Blank								
Alkalinity, Total as CaCO3		ND	mg/L	4						Run: METROHM 2_211216A 12/16/21 09:44
<b>Lab ID: MBLK</b>		Method Blank								
Alkalinity, Total as CaCO3		ND	mg/L	4						Run: METROHM 2_211216A 12/16/21 12:54
<b>Lab ID: LCS</b>		Laboratory Control Sample								
Alkalinity, Total as CaCO3		102	mg/L	4.0	102	90	110			Run: METROHM 2_211216A 12/16/21 13:11
<b>Lab ID: B21112217-001BDUP</b>	3	Sample Duplicate								
Alkalinity, Total as CaCO3		93.7	mg/L	4.0				0.3	10	Run: METROHM 2_211216A 12/16/21 13:25
Bicarbonate as HCO3		114	mg/L	4.0				0.3	10	
Carbonate as CO3		ND	mg/L	4.0					10	
<b>Lab ID: B21120960-001ADUP</b>	3	Sample Duplicate								
Alkalinity, Total as CaCO3		509	mg/L	4.0				0.1	10	Run: METROHM 2_211216A 12/16/21 13:58
Bicarbonate as HCO3		621	mg/L	4.0				0.1	10	
Carbonate as CO3		ND	mg/L	4.0					10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120960

**Report Date:** 12/29/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A2510 B										Batch: R371527
<b>Lab ID:</b> SC 2nd 1413		Laboratory Control Sample					Run: PHSC _101-B_211210A			12/10/21 10:01
Conductivity @ 25 C	1410	umhos/cm		5.0	100	90	110			
<b>Lab ID:</b> MBLK		Method Blank					Run: PHSC _101-B_211210A			12/10/21 16:50
Conductivity @ 25 C	ND	umhos/cm		5						
<b>Lab ID:</b> B21120914-005ADUP		Sample Duplicate					Run: PHSC _101-B_211210A			12/10/21 16:55
Conductivity @ 25 C	86.0	umhos/cm		5.0				0.0	10	
<b>Lab ID:</b> B21120953-009BDUP		Sample Duplicate					Run: PHSC _101-B_211210A			12/10/21 17:24
Conductivity @ 25 C	216	umhos/cm		5.0				0.0	10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120960

**Report Date:** 12/29/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: A2540 C</b>										
Batch: 162108										
<b>Lab ID: MB-162108</b>		Method Blank								
Solids, Total Dissolved TDS @ 180 C	1	mg/L								Run: BAL #30_211213A 12/13/21 08:53
<b>Lab ID: LCS-162108</b>		Laboratory Control Sample								
Solids, Total Dissolved TDS @ 180 C	1040	mg/L		10	104	90	110			Run: BAL #30_211213A 12/13/21 08:53
<b>Lab ID: B21120960-001A DUP</b>		Sample Duplicate								
Solids, Total Dissolved TDS @ 180 C	3380	mg/L		100				2.4	5	Run: BAL #30_211213A 12/13/21 08:53

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120960

**Report Date:** 12/29/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method:</b> A4500-H B		Analytical Run: PHSC _101-B_211210A									
<b>Lab ID:</b> pH 8	2	Initial Calibration Verification Standard							12/10/21 09:48		
pH		8.0	s.u.	0.1	100	98	102				
pH Measurement Temp		19.0	°C	1.0							
<b>Method:</b> A4500-H B		Batch: R371527									
<b>Lab ID:</b> B21120914-005ADUP	2	Sample Duplicate							Run: PHSC _101-B_211210A		12/10/21 16:55
pH		6.9	s.u.	0.1				0.6	3		
pH Measurement Temp		16.5	°C	1.0							
<b>Lab ID:</b> B21120953-009BDUP	2	Sample Duplicate							Run: PHSC _101-B_211210A		12/10/21 17:24
pH		8.1	s.u.	0.1				0.1	3		
pH Measurement Temp		16.0	°C	1.0							

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120960

**Report Date:** 12/29/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.7</b>		Analytical Run: ICP204-B_211213A									
<b>Lab ID: ICV</b>	6	Continuing Calibration Verification Standard							12/13/21 10:39		
Boron		2.47	mg/L	0.10	99	95	105				
Calcium		25.4	mg/L	1.0	101	95	105				
Magnesium		25.5	mg/L	1.0	102	95	105				
Manganese		2.43	mg/L	0.010	97	95	105				
Potassium		25.7	mg/L	1.0	103	95	105				
Sodium		25.7	mg/L	1.0	103	95	105				
<b>Method: E200.7</b>		Batch: R371636									
<b>Lab ID: MB-7400DIS211213A</b>	6	Method Blank							Run: ICP204-B_211213A 12/13/21 09:51		
Boron		ND	mg/L	0.01							
Calcium		ND	mg/L	0.3							
Magnesium		ND	mg/L	0.02							
Manganese		ND	mg/L	0.001							
Potassium		ND	mg/L	0.1							
Sodium		ND	mg/L	0.3							
<b>Lab ID: LFB-7400DIS211213A</b>	6	Laboratory Fortified Blank							Run: ICP204-B_211213A 12/13/21 09:59		
Boron		1.01	mg/L	0.10	101	85	115				
Calcium		50.3	mg/L	1.0	101	85	115				
Magnesium		51.5	mg/L	1.0	103	85	115				
Manganese		4.85	mg/L	0.010	97	85	115				
Potassium		52.1	mg/L	1.0	104	85	115				
Sodium		51.0	mg/L	1.0	102	85	115				
<b>Lab ID: B21120957-004BMS2</b>	6	Sample Matrix Spike							Run: ICP204-B_211213A 12/13/21 18:05		
Boron		6.13	mg/L	0.065	104	70	130				
Calcium		492	mg/L	1.5	105	70	130				
Magnesium		481	mg/L	1.0	110	70	130				
Manganese		24.7	mg/L	0.0052	98	70	130				
Potassium		292	mg/L	1.0	112	70	130				
Sodium		423	mg/L	1.5	110	70	130				
<b>Lab ID: B21120957-004BMSD</b>	6	Sample Matrix Spike Duplicate							Run: ICP204-B_211213A 12/13/21 18:10		
Boron		5.90	mg/L	0.065	99	70	130	3.9	20		
Calcium		481	mg/L	1.5	101	70	130	2.3	20		
Magnesium		471	mg/L	1.0	106	70	130	2.1	20		
Manganese		23.6	mg/L	0.0052	94	70	130	4.3	20		
Potassium		277	mg/L	1.0	107	70	130	5.2	20		
Sodium		408	mg/L	1.5	104	70	130	3.6	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120960

**Report Date:** 12/29/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.7</b> <span style="float: right;">Analytical Run: ICP204-B_211214A</span>											
<b>Lab ID: ICV</b>	7	Continuing Calibration Verification Standard								12/14/21 13:52	
Boron		2.46	mg/L	0.10	98	95	105				
Calcium		25.7	mg/L	1.0	103	95	105				
Lithium		1.29	mg/L	0.10	103	95	105				
Magnesium		25.6	mg/L	1.0	102	95	105				
Manganese		2.44	mg/L	0.010	98	95	105				
Potassium		25.8	mg/L	1.0	103	95	105				
Sodium		25.7	mg/L	1.0	103	95	105				
<b>Method: E200.7</b> <span style="float: right;">Batch: 162148</span>											
<b>Lab ID: MB-162148</b>	7	Method Blank								Run: ICP204-B_211214A	12/15/21 04:38
Boron		ND	mg/L	0.009							
Calcium		ND	mg/L	0.07							
Lithium		ND	mg/L	0.006							
Magnesium		ND	mg/L	0.02							
Manganese		ND	mg/L	0.001							
Potassium		ND	mg/L	0.05							
Sodium		ND	mg/L	0.3							
<b>Lab ID: LCS3-162148</b>	7	Laboratory Control Sample								Run: ICP204-B_211214A	12/15/21 04:42
Boron		1.02	mg/L	0.10	102	85	115				
Calcium		52.5	mg/L	1.0	105	85	115				
Lithium		1.11	mg/L	0.10	111	85	115				
Magnesium		52.9	mg/L	1.0	106	85	115				
Manganese		5.00	mg/L	0.010	100	85	115				
Potassium		55.3	mg/L	1.0	111	85	115				
Sodium		53.7	mg/L	1.0	107	85	115				
<b>Lab ID: B21120953-004EMS3</b>	7	Sample Matrix Spike								Run: ICP204-B_211214A	12/15/21 05:07
Boron		1.05	mg/L	0.050	101	70	130				
Calcium		123	mg/L	1.0	100	70	130				
Lithium		1.12	mg/L	0.10	109	70	130				
Magnesium		81.8	mg/L	1.0	105	70	130				
Manganese		4.94	mg/L	0.0010	99	70	130				
Potassium		56.8	mg/L	1.0	109	70	130				
Sodium		61.0	mg/L	1.0	105	70	130				
<b>Lab ID: B21120953-004EMSD</b>	7	Sample Matrix Spike Duplicate								Run: ICP204-B_211214A	12/15/21 05:11
Boron		1.07	mg/L	0.050	102	70	130	1.1	20		
Calcium		123	mg/L	1.0	100	70	130	0	20		
Lithium		1.13	mg/L	0.10	110	70	130	0.4	20		
Magnesium		82.1	mg/L	1.0	106	70	130	0.4	20		
Manganese		4.97	mg/L	0.0010	99	70	130	0.7	20		
Potassium		57.2	mg/L	1.0	110	70	130	0.8	20		
Sodium		61.1	mg/L	1.0	106	70	130	0.2	20		
<b>Method: E200.7</b> <span style="float: right;">Batch: R371750</span>											

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120960

**Report Date:** 12/29/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> E200.7										Batch: R371750
<b>Lab ID:</b> MB-7400DIS211214A		Method Blank					Run: ICP204-B_211214A			12/14/21 14:00
Lithium		ND	mg/L	0.003						
<b>Lab ID:</b> LFB-7400DIS211214A		Laboratory Fortified Blank					Run: ICP204-B_211214A			12/14/21 14:09
Lithium		1.01	mg/L	0.10	101	85	115			
<b>Lab ID:</b> B21120957-004BMS2		Sample Matrix Spike					Run: ICP204-B_211214A			12/14/21 18:55
Lithium		5.04	mg/L	0.10	99	70	130			
<b>Lab ID:</b> B21120957-004BMSD		Sample Matrix Spike Duplicate					Run: ICP204-B_211214A			12/14/21 18:59
Lithium		5.04	mg/L	0.10	99	70	130	0.1	20	
<b>Lab ID:</b> B21120871-001BMS2		Sample Matrix Spike					Run: ICP204-B_211214A			12/14/21 19:58
Lithium		5.19	mg/L	0.10	101	70	130			
<b>Lab ID:</b> B21120871-001BMSD		Sample Matrix Spike Duplicate					Run: ICP204-B_211214A			12/14/21 20:02
Lithium		5.32	mg/L	0.10	103	70	130	2.4	20	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)





# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120960

**Report Date:** 12/29/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.8</b>		Analytical Run: ICPMS207-B_211214A									
<b>Lab ID: QCS</b>	2	Initial Calibration Verification Standard								12/14/21 14:52	
Cobalt		0.0516	mg/L	0.010	103	90	110				
Selenium		0.0481	mg/L	0.0050	96	90	110				
<b>Method: E200.8</b>		Batch: R371793									
<b>Lab ID: LRB</b>	2	Method Blank		Run: ICPMS207-B_211214A						12/14/21 15:16	
Cobalt		ND	mg/L	0.00002							
Selenium		ND	mg/L	0.00007							
<b>Lab ID: LFB</b>	2	Laboratory Fortified Blank		Run: ICPMS207-B_211214A						12/14/21 15:22	
Cobalt		0.0489	mg/L	0.010	98	85	115				
Selenium		0.0471	mg/L	0.0050	94	85	115				
<b>Lab ID: B21120953-009DMS</b>	2	Sample Matrix Spike		Run: ICPMS207-B_211214A						12/14/21 21:24	
Cobalt		0.0465	mg/L	0.0050	93	70	130				
Selenium		0.0448	mg/L	0.0010	89	70	130				
<b>Lab ID: B21120953-009DMSD</b>	2	Sample Matrix Spike Duplicate		Run: ICPMS207-B_211214A						12/14/21 21:30	
Cobalt		0.0465	mg/L	0.0050	93	70	130	0.1	20		
Selenium		0.0449	mg/L	0.0010	90	70	130	0.3	20		
<b>Method: E200.8</b>		Analytical Run: ICPMS208-B_211215A									
<b>Lab ID: QCS</b>	2	Initial Calibration Verification Standard		12/16/21 01:14							
Cobalt		0.0518	mg/L	0.010	104	90	110				
Selenium		0.0505	mg/L	0.0050	101	90	110				
<b>Method: E200.8</b>		Batch: 162148									
<b>Lab ID: MB-162148</b>	2	Method Blank		Run: ICPMS208-B_211215A						12/16/21 05:16	
Cobalt		ND	mg/L	0.00002							
Selenium		ND	mg/L	0.00009							
<b>Lab ID: LCS4-162148</b>	2	Laboratory Control Sample		Run: ICPMS208-B_211215A						12/16/21 05:20	
Cobalt		0.0972	mg/L	0.0050	97	85	115				
Selenium		0.102	mg/L	0.0010	102	85	115				
<b>Lab ID: B21120953-005EMS4</b>	2	Sample Matrix Spike		Run: ICPMS208-B_211215A						12/16/21 06:09	
Cobalt		0.0973	mg/L	0.0050	97	70	130				
Selenium		0.101	mg/L	0.0010	101	70	130				
<b>Lab ID: B21120953-005EMSD</b>	2	Sample Matrix Spike Duplicate		Run: ICPMS208-B_211215A						12/16/21 06:13	
Cobalt		0.0998	mg/L	0.0050	100	70	130	2.6	20		
Selenium		0.101	mg/L	0.0010	101	70	130	0.5	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B21120960

Report Date: 12/29/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E300.0</b>		Analytical Run: IC METROHM 2_211216A									
<b>Lab ID: ICV</b>	3	Initial Calibration Verification Standard							12/17/21 14:45		
Chloride		26.1	mg/L	1.0	104	90	110				
Sulfate		105	mg/L	1.0	105	90	110				
Bromide		1.29	mg/L	0.50	103	90	110				
<b>Method: E300.0</b>		Batch: R371954									
<b>Lab ID: ICB</b>	3	Method Blank							Run: IC METROHM 2_211216A 12/17/21 00:44		
Chloride		ND	mg/L	0.06							
Sulfate		ND	mg/L	0.3							
Bromide		ND	mg/L	0.007							
<b>Lab ID: LFB</b>	3	Laboratory Fortified Blank							Run: IC METROHM 2_211216A 12/17/21 01:36		
Chloride		26	mg/L	1.0	105	90	110				
Sulfate		110	mg/L	1.0	107	90	110				
Bromide		1.4	mg/L	0.50	109	90	110				
<b>Lab ID: B21120957-001AMS</b>	3	Sample Matrix Spike							Run: IC METROHM 2_211216A 12/20/21 11:40		
Chloride		594	mg/L	5.3	112	90	110			S	
Sulfate		4450	mg/L	11	107	90	110				
Bromide		25.6	mg/L	0.50	101	90	110				
<b>Lab ID: B21120957-001AMSD</b>	3	Sample Matrix Spike Duplicate							Run: IC METROHM 2_211216A 12/20/21 11:57		
Chloride		595	mg/L	5.3	112	90	110	0.2	20	S	
Sulfate		4520	mg/L	11	110	90	110	1.6	20		
Bromide		25.5	mg/L	0.50	101	90	110	0.4	20		
<b>Lab ID: B21120977-001BMS</b>	3	Sample Matrix Spike							Run: IC METROHM 2_211216A 12/21/21 19:38		
Chloride		1230	mg/L	12	98	90	110				
Sulfate		6890	mg/L	25	98	90	110				
Bromide		58.6	mg/L	0.62	89	90	110			S	
<b>Lab ID: B21120977-001BMSD</b>	3	Sample Matrix Spike Duplicate							Run: IC METROHM 2_211216A 12/21/21 19:56		
Chloride		1240	mg/L	12	99	90	110	0.3	20		
Sulfate		6910	mg/L	25	99	90	110	0.2	20		
Bromide		58.6	mg/L	0.62	89	90	110	0.1	20	S	

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B21120960

**Report Date:** 12/29/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E300.0</b>		Analytical Run: IC METROHM 2_211228A								
<b>Lab ID: ICV</b>	3	Initial Calibration Verification Standard							12/27/21 16:05	
Chloride		25.5	mg/L	1.0	102	90	110			
Sulfate		103	mg/L	1.0	103	90	110			
Bromide		1.21	mg/L	0.50	97	90	110			
<b>Method: E300.0</b>		Batch: R372401								
<b>Lab ID: ICB</b>	3	Method Blank							Run: IC METROHM 2_211228A 12/27/21 16:22	
Chloride		ND	mg/L	0.06						
Sulfate		ND	mg/L	0.3						
Bromide		ND	mg/L	0.007						
<b>Lab ID: LFB</b>	3	Laboratory Fortified Blank							Run: IC METROHM 2_211228A 12/27/21 17:49	
Chloride		25.6	mg/L	1.0	102	90	110			
Sulfate		103	mg/L	1.0	103	90	110			
Bromide		1.17	mg/L	0.50	94	90	110			
<b>Lab ID: B21120957-001AMS</b>	3	Sample Matrix Spike							Run: IC METROHM 2_211228A 12/28/21 04:51	
Chloride		548	mg/L	5.3	103	90	110			
Sulfate		4250	mg/L	11	97	90	110			
Bromide		23.7	mg/L	0.50	94	90	110			
<b>Lab ID: B21120957-001AMSD</b>	3	Sample Matrix Spike Duplicate							Run: IC METROHM 2_211228A 12/28/21 05:06	
Chloride		550	mg/L	5.3	103	90	110	0.5	20	
Sulfate		4240	mg/L	11	97	90	110	0.2	20	
Bromide		23.8	mg/L	0.50	94	90	110	0.5	20	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# Work Order Receipt Checklist

Talen Energy Supply LLC

B21120960

Login completed by: Richard L. Shular

Date Received: 12/10/2021

Reviewed by: BL2000\gmccartney

Received by: rs4

Reviewed Date: 12/16/2021

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	°C On Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input type="checkbox"/>

## 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.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

## Contact and Corrective Action Comments:

The Temperature Blank temperature for shipping container 1 was 2.6°C and shipping container 2 was 3.4°C.



# Chain of Custody and Analytical Request Record

PLEASE PRINT; provide as much information as possible. Refer to corresponding notes on reverse side. Page      of     

<b>Company Name:</b> <b>Talen Montana, LLC</b>		<b>Project Name, PWS#, Permit #, Etc</b> <b>STEP 1&amp;2 Semi-annual Analysis</b>		<b>Sample Origin</b> State: <b>Montana</b>		<b>EPA/State Compliance:</b> Yes <input type="checkbox"/> No <input type="checkbox"/>	
<b>Report Mail Address</b> Kordelle Stephenson PO Box 38 Colstrip, MT 59323		<b>Contact Name, Kordelle Stephenson</b> Voice: 406-748-5290 Fax: 406-748-5900 Email: Kordelle.stephenson@talenergy.com		<b>Sampler Name if other than Contact:</b> Rick Lubbe 406.490.3168		<b>ELI Quote #:</b> B-5242 - analyze for total inorganic phosphorus dissolved	
<b>Invoice Address: TALEN MONTANA, LLC</b> ATTN: A.P GENTW13 P.O. Box 25223 Lehigh Valley, PA 18002-5223		<b>Invoice Contact &amp; Phone #:</b> Kordelle Stephenson 406-748-5364		<b>Purchase Order #:</b> Contract #622268-18		<b>Notify ELI prior to RUSH sample submittal for additional charges and scheduling</b> Comments: Please copy results to Jenny Vanek, Hydrometrics, Inc. Billings. <b>Site Name:</b> Talen - Colstrip	
<b>Report Required For:</b> POTW/WWTP <input type="checkbox"/> DW <input type="checkbox"/> Other <input type="checkbox"/>		<b>Special Report Formats - ELI must be notified prior to sample submittal for the following:</b> NELAC <input type="checkbox"/> A2LA <input type="checkbox"/> Level IV <input type="checkbox"/> Other <input type="checkbox"/>		<b>SEE ATTACHED</b>		<b>Receipt Temp</b> Cooler ID(s) _____ °C Custody Seal Y N Intact Y N Signature Y N Match Y N LAB ID _____	
<b>Number of Containers</b> 15242 + 4 (K)		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time: 12-9-21 1225	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time: 12-9-21 1300	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
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<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
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<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
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<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
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<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
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<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
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<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
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<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
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<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
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<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
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<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water		<b>Normal Turnaround (TAT)</b> <input checked="" type="checkbox"/>		<b>Signature</b> Date/Time:	
<b>Matrix</b> 2 - water		<b>Matrix</b> 2 - water					



# ANALYTICAL SUMMARY REPORT

February 01, 2022

Talen Energy Supply LLC  
PO Box 38  
Colstrip, MT 59323-0038

Work Order: B22010459                      Quote ID: B5242

Project Name: STEP 1&2 Semi-annual Analysis

Energy Laboratories Inc Billings MT received the following 6 samples for Talen Energy Supply LLC on 1/10/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B22010459-001	TLN-2201-103	01/10/22 11:05	01/10/22	Ground Water	Metals by ICP/ICPMS, Dissolved Alkalinity Anion - Cation Balance Conductivity Hardness Anions by Ion Chromatography pH Preparation for TDS A2540 C Solids, Total Dissolved
B22010459-002	TLN-2201-104	01/10/22 11:20	01/10/22	Ground Water	Same As Above
B22010459-003	TLN-2201-105	01/10/22 12:10	01/10/22	Ground Water	Same As Above
B22010459-004	TLN-2201-106	01/10/22 12:00	01/10/22	Ground Water	Same As Above
B22010459-005	TLN-2201-107	01/10/22 12:40	01/10/22	Ground Water	Same As Above
B22010459-006	TLN-2201-108	01/10/22 13:00	01/10/22	Ground Water	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B22010459-001  
**Client Sample ID:** TLN-2201-103

**Report Date:** 02/01/22  
**Collection Date:** 01/10/22 11:05  
**Date Received:** 01/10/22  
**Matrix:** Ground Water

# SPS

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	9.1	s.u.	H	0.1		A4500-H B	01/10/22 16:34 / mjb
pH Measurement Temp	11.1	°C		1.0		A4500-H B	01/10/22 16:34 / mjb
Conductivity @ 25 C	4440	umhos/cm	L	5		A2510 B	01/10/22 16:34 / mjb
Solids, Total Dissolved TDS @ 180 C	3940	mg/L	D	100		A2540 C	01/11/22 08:57 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	104	mg/L		4		A2320 B	01/11/22 10:45 / ftk
Bicarbonate as HCO3	81	mg/L		4		A2320 B	01/11/22 10:45 / ftk
Carbonate as CO3	22	mg/L		4		A2320 B	01/11/22 10:45 / ftk
Chloride	55	mg/L	D	5		E300.0	01/18/22 09:32 / caa
Sulfate	3000	mg/L	D	10		E300.0	01/18/22 09:32 / caa
Bromide	ND	mg/L		0.5		E300.0	01/18/22 09:32 / caa
Hardness as CaCO3	2070	mg/L		1		A2340 B	01/11/22 13:58 / bap
<b>METALS, DISSOLVED</b>							
Boron	1.2	mg/L		0.1		E200.7	01/11/22 13:58 / rlh
Calcium	63	mg/L	D	3		E200.7	01/11/22 13:58 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/16/22 00:49 / car
Lithium	0.10	mg/L	D	0.03		E200.7	01/11/22 13:58 / rlh
Magnesium	464	mg/L		1		E200.7	01/11/22 13:58 / rlh
Manganese	0.292	mg/L		0.001		E200.8	01/16/22 00:49 / car
Potassium	16	mg/L		1		E200.7	01/11/22 13:58 / rlh
Selenium	ND	mg/L		0.005		E200.8	01/16/22 00:49 / car
Sodium	422	mg/L	D	3		E200.7	01/11/22 13:58 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-4.76	%				A1030 E	01/19/22 16:57 / bap
TDS Ratio	0.97			0.01		A1030 E	01/19/22 16:57 / bap

**Report Definitions:**

RL - Analyte Reporting Limit	MCL - Maximum Contaminant Level
QCL - Quality Control Limit	ND - Not detected at the Reporting Limit (RL)
D - Reporting Limit (RL) increased due to sample matrix	H - Analysis performed past the method holding time
L - Lowest available reporting limit for the analytical method used	



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B22010459-002  
**Client Sample ID:** TLN-2201-104

# SPN

**Report Date:** 02/01/22  
**Collection Date:** 01/10/22 11:20  
**Date Received:** 01/10/22  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.0	s.u.	H	0.1		A4500-H B	01/10/22 16:39 / mjb
pH Measurement Temp	10.8	°C		1.0		A4500-H B	01/10/22 16:39 / mjb
Conductivity @ 25 C	3940	umhos/cm		5		A2510 B	01/10/22 16:39 / mjb
Solids, Total Dissolved TDS @ 180 C	3460	mg/L	D	100		A2540 C	01/11/22 08:57 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	269	mg/L		4		A2320 B	01/11/22 10:56 / ftk
Bicarbonate as HCO3	328	mg/L		4		A2320 B	01/11/22 10:56 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/11/22 10:56 / ftk
Chloride	41	mg/L	D	5		E300.0	01/26/22 02:47 / caa
Sulfate	2540	mg/L	D	10		E300.0	01/26/22 02:47 / caa
Bromide	3.2	mg/L		0.5		E300.0	01/26/22 02:47 / caa
Hardness as CaCO3	2020	mg/L		1		A2340 B	01/20/22 10:31 / klc
<b>METALS, DISSOLVED</b>							
Boron	1.2	mg/L		0.1		E200.7	01/11/22 14:02 / rlh
Calcium	305	mg/L	D	3		E200.7	01/20/22 10:31 / rlh
Cobalt	0.005	mg/L		0.005		E200.8	01/16/22 00:55 / car
Lithium	0.11	mg/L	D	0.03		E200.7	01/11/22 14:02 / rlh
Magnesium	306	mg/L		1		E200.7	01/20/22 10:31 / rlh
Manganese	1.68	mg/L		0.001		E200.8	01/16/22 00:55 / car
Potassium	12	mg/L		1		E200.7	01/20/22 10:31 / rlh
Selenium	ND	mg/L		0.005		E200.8	01/16/22 00:55 / car
Sodium	252	mg/L	D	3		E200.7	01/20/22 10:31 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-6.94	%				A1030 E	01/27/22 11:09 / klc
TDS Ratio	0.96			0.01		A1030 E	01/27/22 11:09 / klc

- The Balance was confirmed by re-analysis of anions, cations, and alkalinity.

<b>Report Definitions:</b>	RL - Analyte Reporting Limit	MCL - Maximum Contaminant Level
	QCL - Quality Control Limit	ND - Not detected at the Reporting Limit (RL)
	D - Reporting Limit (RL) increased due to sample matrix	H - Analysis performed past the method holding time





### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B22010459-003  
**Client Sample ID:** TLN-2201-105

**Report Date:** 02/01/22  
**Collection Date:** 01/10/22 12:10  
**Date Received:** 01/10/22  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	5.4	s.u.	H	0.1		A4500-H B	01/10/22 16:42 / mjb
pH Measurement Temp	11.4	°C		1.0		A4500-H B	01/10/22 16:42 / mjb
Conductivity @ 25 C	4770	umhos/cm		5		A2510 B	01/10/22 16:42 / mjb
Solids, Total Dissolved TDS @ 180 C	5660	mg/L	D	100		A2540 C	01/11/22 08:57 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	ND	mg/L		4		A2320 B	01/11/22 11:03 / ftk
Bicarbonate as HCO3	ND	mg/L		4		A2320 B	01/11/22 11:03 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/11/22 11:03 / ftk
Chloride	57	mg/L	D	5		E300.0	01/26/22 03:04 / caa
Sulfate	4650	mg/L	D	10		E300.0	01/26/22 03:04 / caa
Bromide	0.5	mg/L		0.5		E300.0	01/26/22 03:04 / caa
Hardness as CaCO3	1040	mg/L		1		A2340 B	01/11/22 14:06 / klc
<b>METALS, DISSOLVED</b>							
Boron	0.9	mg/L		0.1		E200.7	01/11/22 14:06 / rlh
Calcium	228	mg/L	D	3		E200.7	01/11/22 14:06 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/16/22 01:18 / car
Lithium	0.08	mg/L	D	0.03		E200.7	01/11/22 14:06 / rlh
Magnesium	115	mg/L		1		E200.7	01/11/22 14:06 / rlh
Manganese	7.48	mg/L	D	0.01		E200.7	01/11/22 14:06 / rlh
Potassium	7	mg/L		1		E200.7	01/11/22 14:06 / rlh
Selenium	ND	mg/L		0.005		E200.8	01/16/22 01:18 / car
Sodium	174	mg/L	D	3		E200.7	01/11/22 14:06 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-55.0	%				A1030 E	02/01/22 10:35 / klc
TDS Ratio	1.08			0.01		A1030 E	02/01/22 10:35 / klc

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B22010459-004  
**Client Sample ID:** TLN-2201-106

# 917A

**Report Date:** 02/01/22  
**Collection Date:** 01/10/22 12:00  
**Date Received:** 01/10/22  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.1	s.u.	H	0.1		A4500-H B	01/10/22 16:44 / mjb
pH Measurement Temp	11.4	°C		1.0		A4500-H B	01/10/22 16:44 / mjb
Conductivity @ 25 C	3340	umhos/cm		5		A2510 B	01/10/22 16:44 / mjb
Solids, Total Dissolved TDS @ 180 C	2940	mg/L	D	40		A2540 C	01/11/22 08:57 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	390	mg/L		4		A2320 B	01/11/22 11:06 / ftk
Bicarbonate as HCO3	476	mg/L		4		A2320 B	01/11/22 11:06 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/11/22 11:06 / ftk
Chloride	57	mg/L	D	2		E300.0	01/18/22 10:55 / caa
Sulfate	1830	mg/L	D	5		E300.0	01/18/22 10:55 / caa
Bromide	12.4	mg/L		0.5		E300.0	01/18/22 10:55 / caa
Hardness as CaCO3	1880	mg/L		1		A2340 B	01/11/22 14:10 / bap
<b>METALS, DISSOLVED</b>							
Boron	1.2	mg/L		0.1		E200.7	01/11/22 14:10 / rlh
Calcium	293	mg/L		1		E200.7	01/11/22 14:10 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/16/22 01:24 / car
Lithium	0.09	mg/L	D	0.02		E200.7	01/11/22 14:10 / rlh
Magnesium	279	mg/L		1		E200.7	01/11/22 14:10 / rlh
Manganese	0.153	mg/L		0.001		E200.8	01/16/22 01:24 / car
Potassium	10	mg/L		1		E200.7	01/11/22 14:10 / rlh
Selenium	ND	mg/L		0.005		E200.8	01/16/22 01:24 / car
Sodium	161	mg/L		1		E200.7	01/11/22 14:10 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-3.11	%				A1030 E	01/19/22 16:56 / bap
TDS Ratio	1.02			0.01		A1030 E	01/19/22 16:56 / bap

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B22010459-005  
**Client Sample ID:** TLN-2201-107

**Report Date:** 02/01/22  
**Collection Date:** 01/10/22 12:40  
**Date Received:** 01/10/22  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.1	s.u.	H	0.1		A4500-H B	01/10/22 16:47 / mjb
pH Measurement Temp	12.0	°C		1.0		A4500-H B	01/10/22 16:47 / mjb
Conductivity @ 25 C	2680	umhos/cm		5		A2510 B	01/10/22 16:47 / mjb
Solids, Total Dissolved TDS @ 180 C	2220	mg/L	D	40		A2540 C	01/11/22 08:57 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	359	mg/L		4		A2320 B	01/11/22 11:13 / ftk
Bicarbonate as HCO3	438	mg/L		4		A2320 B	01/11/22 11:13 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/11/22 11:13 / ftk
Chloride	27	mg/L	D	2		E300.0	01/18/22 11:12 / caa
Sulfate	1390	mg/L	D	5		E300.0	01/18/22 11:12 / caa
Bromide	ND	mg/L		0.5		E300.0	01/18/22 11:12 / caa
Hardness as CaCO3	1340	mg/L		1		A2340 B	01/11/22 14:52 / bap
<b>METALS, DISSOLVED</b>							
Boron	0.9	mg/L		0.1		E200.7	01/11/22 14:52 / rlh
Calcium	169	mg/L		1		E200.7	01/11/22 14:52 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/16/22 01:29 / car
Lithium	0.07	mg/L	D	0.02		E200.7	01/11/22 14:52 / rlh
Magnesium	222	mg/L		1		E200.7	01/11/22 14:52 / rlh
Manganese	0.610	mg/L		0.001		E200.8	01/16/22 01:29 / car
Potassium	11	mg/L		1		E200.7	01/11/22 14:52 / rlh
Selenium	ND	mg/L		0.005		E200.8	01/16/22 01:29 / car
Sodium	181	mg/L		1		E200.7	01/11/22 14:52 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-2.76	%				A1030 E	01/19/22 16:56 / bap
TDS Ratio	1.00			0.01		A1030 E	01/19/22 16:56 / bap

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B22010459-006  
**Client Sample ID:** TLN-2201-108

# P-12

**Report Date:** 02/01/22  
**Collection Date:** 01/10/22 13:00  
**Date Received:** 01/10/22  
**Matrix:** Ground Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.1	s.u.	H	0.1		A4500-H B	01/10/22 16:50 / mjb
pH Measurement Temp	12.6	°C		1.0		A4500-H B	01/10/22 16:50 / mjb
Conductivity @ 25 C	4080	umhos/cm		5		A2510 B	01/10/22 16:50 / mjb
Solids, Total Dissolved TDS @ 180 C	3660	mg/L	D	100		A2540 C	01/11/22 08:58 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	392	mg/L		4		A2320 B	01/11/22 11:19 / ftk
Bicarbonate as HCO3	478	mg/L		4		A2320 B	01/11/22 11:19 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/11/22 11:19 / ftk
Chloride	37	mg/L	D	5		E300.0	01/18/22 11:28 / caa
Sulfate	2310	mg/L	D	10		E300.0	01/18/22 11:28 / caa
Bromide	4.4	mg/L		0.5		E300.0	01/18/22 11:28 / caa
Hardness as CaCO3	2120	mg/L		1		A2340 B	01/11/22 14:56 / bap
<b>METALS, DISSOLVED</b>							
Boron	1.9	mg/L		0.1		E200.7	01/11/22 14:56 / rlh
Calcium	251	mg/L	D	3		E200.7	01/11/22 14:56 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/16/22 01:35 / car
Lithium	0.12	mg/L	D	0.03		E200.7	01/11/22 14:56 / rlh
Magnesium	362	mg/L		1		E200.7	01/11/22 14:56 / rlh
Manganese	0.862	mg/L		0.001		E200.8	01/16/22 01:35 / car
Potassium	14	mg/L		1		E200.7	01/11/22 14:56 / rlh
Selenium	ND	mg/L		0.005		E200.8	01/16/22 01:35 / car
Sodium	284	mg/L	D	3		E200.7	01/11/22 14:56 / rlh
<b>QUALITY CONTROL</b>							
A/C Balance	-1.76	%				A1030 E	01/19/22 16:56 / bap
TDS Ratio	1.05			0.01		A1030 E	01/19/22 16:56 / bap

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22010459

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: A2320 B</b> <span style="float: right;">Batch: R372963</span>										
<b>Lab ID: MBLK</b> <span style="float: right;">Run: METROHM 2_220111A</span>										
Method Blank <span style="float: right;">01/11/22 09:13</span>										
Alkalinity, Total as CaCO3		ND	mg/L	4						
<b>Lab ID: LCS</b> <span style="float: right;">Run: METROHM 2_220111A</span>										
Laboratory Control Sample <span style="float: right;">01/11/22 10:40</span>										
Alkalinity, Total as CaCO3		102	mg/L	4.0	102	90	110			
<b>Lab ID: B22010459-001ADUP</b> <span style="float: right;">Run: METROHM 2_220111A</span>										
3 Sample Duplicate <span style="float: right;">01/11/22 10:50</span>										
Alkalinity, Total as CaCO3		105	mg/L	4.0				1.3	10	
Bicarbonate as HCO3		82.4	mg/L	4.0				1.8	10	
Carbonate as CO3		22.5	mg/L	4.0				0.5	10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22010459

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A2510 B										Batch: R372914
<b>Lab ID:</b> SC 2nd 1413		Laboratory Control Sample					Run: PHSC _101-B_220110A			01/10/22 09:40
Conductivity @ 25 C	1470	umhos/cm		5.0	104	90	110			
<b>Lab ID:</b> MBLK		Method Blank					Run: PHSC _101-B_220110A			01/10/22 09:46
Conductivity @ 25 C	ND	umhos/cm		5						
<b>Lab ID:</b> B22010370-004ADUP		Sample Duplicate					Run: PHSC _101-B_220110A			01/10/22 10:09
Conductivity @ 25 C	2040	umhos/cm		5.0				0.3	10	
<b>Lab ID:</b> B22010459-001ADUP		Sample Duplicate					Run: PHSC _101-B_220110A			01/10/22 16:37
Conductivity @ 25 C	4410	umhos/cm		5.0				0.8	10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22010459

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A2540 C										Batch: 162844
<b>Lab ID:</b> MB-162844		Method Blank								Run: BAL #30_220111A 01/11/22 08:56
Solids, Total Dissolved TDS @ 180 C	1		mg/L							
<b>Lab ID:</b> LCS-162844		Laboratory Control Sample								Run: BAL #30_220111A 01/11/22 08:56
Solids, Total Dissolved TDS @ 180 C	1050		mg/L	10	105	90	110			
<b>Lab ID:</b> B22010459-001A DUP		Sample Duplicate								Run: BAL #30_220111A 01/11/22 08:57
Solids, Total Dissolved TDS @ 180 C	4000		mg/L	100				1.5	5	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22010459

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A4500-H B		Analytical Run: PHSC _101-B_220110A								
<b>Lab ID:</b> pH 8	2	Initial Calibration Verification Standard								01/10/22 09:28
pH		8.0	s.u.	0.1	100	98	102			
pH Measurement Temp		20.2	°C	1.0						
<b>Method:</b> A4500-H B		Batch: R372914								
<b>Lab ID:</b> B22010459-001ADUP	2	Sample Duplicate								01/10/22 16:37
pH		9.1	s.u.	0.1				0.6	3	
pH Measurement Temp		11.1	°C	1.0						

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)





# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22010459

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E300.0</b>		Analytical Run: IC METROHM 2_220117A								
<b>Lab ID: ICV</b>	3	Initial Calibration Verification Standard							01/17/22 13:27	
Chloride		25.7	mg/L	1.0	103	90	110			
Sulfate		107	mg/L	1.0	107	90	110			
Bromide		1.23	mg/L	0.50	99	90	110			
<b>Method: E300.0</b>		Batch: R373282								
<b>Lab ID: ICB</b>	3	Method Blank							Run: IC METROHM 2_220117A 01/17/22 13:44	
Chloride		ND	mg/L	0.06						
Sulfate		ND	mg/L	0.3						
Bromide		ND	mg/L	0.007						
<b>Lab ID: LFB</b>	3	Laboratory Fortified Blank							Run: IC METROHM 2_220117A 01/17/22 15:06	
Chloride		25.9	mg/L	1.0	104	90	110			
Sulfate		108	mg/L	1.0	108	90	110			
Bromide		1.21	mg/L	0.50	97	90	110			
<b>Lab ID: B22010399-001BDUP</b>	3	Sample Duplicate							Run: IC METROHM 2_220117A 01/18/22 07:04	
Chloride		569	mg/L	1.2				0.6	20	
Sulfate		334	mg/L	2.5				15	20	
Bromide		2.34	mg/L	0.50				0.6	20	
<b>Lab ID: B22010448-001AMS</b>	3	Sample Matrix Spike							Run: IC METROHM 2_220117A 01/18/22 08:43	
Chloride		146	mg/L	1.3	108	90	110			
Sulfate		1310	mg/L	2.6	105	90	110			
Bromide		6.32	mg/L	0.50	101	90	110			
<b>Lab ID: B22010448-001AMSD</b>	3	Sample Matrix Spike Duplicate							Run: IC METROHM 2_220117A 01/18/22 08:59	
Chloride		146	mg/L	1.3	108	90	110	0.3	20	
Sulfate		1310	mg/L	2.6	104	90	110	0.3	20	
Bromide		6.31	mg/L	0.50	101	90	110	0.2	20	

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22010459

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E300.0</b>		Analytical Run: IC METROHM 2_220125A									
<b>Lab ID: ICV</b>	3	Initial Calibration Verification Standard							01/25/22 12:11		
Chloride		25.8	mg/L	1.0	103	90	110				
Sulfate		106	mg/L	1.0	106	90	110				
Bromide		1.27	mg/L	0.50	101	90	110				
<b>Method: E300.0</b>		Batch: R373656									
<b>Lab ID: ICB</b>	3	Method Blank							Run: IC METROHM 2_220125A 01/25/22 12:28		
Chloride		ND	mg/L	0.06							
Sulfate		ND	mg/L	0.3							
Bromide		ND	mg/L	0.007							
<b>Lab ID: B22010740-001AMS</b>	3	Sample Matrix Spike							Run: IC METROHM 2_220125A 01/26/22 03:37		
Chloride		690	mg/L	5.3	115	90	110			S	
Sulfate		4380	mg/L	11	115	90	110			S	
Bromide		26.6	mg/L	0.50	104	90	110				
<b>Lab ID: B22010740-001AMSD</b>	3	Sample Matrix Spike Duplicate							Run: IC METROHM 2_220125A 01/26/22 03:53		
Chloride		687	mg/L	5.3	114	90	110	0.4	20	S	
Sulfate		4310	mg/L	11	111	90	110	1.6	20	S	
Bromide		27.2	mg/L	0.50	106	90	110	2.0	20		
<b>Lab ID: LFB</b>	3	Laboratory Fortified Blank							Run: IC METROHM 2_220125A 01/26/22 09:40		
Chloride		25.6	mg/L	1.0	103	90	110				
Sulfate		106	mg/L	1.0	106	90	110				
Bromide		1.14	mg/L	0.50	91	90	110				

**Qualifiers:**

RL - Analyte Reporting Limit

S - Spike recovery outside of advisory limits

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22010459

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.7</b>		Analytical Run: ICP204-B_220111A									
<b>Lab ID: ICV</b>	7	Continuing Calibration Verification Standard							01/11/22 10:02		
Boron		2.48	mg/L	0.10	99	95	105				
Calcium		25.7	mg/L	1.0	103	95	105				
Lithium		1.29	mg/L	0.10	103	95	105				
Magnesium		26.0	mg/L	1.0	104	95	105				
Manganese		2.46	mg/L	0.010	98	95	105				
Potassium		25.7	mg/L	1.0	103	95	105				
Sodium		25.8	mg/L	1.0	103	95	105				
<b>Method: E200.7</b>		Batch: R372979									
<b>Lab ID: MB-7400DIS220111A</b>	7	Method Blank							Run: ICP204-B_220111A 01/11/22 10:10		
Boron		ND	mg/L	0.01							
Calcium		ND	mg/L	0.3							
Lithium		ND	mg/L	0.003							
Magnesium		ND	mg/L	0.02							
Manganese		ND	mg/L	0.001							
Potassium		ND	mg/L	0.1							
Sodium		ND	mg/L	0.3							
<b>Lab ID: LFB-7400DIS220111A</b>	7	Laboratory Fortified Blank							Run: ICP204-B_220111A 01/11/22 10:19		
Boron		0.989	mg/L	0.10	99	85	115				
Calcium		50.4	mg/L	1.0	101	85	115				
Lithium		1.01	mg/L	0.10	101	85	115				
Magnesium		50.9	mg/L	1.0	102	85	115				
Manganese		4.76	mg/L	0.010	95	85	115				
Potassium		50.4	mg/L	1.0	101	85	115				
Sodium		50.6	mg/L	1.0	101	85	115				
<b>Lab ID: B22010391-001EMS2</b>	7	Sample Matrix Spike							Run: ICP204-B_220111A 01/11/22 13:33		
Boron		4.81	mg/L	0.065	96	70	130				
Calcium		569	mg/L	1.5	95	70	130				
Lithium		4.94	mg/L	0.10	98	70	130				
Magnesium		318	mg/L	1.0	101	70	130				
Manganese		27.1	mg/L	0.0052	92	70	130				
Potassium		251	mg/L	1.0	99	70	130				
Sodium		273	mg/L	1.5	100	70	130				
<b>Lab ID: B22010391-001EMSD</b>	7	Sample Matrix Spike Duplicate							Run: ICP204-B_220111A 01/11/22 13:37		
Boron		4.82	mg/L	0.065	96	70	130	0.2	20		
Calcium		567	mg/L	1.5	95	70	130	0.3	20		
Lithium		4.94	mg/L	0.10	98	70	130	0.1	20		
Magnesium		317	mg/L	1.0	101	70	130	0.3	20		
Manganese		27.2	mg/L	0.0052	92	70	130	0.4	20		
Potassium		251	mg/L	1.0	99	70	130	0.1	20		
Sodium		272	mg/L	1.5	100	70	130	0.4	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22010459

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method:</b> E200.7											
Batch: R372979											
<b>Lab ID:</b> B22010459-006BMS2	7	Sample Matrix Spike		Run: ICP204-B_220111A				01/11/22 15:01			
Boron		11.9	mg/L	0.13	100	70	130				
Calcium		750	mg/L	3.1	100	70	130				
Lithium		10.2	mg/L	0.10	101	70	130				
Magnesium		874	mg/L	1.0	102	70	130				
Manganese		48.9	mg/L	0.010	96	70	130				
Potassium		519	mg/L	1.5	101	70	130				
Sodium		792	mg/L	3.0	102	70	130				
<b>Lab ID:</b> B22010459-006BMSD	7	Sample Matrix Spike Duplicate		Run: ICP204-B_220111A				01/11/22 15:04			
Boron		11.8	mg/L	0.13	99	70	130	1.1	20		
Calcium		743	mg/L	3.1	98	70	130	1.0	20		
Lithium		10.1	mg/L	0.10	100	70	130	1.3	20		
Magnesium		867	mg/L	1.0	101	70	130	0.8	20		
Manganese		48.4	mg/L	0.010	95	70	130	1.1	20		
Potassium		512	mg/L	1.5	100	70	130	1.4	20		
Sodium		777	mg/L	3.0	99	70	130	1.9	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22010459

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.7</b>		Analytical Run: ICP204-B_220120A									
<b>Lab ID: ICV</b>	4	Continuing Calibration Verification Standard							01/20/22 09:19		
Calcium		25.8	mg/L	1.0	103	95	105				
Magnesium		25.9	mg/L	1.0	103	95	105				
Potassium		25.6	mg/L	1.0	102	95	105				
Sodium		25.7	mg/L	1.0	103	95	105				
<b>Method: E200.7</b>		Batch: R373430									
<b>Lab ID: MB-7400DIS220120A</b>	4	Method Blank							Run: ICP204-B_220120A 01/20/22 09:27		
Calcium		ND	mg/L		0.3						
Magnesium		ND	mg/L		0.02						
Potassium		ND	mg/L		0.1						
Sodium		ND	mg/L		0.3						
<b>Lab ID: LFB-7400DIS220120A</b>	4	Laboratory Fortified Blank							Run: ICP204-B_220120A 01/20/22 09:35		
Calcium		51.1	mg/L	1.0	102	85	115				
Magnesium		51.3	mg/L	1.0	103	85	115				
Potassium		50.9	mg/L	1.0	102	85	115				
Sodium		51.0	mg/L	1.0	102	85	115				
<b>Lab ID: B22011141-001CMS2</b>	4	Sample Matrix Spike							Run: ICP204-B_220120A 01/20/22 11:41		
Calcium		571	mg/L	3.1	100	70	130				
Magnesium		977	mg/L	1.0	102	70	130				
Potassium		515	mg/L	1.5	100	70	130				
Sodium		913	mg/L	3.0	99	70	130				
<b>Lab ID: B22011141-001CMSD</b>	4	Sample Matrix Spike Duplicate							Run: ICP204-B_220120A 01/20/22 11:45		
Calcium		572	mg/L	3.1	101	70	130	0.3	20		
Magnesium		978	mg/L	1.0	102	70	130	0	20		
Potassium		516	mg/L	1.5	100	70	130	0.3	20		
Sodium		913	mg/L	3.0	99	70	130	0	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22010459

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.8</b>		Analytical Run: ICPMS206-B_220114A									
<b>Lab ID: QCS</b>	3	Initial Calibration Verification Standard							01/15/22 19:05		
Cobalt		0.0506	mg/L	0.010	101	90	110				
Manganese		0.253	mg/L	0.010	101	90	110				
Selenium		0.0509	mg/L	0.0050	102	90	110				
<b>Method: E200.8</b>		Batch: R373216									
<b>Lab ID: LRB</b>	3	Method Blank							Run: ICPMS206-B_220114A 01/14/22 13:37		
Cobalt		ND	mg/L	0.00005							
Manganese		ND	mg/L	0.0001							
Selenium		ND	mg/L	0.0001							
<b>Lab ID: LFB</b>	3	Laboratory Fortified Blank							Run: ICPMS206-B_220114A 01/14/22 13:42		
Cobalt		0.0479	mg/L	0.010	96	85	115				
Manganese		0.0470	mg/L	0.010	94	85	115				
Selenium		0.0488	mg/L	0.0050	98	85	115				
<b>Lab ID: B22010459-002BMS</b>	3	Sample Matrix Spike							Run: ICPMS206-B_220114A 01/16/22 01:01		
Cobalt		0.231	mg/L	0.0050	90	70	130				
Manganese		2.00	mg/L	0.0010		70	130			A	
Selenium		0.255	mg/L	0.0010	102	70	130				
<b>Lab ID: B22010459-002BMDS</b>	3	Sample Matrix Spike Duplicate							Run: ICPMS206-B_220114A 01/16/22 01:06		
Cobalt		0.234	mg/L	0.0050	92	70	130	1.3	20		
Manganese		1.95	mg/L	0.0010		70	130	2.5	20	A	
Selenium		0.252	mg/L	0.0010	101	70	130	1.1	20		

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

A - Analyte level was greater than four times the spike level - in accordance with the method, percent recovery is not calculated



# Work Order Receipt Checklist

Talen Energy Supply LLC

B22010459

Login completed by: Dylan A. Chirrick

Date Received: 1/10/2022

Reviewed by: BL2000\gmccartney

Received by: tkb

Reviewed Date: 1/15/2022

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	1.0°C On Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input type="checkbox"/>

## 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.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

## Contact and Corrective Action Comments:

None



# Chain of Custody and Analytical Request Record

PLEASE PRINT, provide as much information as possible. Refer to corresponding notes on reverse side. Page 1 of 1

<b>Company Name</b> <b>Talen Montana, LLC</b>		<b>Project Name, PWS#, Permit #, Etc.</b> <b>STEP 1&amp;2 Semi-annual Analysis</b>		<b>Sample Origin</b> State <b>Montana</b>		<b>EPA/State Compliance</b> Yes <input type="checkbox"/> No <input type="checkbox"/>	
<b>Report Mail Address</b> <b>Kordelle Stephenson</b> <b>PO Box 38</b> <b>Colstrip, MT 59323</b>		<b>Contact Name</b> Kordelle Stephenson <b>Voice</b> 406-748-5290 <b>Fax</b> 406-748-5900 <b>Email</b> Kordelle.stephenson@talenergy.com		<b>Sampler Name if other than Contact</b> Gary Hoffmann RB		<b>ELI Quote #</b> <b>B-5242</b>	
<b>Invoice Address</b> <b>TALen MONTANA, LLC</b> ATTN A.P GENTW13 P O Box 25223 Lehigh Valley, PA 18002-5223		<b>Invoice Contact &amp; Phone #</b> Kordelle Stephenson 406-748-5364		<b>Purchase Order #</b> <b>Contract #622268-18</b>		<b>Notify ELI prior to RUSH sample submittal for additional charges and scheduling</b> Comments: Please copy results to Jenny Vanek, Hydrometrics, Inc. Billings <b>Site Name:</b> <b>Talen - Colstrip</b>	
<b>Report Required For</b> POTW/WWTP <input type="checkbox"/> DW <input type="checkbox"/> Other <input type="checkbox"/>		<b>ANALYSIS REQUESTED</b> Normal Turnaround (TAT) <input type="checkbox"/> RUSH Turnaround (TAT) <input type="checkbox"/>		<b>Receipt Temp</b> _____ °C <b>Cooler ID(s)</b> _____ <b>Custody Seal</b> Y N <b>Intact</b> Y N <b>Signature Match</b> Y N <b>LAB ID</b> _____		<b>LABORATORY USE ONLY</b>	
<b>Special Report Formats - ELI must be notified prior to sample submittal for the following</b> NELAC <input type="checkbox"/> A2LA <input type="checkbox"/> Level IV <input type="checkbox"/> Other <input type="checkbox"/> <b>EDD/EDT</b> <input type="checkbox"/> Format _____		<b>Number of Containers</b> Air, Water, Soils/Solids, Vegetation, Biossary/Other <b>MATRIX</b> 2 - water 2 - water 2 - water 2 - water 2 - water 2 - water 2 - water 2 - water 2 - water		<b>Received by (print)</b> Received by (print) <b>TAMMIEY BARRIS</b> <b>Signature</b> <b>Date/Time</b> 1/10/22 1545		<b>Received by (print)</b> Received by (print) _____ <b>Signature</b> _____ <b>Date/Time</b> _____	
<b>SAMPLE IDENTIFICATION</b> (Name, Location, Interval, etc)		<b>Collection Date</b> 1/10/22 ↓ 1/12/22 1/20/22 1/24/22 1/30/22		<b>Collection Time</b> 1105 1120 1210 1200 1340 1300		<b>Relinquished by (print)</b> Relinquished by (print) <b>Gary Hoffmann</b> <b>Signature</b> <b>Date/Time</b> 1/10/22 1545	
<b>Custody Record MUST be Signed</b>		<b>Sample Disposal:</b> Return to Client <input type="checkbox"/> Lab Disposal <input type="checkbox"/>		<b>LABORATORY USE ONLY: Sample Type</b>		<b># of fractions</b>	

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





# ANALYTICAL SUMMARY REPORT

February 01, 2022

Talen Energy Supply LLC  
PO Box 38  
Colstrip, MT 59323-0038

Work Order: B22011141                      Quote ID: B6025

Project Name: STEP 1&2 Semi-Annual Analysis

Energy Laboratories Inc Billings MT received the following 6 samples for Talen Energy Supply LLC on 1/18/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B22011141-001	TLN-2201-203	01/18/22 9:40	01/18/22	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity Conductivity Hardness Anions by Ion Chromatography Nitrogen, Nitrate + Nitrite Nitrogen, Total Persulfate pH E365.1 Digestion, Total P Preparation for TDS A2540 C Phosphorus, Total Solids, Total Dissolved
B22011141-002	TLN-2201-204	01/18/22 10:00	01/18/22	Aqueous	Same As Above
B22011141-003	TLN-2201-205	01/18/22 11:25	01/18/22	Aqueous	Same As Above
B22011141-004	TLN-2201-206	01/18/22 11:07	01/18/22	Aqueous	Same As Above
B22011141-005	TLN-2201-207	01/18/22 12:23	01/18/22	Aqueous	Same As Above
B22011141-006	TLN-2201-208	01/18/22 12:00	01/18/22	Aqueous	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:



**CLIENT:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-Annual Analysis  
**Work Order:** B22011141

**Report Date:** 02/01/22

## **CASE NARRATIVE**

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Tests associated with analyst identified as ELI-H were subcontracted to Energy Laboratories, 3161 East Lyndale Ave, Helena, MT, EPA Number MT00945.



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-Annual Analysis  
**Lab ID:** B22011141-001  
**Client Sample ID:** TLN-2201-203

# SPS

**Report Date:** 02/01/22  
**Collection Date:** 01/18/22 09:40  
**Date Received:** 01/18/22  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	8.9	s.u.	H	0.1		A4500-H B	01/19/22 09:38 / mjb
pH Measurement Temp	14.5	°C		1.0		A4500-H B	01/19/22 09:38 / mjb
Conductivity @ 25 C	4410	umhos/cm		5		A2510 B	01/19/22 09:38 / mjb
Solids, Total Dissolved TDS @ 180 C	4080	mg/L	D	100		A2540 C	01/19/22 10:36 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	120	mg/L		4		A2320 B	01/19/22 12:19 / ftk
Bicarbonate as HCO3	115	mg/L		4		A2320 B	01/19/22 12:19 / ftk
Carbonate as CO3	15	mg/L		4		A2320 B	01/19/22 12:19 / ftk
Chloride	56	mg/L	D	5		E300.0	01/28/22 21:53 / caa
Sulfate	2930	mg/L	D	10		E300.0	01/28/22 21:53 / caa
Bromide	ND	mg/L		0.5		E300.0	01/28/22 21:53 / caa
Fluoride	ND	mg/L	D	0.2		E300.0	01/28/22 21:53 / caa
Hardness as CaCO3	2100	mg/L		1		A2340 B	01/20/22 11:30 / klc
<b>NUTRIENTS</b>							
Nitrogen, Total (Persulfate)	0.31	mg/L		0.04		A4500 N-C	01/21/22 14:42 / eli-h
Nitrogen, Nitrate+Nitrite as N	0.11	mg/L		0.01		E353.2	01/20/22 11:48 / srh
Phosphorus, Total as P	0.013	mg/L		0.002		E365.1	01/21/22 10:33 / mh
<b>METALS, DISSOLVED</b>							
Aluminum	ND	mg/L		0.009		E200.8	01/20/22 10:31 / srh
Antimony	ND	mg/L	D	0.0006		E200.8	01/27/22 17:44 / srh
Arsenic	ND	mg/L		0.001		E200.8	01/20/22 10:31 / srh
Beryllium	ND	mg/L		0.0008		E200.8	01/20/22 10:31 / srh
Boron	1.3	mg/L	D	0.1		E200.7	01/20/22 11:30 / rlh
Cadmium	ND	mg/L		0.001		E200.8	01/20/22 10:31 / srh
Calcium	70	mg/L	D	3		E200.7	01/20/22 11:30 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/20/22 10:31 / srh
Iron	0.3	mg/L	D	0.1		E200.7	01/20/22 11:30 / rlh
Lead	ND	mg/L		0.001		E200.8	01/20/22 10:31 / srh
Lithium	0.10	mg/L	D	0.03		E200.7	01/20/22 11:30 / rlh
Magnesium	467	mg/L		1		E200.7	01/20/22 11:30 / rlh
Manganese	0.274	mg/L		0.001		E200.8	01/20/22 10:31 / srh
Molybdenum	0.002	mg/L		0.001		E200.8	01/20/22 10:31 / srh
Potassium	17	mg/L		1		E200.7	01/20/22 11:30 / rlh
Selenium	ND	mg/L		0.001		E200.8	01/20/22 10:31 / srh
Sodium	417	mg/L	D	3		E200.7	01/20/22 11:30 / rlh
Strontium	1.53	mg/L		0.01		E200.7	01/20/22 11:30 / rlh
Thallium	ND	mg/L		0.0002		E200.8	01/25/22 23:20 / srh
Uranium	ND	mg/L		0.0002		E200.8	01/20/22 10:31 / srh

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-Annual Analysis  
**Lab ID:** B22011141-002  
**Client Sample ID:** TLN-2201-204

# SPN

**Report Date:** 02/01/22  
**Collection Date:** 01/18/22 10:00  
**Date Received:** 01/18/22  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.0	s.u.	H	0.1		A4500-H B	01/19/22 09:40 / mjb
pH Measurement Temp	14.8	°C		1.0		A4500-H B	01/19/22 09:40 / mjb
Conductivity @ 25 C	4340	umhos/cm		5		A2510 B	01/19/22 09:40 / mjb
Solids, Total Dissolved TDS @ 180 C	4130	mg/L	D	100		A2540 C	01/19/22 10:36 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	278	mg/L		4		A2320 B	01/19/22 12:25 / ftk
Bicarbonate as HCO3	338	mg/L		4		A2320 B	01/19/22 12:25 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/19/22 12:25 / ftk
Chloride	68	mg/L	D	5		E300.0	01/23/22 06:07 / caa
Sulfate	3380	mg/L	D	10		E300.0	01/23/22 06:07 / caa
Bromide	14.0	mg/L		0.5		E300.0	01/23/22 06:07 / caa
Fluoride	ND	mg/L	D	0.2		E300.0	01/27/22 09:21 / caa
Hardness as CaCO3	2990	mg/L		1		A2340 B	01/26/22 12:33 / klc
<b>NUTRIENTS</b>							
Nitrogen, Total (Persulfate)	0.70	mg/L		0.04		A4500 N-C	01/21/22 14:43 / eli-h
Nitrogen, Nitrate+Nitrite as N	0.10	mg/L		0.01		E353.2	01/20/22 11:49 / srh
Phosphorus, Total as P	0.011	mg/L		0.002		E365.1	01/21/22 10:34 / mh
<b>METALS, DISSOLVED</b>							
Aluminum	ND	mg/L		0.009		E200.8	01/20/22 10:37 / srh
Antimony	ND	mg/L	D	0.0006		E200.8	01/27/22 18:22 / srh
Arsenic	ND	mg/L		0.001		E200.8	01/20/22 10:37 / srh
Beryllium	ND	mg/L		0.0008		E200.8	01/20/22 10:37 / srh
Boron	1.3	mg/L	D	0.1		E200.7	01/26/22 12:33 / rlh
Cadmium	ND	mg/L		0.001		E200.8	01/20/22 10:37 / srh
Calcium	460	mg/L	D	3		E200.7	01/26/22 12:33 / rlh
Cobalt	0.007	mg/L		0.005		E200.8	01/20/22 10:37 / srh
Iron	45.3	mg/L	D	0.1		E200.7	01/20/22 11:50 / rlh
Lead	ND	mg/L		0.001		E200.8	01/20/22 10:37 / srh
Lithium	0.11	mg/L	D	0.03		E200.7	01/20/22 11:50 / rlh
Magnesium	447	mg/L		1		E200.7	01/26/22 12:33 / rlh
Manganese	1.31	mg/L	D	0.01		E200.7	01/20/22 11:50 / rlh
Molybdenum	0.002	mg/L		0.001		E200.8	01/20/22 10:37 / srh
Potassium	15	mg/L		1		E200.7	01/26/22 12:33 / rlh
Selenium	ND	mg/L		0.001		E200.8	01/20/22 10:37 / srh
Sodium	304	mg/L	D	3		E200.7	01/26/22 12:33 / rlh
Strontium	10.4	mg/L		0.01		E200.7	01/20/22 11:50 / rlh
Thallium	ND	mg/L		0.0002		E200.8	01/25/22 23:29 / srh
Uranium	0.0040	mg/L		0.0002		E200.8	01/20/22 10:37 / srh

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-Annual Analysis  
**Lab ID:** B22011141-003  
**Client Sample ID:** TLN-2201-205

# SP3

**Report Date:** 02/01/22  
**Collection Date:** 01/18/22 11:25  
**Date Received:** 01/18/22  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	5.6	s.u.	H	0.1		A4500-H B	01/19/22 09:43 / mjb
pH Measurement Temp	14.8	°C		1.0		A4500-H B	01/19/22 09:43 / mjb
Conductivity @ 25 C	4300	umhos/cm		5		A2510 B	01/19/22 09:43 / mjb
Solids, Total Dissolved TDS @ 180 C	5030	mg/L	D	100		A2540 C	01/19/22 10:36 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	4	mg/L		4		A2320 B	01/19/22 12:31 / ftk
Bicarbonate as HCO3	5	mg/L		4		A2320 B	01/19/22 12:31 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/19/22 12:31 / ftk
Chloride	49	mg/L	D	5		E300.0	01/23/22 06:24 / caa
Sulfate	4020	mg/L	D	10		E300.0	01/23/22 06:24 / caa
Bromide	ND	mg/L		0.5		E300.0	01/23/22 06:24 / caa
Fluoride	0.3	mg/L	D	0.2		E300.0	01/23/22 06:24 / caa
Hardness as CaCO3	1090	mg/L		1		A2340 B	01/20/22 12:02 / klc
<b>NUTRIENTS</b>							
Nitrogen, Total (Persulfate)	0.06	mg/L		0.04		A4500 N-C	01/21/22 14:44 / eli-h
Nitrogen, Nitrate+Nitrite as N	0.23	mg/L	D	0.06		E353.2	01/20/22 12:54 / srh
Phosphorus, Total as P	0.046	mg/L		0.002		E365.1	01/21/22 10:36 / mh
<b>METALS, DISSOLVED</b>							
Aluminum	ND	mg/L		0.009		E200.8	01/20/22 10:42 / srh
Antimony	ND	mg/L	D	0.0006		E200.8	01/27/22 18:28 / srh
Arsenic	ND	mg/L		0.001		E200.8	01/20/22 10:42 / srh
Beryllium	ND	mg/L		0.0008		E200.8	01/20/22 10:42 / srh
Boron	1.1	mg/L	D	0.1		E200.7	01/20/22 12:02 / rlh
Cadmium	ND	mg/L		0.001		E200.8	01/20/22 10:42 / srh
Calcium	236	mg/L	D	3		E200.7	01/20/22 12:02 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/20/22 10:42 / srh
Iron	964	mg/L	D	1		E200.7	01/20/22 12:02 / rlh
Lead	ND	mg/L		0.001		E200.8	01/20/22 10:42 / srh
Lithium	0.08	mg/L	D	0.03		E200.7	01/20/22 12:02 / rlh
Magnesium	122	mg/L		1		E200.7	01/20/22 12:02 / rlh
Manganese	5.91	mg/L	D	0.01		E200.7	01/20/22 12:02 / rlh
Molybdenum	ND	mg/L		0.001		E200.8	01/20/22 10:42 / srh
Potassium	7	mg/L		1		E200.7	01/20/22 12:02 / rlh
Selenium	ND	mg/L		0.001		E200.8	01/20/22 10:42 / srh
Sodium	196	mg/L	D	3		E200.7	01/20/22 12:02 / rlh
Strontium	3.04	mg/L		0.01		E200.7	01/20/22 12:02 / rlh
Thallium	ND	mg/L		0.0002		E200.8	01/26/22 02:58 / srh
Uranium	ND	mg/L		0.0002		E200.8	01/20/22 10:42 / srh

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-Annual Analysis  
**Lab ID:** B22011141-004  
**Client Sample ID:** TLN-2201-206

**Report Date:** 02/01/22  
**Collection Date:** 01/18/22 11:07  
**Date Received:** 01/18/22  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.4	s.u.	H	0.1		A4500-H B	01/19/22 09:45 / mjb
pH Measurement Temp	15.0	°C		1.0		A4500-H B	01/19/22 09:45 / mjb
Conductivity @ 25 C	3450	umhos/cm		5		A2510 B	01/19/22 09:45 / mjb
Solids, Total Dissolved TDS @ 180 C	3150	mg/L	D	40		A2540 C	01/19/22 10:37 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	389	mg/L		4		A2320 B	01/19/22 12:35 / ftk
Bicarbonate as HCO3	474	mg/L		4		A2320 B	01/19/22 12:35 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/19/22 12:35 / ftk
Chloride	85	mg/L	D	2		E300.0	01/23/22 06:40 / caa
Sulfate	2650	mg/L	D	5		E300.0	01/23/22 06:40 / caa
Bromide	22.6	mg/L		0.5		E300.0	01/23/22 06:40 / caa
Fluoride	0.2	mg/L		0.1		E300.0	01/23/22 06:40 / caa
Hardness as CaCO3	1980	mg/L		1		A2340 B	01/20/22 12:06 / klc
<b>NUTRIENTS</b>							
Nitrogen, Total (Persulfate)	1.19	mg/L		0.04		A4500 N-C	01/21/22 14:45 / eli-h
Nitrogen, Nitrate+Nitrite as N	0.47	mg/L		0.01		E353.2	01/20/22 11:51 / srh
Phosphorus, Total as P	0.007	mg/L		0.002		E365.1	01/21/22 10:37 / mh
<b>METALS, DISSOLVED</b>							
Aluminum	ND	mg/L		0.009		E200.8	01/20/22 10:48 / srh
Antimony	ND	mg/L	D	0.0006		E200.8	01/27/22 18:34 / srh
Arsenic	ND	mg/L		0.001		E200.8	01/20/22 10:48 / srh
Beryllium	ND	mg/L		0.0008		E200.8	01/20/22 10:48 / srh
Boron	1.29	mg/L		0.05		E200.7	01/20/22 12:06 / rlh
Cadmium	ND	mg/L		0.001		E200.8	01/20/22 10:48 / srh
Calcium	308	mg/L		1		E200.7	01/20/22 12:06 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/20/22 10:48 / srh
Iron	0.39	mg/L		0.02		E200.8	01/26/22 03:08 / srh
Lead	ND	mg/L		0.001		E200.8	01/20/22 10:48 / srh
Lithium	0.09	mg/L	D	0.02		E200.7	01/20/22 12:06 / rlh
Magnesium	294	mg/L		1		E200.7	01/20/22 12:06 / rlh
Manganese	0.151	mg/L		0.001		E200.8	01/20/22 10:48 / srh
Molybdenum	0.004	mg/L		0.001		E200.8	01/20/22 10:48 / srh
Potassium	11	mg/L		1		E200.7	01/20/22 12:06 / rlh
Selenium	0.006	mg/L		0.001		E200.8	01/20/22 10:48 / srh
Sodium	167	mg/L		1		E200.7	01/20/22 12:06 / rlh
Strontium	8.39	mg/L		0.01		E200.7	01/20/22 12:06 / rlh
Thallium	ND	mg/L		0.0002		E200.8	01/26/22 03:08 / srh
Uranium	0.0120	mg/L		0.0002		E200.8	01/20/22 10:48 / srh

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-Annual Analysis  
**Lab ID:** B22011141-005  
**Client Sample ID:** TLN-2201-207

P-11

**Report Date:** 02/01/22  
**Collection Date:** 01/18/22 12:23  
**Date Received:** 01/18/22  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.4	s.u.	H	0.1		A4500-H B	01/19/22 09:48 / mjb
pH Measurement Temp	15.4	°C		1.0		A4500-H B	01/19/22 09:48 / mjb
Conductivity @ 25 C	2670	umhos/cm		5		A2510 B	01/19/22 09:48 / mjb
Solids, Total Dissolved TDS @ 180 C	2290	mg/L	D	40		A2540 C	01/19/22 10:37 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	359	mg/L		4		A2320 B	01/19/22 12:42 / ftk
Bicarbonate as HCO3	438	mg/L		4		A2320 B	01/19/22 12:42 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/19/22 12:42 / ftk
Chloride	27	mg/L	D	2		E300.0	01/27/22 14:25 / caa
Sulfate	1390	mg/L	D	5		E300.0	01/27/22 14:25 / caa
Bromide	ND	mg/L		0.5		E300.0	01/27/22 14:25 / caa
Fluoride	0.3	mg/L		0.1		E300.0	01/23/22 06:57 / caa
Hardness as CaCO3	1330	mg/L		1		A2340 B	01/20/22 12:10 / klc
<b>NUTRIENTS</b>							
Nitrogen, Total (Persulfate)	0.15	mg/L		0.04		A4500 N-C	01/21/22 14:47 / eli-h
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.01		E353.2	01/20/22 11:53 / srh
Phosphorus, Total as P	0.008	mg/L		0.002		E365.1	01/21/22 10:38 / mh
<b>METALS, DISSOLVED</b>							
Aluminum	ND	mg/L		0.009		E200.8	01/20/22 11:05 / srh
Antimony	ND	mg/L	D	0.0006		E200.8	01/27/22 18:40 / srh
Arsenic	ND	mg/L		0.001		E200.8	01/20/22 11:05 / srh
Beryllium	ND	mg/L		0.0008		E200.8	01/20/22 11:05 / srh
Boron	0.83	mg/L		0.05		E200.7	01/20/22 12:10 / rlh
Cadmium	ND	mg/L		0.001		E200.8	01/20/22 11:05 / srh
Calcium	167	mg/L		1		E200.7	01/20/22 12:10 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/20/22 11:05 / srh
Iron	0.15	mg/L		0.02		E200.8	01/20/22 11:05 / srh
Lead	ND	mg/L		0.001		E200.8	01/20/22 11:05 / srh
Lithium	0.07	mg/L	D	0.02		E200.7	01/20/22 12:10 / rlh
Magnesium	222	mg/L		1		E200.7	01/20/22 12:10 / rlh
Manganese	0.582	mg/L		0.001		E200.8	01/20/22 11:05 / srh
Molybdenum	0.002	mg/L		0.001		E200.8	01/20/22 11:05 / srh
Potassium	11	mg/L		1		E200.7	01/20/22 12:10 / rlh
Selenium	ND	mg/L		0.001		E200.8	01/20/22 11:05 / srh
Sodium	180	mg/L		1		E200.7	01/20/22 12:10 / rlh
Strontium	4.54	mg/L		0.01		E200.7	01/20/22 12:10 / rlh
Thallium	ND	mg/L		0.0002		E200.8	01/26/22 03:39 / srh
Uranium	0.0067	mg/L		0.0002		E200.8	01/20/22 11:05 / srh

**Report Definitions:**  
 RL - Analyte Reporting Limit  
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 MCL - Maximum Contaminant Level  
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 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-Annual Analysis  
**Lab ID:** B22011141-006  
**Client Sample ID:** TLN-2201-208

# P-12

**Report Date:** 02/01/22  
**Collection Date:** 01/18/22 12:00  
**Date Received:** 01/18/22  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.4	s.u.	H	0.1		A4500-H B	01/19/22 09:51 / mjb
pH Measurement Temp	15.8	°C		1.0		A4500-H B	01/19/22 09:51 / mjb
Conductivity @ 25 C	3930	umhos/cm		5		A2510 B	01/19/22 09:51 / mjb
Solids, Total Dissolved TDS @ 180 C	3580	mg/L	D	100		A2540 C	01/19/22 10:37 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	387	mg/L		4		A2320 B	01/19/22 12:48 / ftk
Bicarbonate as HCO3	471	mg/L		4		A2320 B	01/19/22 12:48 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/19/22 12:48 / ftk
Chloride	51	mg/L	D	5		E300.0	01/23/22 07:13 / caa
Sulfate	3240	mg/L	D	10		E300.0	01/23/22 07:13 / caa
Bromide	4.5	mg/L		0.5		E300.0	01/23/22 07:13 / caa
Fluoride	0.3	mg/L	D	0.2		E300.0	01/23/22 07:13 / caa
Hardness as CaCO3	2070	mg/L		1		A2340 B	01/20/22 12:14 / klc
<b>NUTRIENTS</b>							
Nitrogen, Total (Persulfate)	0.27	mg/L		0.04		A4500 N-C	01/21/22 14:48 / eli-h
Nitrogen, Nitrate+Nitrite as N	0.01	mg/L		0.01		E353.2	01/20/22 11:54 / srh
Phosphorus, Total as P	0.015	mg/L		0.002		E365.1	01/21/22 10:39 / mh
<b>METALS, DISSOLVED</b>							
Aluminum	ND	mg/L		0.009		E200.8	01/20/22 11:11 / srh
Antimony	ND	mg/L	D	0.0006		E200.8	01/27/22 18:47 / srh
Arsenic	ND	mg/L		0.001		E200.8	01/20/22 11:11 / srh
Beryllium	ND	mg/L		0.0008		E200.8	01/20/22 11:11 / srh
Boron	1.8	mg/L	D	0.1		E200.7	01/20/22 12:14 / rlh
Cadmium	ND	mg/L		0.001		E200.8	01/20/22 11:11 / srh
Calcium	244	mg/L	D	3		E200.7	01/20/22 12:14 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/20/22 11:11 / srh
Iron	0.05	mg/L		0.02		E200.8	01/26/22 03:49 / srh
Lead	ND	mg/L		0.001		E200.8	01/20/22 11:11 / srh
Lithium	0.10	mg/L	D	0.03		E200.7	01/20/22 12:14 / rlh
Magnesium	354	mg/L		1		E200.7	01/20/22 12:14 / rlh
Manganese	0.738	mg/L		0.001		E200.8	01/20/22 11:11 / srh
Molybdenum	0.003	mg/L		0.001		E200.8	01/20/22 11:11 / srh
Potassium	14	mg/L		1		E200.7	01/20/22 12:14 / rlh
Selenium	ND	mg/L		0.001		E200.8	01/20/22 11:11 / srh
Sodium	281	mg/L	D	3		E200.7	01/20/22 12:14 / rlh
Strontium	6.80	mg/L		0.01		E200.7	01/20/22 12:14 / rlh
Thallium	ND	mg/L		0.0002		E200.8	01/26/22 03:49 / srh
Uranium	0.0098	mg/L		0.0002		E200.8	01/20/22 11:11 / srh

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time





# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 01/25/22

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: A4500 N-C</b>							Analytical Run: FIA203-HE_220121A		
<b>Lab ID: ICB</b>	Initial Calibration Blank, Instrument Blank								
Nitrogen, Total (Persulfate)	-0.00210	mg/L	0.10		0	0			01/21/22 14:36
<b>Lab ID: CCV</b>							Continuing Calibration Verification Standard		
Nitrogen, Total (Persulfate)	0.511	mg/L	0.10	102	90	110			01/21/22 14:37
<b>Method: A4500 N-C</b>							Batch: 59874		
<b>Lab ID: MB-59874</b>	Method Blank								
Nitrogen, Total (Persulfate)	ND	mg/L	0.04						01/21/22 14:38
<b>Lab ID: LCS-59874</b>	Laboratory Control Sample								
Nitrogen, Total (Persulfate)	11.2	mg/L	0.30	100	90	110			01/21/22 14:39
<b>Lab ID: LFB-59874</b>	Laboratory Fortified Blank								
Nitrogen, Total (Persulfate)	1.02	mg/L	0.10	102	90	110			01/21/22 14:41
<b>Lab ID: B22011141-006AMS</b>	Sample Matrix Spike								
Nitrogen, Total (Persulfate)	1.31	mg/L	0.10	104	90	110			01/21/22 14:49
<b>Lab ID: B22011141-006AMSD</b>	Sample Matrix Spike Duplicate								
Nitrogen, Total (Persulfate)	1.30	mg/L	0.10	103	90	110	0.7	20	01/21/22 14:50

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



## QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: A2320 B</b> <span style="float: right;">Batch: R373358</span>										
<b>Lab ID: MBLK</b> <span style="float: right;">Run: METROHM 2_220119A</span>										
Method Blank										
Alkalinity, Total as CaCO3		ND	mg/L	4						01/19/22 09:24
<b>Lab ID: LCS</b> <span style="float: right;">Run: METROHM 2_220119A</span>										
Laboratory Control Sample										
Alkalinity, Total as CaCO3		99.8	mg/L	4.0	100	90	110			01/19/22 11:50
<b>Lab ID: B21112176-002CDUP</b> <span style="float: right;">Run: METROHM 2_220119A</span>										
3 Sample Duplicate										
Alkalinity, Total as CaCO3		236	mg/L	4.0				0.2	10	01/19/22 12:02
Bicarbonate as HCO3		288	mg/L	4.0				0.2	10	
Carbonate as CO3		ND	mg/L	4.0					10	
<b>Lab ID: B22011142-002BDUP</b> <span style="float: right;">Run: METROHM 2_220119A</span>										
3 Sample Duplicate										
Alkalinity, Total as CaCO3		478	mg/L	4.0				0.1	10	01/19/22 13:07
Bicarbonate as HCO3		583	mg/L	4.0				0.1	10	
Carbonate as CO3		ND	mg/L	4.0					10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A2510 B										Batch: R373357
<b>Lab ID:</b> SC 2nd 1413		Laboratory Control Sample					Run: PHSC _101-B_220119A			01/19/22 08:49
Conductivity @ 25 C	1410	umhos/cm		5.0	100	90	110			
<b>Lab ID:</b> MBLK		Method Blank					Run: PHSC _101-B_220119A			01/19/22 08:54
Conductivity @ 25 C	ND	umhos/cm		5						
<b>Lab ID:</b> B22011140-001ADUP		Sample Duplicate					Run: PHSC _101-B_220119A			01/19/22 09:35
Conductivity @ 25 C	728	umhos/cm		5.0				0.3	10	
<b>Lab ID:</b> B22011142-001BDUP		Sample Duplicate					Run: PHSC _101-B_220119A			01/19/22 10:01
Conductivity @ 25 C	3760	umhos/cm		5.0				0.2	10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A2540 C										Batch: 163049
<b>Lab ID:</b> MB-163049		Method Blank								Run: BAL #30_220119A 01/19/22 10:35
Solids, Total Dissolved TDS @ 180 C		ND	mg/L							
<b>Lab ID:</b> LCS-163049		Laboratory Control Sample								Run: BAL #30_220119A 01/19/22 10:35
Solids, Total Dissolved TDS @ 180 C		1050	mg/L	10	105	90	110			
<b>Lab ID:</b> B22011140-001A DUP		Sample Duplicate								Run: BAL #30_220119A 01/19/22 10:36
Solids, Total Dissolved TDS @ 180 C		472	mg/L	20				0.9	5	
<b>Lab ID:</b> B22011161-001A DUP		Sample Duplicate								Run: BAL #30_220119A 01/19/22 10:38
Solids, Total Dissolved TDS @ 180 C		556	mg/L	10				2.0	5	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A4500-H B		Analytical Run: PHSC _101-B_220119A								
<b>Lab ID:</b> pH 8	2	Initial Calibration Verification Standard								01/19/22 08:36
pH		8.0	s.u.	0.1	100	98	102			
pH Measurement Temp		20.3	°C	1.0						
<b>Method:</b> A4500-H B		Batch: R373357								
<b>Lab ID:</b> B22011140-001ADUP	2	Sample Duplicate								01/19/22 09:35
pH		8.0	s.u.	0.1				0.0	3	
pH Measurement Temp		14.3	°C	1.0						
<b>Lab ID:</b> B22011142-001BDUP	2	Sample Duplicate								01/19/22 10:01
pH		7.9	s.u.	0.1				0.3	3	
pH Measurement Temp		16.1	°C	1.0						

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E300.0</b>		Analytical Run: IC METROHM 2_220121A									
<b>Lab ID: ICV</b>	4	Initial Calibration Verification Standard							01/21/22 13:21		
Chloride		25.0	mg/L	1.0	100	90	110				
Sulfate		102	mg/L	1.0	102	90	110				
Bromide		1.20	mg/L	0.50	96	90	110				
Fluoride		1.23	mg/L	0.10	98	90	110				
<b>Method: E300.0</b>		Batch: R373567									
<b>Lab ID: ICB</b>	4	Method Blank							Run: IC METROHM 2_220121A 01/21/22 13:38		
Chloride		ND	mg/L	0.06							
Sulfate		ND	mg/L	0.3							
Bromide		ND	mg/L	0.007							
Fluoride		ND	mg/L	0.008							
<b>Lab ID: LFB</b>	4	Laboratory Fortified Blank							Run: IC METROHM 2_220121A 01/22/22 11:55		
Chloride		25.8	mg/L	1.0	103	90	110				
Sulfate		107	mg/L	1.0	107	90	110				
Bromide		1.16	mg/L	0.50	93	90	110				
Fluoride		1.27	mg/L	0.10	102	90	110				
<b>Lab ID: B22011140-001AMS</b>	4	Sample Matrix Spike							Run: IC METROHM 2_220121A 01/23/22 04:44		
Chloride		40.6	mg/L	1.0	108	90	110				
Sulfate		303	mg/L	1.0	106	90	110				
Bromide		1.58	mg/L	0.50	20	90	110			S	
Fluoride		1.84	mg/L	0.10	110	90	110				
<b>Lab ID: B22011140-001AMSD</b>	4	Sample Matrix Spike Duplicate							Run: IC METROHM 2_220121A 01/23/22 05:34		
Chloride		41.3	mg/L	1.0	110	90	110	1.6	20		
Sulfate		306	mg/L	1.0	109	90	110	0.8	20		
Bromide		1.62	mg/L	0.50	23	90	110	2.1	20	S	
Fluoride		1.89	mg/L	0.10	114	90	110	2.5	20	S	
<b>Lab ID: B22011156-002AMS</b>	4	Sample Matrix Spike							Run: IC METROHM 2_220121A 01/23/22 08:36		
Chloride		40.4	mg/L	1.0	110	90	110				
Sulfate		127	mg/L	1.0	112	90	110			S	
Bromide		1.44	mg/L	0.50	112	90	110			S	
Fluoride		1.43	mg/L	0.10	109	90	110				
<b>Lab ID: B22011156-002AMSD</b>	4	Sample Matrix Spike Duplicate							Run: IC METROHM 2_220121A 01/23/22 09:25		
Chloride		41.1	mg/L	1.0	113	90	110	1.7	20	S	
Sulfate		130	mg/L	1.0	114	90	110	2.2	20	S	
Bromide		1.48	mg/L	0.50	116	90	110	3.1	20	S	
Fluoride		1.49	mg/L	0.10	113	90	110	3.5	20	S	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits

# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E300.0</b>		Analytical Run: IC METROHM 2_220125A									
<b>Lab ID: ICV</b>	4	Initial Calibration Verification Standard							01/25/22 12:11		
Chloride		25.8	mg/L	1.0	103	90	110				
Sulfate		106	mg/L	1.0	106	90	110				
Bromide		1.27	mg/L	0.50	101	90	110				
Fluoride		1.31	mg/L	0.10	105	90	110				
<b>Method: E300.0</b>		Batch: R373656									
<b>Lab ID: ICB</b>	4	Method Blank							Run: IC METROHM 2_220125A 01/25/22 12:28		
Chloride		ND	mg/L	0.06							
Sulfate		ND	mg/L	0.3							
Bromide		ND	mg/L	0.007							
Fluoride		ND	mg/L	0.008							
<b>Lab ID: LFB</b>	4	Laboratory Fortified Blank							Run: IC METROHM 2_220125A 01/26/22 09:40		
Chloride		25.6	mg/L	1.0	103	90	110				
Sulfate		106	mg/L	1.0	106	90	110				
Bromide		1.14	mg/L	0.50	91	90	110				
Fluoride		1.33	mg/L	0.10	106	90	110				
<b>Lab ID: B22011164-002AMS</b>	4	Sample Matrix Spike							Run: IC METROHM 2_220125A 01/26/22 12:59		
Chloride		1740	mg/L	5.3	100	90	110				
Sulfate		2380	mg/L	11	119	90	110			S	
Bromide		26.5	mg/L	0.50	101	90	110				
Fluoride		29.6	mg/L	0.26	118	90	110			S	
<b>Lab ID: B22011164-002AMSD</b>	4	Sample Matrix Spike Duplicate							Run: IC METROHM 2_220125A 01/26/22 13:48		
Chloride		1790	mg/L	5.3	112	90	110	3.2	20	S	
Sulfate		2330	mg/L	11	116	90	110	2.1	20	S	
Bromide		26.3	mg/L	0.50	100	90	110	0.8	20		
Fluoride		29.8	mg/L	0.26	119	90	110	0.8	20	S	
<b>Lab ID: B22010964-002AMS</b>	4	Sample Matrix Spike							Run: IC METROHM 2_220125A 01/27/22 08:15		
Chloride		272	mg/L	2.6	105	90	110				
Sulfate		2120	mg/L	5.3	104	90	110				
Bromide		11.9	mg/L	0.50	95	90	110				
Fluoride		13.1	mg/L	0.13	104	90	110				
<b>Lab ID: B22011365-003AMS</b>	4	Sample Matrix Spike							Run: IC METROHM 2_220125A 01/27/22 15:31		
Chloride		6640	mg/L	26	100	90	110				
Sulfate		10900	mg/L	53	109	90	110				
Bromide		144	mg/L	1.3	103	90	110				
Fluoride		145	mg/L	1.3	107	90	110				
<b>Lab ID: B22011365-003AMSD</b>	4	Sample Matrix Spike Duplicate							Run: IC METROHM 2_220125A 01/27/22 15:48		
Chloride		6640	mg/L	26	101	90	110	0	20		
Sulfate		10900	mg/L	53	109	90	110	0.2	20		
Bromide		146	mg/L	1.3	105	90	110	1.7	20		
Fluoride		145	mg/L	1.3	107	90	110	0.4	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits

# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011141

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E300.0</b>		Analytical Run: IC METROHM 2_220128A									
<b>Lab ID: ICV</b>	4	Initial Calibration Verification Standard							01/28/22 10:03		
Chloride		25.9	mg/L	1.0	104	90	110				
Sulfate		107	mg/L	1.0	107	90	110				
Bromide		1.24	mg/L	0.50	99	90	110				
Fluoride		1.31	mg/L	0.10	105	90	110				
<b>Method: E300.0</b>		Batch: R373864									
<b>Lab ID: ICB</b>	4	Method Blank							Run: IC METROHM 2_220128A 01/28/22 10:19		
Chloride		ND	mg/L	0.06							
Sulfate		ND	mg/L	0.3							
Bromide		ND	mg/L	0.007							
Fluoride		ND	mg/L	0.008							
<b>Lab ID: LFB</b>	4	Laboratory Fortified Blank							Run: IC METROHM 2_220128A 01/28/22 14:10		
Chloride		26.3	mg/L	1.0	105	90	110				
Sulfate		109	mg/L	1.0	109	90	110				
Bromide		1.21	mg/L	0.50	97	90	110				
Fluoride		1.32	mg/L	0.10	105	90	110				
<b>Lab ID: B22011365-001AMS</b>	4	Sample Matrix Spike							Run: IC METROHM 2_220128A 01/28/22 18:18		
Chloride		3640	mg/L	13	104	90	110				
Sulfate		5840	mg/L	26	111	90	110			S	
Bromide		73.3	mg/L	0.66	105	90	110				
Fluoride		71.4	mg/L	0.66	111	90	110			S	
<b>Lab ID: B22011365-001AMSD</b>	4	Sample Matrix Spike Duplicate							Run: IC METROHM 2_220128A 01/28/22 18:34		
Chloride		3620	mg/L	13	102	90	110	0.6	20		
Sulfate		5810	mg/L	26	110	90	110	0.5	20		
Bromide		73.0	mg/L	0.66	104	90	110	0.4	20		
Fluoride		71.1	mg/L	0.66	111	90	110	0.4	20	S	
<b>Lab ID: B22011436-001BDUP</b>	4	Sample Duplicate							Run: IC METROHM 2_220128A 01/28/22 20:30		
Chloride		2.96	mg/L	1.0				3.3	20		
Sulfate		7.56	mg/L	1.0				13	20		
Bromide		ND	mg/L	0.50					20		
Fluoride		0.407	mg/L	0.10				29	20	R	

**Qualifiers:**

RL - Analyte Reporting Limit

R - Relative Percent Difference (RPD) exceeds advisory limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits





## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011141

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E353.2</b> Analytical Run: FIA203-B_220120B										
<b>Lab ID: ICV</b>	Initial Calibration Verification Standard 01/20/22 11:02									
Nitrogen, Nitrate+Nitrite as N		0.520	mg/L	0.010	92	90	110			
<b>Lab ID: CCV</b>	Continuing Calibration Verification Standard 01/20/22 11:41									
Nitrogen, Nitrate+Nitrite as N		0.945	mg/L	0.010	95	90	110			
<b>Lab ID: CCV</b>	Continuing Calibration Verification Standard 01/20/22 12:46									
Nitrogen, Nitrate+Nitrite as N		0.948	mg/L	0.010	95	90	110			
<b>Lab ID: CCV</b>	Continuing Calibration Verification Standard 01/20/22 12:55									
Nitrogen, Nitrate+Nitrite as N		0.930	mg/L	0.010	93	90	110			
<b>Method: E353.2</b> Batch: R373450										
<b>Lab ID: MBLK</b>	Method Blank Run: FIA203-B_220120B 01/20/22 11:03									
Nitrogen, Nitrate+Nitrite as N		ND	mg/L	0.006						
<b>Lab ID: LFB</b>	Laboratory Fortified Blank Run: FIA203-B_220120B 01/20/22 11:05									
Nitrogen, Nitrate+Nitrite as N		0.952	mg/L	0.010	95	90	110			
<b>Lab ID: FILTERLFB</b>	Laboratory Fortified Blank Run: FIA203-B_220120B 01/20/22 11:06									
Nitrogen, Nitrate+Nitrite as N		0.943	mg/L	0.010	94	90	110			
<b>Lab ID: B22011118-001DMS</b>	Sample Matrix Spike Run: FIA203-B_220120B 01/20/22 11:45									
Nitrogen, Nitrate+Nitrite as N		1.65	mg/L	0.010	97	90	110			
<b>Lab ID: B22011118-001DMSD</b>	Sample Matrix Spike Duplicate Run: FIA203-B_220120B 01/20/22 11:46									
Nitrogen, Nitrate+Nitrite as N		1.64	mg/L	0.010	96	90	110	0.7	10	
<b>Lab ID: B22011152-001AMS</b>	Sample Matrix Spike Run: FIA203-B_220120B 01/20/22 12:00									
Nitrogen, Nitrate+Nitrite as N		0.973	mg/L	0.010	96	90	110			
<b>Lab ID: B22011152-001AMSD</b>	Sample Matrix Spike Duplicate Run: FIA203-B_220120B 01/20/22 12:01									
Nitrogen, Nitrate+Nitrite as N		0.973	mg/L	0.010	96	90	110	0.0	10	
<b>Lab ID: B22011226-004AMS</b>	Sample Matrix Spike Run: FIA203-B_220120B 01/20/22 12:49									
Nitrogen, Nitrate+Nitrite as N		1.98	mg/L	0.010	97	90	110			
<b>Lab ID: B22011226-004AMSD</b>	Sample Matrix Spike Duplicate Run: FIA203-B_220120B 01/20/22 12:50									
Nitrogen, Nitrate+Nitrite as N		1.98	mg/L	0.010	97	90	110	0.1	10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011141

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> E365.1										Analytical Run: FIA202-B_220121A
<b>Lab ID:</b> ICV-163110		Initial Calibration Verification Standard								01/21/22 09:16
Phosphorus, Total as P		0.0450	mg/L	0.0020	90	90	110			
<b>Lab ID:</b> CCV-163110		Continuing Calibration Verification Standard								01/21/22 10:25
Phosphorus, Total as P		0.0500	mg/L	0.0020	100	90	110			
<b>Method:</b> E365.1										Batch: 163058
<b>Lab ID:</b> MB-163058		Method Blank								01/21/22 10:07
Phosphorus, Total as P		ND	mg/L	0.001				Run: FIA202-B_220121A		
<b>Lab ID:</b> LCS-163058		Laboratory Control Sample								01/21/22 10:09
Phosphorus, Total as P		0.0450	mg/L	0.0020	90	90	110	Run: FIA202-B_220121A		
<b>Lab ID:</b> B22011014-010CMS		Sample Matrix Spike								01/21/22 10:29
Phosphorus, Total as P		0.0440	mg/L	0.0020	88	90	110	Run: FIA202-B_220121A		S
<b>Lab ID:</b> B22011014-010CMSD		Sample Matrix Spike Duplicate								01/21/22 10:30
Phosphorus, Total as P		0.0430	mg/L	0.0020	86	90	110	Run: FIA202-B_220121A	2.3	10 S

**Qualifiers:**

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# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> E200.7		Analytical Run: ICP203-B_220126A								
<b>Lab ID:</b> ICV	5	Continuing Calibration Verification Standard							01/26/22 09:59	
Boron		2.44	mg/L	0.10	98	95	105			
Calcium		25.5	mg/L	1.0	102	95	105			
Magnesium		25.6	mg/L	1.0	102	95	105			
Potassium		25.3	mg/L	1.0	101	95	105			
Sodium		25.3	mg/L	1.0	101	95	105			
<b>Method:</b> E200.7		Batch: R373718								
<b>Lab ID:</b> MB-6500DIS220126A	5	Method Blank							Run: ICP203-B_220126A 01/26/22 10:08	
Boron		ND	mg/L	0.01						
Calcium		ND	mg/L	0.3						
Magnesium		ND	mg/L	0.02						
Potassium		ND	mg/L	0.1						
Sodium		ND	mg/L	0.3						
<b>Lab ID:</b> LFB-6500DIS220126A	5	Laboratory Fortified Blank							Run: ICP203-B_220126A 01/26/22 10:17	
Boron		0.997	mg/L	0.10	100	85	115			
Calcium		51.1	mg/L	1.0	102	85	115			
Magnesium		51.5	mg/L	1.0	103	85	115			
Potassium		51.2	mg/L	1.0	102	85	115			
Sodium		51.3	mg/L	1.0	103	85	115			
<b>Lab ID:</b> B22010962-005CMS2	5	Sample Matrix Spike							Run: ICP203-B_220126A 01/26/22 12:20	
Boron		0.994	mg/L	0.050	98	70	130			
Calcium		71.8	mg/L	1.0	99	70	130			
Magnesium		64.4	mg/L	1.0	103	70	130			
Potassium		53.2	mg/L	1.0	101	70	130			
Sodium		59.0	mg/L	1.0	98	70	130			
<b>Lab ID:</b> B22010962-005CMSD	5	Sample Matrix Spike Duplicate							Run: ICP203-B_220126A 01/26/22 12:24	
Boron		1.00	mg/L	0.050	99	70	130	0.8	20	
Calcium		72.1	mg/L	1.0	100	70	130	0.4	20	
Magnesium		64.8	mg/L	1.0	103	70	130	0.5	20	
Potassium		53.4	mg/L	1.0	102	70	130	0.4	20	
Sodium		59.1	mg/L	1.0	98	70	130	0.2	20	
<b>Lab ID:</b> B22010957-002BMS2	5	Sample Matrix Spike							Run: ICP203-B_220126A 01/26/22 13:16	
Boron		5.28	mg/L	0.065	100	70	130			
Calcium		412	mg/L	1.5	100	70	130			
Magnesium		406	mg/L	1.0	105	70	130			
Potassium		268	mg/L	1.0	104	70	130			
Sodium		945	mg/L	1.5	98	70	130			
<b>Lab ID:</b> B22010957-002BMSD	5	Sample Matrix Spike Duplicate							Run: ICP203-B_220126A 01/26/22 13:20	
Boron		5.29	mg/L	0.065	100	70	130	0.2	20	
Calcium		412	mg/L	1.5	100	70	130	0.1	20	
Magnesium		407	mg/L	1.0	105	70	130	0	20	
Potassium		267	mg/L	1.0	104	70	130	0.2	20	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> E200.7										Batch: R373718
<b>Lab ID:</b> B22010957-002BMSD	5	Sample Matrix Spike Duplicate								Run: ICP203-B_220126A 01/26/22 13:20
Sodium		942	mg/L	1.5	97	70	130	0.3	20	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.7</b>		Analytical Run: ICP204-B_220120A									
<b>Lab ID: ICV</b>	9	Continuing Calibration Verification Standard							01/20/22 09:19		
Boron		2.44	mg/L	0.10	98	95	105				
Calcium		25.8	mg/L	1.0	103	95	105				
Iron		2.59	mg/L	0.020	104	95	105				
Lithium		1.28	mg/L	0.10	103	95	105				
Magnesium		25.9	mg/L	1.0	103	95	105				
Manganese		2.45	mg/L	0.010	98	95	105				
Potassium		25.6	mg/L	1.0	102	95	105				
Sodium		25.7	mg/L	1.0	103	95	105				
Strontium		2.43	mg/L	0.10	97	95	105				
<b>Method: E200.7</b>		Batch: R373430									
<b>Lab ID: MB-7400DIS220120A</b>	9	Method Blank							Run: ICP204-B_220120A 01/20/22 09:27		
Boron		ND	mg/L	0.01							
Calcium		ND	mg/L	0.3							
Iron		ND	mg/L	0.01							
Lithium		ND	mg/L	0.003							
Magnesium		ND	mg/L	0.02							
Manganese		ND	mg/L	0.001							
Potassium		ND	mg/L	0.1							
Sodium		ND	mg/L	0.3							
Strontium		ND	mg/L	0.001							
<b>Lab ID: LFB-7400DIS220120A</b>	9	Laboratory Fortified Blank							Run: ICP204-B_220120A 01/20/22 09:35		
Boron		0.982	mg/L	0.10	98	85	115				
Calcium		51.1	mg/L	1.0	102	85	115				
Iron		5.15	mg/L	0.020	103	85	115				
Lithium		1.02	mg/L	0.10	102	85	115				
Magnesium		51.3	mg/L	1.0	103	85	115				
Manganese		4.80	mg/L	0.010	96	85	115				
Potassium		50.9	mg/L	1.0	102	85	115				
Sodium		51.0	mg/L	1.0	102	85	115				
Strontium		0.974	mg/L	0.10	97	85	115				
<b>Lab ID: B22011141-001CMS2</b>	9	Sample Matrix Spike							Run: ICP204-B_220120A 01/20/22 11:41		
Boron		10.8	mg/L	0.11	95	70	130				
Calcium		571	mg/L	3.1	100	70	130				
Iron		51.1	mg/L	0.14	102	70	130				
Lithium		10.0	mg/L	0.10	99	70	130				
Magnesium		977	mg/L	1.0	102	70	130				
Manganese		47.1	mg/L	0.010	94	70	130				
Potassium		515	mg/L	1.5	100	70	130				
Sodium		913	mg/L	3.0	99	70	130				
Strontium		11.1	mg/L	0.011	96	70	130				
<b>Lab ID: B22011141-001CMSD</b>	9	Sample Matrix Spike Duplicate							Run: ICP204-B_220120A 01/20/22 11:45		
Boron		10.8	mg/L	0.11	95	70	130	0	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> E200.7										
<b>Lab ID:</b> B22011141-001CMSD 9 Sample Matrix Spike Duplicate										
Run: ICP204-B_220120A										
Batch: R373430										
Calcium	572	mg/L	3.1	101	70	130	0.3	20		
Iron	51.3	mg/L	0.14	102	70	130	0.4	20		
Lithium	10.0	mg/L	0.10	99	70	130	0	20		
Magnesium	978	mg/L	1.0	102	70	130	0	20		
Manganese	47.1	mg/L	0.010	94	70	130	0.1	20		
Potassium	516	mg/L	1.5	100	70	130	0.3	20		
Sodium	913	mg/L	3.0	99	70	130	0	20		
Strontium	11.2	mg/L	0.011	96	70	130	0.3	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011141

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.8</b>		Analytical Run: ICPMS206-B_220119A									
<b>Lab ID: QCS</b>	11	Initial Calibration Verification Standard							01/20/22 09:05		
Aluminum		0.246	mg/L	0.10	99	90	110				
Arsenic		0.0474	mg/L	0.0050	95	90	110				
Beryllium		0.0242	mg/L	0.0010	97	90	110				
Cadmium		0.0246	mg/L	0.0010	98	90	110				
Cobalt		0.0482	mg/L	0.010	96	90	110				
Iron		0.244	mg/L	0.020	98	90	110				
Lead		0.0480	mg/L	0.010	96	90	110				
Manganese		0.240	mg/L	0.010	96	90	110				
Molybdenum		0.0487	mg/L	0.0050	97	90	110				
Selenium		0.0479	mg/L	0.0050	96	90	110				
Uranium		0.0536	mg/L	0.00030	107	90	110				

<b>Method: E200.8</b>		Batch: R373404									
<b>Lab ID: LRB</b>	11	Method Blank							Run: ICPMS206-B_220119A 01/19/22 14:17		
Aluminum		ND	mg/L	0.0007							
Arsenic		ND	mg/L	0.0002							
Beryllium		ND	mg/L	0.00007							
Cadmium		ND	mg/L	0.00008							
Cobalt		ND	mg/L	0.00005							
Iron		ND	mg/L	0.005							
Lead		ND	mg/L	0.00006							
Manganese		ND	mg/L	0.0001							
Molybdenum		ND	mg/L	0.00008							
Selenium		ND	mg/L	0.0001							
Uranium		ND	mg/L	0.00003							

<b>Lab ID: LFB</b>	11	Laboratory Fortified Blank							Run: ICPMS206-B_220119A 01/19/22 14:22		
Aluminum		0.0457	mg/L	0.10	91	85	115				
Arsenic		0.0498	mg/L	0.0050	100	85	115				
Beryllium		0.0468	mg/L	0.0010	94	85	115				
Cadmium		0.0492	mg/L	0.0010	98	85	115				
Cobalt		0.0451	mg/L	0.010	90	85	115				
Iron		4.76	mg/L	0.020	95	85	115				
Lead		0.0465	mg/L	0.010	93	85	115				
Manganese		0.0459	mg/L	0.010	92	85	115				
Molybdenum		0.0469	mg/L	0.0050	94	85	115				
Selenium		0.0473	mg/L	0.0050	95	85	115				
Uranium		0.0470	mg/L	0.00030	94	85	115				

<b>Lab ID: B22010951-009CMS</b>	11	Sample Matrix Spike							Run: ICPMS206-B_220119A 01/20/22 10:08		
Aluminum		0.0543	mg/L	0.030	100	70	130				
Arsenic		0.0507	mg/L	0.0010	101	70	130				
Beryllium		0.0503	mg/L	0.0010	101	70	130				
Cadmium		0.0483	mg/L	0.0010	97	70	130				
Cobalt		0.0478	mg/L	0.0050	95	70	130				
Iron		5.08	mg/L	0.020	102	70	130				

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> E200.8 <span style="float: right;">Batch: R373404</span>										
<b>Lab ID:</b> B22010951-009CMS 11 Sample Matrix Spike <span style="float: right;">Run: ICPMS206-B_220119A 01/20/22 10:08</span>										
Lead		0.0489	mg/L	0.0010	98	70	130			
Manganese		0.0488	mg/L	0.0010	97	70	130			
Molybdenum		0.0548	mg/L	0.0010	100	70	130			
Selenium		0.0530	mg/L	0.0010	103	70	130			
Uranium		0.0557	mg/L	0.00030	104	70	130			
<b>Lab ID:</b> B22010951-009CMSD 11 Sample Matrix Spike Duplicate <span style="float: right;">Run: ICPMS206-B_220119A 01/20/22 10:14</span>										
Aluminum		0.0530	mg/L	0.030	98	70	130	2.4	20	
Arsenic		0.0503	mg/L	0.0010	100	70	130	0.7	20	
Beryllium		0.0497	mg/L	0.0010	99	70	130	1.3	20	
Cadmium		0.0479	mg/L	0.0010	96	70	130	0.7	20	
Cobalt		0.0485	mg/L	0.0050	97	70	130	1.4	20	
Iron		5.09	mg/L	0.020	102	70	130	0.1	20	
Lead		0.0471	mg/L	0.0010	94	70	130	3.9	20	
Manganese		0.0480	mg/L	0.0010	96	70	130	1.5	20	
Molybdenum		0.0533	mg/L	0.0010	97	70	130	2.7	20	
Selenium		0.0526	mg/L	0.0010	102	70	130	0.7	20	
Uranium		0.0551	mg/L	0.00030	103	70	130	1.2	20	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)





## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011141

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E200.8</b>		Analytical Run: ICPMS207-B_220122A								
<b>Lab ID: QCS</b>	2	Initial Calibration Verification Standard								01/25/22 04:40
Iron		0.258	mg/L	0.020	103	90	110			
Thallium		0.0506	mg/L	0.10	101	90	110			
<b>Method: E200.8</b>		Batch: R373587								
<b>Lab ID: LRB</b>	2	Method Blank								01/22/22 16:43
Iron		ND	mg/L	0.002						
Thallium		ND	mg/L	0.0001						
<b>Lab ID: LFB</b>	2	Laboratory Fortified Blank								01/22/22 16:49
Iron		5.08	mg/L	0.020	102	85	115			
Thallium		0.0515	mg/L	0.10	103	85	115			
<b>Lab ID: B22011141-002CMS</b>	2	Sample Matrix Spike								01/25/22 23:39
Iron		70.6	mg/L	0.020	90	70	130			E
Thallium		0.241	mg/L	0.00050	97	70	130			
<b>Lab ID: B22011141-002CMSD</b>	2	Sample Matrix Spike Duplicate								01/25/22 23:49
Iron		69.9	mg/L	0.020	87	70	130	1.0	20	E
Thallium		0.236	mg/L	0.00050	94	70	130	2.4	20	
<b>Lab ID: B22011202-003BMS</b>	2	Sample Matrix Spike								01/26/22 05:00
Iron		9.56	mg/L	0.020	95	70	130			
Thallium		0.0924	mg/L	0.00050	92	70	130			
<b>Lab ID: B22011202-003BMSD</b>	2	Sample Matrix Spike Duplicate								01/26/22 05:11
Iron		9.67	mg/L	0.020	96	70	130	1.1	20	
Thallium		0.0912	mg/L	0.00050	91	70	130	1.3	20	

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

E - Estimated value - result exceeds the instrument upper quantitation limit



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011141

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method:</b> E200.8										Analytical Run: ICPMS207-B_220126A	
<b>Lab ID:</b> QCS		Initial Calibration Verification Standard								01/27/22 13:06	
Antimony		0.0503	mg/L	0.050	101	90	110				
<b>Method:</b> E200.8										Batch: R373778	
<b>Lab ID:</b> LRB		Method Blank								Run: ICPMS207-B_220126A	01/26/22 21:21
Antimony		ND	mg/L	0.0003							
<b>Lab ID:</b> LFB		Laboratory Fortified Blank								Run: ICPMS207-B_220126A	01/26/22 21:27
Antimony		0.0475	mg/L	0.050	95	85	115				
<b>Lab ID:</b> B22011141-001CMS		Sample Matrix Spike								Run: ICPMS207-B_220126A	01/27/22 18:03
Antimony		0.0978	mg/L	0.0010	98	70	130				
<b>Lab ID:</b> B22011141-001CMSD		Sample Matrix Spike Duplicate								Run: ICPMS207-B_220126A	01/27/22 18:09
Antimony		0.0985	mg/L	0.0010	98	70	130	0.7	20		
<b>Lab ID:</b> B22011375-002AMS		Sample Matrix Spike								Run: ICPMS207-B_220126A	01/29/22 23:34
Antimony		0.244	mg/L	0.0015	98	70	130				
<b>Lab ID:</b> B22011375-002AMSD		Sample Matrix Spike Duplicate								Run: ICPMS207-B_220126A	01/29/22 23:43
Antimony		0.246	mg/L	0.0015	98	70	130	140	20	R	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

R - Relative Percent Difference (RPD) exceeds advisory limit



# Work Order Receipt Checklist

Talen Energy Supply LLC

B22011141

Login completed by: Taylor K. Burris

Date Received: 1/18/2022

Reviewed by: BL2000\gmccartney

Received by: dac

Reviewed Date: 1/22/2022

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: °C On Ice
- Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4"). 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.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

## Contact and Corrective Action Comments:

The Temperature Blank temperature for shipping container 1 was 0.1°C, shipping container 2 was -0.4°C, and shipping container 3 was 0.3°C.



# Chain of Custody and Analytical Request Record

PLEASE PRINT; provide as much information as possible. Refer to corresponding notes on reverse side. Page 1 of 1

<b>Company Name</b> <b>Talen Montana, LLC</b>	<b>Project Name, PWS#, Permit #, Etc</b> <b>STEP 1&amp;2 Semi-annual Analysis</b>	<b>Sample Origin State:</b> <b>Montana</b>	<b>EPA/State Compliance</b> Yes <input type="checkbox"/> No <input type="checkbox"/>
<b>Report Mail Address</b> Cordelle Stephenson PO Box 38 Colstrip, MT 59323	<b>Contact Name:</b> Kordelle Stephenson Voice: 406-748-5290 Fax: 406-748-5900 Email: Kordelle.stephenson@talenergy.com	<b>Sampler Name if other than Contact</b>	
<b>Invoice Address</b> <b>TALEN MONTANA, LLC</b> ATTN: A.P. GENTW13 PO Box 25223 Lehigh Valley, PA 18002-5223	<b>Invoice Contact &amp; Phone #:</b> Kordelle Stephenson 406-748-5364	<b>Purchase Order #</b> <b>Contract #622268-18</b>	<b>ELI Quote #</b>
<b>Report Required For:</b> POTW/WWTP <input type="checkbox"/> DW <input type="checkbox"/> Other <input type="checkbox"/>	<b>Special Report Formats - ELI must be notified prior to sample submittal for the following</b> NELAC <input type="checkbox"/> A2LA <input type="checkbox"/> Level IV <input type="checkbox"/> Other <input type="checkbox"/> Format _____		
<b>SAMPLE IDENTIFICATION</b> (Name, Location, Interval, etc)	<b>Collection Date</b>	<b>Collection Time</b>	<b>Receipt Temp</b> °C
FLN-2201-203	1/18/22	0940	Cooler ID(s) _____ Custody Seal Intact Y N Signature Match Y N LAB ID _____
FLN-2201-204	11/25	1800	<b>LABORATORY USE ONLY</b> Notify ELI prior to RUSH sample submittal for additional charges and scheduling Comments: Please copy results to Jenny Vanek, Hydrometrics, Inc. Billings Site Name: <b>Talen - Colstrip</b>
FLN-2201-205	11/07	1123	
FLN-2201-206	1200	11/14	
FLN-2201-207			
FLN-2201-208			
<b>Number of Containers</b> Sample Type: _____ Air, Water, Soils/Solids, Vegetation, Biosessy Other	<b>ANALYSIS REQUESTED</b>	<b>SEE ATTACHED</b>	<b>Notify ELI prior to RUSH sample submittal for additional charges and scheduling</b> Comments: Please copy results to Jenny Vanek, Hydrometrics, Inc. Billings Site Name: <b>Talen - Colstrip</b>
<b>Matrix</b> - water - water - water - water - water - water	Normal Turnaround (TAT) <input checked="" type="checkbox"/> X RUSH Turnaround (TAT) <input type="checkbox"/>	Received by (print) _____ Signature _____ Date/Time _____	Received by (print) _____ Signature _____ Date/Time _____
<b>Relinquished by (print)</b> Charles Lantz	<b>Relinquished by (print)</b> Dylan Chivrich	<b>Date/Time</b> 1/18/22 1610	<b>Date/Time</b> 1/18/22 1610
<b>Custody Record MUST be Signed</b>	<b>Signature</b> Charles Lantz	<b>Signature</b> Dylan Chivrich	<b>Signature</b> Dylan Chivrich
<b>Sample Disposal:</b> Return to Client <input type="checkbox"/> Lab Disposal <input type="checkbox"/>	<b>LABORATORY USE ONLY: Sample Type</b> _____ # of fractions _____		

**Parameter List - 1&2 Pipeline Drain Pond Area**  
**Schedule: Groundwater**

Parameter	Laboratory Methods and Reporting Detection Limits			Reporting Detection Limit (mg/L)
	Analytical Lab Method	Fraction	Matrix	
PH - FLD	FIELD		Water	
SC (UMHOS/CM AT 25 C) (FLD)	FIELD		Water	
WATER TEMPERATURE (FLD)	FIELD		Water	
pH - LAB	A4500-HB		Water	0.1
SC (UMHOS/CM AT 25 C)	A2510B		Water	5
TDS (MEASURED AT 180 C)	A2540C		Water	10
BICARBONATE ALK AS HCO3	A2320B		Water	4
CARBONATE AS CO3	A2320B		Water	4
TOTAL ALKALINITY AS CaCO3	A2320B		Water	4
TOTAL HARDNESS AS CaCO3	A2340B		Water	1
ANION/CATION BALANCE	SM1030E		Water	
CALCIUM (CA)	E200 7/E200 8	Dissolved	Water	1
MAGNESIUM (MG)	E200 7/E200 8	Dissolved	Water	1
POTASSIUM (K)	E200 7/E200 8	Dissolved	Water	1
SODIUM (NA)	E200 7/E200 8	Dissolved	Water	1
SULFATE (SO4)	E300 0		Water	1
CHLORIDE (CL)	E300 0		Water	1
BROMIDE (BR)	E300 0		Water	0.5
FLUORIDE (F)	E300 0		Water	0.1
ALUMINUM (AL)	E200 7	Dissolved	Water	0.009
ANTIMONY (SB)	E200 7/E200 8	Dissolved	Water	0.0005
ARSENIC (AS)	E200 7/E200 8	Dissolved	Water	0.001
BERYLLIUM	E200 7/E200 8	Dissolved	Water	0.0008
BORON (B)	E200 7/E200 8	Dissolved	Water	0.1
CADMIUM (CD)	E200 7/E200 8	Dissolved	Water	0.001
COBALT (CO)	E200 7/E200 8	Dissolved	Water	0.005
IRON (FE)	E200 7/E200 9	Dissolved	Water	0.02
LEAD (PB)	E200 7/E200 8	Dissolved	Water	0.001
LITHIUM (LI)	E200 7/E200 8	Dissolved	Water	0.01
MANGANESE (MN)	E200 7/E200 8	Dissolved	Water	0.001
MOLYBDENUM (MO)	E200 7/E200 8	Dissolved	Water	0.001
SELENIUM (SF)	E200 7/E200 8	Dissolved	Water	0.001
THALLIUM (TL)	E200 7/E200 8	Dissolved	Water	0.0002
STRONTIUM (SR)	E200 7/E200 8	Dissolved	Water	0.02
URANIUM, NATURAL	E200 8	Dissolved	Water	0.0002
Total Persulfate Nitrogen (TN)	A4500-NC		Water	0.04
Total Phosphorus, as P	EPA 365.1		Water	0.003
Nitrate + Nitrite, as N	E 353.2/E 300.0		Water	0.05



# ANALYTICAL SUMMARY REPORT

February 01, 2022

Talen Energy Supply LLC  
PO Box 38  
Colstrip, MT 59323-0038

Work Order: B22011142                      Quote ID: B6025

Project Name: STEP 1&2 Semi-annual Analysis

Energy Laboratories Inc Billings MT received the following 2 samples for Talen Energy Supply LLC on 1/18/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B22011142-001	TLN-2201-209	01/18/22 12:40	01/18/22	Aqueous	Metals by ICP/ICPMS, Dissolved Metals by ICP/ICPMS, Total Alkalinity Conductivity Hardness Anions by Ion Chromatography Nitrogen, Nitrate + Nitrite Nitrogen, Total Persulfate pH Metals Digestion by E200.2 E365.1 Digestion, Total P Preparation for TDS A2540 C Phosphorus, Total Sodium Adsorption Ratio Solids, Total Dissolved
B22011142-002	TLN-2201-210	01/18/22 10:30	01/18/22	Aqueous	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:



**CLIENT:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Work Order:** B22011142

**Report Date:** 02/01/22

## **CASE NARRATIVE**

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Tests associated with analyst identified as ELI-H were subcontracted to Energy Laboratories, 3161 East Lyndale Ave, Helena, MT, EPA Number MT00945.



## LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B22011142-001  
**Client Sample ID:** TLN-2201-209

# AR-1NF

**Report Date:** 02/01/22  
**Collection Date:** 01/18/22 12:40  
**Date Received:** 01/18/22  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	7.9	s.u.	H	0.1		A4500-H B	01/19/22 09:59 / mjb
pH Measurement Temp	16.4	°C		1.0		A4500-H B	01/19/22 09:59 / mjb
Conductivity @ 25 C	3750	umhos/cm		5		A2510 B	01/19/22 09:59 / mjb
Solids, Total Dissolved TDS @ 180 C	3290	mg/L	D	100		A2540 C	01/19/22 10:37 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	497	mg/L		4		A2320 B	01/19/22 12:55 / ftk
Bicarbonate as HCO3	606	mg/L		4		A2320 B	01/19/22 12:55 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/19/22 12:55 / ftk
Chloride	104	mg/L	D	5		E300.0	01/23/22 07:30 / caa
Sulfate	2410	mg/L	D	10		E300.0	01/23/22 07:30 / caa
Bromide	0.7	mg/L		0.5		E300.0	01/23/22 07:30 / caa
Fluoride	0.4	mg/L	D	0.2		E300.0	01/23/22 07:30 / caa
Hardness as CaCO3	2130	mg/L		1		A2340 B	01/20/22 12:19 / klc
Sodium Adsorption Ratio (SAR)	1.99	unitless		0.01		Calculation	01/20/22 12:19 / klc
<b>NUTRIENTS</b>							
Nitrogen, Total (Persulfate)	1.03	mg/L		0.04		A4500 N-C	01/21/22 14:51 / eli-h
Nitrogen, Nitrate+Nitrite as N	0.24	mg/L		0.01		E353.2	01/20/22 11:55 / srh
Phosphorus, Total as P	0.086	mg/L	D	0.004		E365.1	01/21/22 11:00 / mh
<b>METALS, DISSOLVED</b>							
Aluminum	ND	mg/L		0.009		E200.8	01/20/22 11:17 / srh
Antimony	ND	mg/L	D	0.0006		E200.8	01/27/22 18:53 / srh
Arsenic	ND	mg/L		0.001		E200.8	01/20/22 11:17 / srh
Beryllium	ND	mg/L		0.0008		E200.8	01/20/22 11:17 / srh
Boron	1.3	mg/L	D	0.1		E200.7	01/20/22 12:19 / rlh
Cadmium	ND	mg/L		0.001		E200.8	01/20/22 11:17 / srh
Calcium	298	mg/L	D	3		E200.7	01/20/22 12:19 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/20/22 11:17 / srh
Iron	0.13	mg/L		0.02		E200.8	01/20/22 11:17 / srh
Lead	ND	mg/L		0.001		E200.8	01/20/22 11:17 / srh
Lithium	0.11	mg/L	D	0.03		E200.7	01/20/22 12:19 / rlh
Magnesium	336	mg/L		1		E200.7	01/20/22 12:19 / rlh
Manganese	1.50	mg/L		0.001		E200.8	01/20/22 11:17 / srh
Molybdenum	0.002	mg/L		0.001		E200.8	01/20/22 11:17 / srh
Potassium	13	mg/L		1		E200.7	01/20/22 12:19 / rlh
Selenium	ND	mg/L		0.001		E200.8	01/20/22 11:17 / srh
Sodium	211	mg/L	D	3		E200.7	01/20/22 12:19 / rlh
Strontium	6.59	mg/L		0.01		E200.8	01/26/22 03:59 / srh
Thallium	ND	mg/L		0.0002		E200.8	01/26/22 03:59 / srh
Uranium	0.0138	mg/L		0.0002		E200.8	01/20/22 11:17 / srh

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time





### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B22011142-001  
**Client Sample ID:** TLN-2201-209

**Report Date:** 02/01/22  
**Collection Date:** 01/18/22 12:40  
**DateReceived:** 01/18/22  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>METALS, TOTAL</b>							
Aluminum	0.093	mg/L		0.009		E200.8	01/28/22 11:16 / srh
Antimony	ND	mg/L	D	0.0008		E200.8	01/28/22 11:16 / srh
Arsenic	ND	mg/L		0.001		E200.8	01/28/22 11:16 / srh
Beryllium	ND	mg/L		0.0008		E200.8	01/28/22 11:16 / srh
Boron	1.44	mg/L	D	0.07		E200.7	01/21/22 17:47 / rlh
Cadmium	ND	mg/L		0.001		E200.8	01/28/22 11:16 / srh
Calcium	309	mg/L		1		E200.7	01/21/22 17:47 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/28/22 11:16 / srh
Iron	0.89	mg/L	D	0.04		E200.7	01/21/22 17:47 / rlh
Lead	ND	mg/L		0.001		E200.8	01/28/22 11:16 / srh
Lithium	0.10	mg/L	D	0.04		E200.7	01/21/22 17:47 / rlh
Magnesium	347	mg/L		1		E200.7	01/21/22 17:47 / rlh
Manganese	1.97	mg/L		0.001		E200.8	01/28/22 11:16 / srh
Molybdenum	0.002	mg/L		0.001		E200.8	01/28/22 11:16 / srh
Potassium	13	mg/L		1		E200.7	01/21/22 17:47 / rlh
Selenium	ND	mg/L		0.001		E200.8	01/28/22 11:16 / srh
Sodium	221	mg/L	D	2		E200.7	01/21/22 17:47 / rlh
Strontium	6.61	mg/L		0.01		E200.7	01/21/22 17:47 / rlh
Thallium	ND	mg/L		0.0002		E200.8	01/28/22 11:16 / srh
Uranium	0.0142	mg/L		0.0002		E200.8	01/28/22 11:16 / srh

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B22011142-002  
**Client Sample ID:** TLN-2201-210

# AR-8

**Report Date:** 02/01/22  
**Collection Date:** 01/18/22 10:30  
**Date Received:** 01/18/22  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL PROPERTIES</b>							
pH	8.0	s.u.	H	0.1		A4500-H B	01/19/22 10:04 / mjb
pH Measurement Temp	16.7	°C		1.0		A4500-H B	01/19/22 10:04 / mjb
Conductivity @ 25 C	3530	umhos/cm		5		A2510 B	01/19/22 10:04 / mjb
Solids, Total Dissolved TDS @ 180 C	3130	mg/L	D	100		A2540 C	01/19/22 10:37 / mjb
<b>INORGANICS</b>							
Alkalinity, Total as CaCO3	478	mg/L		4		A2320 B	01/19/22 13:01 / ftk
Bicarbonate as HCO3	583	mg/L		4		A2320 B	01/19/22 13:01 / ftk
Carbonate as CO3	ND	mg/L		4		A2320 B	01/19/22 13:01 / ftk
Chloride	82	mg/L	D	5		E300.0	01/23/22 07:46 / caa
Sulfate	2000	mg/L	D	10		E300.0	01/23/22 07:46 / caa
Bromide	0.5	mg/L		0.5		E300.0	01/23/22 07:46 / caa
Fluoride	0.3	mg/L	D	0.2		E300.0	01/23/22 07:46 / caa
Hardness as CaCO3	1990	mg/L		1		A2340 B	01/20/22 12:23 / klc
Sodium Adsorption Ratio (SAR)	1.97	unitless		0.01		Calculation	01/20/22 12:23 / klc
<b>NUTRIENTS</b>							
Nitrogen, Total (Persulfate)	0.86	mg/L		0.04		A4500 N-C	01/21/22 14:52 / eli-h
Nitrogen, Nitrate+Nitrite as N	0.20	mg/L		0.01		E353.2	01/20/22 11:56 / srh
Phosphorus, Total as P	0.065	mg/L		0.002		E365.1	01/21/22 09:29 / mh
<b>METALS, DISSOLVED</b>							
Aluminum	ND	mg/L		0.009		E200.8	01/26/22 04:09 / srh
Antimony	ND	mg/L	D	0.0006		E200.8	01/27/22 18:59 / srh
Arsenic	ND	mg/L		0.001		E200.8	01/26/22 04:09 / srh
Beryllium	ND	mg/L		0.0008		E200.8	01/26/22 04:09 / srh
Boron	1.23	mg/L		0.05		E200.7	01/20/22 12:23 / rlh
Cadmium	ND	mg/L		0.001		E200.8	01/26/22 04:09 / srh
Calcium	278	mg/L		1		E200.7	01/20/22 12:23 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/26/22 04:09 / srh
Iron	0.08	mg/L		0.02		E200.8	01/26/22 04:09 / srh
Lead	ND	mg/L		0.001		E200.8	01/26/22 04:09 / srh
Lithium	0.09	mg/L	D	0.02		E200.7	01/20/22 12:23 / rlh
Magnesium	314	mg/L		1		E200.7	01/20/22 12:23 / rlh
Manganese	0.944	mg/L		0.001		E200.8	01/26/22 04:09 / srh
Molybdenum	0.002	mg/L		0.001		E200.8	01/26/22 04:09 / srh
Potassium	13	mg/L		1		E200.7	01/20/22 12:23 / rlh
Selenium	ND	mg/L		0.001		E200.8	01/26/22 04:09 / srh
Sodium	202	mg/L		1		E200.7	01/20/22 12:23 / rlh
Strontium	5.86	mg/L		0.01		E200.7	01/20/22 12:23 / rlh
Thallium	ND	mg/L		0.0002		E200.8	01/26/22 04:09 / srh
Uranium	0.0120	mg/L		0.0002		E200.8	01/26/22 04:09 / srh

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)  
 H - Analysis performed past the method holding time



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC  
**Project:** STEP 1&2 Semi-annual Analysis  
**Lab ID:** B22011142-002  
**Client Sample ID:** TLN-2201-210

**Report Date:** 02/01/22  
**Collection Date:** 01/18/22 10:30  
**DateReceived:** 01/18/22  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>METALS, TOTAL</b>							
Aluminum	ND	mg/L		0.009		E200.8	01/28/22 11:22 / srh
Antimony	ND	mg/L	D	0.0008		E200.8	01/28/22 11:22 / srh
Arsenic	ND	mg/L		0.001		E200.8	01/28/22 11:22 / srh
Beryllium	ND	mg/L		0.0008		E200.8	01/28/22 11:22 / srh
Boron	1.30	mg/L	D	0.07		E200.7	01/21/22 17:52 / rlh
Cadmium	ND	mg/L		0.001		E200.8	01/28/22 11:22 / srh
Calcium	283	mg/L		1		E200.7	01/21/22 17:52 / rlh
Cobalt	ND	mg/L		0.005		E200.8	01/28/22 11:22 / srh
Iron	0.22	mg/L		0.02		E200.8	01/28/22 11:22 / srh
Lead	ND	mg/L		0.001		E200.8	01/28/22 11:22 / srh
Lithium	0.09	mg/L	D	0.04		E200.7	01/21/22 17:52 / rlh
Magnesium	315	mg/L		1		E200.7	01/21/22 17:52 / rlh
Manganese	1.02	mg/L		0.001		E200.8	01/28/22 11:22 / srh
Molybdenum	0.002	mg/L		0.001		E200.8	01/28/22 11:22 / srh
Potassium	13	mg/L		1		E200.7	01/21/22 17:52 / rlh
Selenium	ND	mg/L		0.001		E200.8	01/28/22 11:22 / srh
Sodium	207	mg/L	D	2		E200.7	01/21/22 17:52 / rlh
Strontium	6.20	mg/L		0.01		E200.7	01/21/22 17:52 / rlh
Thallium	ND	mg/L		0.0002		E200.8	01/28/22 11:22 / srh
Uranium	0.0123	mg/L		0.0002		E200.8	01/28/22 11:22 / srh

**Report Definitions:**  
 RL - Analyte Reporting Limit  
 QCL - Quality Control Limit  
 D - Reporting Limit (RL) increased due to sample matrix  
 MCL - Maximum Contaminant Level  
 ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Helena, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011142

**Report Date:** 01/25/22

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: A4500 N-C</b>							Analytical Run: FIA203-HE_220121A		
<b>Lab ID: ICB</b>	Initial Calibration Blank, Instrument Blank								
Nitrogen, Total (Persulfate)	-0.00210	mg/L	0.10		0	0			01/21/22 14:36
<b>Lab ID: CCV</b>	Continuing Calibration Verification Standard								
Nitrogen, Total (Persulfate)	0.511	mg/L	0.10	102	90	110			01/21/22 14:37
<b>Method: A4500 N-C</b>							Batch: 59874		
<b>Lab ID: MB-59874</b>	Method Blank								
Nitrogen, Total (Persulfate)	ND	mg/L	0.04						01/21/22 14:38
<b>Lab ID: LCS-59874</b>	Laboratory Control Sample								
Nitrogen, Total (Persulfate)	11.2	mg/L	0.30	100	90	110			01/21/22 14:39
<b>Lab ID: LFB-59874</b>	Laboratory Fortified Blank								
Nitrogen, Total (Persulfate)	1.02	mg/L	0.10	102	90	110			01/21/22 14:41
<b>Lab ID: H22010404-006AMS</b>	Sample Matrix Spike								
Nitrogen, Total (Persulfate)	1.31	mg/L	0.10	104	90	110			01/21/22 14:49
<b>Lab ID: H22010404-006AMSD</b>	Sample Matrix Spike Duplicate								
Nitrogen, Total (Persulfate)	1.30	mg/L	0.10	103	90	110	0.7	20	01/21/22 14:50

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



## QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011142

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: A2320 B</b>										
Batch: R373358										
<b>Lab ID: MBLK</b>		Method Blank								
Alkalinity, Total as CaCO3		ND	mg/L	4						
Run: METROHM 2_220119A 01/19/22 09:24										
<b>Lab ID: LCS</b>		Laboratory Control Sample								
Alkalinity, Total as CaCO3		99.8	mg/L	4.0	100	90	110			01/19/22 11:50
Run: METROHM 2_220119A 01/19/22 11:50										
<b>Lab ID: B21112176-002CDUP</b>	3	Sample Duplicate								
Alkalinity, Total as CaCO3		236	mg/L	4.0				0.2	10	01/19/22 12:02
Bicarbonate as HCO3		288	mg/L	4.0				0.2	10	
Carbonate as CO3		ND	mg/L	4.0					10	
Run: METROHM 2_220119A 01/19/22 12:02										
<b>Lab ID: B22011142-002BDUP</b>	3	Sample Duplicate								
Alkalinity, Total as CaCO3		478	mg/L	4.0				0.1	10	01/19/22 13:07
Bicarbonate as HCO3		583	mg/L	4.0				0.1	10	
Carbonate as CO3		ND	mg/L	4.0					10	
Run: METROHM 2_220119A 01/19/22 13:07										

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011142

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A2510 B										Batch: R373357
<b>Lab ID:</b> SC 2nd 1413		Laboratory Control Sample					Run: PHSC _101-B_220119A			01/19/22 08:49
Conductivity @ 25 C	1410	umhos/cm		5.0	100	90	110			
<b>Lab ID:</b> MBLK		Method Blank					Run: PHSC _101-B_220119A			01/19/22 08:54
Conductivity @ 25 C	ND	umhos/cm		5						
<b>Lab ID:</b> B22011140-001ADUP		Sample Duplicate					Run: PHSC _101-B_220119A			01/19/22 09:35
Conductivity @ 25 C	728	umhos/cm		5.0				0.3	10	
<b>Lab ID:</b> B22011142-001BDUP		Sample Duplicate					Run: PHSC _101-B_220119A			01/19/22 10:01
Conductivity @ 25 C	3760	umhos/cm		5.0				0.2	10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011142

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: A2540 C</b> <span style="float: right;">Batch: 163049</span>										
<b>Lab ID: MB-163049</b>		Method Blank								01/19/22 10:35
Solids, Total Dissolved TDS @ 180 C		ND	mg/L							
<b>Run: BAL #30_220119A</b>										
<b>Lab ID: LCS-163049</b>		Laboratory Control Sample								01/19/22 10:35
Solids, Total Dissolved TDS @ 180 C		1050	mg/L	10	105	90	110			
<b>Run: BAL #30_220119A</b>										
<b>Lab ID: B22011140-001A DUP</b>		Sample Duplicate								01/19/22 10:36
Solids, Total Dissolved TDS @ 180 C		472	mg/L	20				0.9	5	
<b>Run: BAL #30_220119A</b>										
<b>Lab ID: B22011161-001A DUP</b>		Sample Duplicate								01/19/22 10:38
Solids, Total Dissolved TDS @ 180 C		556	mg/L	10				2.0	5	
<b>Run: BAL #30_220119A</b>										

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011142

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method:</b> A4500-H B		Analytical Run: PHSC _101-B_220119A									
<b>Lab ID:</b> pH 8	2	Initial Calibration Verification Standard							01/19/22 08:36		
pH		8.0	s.u.	0.1	100	98	102				
pH Measurement Temp		20.3	°C	1.0							
<b>Method:</b> A4500-H B		Batch: R373357									
<b>Lab ID:</b> B22011142-001BDUP	2	Sample Duplicate							Run: PHSC _101-B_220119A		01/19/22 10:01
pH		7.9	s.u.	0.1				0.3	3		
pH Measurement Temp		16.1	°C	1.0							

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)





## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011142

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E300.0</b>		Analytical Run: IC METROHM 2_220121A									
<b>Lab ID: ICV</b>	4	Initial Calibration Verification Standard							01/21/22 13:21		
Chloride		25.0	mg/L	1.0	100	90	110				
Sulfate		102	mg/L	1.0	102	90	110				
Bromide		1.20	mg/L	0.50	96	90	110				
Fluoride		1.23	mg/L	0.10	98	90	110				
<b>Method: E300.0</b>		Batch: R373567									
<b>Lab ID: ICB</b>	4	Method Blank							Run: IC METROHM 2_220121A 01/21/22 13:38		
Chloride		ND	mg/L	0.06							
Sulfate		ND	mg/L	0.3							
Bromide		ND	mg/L	0.007							
Fluoride		ND	mg/L	0.008							
<b>Lab ID: LFB</b>	4	Laboratory Fortified Blank							Run: IC METROHM 2_220121A 01/22/22 11:55		
Chloride		25.8	mg/L	1.0	103	90	110				
Sulfate		107	mg/L	1.0	107	90	110				
Bromide		1.16	mg/L	0.50	93	90	110				
Fluoride		1.27	mg/L	0.10	102	90	110				
<b>Lab ID: B22011156-002AMS</b>	4	Sample Matrix Spike							Run: IC METROHM 2_220121A 01/23/22 08:36		
Chloride		40.4	mg/L	1.0	110	90	110				
Sulfate		127	mg/L	1.0	112	90	110			S	
Bromide		1.44	mg/L	0.50	112	90	110			S	
Fluoride		1.43	mg/L	0.10	109	90	110				
<b>Lab ID: B22011156-002AMSD</b>	4	Sample Matrix Spike Duplicate							Run: IC METROHM 2_220121A 01/23/22 09:25		
Chloride		41.1	mg/L	1.0	113	90	110	1.7	20	S	
Sulfate		130	mg/L	1.0	114	90	110	2.2	20	S	
Bromide		1.48	mg/L	0.50	116	90	110	3.1	20	S	
Fluoride		1.49	mg/L	0.10	113	90	110	3.5	20	S	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits



## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011142

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E353.2</b>										Analytical Run: FIA203-B_220120B
<b>Lab ID: ICV</b>		Initial Calibration Verification Standard								01/20/22 11:02
Nitrogen, Nitrate+Nitrite as N		0.520	mg/L	0.010	92	90	110			
<b>Lab ID: CCV</b>		Continuing Calibration Verification Standard								01/20/22 11:41
Nitrogen, Nitrate+Nitrite as N		0.945	mg/L	0.010	95	90	110			
<b>Method: E353.2</b>										Batch: R373450
<b>Lab ID: MBLK</b>		Method Blank								01/20/22 11:03
Nitrogen, Nitrate+Nitrite as N		ND	mg/L	0.006						Run: FIA203-B_220120B
<b>Lab ID: LFB</b>		Laboratory Fortified Blank								01/20/22 11:05
Nitrogen, Nitrate+Nitrite as N		0.952	mg/L	0.010	95	90	110			Run: FIA203-B_220120B
<b>Lab ID: FILTERLFB</b>		Laboratory Fortified Blank								01/20/22 11:06
Nitrogen, Nitrate+Nitrite as N		0.943	mg/L	0.010	94	90	110			Run: FIA203-B_220120B
<b>Lab ID: B22011152-001AMS</b>		Sample Matrix Spike								01/20/22 12:00
Nitrogen, Nitrate+Nitrite as N		0.973	mg/L	0.010	96	90	110			Run: FIA203-B_220120B
<b>Lab ID: B22011152-001AMSD</b>		Sample Matrix Spike Duplicate								01/20/22 12:01
Nitrogen, Nitrate+Nitrite as N		0.973	mg/L	0.010	96	90	110	0.0	10	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011142

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E365.1</b>								Analytical Run: FIA202-B_220121A			
<b>Lab ID: ICV-163110</b>		Initial Calibration Verification Standard								01/21/22 09:16	
Phosphorus, Total as P		0.0450	mg/L	0.0020	90	90	110				
<b>Lab ID: CCV-163110</b>		Continuing Calibration Verification Standard								01/21/22 10:25	
Phosphorus, Total as P		0.0500	mg/L	0.0020	100	90	110				
<b>Lab ID: CCV-163110</b>		Continuing Calibration Verification Standard								01/21/22 10:54	
Phosphorus, Total as P		0.0470	mg/L	0.0020	94	90	110				
<b>Method: E365.1</b>								Batch: 163058			
<b>Lab ID: MB-163058</b>		Method Blank								01/21/22 10:07	
Phosphorus, Total as P		ND	mg/L	0.001							
<b>Lab ID: LCS-163058</b>		Laboratory Control Sample								01/21/22 10:09	
Phosphorus, Total as P		0.0450	mg/L	0.0020	90	90	110				
<b>Lab ID: B22011014-010CMS</b>		Sample Matrix Spike								01/21/22 10:29	
Phosphorus, Total as P		0.0440	mg/L	0.0020	88	90	110			S	
<b>Lab ID: B22011014-010CMSD</b>		Sample Matrix Spike Duplicate								01/21/22 10:30	
Phosphorus, Total as P		0.0430	mg/L	0.0020	86	90	110	2.3	10	S	
<b>Method: E365.1</b>								Batch: 163110			
<b>Lab ID: MB-163110</b>		Method Blank								01/21/22 09:18	
Phosphorus, Total as P		0.003	mg/L	0.001							
<b>Lab ID: LCS-163110</b>		Laboratory Control Sample								01/21/22 09:19	
Phosphorus, Total as P		0.0550	mg/L	0.0020	110	90	110				
<b>Lab ID: B22010617-001CMS</b>		Sample Matrix Spike								01/21/22 09:22	
Phosphorus, Total as P		0.0690	mg/L	0.0020	118	90	110			S	
<b>Lab ID: B22010617-001CMSD</b>		Sample Matrix Spike Duplicate								01/21/22 09:23	
Phosphorus, Total as P		0.0630	mg/L	0.0020	106	90	110	9.1	10		

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011142

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method:</b> E200.7		Analytical Run: ICP204-B_220120A									
<b>Lab ID:</b> ICV	7	Continuing Calibration Verification Standard							01/20/22 09:19		
Boron		2.44	mg/L	0.10	98	95	105				
Calcium		25.8	mg/L	1.0	103	95	105				
Lithium		1.28	mg/L	0.10	103	95	105				
Magnesium		25.9	mg/L	1.0	103	95	105				
Potassium		25.6	mg/L	1.0	102	95	105				
Sodium		25.7	mg/L	1.0	103	95	105				
Strontium		2.43	mg/L	0.10	97	95	105				
<b>Method:</b> E200.7		Batch: R373430									
<b>Lab ID:</b> MB-7400DIS220120A	7	Method Blank							Run: ICP204-B_220120A 01/20/22 09:27		
Boron		ND	mg/L	0.01							
Calcium		ND	mg/L	0.3							
Lithium		ND	mg/L	0.003							
Magnesium		ND	mg/L	0.02							
Potassium		ND	mg/L	0.1							
Sodium		ND	mg/L	0.3							
Strontium		ND	mg/L	0.001							
<b>Lab ID:</b> LFB-7400DIS220120A	7	Laboratory Fortified Blank							Run: ICP204-B_220120A 01/20/22 09:35		
Boron		0.982	mg/L	0.10	98	85	115				
Calcium		51.1	mg/L	1.0	102	85	115				
Lithium		1.02	mg/L	0.10	102	85	115				
Magnesium		51.3	mg/L	1.0	103	85	115				
Potassium		50.9	mg/L	1.0	102	85	115				
Sodium		51.0	mg/L	1.0	102	85	115				
Strontium		0.974	mg/L	0.10	97	85	115				
<b>Lab ID:</b> B22011204-001BMS2	7	Sample Matrix Spike							Run: ICP204-B_220120A 01/20/22 12:52		
Boron		1.04	mg/L	0.10	99	70	130				
Calcium		160	mg/L	1.0	108	70	130				
Lithium		1.08	mg/L	0.10	106	70	130				
Magnesium		88.6	mg/L	1.0	108	70	130				
Potassium		55.8	mg/L	1.0	106	70	130				
Sodium		81.5	mg/L	1.0	108	70	130				
Strontium		2.29	mg/L	0.010	104	70	130				
<b>Lab ID:</b> B22011204-001BMSD	7	Sample Matrix Spike Duplicate							Run: ICP204-B_220120A 01/20/22 12:56		
Boron		1.02	mg/L	0.10	97	70	130	1.9	20		
Calcium		156	mg/L	1.0	101	70	130	2.1	20		
Lithium		1.04	mg/L	0.10	103	70	130	3.0	20		
Magnesium		87.1	mg/L	1.0	105	70	130	1.7	20		
Potassium		54.4	mg/L	1.0	103	70	130	2.6	20		
Sodium		79.8	mg/L	1.0	104	70	130	2.1	20		
Strontium		2.27	mg/L	0.010	102	70	130	1.0	20		

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011142

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.7</b>		Analytical Run: ICP204-B_220121A									
<b>Lab ID: ICV</b>	8	Continuing Calibration Verification Standard							01/21/22 09:32		
Boron		2.49	mg/L	0.10	100	95	105				
Calcium		25.8	mg/L	1.0	103	95	105				
Iron		2.61	mg/L	0.020	105	95	105				
Lithium		1.29	mg/L	0.10	103	95	105				
Magnesium		25.9	mg/L	1.0	103	95	105				
Potassium		25.6	mg/L	1.0	103	95	105				
Sodium		25.7	mg/L	1.0	103	95	105				
Strontium		2.49	mg/L	0.10	99	95	105				
<b>Method: E200.7</b>		Batch: 163080									
<b>Lab ID: MB-163080</b>	8	Method Blank							Run: ICP204-B_220121A 01/21/22 17:06		
Boron		ND	mg/L	0.009							
Calcium		ND	mg/L	0.07							
Iron		ND	mg/L	0.008							
Lithium		ND	mg/L	0.006							
Magnesium		ND	mg/L	0.02							
Potassium		ND	mg/L	0.05							
Sodium		ND	mg/L	0.3							
Strontium		ND	mg/L	0.0004							
<b>Lab ID: LCS3-163080</b>	8	Laboratory Control Sample							Run: ICP204-B_220121A 01/21/22 17:11		
Boron		1.02	mg/L	0.10	102	85	115				
Calcium		51.4	mg/L	1.0	103	85	115				
Iron		5.20	mg/L	0.020	104	85	115				
Lithium		1.04	mg/L	0.10	104	85	115				
Magnesium		51.6	mg/L	1.0	103	85	115				
Potassium		51.6	mg/L	1.0	103	85	115				
Sodium		51.4	mg/L	1.0	103	85	115				
Strontium		1.00	mg/L	0.10	100	85	115				
<b>Lab ID: B22011138-001AMS3</b>	8	Sample Matrix Spike							Run: ICP204-B_220121A 01/21/22 17:27		
Boron		1.29	mg/L	0.050	104	70	130				
Calcium		96.1	mg/L	1.0	103	70	130				
Iron		5.47	mg/L	0.020	106	70	130				
Lithium		1.12	mg/L	0.10	106	70	130				
Magnesium		65.3	mg/L	1.0	102	70	130				
Potassium		55.9	mg/L	1.0	105	70	130				
Sodium		76.8	mg/L	1.0	103	70	130				
Strontium		1.39	mg/L	0.010	102	70	130				
<b>Lab ID: B22011138-001AMSD</b>	8	Sample Matrix Spike Duplicate							Run: ICP204-B_220121A 01/21/22 17:31		
Boron		1.30	mg/L	0.050	105	70	130	0.5	20		
Calcium		96.8	mg/L	1.0	105	70	130	0.7	20		
Iron		5.46	mg/L	0.020	106	70	130	0.2	20		
Lithium		1.13	mg/L	0.10	107	70	130	0.5	20		
Magnesium		65.9	mg/L	1.0	103	70	130	0.8	20		

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011142

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> E200.7										Batch: 163080
<b>Lab ID:</b> B22011138-001AMSD	8	Sample Matrix Spike Duplicate								Run: ICP204-B_220121A
Potassium		56.0	mg/L	1.0	105	70	130	0.3	20	01/21/22 17:31
Sodium		77.4	mg/L	1.0	105	70	130	0.8	20	
Strontium		1.40	mg/L	0.010	103	70	130	0.7	20	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011142

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.8</b>										Analytical Run: ICPMS206-B_220119A	
<b>Lab ID: QCS</b>	11	Initial Calibration Verification Standard							01/20/22 09:05		
Aluminum		0.246	mg/L	0.10	99	90	110				
Arsenic		0.0474	mg/L	0.0050	95	90	110				
Beryllium		0.0242	mg/L	0.0010	97	90	110				
Cadmium		0.0246	mg/L	0.0010	98	90	110				
Cobalt		0.0482	mg/L	0.010	96	90	110				
Iron		0.244	mg/L	0.020	98	90	110				
Lead		0.0480	mg/L	0.010	96	90	110				
Manganese		0.240	mg/L	0.010	96	90	110				
Molybdenum		0.0487	mg/L	0.0050	97	90	110				
Selenium		0.0479	mg/L	0.0050	96	90	110				
Uranium		0.0536	mg/L	0.00030	107	90	110				
<b>Method: E200.8</b>										Batch: R373404	
<b>Lab ID: LRB</b>	11	Method Blank							Run: ICPMS206-B_220119A 01/19/22 14:17		
Aluminum		ND	mg/L	0.0007							
Arsenic		ND	mg/L	0.0002							
Beryllium		ND	mg/L	0.00007							
Cadmium		ND	mg/L	0.00008							
Cobalt		ND	mg/L	0.00005							
Iron		ND	mg/L	0.005							
Lead		ND	mg/L	0.00006							
Manganese		ND	mg/L	0.0001							
Molybdenum		ND	mg/L	0.00008							
Selenium		ND	mg/L	0.0001							
Uranium		ND	mg/L	0.00003							
<b>Lab ID: LFB</b>	11	Laboratory Fortified Blank							Run: ICPMS206-B_220119A 01/19/22 14:22		
Aluminum		0.0457	mg/L	0.10	91	85	115				
Arsenic		0.0498	mg/L	0.0050	100	85	115				
Beryllium		0.0468	mg/L	0.0010	94	85	115				
Cadmium		0.0492	mg/L	0.0010	98	85	115				
Cobalt		0.0451	mg/L	0.010	90	85	115				
Iron		4.76	mg/L	0.020	95	85	115				
Lead		0.0465	mg/L	0.010	93	85	115				
Manganese		0.0459	mg/L	0.010	92	85	115				
Molybdenum		0.0469	mg/L	0.0050	94	85	115				
Selenium		0.0473	mg/L	0.0050	95	85	115				
Uranium		0.0470	mg/L	0.00030	94	85	115				
<b>Lab ID: B22010951-009CMS</b>	11	Sample Matrix Spike							Run: ICPMS206-B_220119A 01/20/22 10:08		
Aluminum		0.0543	mg/L	0.030	100	70	130				
Arsenic		0.0507	mg/L	0.0010	101	70	130				
Beryllium		0.0503	mg/L	0.0010	101	70	130				
Cadmium		0.0483	mg/L	0.0010	97	70	130				
Cobalt		0.0478	mg/L	0.0050	95	70	130				
Iron		5.08	mg/L	0.020	102	70	130				

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011142

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E200.8</b>										
Batch: R373404										
<b>Lab ID:</b>	<b>B22010951-009CMS</b>	11	Sample Matrix Spike							
										Run: ICPMS206-B_220119A 01/20/22 10:08
Lead		0.0489	mg/L	0.0010	98	70	130			
Manganese		0.0488	mg/L	0.0010	97	70	130			
Molybdenum		0.0548	mg/L	0.0010	100	70	130			
Selenium		0.0530	mg/L	0.0010	103	70	130			
Uranium		0.0557	mg/L	0.00030	104	70	130			
<b>Lab ID:</b>	<b>B22010951-009CMSD</b>	11	Sample Matrix Spike Duplicate							
										Run: ICPMS206-B_220119A 01/20/22 10:14
Aluminum		0.0530	mg/L	0.030	98	70	130	2.4	20	
Arsenic		0.0503	mg/L	0.0010	100	70	130	0.7	20	
Beryllium		0.0497	mg/L	0.0010	99	70	130	1.3	20	
Cadmium		0.0479	mg/L	0.0010	96	70	130	0.7	20	
Cobalt		0.0485	mg/L	0.0050	97	70	130	1.4	20	
Iron		5.09	mg/L	0.020	102	70	130	0.1	20	
Lead		0.0471	mg/L	0.0010	94	70	130	3.9	20	
Manganese		0.0480	mg/L	0.0010	96	70	130	1.5	20	
Molybdenum		0.0533	mg/L	0.0010	97	70	130	2.7	20	
Selenium		0.0526	mg/L	0.0010	102	70	130	0.7	20	
Uranium		0.0551	mg/L	0.00030	103	70	130	1.2	20	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)





# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011142

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E200.8</b>		Analytical Run: ICPMS207-B_220122A								
<b>Lab ID: QCS</b>	13 Initial Calibration Verification Standard								01/24/22 19:10	
Aluminum		0.243	mg/L	0.10	97	90	110			
Arsenic		0.0498	mg/L	0.0050	100	90	110			
Beryllium		0.0245	mg/L	0.0010	98	90	110			
Cadmium		0.0244	mg/L	0.0010	98	90	110			
Cobalt		0.0503	mg/L	0.010	101	90	110			
Iron		0.241	mg/L	0.020	96	90	110			
Lead		0.0479	mg/L	0.010	96	90	110			
Manganese		0.248	mg/L	0.010	99	90	110			
Molybdenum		0.0474	mg/L	0.0050	95	90	110			
Selenium		0.0514	mg/L	0.0050	103	90	110			
Strontium		0.0505	mg/L	0.10	101	90	110			
Thallium		0.0486	mg/L	0.10	97	90	110			
Uranium		0.0510	mg/L	0.00030	102	90	110			

<b>Method: E200.8</b>		Batch: R373587								
<b>Lab ID: LRB</b>	13 Method Blank								Run: ICPMS207-B_220122A 01/22/22 16:43	
Aluminum		ND	mg/L	0.0007						
Arsenic		ND	mg/L	0.0002						
Beryllium		ND	mg/L	0.0001						
Cadmium		ND	mg/L	0.00003						
Cobalt		ND	mg/L	0.00002						
Iron		ND	mg/L	0.002						
Lead		ND	mg/L	0.00004						
Manganese		ND	mg/L	0.00005						
Molybdenum		ND	mg/L	0.00006						
Selenium		ND	mg/L	0.00007						
Strontium		ND	mg/L	0.00009						
Thallium		ND	mg/L	0.0001						
Uranium		ND	mg/L	0.00002						

<b>Lab ID: LFB</b>	13 Laboratory Fortified Blank								Run: ICPMS207-B_220122A 01/22/22 16:49	
Aluminum		0.0494	mg/L	0.10	99	85	115			
Arsenic		0.0521	mg/L	0.0050	104	85	115			
Beryllium		0.0507	mg/L	0.0010	101	85	115			
Cadmium		0.0508	mg/L	0.0010	102	85	115			
Cobalt		0.0504	mg/L	0.010	101	85	115			
Iron		5.08	mg/L	0.020	102	85	115			
Lead		0.0518	mg/L	0.010	104	85	115			
Manganese		0.0495	mg/L	0.010	99	85	115			
Molybdenum		0.0505	mg/L	0.0050	101	85	115			
Selenium		0.0529	mg/L	0.0050	106	85	115			
Strontium		0.0525	mg/L	0.10	105	85	115			
Thallium		0.0515	mg/L	0.10	103	85	115			
Uranium		0.0516	mg/L	0.00030	103	85	115			

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011142

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E200.8</b>										
Batch: R373587										
<b>Lab ID: B22011141-002CMS</b>	13	Sample Matrix Spike			Run: ICPMS207-B_220122A				01/25/22 23:39	
Aluminum		0.252	mg/L	0.030	98	70	130			
Arsenic		0.253	mg/L	0.0010	101	70	130			
Beryllium		0.233	mg/L	0.0010	93	70	130			
Cadmium		0.238	mg/L	0.0010	95	70	130			
Cobalt		0.249	mg/L	0.0050	96	70	130			
Iron		70.6	mg/L	0.020	90	70	130			E
Lead		0.243	mg/L	0.0010	97	70	130			
Manganese		1.73	mg/L	0.0010		70	130			A
Molybdenum		0.253	mg/L	0.0010	100	70	130			
Selenium		0.258	mg/L	0.0010	103	70	130			
Strontium		12.5	mg/L	0.010		70	130			A
Thallium		0.241	mg/L	0.00050	97	70	130			
Uranium		0.263	mg/L	0.00030	104	70	130			
<b>Lab ID: B22011141-002CMSD</b>	13	Sample Matrix Spike Duplicate			Run: ICPMS207-B_220122A				01/25/22 23:49	
Aluminum		0.250	mg/L	0.030	98	70	130	0.6	20	
Arsenic		0.246	mg/L	0.0010	98	70	130	3.0	20	
Beryllium		0.230	mg/L	0.0010	92	70	130	1.2	20	
Cadmium		0.235	mg/L	0.0010	94	70	130	1.3	20	
Cobalt		0.249	mg/L	0.0050	96	70	130	0.2	20	
Iron		69.9	mg/L	0.020	87	70	130	1.0	20	E
Lead		0.246	mg/L	0.0010	98	70	130	1.4	20	
Manganese		1.69	mg/L	0.0010		70	130	2.4	20	A
Molybdenum		0.248	mg/L	0.0010	98	70	130	2.1	20	
Selenium		0.259	mg/L	0.0010	103	70	130	0.4	20	
Strontium		12.3	mg/L	0.010		70	130	1.7	20	A
Thallium		0.236	mg/L	0.00050	94	70	130	2.4	20	
Uranium		0.260	mg/L	0.00030	102	70	130	1.1	20	

### Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

A - Analyte level was greater than four times the spike level - in accordance with the method, percent recovery is not calculated  
E - Estimated value - result exceeds the instrument upper quantitation limit



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Talen Energy Supply LLC

**Work Order:** B22011142

**Report Date:** 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: E200.8</b>										Analytical Run: ICPMS207-B_220126A	
<b>Lab ID: QCS</b>	13 Initial Calibration Verification Standard								01/28/22 08:02		
Aluminum		0.265	mg/L	0.10	106	90	110				
Antimony		0.0498	mg/L	0.050	100	90	110				
Arsenic		0.0508	mg/L	0.0050	102	90	110				
Beryllium		0.0266	mg/L	0.0010	106	90	110				
Cadmium		0.0251	mg/L	0.0010	100	90	110				
Cobalt		0.0505	mg/L	0.010	101	90	110				
Iron		0.257	mg/L	0.020	103	90	110				
Lead		0.0505	mg/L	0.010	101	90	110				
Manganese		0.262	mg/L	0.010	105	90	110				
Molybdenum		0.0489	mg/L	0.0050	98	90	110				
Selenium		0.0521	mg/L	0.0050	104	90	110				
Thallium		0.0504	mg/L	0.10	101	90	110				
Uranium		0.0531	mg/L	0.00030	106	90	110				

<b>Method: E200.8</b>										Batch: 163080		
<b>Lab ID: MB-163080</b>	13 Method Blank								Run: ICPMS207-B_220126A		01/28/22 10:19	
Aluminum		ND	mg/L	0.001								
Antimony		ND	mg/L	0.0004								
Arsenic		ND	mg/L	0.0001								
Beryllium		ND	mg/L	0.0001								
Cadmium		ND	mg/L	0.00003								
Cobalt		ND	mg/L	0.00004								
Iron		ND	mg/L	0.003								
Lead		ND	mg/L	0.00008								
Manganese		ND	mg/L	0.0001								
Molybdenum		ND	mg/L	0.00006								
Selenium		ND	mg/L	0.0002								
Thallium		ND	mg/L	0.00005								
Uranium		ND	mg/L	0.00005								

<b>Lab ID: LCS4-163080</b>	13 Laboratory Control Sample								Run: ICPMS207-B_220126A		01/28/22 10:26	
Aluminum		0.504	mg/L	0.010	101	85	115					
Antimony		0.104	mg/L	0.0050	104	85	115					
Arsenic		0.101	mg/L	0.0010	101	85	115					
Beryllium		0.0508	mg/L	0.0010	102	85	115					
Cadmium		0.0505	mg/L	0.0010	101	85	115					
Cobalt		0.101	mg/L	0.0010	101	85	115					
Iron		0.485	mg/L	0.0030	97	85	115					
Lead		0.0979	mg/L	0.0010	98	85	115					
Manganese		0.508	mg/L	0.0010	102	85	115					
Molybdenum		0.0945	mg/L	0.0050	95	85	115					
Selenium		0.102	mg/L	0.0050	102	85	115					
Thallium		0.0978	mg/L	0.0010	98	85	115					
Uranium		0.0968	mg/L	0.00030	97	85	115					

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Talen Energy Supply LLC

Work Order: B22011142

Report Date: 02/01/22

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E200.8</b> <span style="float: right;">Batch: 163080</span>										
<b>Lab ID: B22011138-002AMS4</b>	13	Sample Matrix Spike			Run: ICPMS207-B_220126A			01/28/22 10:51		
Aluminum		0.574	mg/L	0.030	101	70	130			
Antimony		0.104	mg/L	0.0010	104	70	130			
Arsenic		0.112	mg/L	0.0010	101	70	130			
Beryllium		0.0504	mg/L	0.0010	101	70	130			
Cadmium		0.0495	mg/L	0.0010	99	70	130			
Cobalt		0.0970	mg/L	0.0050	97	70	130			
Iron		0.589	mg/L	0.020	97	70	130			
Lead		0.0997	mg/L	0.0010	100	70	130			
Manganese		0.506	mg/L	0.0010	98	70	130			
Molybdenum		0.0980	mg/L	0.0010	97	70	130			
Selenium		0.104	mg/L	0.0010	103	70	130			
Thallium		0.0992	mg/L	0.00050	99	70	130			
Uranium		0.104	mg/L	0.00030	102	70	130			
<b>Lab ID: B22011138-002AMSD</b>	13	Sample Matrix Spike Duplicate			Run: ICPMS207-B_220126A			01/28/22 10:57		
Aluminum		0.562	mg/L	0.030	98	70	130	2.2	20	
Antimony		0.105	mg/L	0.0010	105	70	130	0.8	20	
Arsenic		0.113	mg/L	0.0010	101	70	130	0.8	20	
Beryllium		0.0491	mg/L	0.0010	98	70	130	2.7	20	
Cadmium		0.0498	mg/L	0.0010	100	70	130	0.6	20	
Cobalt		0.0969	mg/L	0.0050	97	70	130	0.1	20	
Iron		0.581	mg/L	0.020	95	70	130	1.3	20	
Lead		0.100	mg/L	0.0010	100	70	130	0.2	20	
Manganese		0.511	mg/L	0.0010	99	70	130	0.8	20	
Molybdenum		0.0990	mg/L	0.0010	98	70	130	1.1	20	
Selenium		0.102	mg/L	0.0010	101	70	130	2.1	20	
Thallium		0.0981	mg/L	0.00050	98	70	130	1.1	20	
Uranium		0.103	mg/L	0.00030	101	70	130	1.3	20	
<b>Method: E200.8</b> <span style="float: right;">Batch: R373778</span>										
<b>Lab ID: LRB</b>		Method Blank			Run: ICPMS207-B_220126A			01/26/22 21:21		
Antimony		ND	mg/L	0.0003						
<b>Lab ID: LFB</b>		Laboratory Fortified Blank			Run: ICPMS207-B_220126A			01/26/22 21:27		
Antimony		0.0475	mg/L	0.050	95	85	115			
<b>Lab ID: B22011141-001CMS</b>		Sample Matrix Spike			Run: ICPMS207-B_220126A			01/27/22 18:03		
Antimony		0.0978	mg/L	0.0010	98	70	130			
<b>Lab ID: B22011141-001CMSD</b>		Sample Matrix Spike Duplicate			Run: ICPMS207-B_220126A			01/27/22 18:09		
Antimony		0.0985	mg/L	0.0010	98	70	130	0.7	20	
<b>Lab ID: B22011196-002AMS</b>		Sample Matrix Spike			Run: ICPMS207-B_220126A			01/28/22 12:00		
Antimony		0.0474	mg/L	0.0010	95	70	130			
<b>Lab ID: B22011196-002AMSD</b>		Sample Matrix Spike Duplicate			Run: ICPMS207-B_220126A			01/28/22 12:06		
Antimony		0.0483	mg/L	0.0010	97	70	130	1.7	20	

**Qualifiers:**

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)



# Work Order Receipt Checklist

Talen Energy Supply LLC

B22011142

Login completed by: Taylor K. Burris

Date Received: 1/18/2022

Reviewed by: BL2000\gmccartney

Received by: dac

Reviewed Date: 1/22/2022

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: °C On Ice
- Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4"). 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.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

## Contact and Corrective Action Comments:

The Temperature Blank temperature for shipping container 1 was 0.1°C, shipping container 2 was -0.4°C, and shipping container 3 was 0.3°C.



# Chain of Custody and Analytical Request Record

PLEASE PRINT; provide as much information as possible. Refer to corresponding notes on reverse side. Page  /  of  /

<b>Company Name</b> <b>Talen Montana, LLC</b>	<b>Project Name, PWS#, Permit #, Etc.</b> <b>STEP 1&amp;2 Semi-annual Analysis</b>	<b>Sample Origin</b> State <b>Montana</b>	<b>EPA/State Compliance</b> Yes <input type="checkbox"/> No <input type="checkbox"/>
<b>Report Mail Address</b> Kordelle Stephenson PO Box 38 Colstrip, MT 59323	<b>Contact Name</b> Kordelle Stephenson <b>Voice</b> 406-748-5290 <b>Fax</b> 406-748-5900 <b>Email:</b> Kordelle.stephenson@talenergy.com	<b>Sampler Name if other than Contact.</b>	
<b>Invoice Address: TALEN MONTANA, LLC</b> ATTN: A.P. GENTW13 P.O. Box 25223 Lehigh Valley, PA 18002-5223	<b>Invoice Contact &amp; Phone #</b> Kordelle Stephenson 406-748-5364	<b>Purchase Order #:</b> <b>Contract #622268-18</b>	<b>ELI Quote #</b>
<b>Report Required For:</b> POTW/MWTP <input type="checkbox"/> DW <input type="checkbox"/> Other <input type="checkbox"/>	<b>Special Report Formats - ELI must be notified prior to sample submittal for the following</b> NELAC <input type="checkbox"/> A2LA <input type="checkbox"/> Level IV <input type="checkbox"/> Other <input type="checkbox"/> EDD/EDT <input type="checkbox"/> Format _____		
<b>SAMPLE IDENTIFICATION</b> (Name, Location, Interval, etc)	<b>Collection Date</b> 1/18/22 ↓	<b>Collection Time</b> 1240 1030	<b>Receipt Temp</b> _____ °C <b>Cooler ID(s)</b> _____ <b>Custody Seal</b> Y N <b>Intact</b> Y N <b>Signature Match</b> Y N <b>LAB ID</b> _____
<b>Number of Containers</b> AWSVBO Air, Water, Soils, Sediment, Other	<b>MATRIX</b> - water - water	<b>ANALYSIS REQUESTED</b>	<b>Notify ELI prior to RUSH sample submittal for additional charges and scheduling</b> <b>Comments:</b> Please copy results to Jenny Vanek, Hydrometrics, Inc. Billings. <b>Site Name:</b> Talen - Colstrip
<b>Sample Type:</b> MATRIX - water - water	<b>SEE ATTACHED</b> X X	<b>Normal Turnaround (TAT)</b> X X	<b>RUSH Turnaround (TAT)</b> X X
<b>Received by (print)</b> Signature: <i>[Signature]</i>	<b>Date/Time</b> 1/18/22 1610	<b>Received by (print)</b> Signature: <i>[Signature]</i>	<b>Date/Time</b> 1/18/22 1610
<b>Relinquished by (print)</b> Charles Lane	<b>Signature</b> <i>[Signature]</i>	<b>Relinquished by (print)</b> Dylan Chirries	<b>Signature</b> <i>[Signature]</i>
<b>Custody Record MUST be Signed</b> of _____	<b>LABORATORY USE ONLY:</b> Sample Type _____ # of fractions _____	<b>LABORATORY USE ONLY:</b> Sample Type _____ # of fractions _____	

**Schedule: Surface Water**

Parameter	Laboratory Methods and Reporting Detection Limits			
	Analytical Lab Method	Fraction	Matrix	Reporting Detection Limit
PH - FLD	FIELD		Water	
SC (UMHOS/CM AT 25 C) (FLD)	FIELD		Water	
WATER TEMPERATURE (FLD)	FIELD		Water	
pH - LAB	A4500-HB		Water	0.1
SC (UMHOS/CM AT 25 C)	A2510B		Water	5
TDS (MEASURED AT 180 C)	A2540C		Water	10
BICARBONATE ALK AS HCO3	A2320B		Water	4
CARBONATE AS CO3	A2320B		Water	4
TOTAL ALKALINITY AS CaCO3	A2320B		Water	4
TOTAL HARDNESS AS CaCO3	A2340B		Water	1
ANION/CATION BALANCE	SM1030E		Water	
SODIUM ADSORPTION RATIO (SAR)	Calculated		Water	
CALCIUM (CA)	E200 7/E200 8	TOTAL	Water	1
MAGNESIUM (MG)	E200 7/E200 8	TOTAL	Water	1
POTASSIUM (K)	E200 7/E200 8	TOTAL	Water	1
SODIUM (NA)	E200 7/E200 8	TOTAL	Water	1
CALCIUM (CA)	E200 7/E200 8	Dissolved	Water	1
MAGNESIUM (MG)	E200 7/E200 8	Dissolved	Water	1
POTASSIUM (K)	E200 7/E200 8	Dissolved	Water	1
SODIUM (NA)	E200 7/E200 8	Dissolved	Water	1
SULFATE (SO4)	E300 0		Water	1
CHLORIDE (CL)	E300 0		Water	1
BROMIDE (BR)	E300 0		Water	0.5
FLUORIDE (F)	E300 0		Water	0.1
ALUMINUM (AL)	E200 7	Dissolved	Water	0.009
ANTIMONY (SB)	E200 7/E200 8	Dissolved	Water	0.0005
ARSENIC (AS)	E200 7/E200 8	Dissolved	Water	0.001
BERYLLIUM	E200 7/E200 8	Dissolved	Water	0.0008
BORON (B)	E200 7/E200 8	Dissolved	Water	0.1
CADMIUM (CD)	E200 7/E200 8	Dissolved	Water	0.001
COBAL T (CO)	E200 7/E200 8	Dissolved	Water	0.005
IRON (FE)	E200 7/E200 9	Dissolved	Water	0.02
LEAD (PB)	E200 7/E200 8	Dissolved	Water	0.001
LITHIUM (LI)	E200 7/E200 8	Dissolved	Water	0.01
MANGANESE (MN)	E200 7/E200 8	Dissolved	Water	0.001
MOLYBDENUM (MO)	E200 7/E200 8	Dissolved	Water	0.001
SELENIUM (SE)	E200 7/E200 8	Dissolved	Water	0.001
THALLIUM (TL)	E200 7/E200 8	Dissolved	Water	0.0002
STRONTIUM (SR)	E200 7/E200 8	Dissolved	Water	0.02
URANIUM, NATURAL	E200 8	Dissolved	Water	0.0002
ALUMINUM (AL)	E200 7	Total	Water	0.009
ANTIMONY (SB)	E200 7/E200 8	Total	Water	0.0005
ARSENIC (AS)	E200 7/E200 8	Total	Water	0.001
BERYLLIUM	E200 7/E200 8	Total	Water	0.0008
BORON (B)	E200 7/E200 8	Total	Water	0.1
CADMIUM (CD)	E200 7/E200 8	Total	Water	0.001
COBAL T (CO)	E200 7/E200 8	Total	Water	0.005
IRON (FE)	E200 7/E200 9	Total	Water	0.02
LEAD (PB)	E200 7/E200 8	Total	Water	0.001
LITHIUM (LI)	E200 7/E200 8	Total	Water	0.01
MANGANESE (MN)	E200 7/E200 8	Total	Water	0.001
MOLYBDENUM (MO)	E200 7/E200 8	Total	Water	0.001
SELENIUM (SE)	E200 7/E200 8	Total	Water	0.001
THALLIUM (TL)	E200 7/E200 8	Total	Water	0.0002
STRONTIUM (SR)	E200 7/E200 8	Total	Water	0.02
URANIUM, NATURAL	E200 8	Total	Water	0.0002
Total Persulfate Nitrogen (TN)	A4500-NC		Water	0.04
Total Phosphorus, as P	EPA 365.1		Water	0.003
Nitrate + Nitrite, as N	E 353.2/E 300.0		Water	0.05