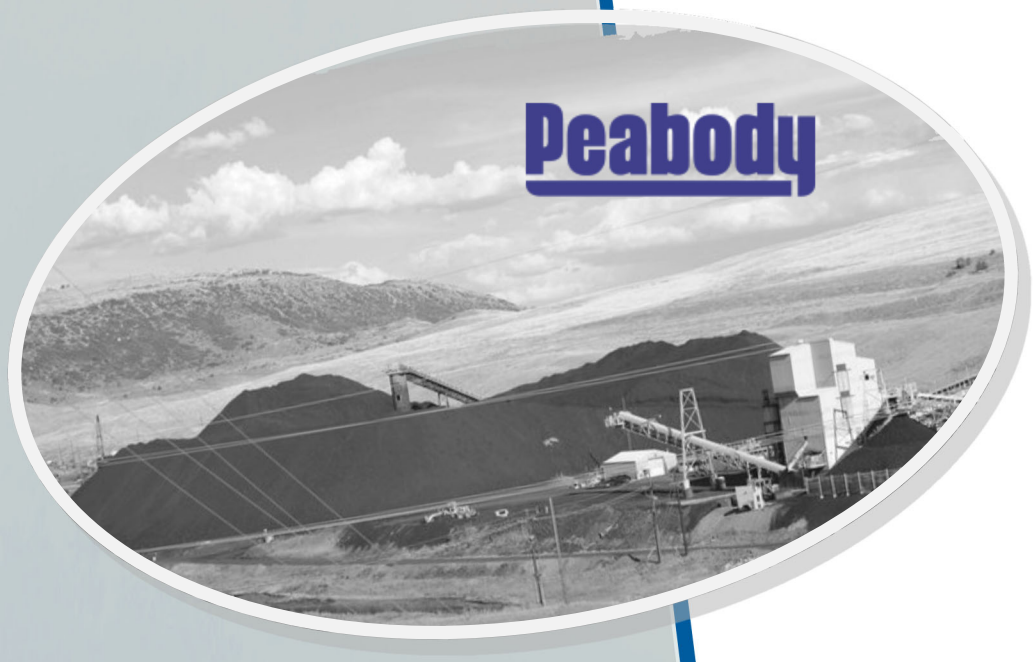
FOIDEL CREEK MINE

Twentymile Coal, LLC



2019 Annual Hydrology Report

Submitted March 2020

To: Colorado Division of Reclamation, Mining, and Safety

BY: Twentymile Coal, LLC

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2019 ANNUAL HYDROLOGY REPORT
Permit No. C-82-056

Submitted to:

Colorado Division of Reclamation, Mining, and Safety
Denver, Colorado

Submitted by:

Twentymile Coal Company
Oak Creek, Colorado

March 2020

2019 ANNUAL HYDROLOGY REPORT

1.0 INTRODUCTION

The following Annual Hydrology Report (AHR) presents 2019 hydrologic monitoring data from the Twentymile Coal, LLC's (TC's) Foidel Creek Mine located near Oak Creek, Colorado. Hydrologic monitoring locations and specific data results are discussed below. This AHR fulfills the reporting requirements under the Colorado State Division of Reclamation Mining and Safety (DRMS) Permit No. C-82-056. Unless otherwise indicated, all references to "2019" in this report refer to the 2019 Water Year (October 1, 2018 through September 30, 2019). Monitoring results for prior water years are presented in previous AHRs, although selected historical data from prior years are summarized in some of the tables and figures for comparison with 2019 data.

Following Section 2.0's discussion of Site Location and Background, this AHR provides Section 3.0 on the TC 2019 Hydrologic Monitoring Program, which in turn is divided into nine subsections:

3.1) Bedrock Groundwater monitoring,
3.2) Alluvial groundwater monitoring,
3.3) Surface water monitoring,
3.4) Spoil springs monitoring,
3.5) Natural springs monitoring,
3.6) Mine water discharge sites monitoring,
3.7) CDPS discharge sites monitoring
3.8) Mine inflow study.
3.9) Water Balance

Next follows Section 4.0, discussing Subsidence impacts for local creeks (Fish, Foidel, and Middle Creeks), and lastly Section 5.0, Summary and Conclusions. Tables and Figures are provided in appendices located at the back of this AHR.

2.0 SITE LOCATION AND BACKGROUND

The TC Foidel Creek Mine site is located approximately 20 miles southwest of Steamboat Springs, Colorado, at the south end of Twentymile Park (see Figure 1). This is an active underground coal mining operation, having affected a cumulative total of roughly 15,200 acres in south Routt County through 2019. The total Life-Of-Mine permit area encompasses approximately 22,647 acreas. The primary TC surface facilities cover about 800 acres, including discharge ponds and railroad loadout areas. The Foidel Creek Mine portals and surface facility areas are bordered on the south and south west by strip mine spoils from the former Colorado Yampa Coal Company (CYCC). Trench and berm rockfall mitigation structures, located north of the primary TC facilities along Routt County Road 27 beneath the Twentymile Sandstone cliffs, covers approximately 30 acres. The coal refuse pile is currently at 105 acres (as of July 2016). Expansion of the refuse pile footprint was intended to add an additional

140 acres to the refuse pile area (see TR09-67). Other associated satellite TC support facilities contribute an additional 10 to 15 acres.

Surface coal mining has been conducted in the area since the 1960's. The Foidel Creek Mine underground operation was later established in 1983, and has been an on-going operation using a longwall mining process since 1989. This is a form of underground mining where a 1000 foot long wall is mined in a single slice (typically 2-3 m thick). The block of coal being mined, known as the longwall "panel", may be on the order of 12,000 feet long. The gate road along one side of the wall is called the main gate, while the other side is called the tail gate. The end of the block that includes the longwall equipment is called the "face". Air is provided by ventilation fans and associated bleeder vent shafts from the surface. The advantage of longwall mining is that over 80 percent of the coal is recovered, compared with about 50 percent for the traditional pillar method. In addition, subsidence is immediate, allowing for better planning by the mining company. The Foidel Creek Mine portals are faced-up in the down dip high-wall of the strip mine.

Foidel Creek flows eastward, and is located adjacent to the TC Foidel Creek Mine surface facilities. Foidel Creek receives treated effluent from a series of sediment ponds established at the facility. Mine site drainage is controlled through seven (7) sediment ponds (NPDES Ponds T, B, C, D, E, F, and G – see Figure 2 in Map Pouch at back of report).

The Fish Creek drainage is located north of the Foidel Creek Mine surface facilities area and overlies tracts, which have been longwall mined. Fish Creek runs through the Twentymile Park syncline area. Mine water was historically discharged into Fish Creek via the Fish Creek Borehole (FCBH) pump and sodium hydroxide treatment pond facility (discharge site 115), however that practice ceased in early 2005. In 2005, an electro-coagulation treatment system was constructed re-using the FCBH pump. Treated mine water was directed back underground for dust suppression. Electro-coagulation treatment assists in minimizing pipe scaling underground.

Mine water is currently dewatered from wells located at the former Fish Creek vent shaft in the old Western Mining District (WMD) and the 10RT well located in the old Eastern Mining District (EMD). The wells discharge into the Area 1 Pit. The Pit supplies water to the new Wash Plant. If the Pit overflows, it runs through a flume (site 7) into Pond D. Pond D (site 84) is an NPDES point that discharges to Foidel Creek.

Hydrologic monitoring was initiated by CYCC in 1979. TC continues the monitoring program under updated DRMS permit requirements, which is discussed in the next section.

The Fish Creek Tipple site is located approximately 15 miles southwest of Steamboat Springs at the northeast end of Twentymile Park, covering an area of approximately 15 acres. The Fish Creek Tipple site was constructed in 1974 and ceased operation in 1983. Spoil springs (sites 303-1, 303-2, and 303-3) from the former surface operations at the Fish Creek Tipple site (east of the TC Foidel Creek Mine and Twentymile Park area) also discharge to Fish Creek at NPDES site 62. The area was reclaimed in 2012, at which time sites 303-2 and 303-3 ceased to flow.

The southwest area of TC (Eckman Park area), has been reclaimed and has been released from bond. In addition, the former surface mine area referred to as Area 1 was released from bond in January 2002. As a result, the Colorado Department of Public Health and Environment (CDPHE) subsequently approved eliminating Ponds A (Eckman Park) and H (Area 1) from our ongoing NPDES monitoring program in 2002.

Since mid-1987, hydrologic monitoring and reporting has primarily been conducted by TC personnel. In May of 1995, a private firm (Miller Water Monitoring Service) was contracted to assist with hydrologic monitoring at the TC sites, and continues to assist in monitoring to date. Prior to June 1986, water quality analyses were performed by the on-site CYCC laboratory. From 1987 to 2000, water quality analyses were primarily performed by ACZ Laboratories (formerly Bookcliffs) of Steamboat Springs, Colorado. From 2001 through 2005, water quality analysis was primarily been performed by SGS North America laboratory of Denver, Colorado. Since mid-2005, analyses are again primarily performed by ACZ Laboratory of Steamboat Springs, Colorado. Whole Effluent Toxicity (WET) testing was historically conducted by SGS, and then Aqua-Tox of Wheatridge Colorado through May 2018 where TC switched to Environ Chem Analytical of Grand Junction, Colorado.

Note that in 2003, DRMS approved TR03-42 (See Permit Exhibits 14-5, 14-6, and 14-10), and PR 03-06 (See Permit Exhibits 14-7 through 14-9), which eliminated several surface, alluvial, and bedrock well monitoring sites, and reduced the monitoring frequency of other sites, while adding additional monitoring requirements to existing surface site 305 (located downstream at the time of Twentymile Park subsidence). Data from terminated sites can be found in previous AHRs.

Three former US Geologic Survey (USGS) surface water sites (USGS 09243700, USGS 09243800 and USGS 09243900) were monitored for flow by the USGS through the 2001 water year. Prior to the 1989 Water Year, the USGS had collected and analyzed water quality samples from these sites. From the 1989 water year to date, TC has collected water quality samples from these sites for laboratory analysis. Beginning with the 2002 water year, TC took over monitoring of these three sites (referred to as sites 700, 800, and 900, respectively) from the USGS. In 2003, TR03-42 eliminated site 700 on Middle Creek.

3.0 2019 HYDROLOGIC MONITORING PROGRAM

Specific monitoring site locations and their elevations are shown on Figure 2 (Map pouch at back of report). Required monitoring frequencies are listed in Permit No. C-82-056, under Exhibit 14. 2019 data tables and figures for each site are referenced in the following discussions. Statistical summaries of the historical data base are provided after presentation of the 2019 data.

3.1 Bedrock Groundwater Monitoring

Hydrogeology: TC's underground Wadge mining operations are located roughly 1600 feet beneath the surface of Twentymile Park Basin. This is an enclosed synclinal ground water basin, rimmed by outcrops of major lithologic units. Ground water in the Twentymile Park Basin exists primarily under confined conditions within the bedrock units. All ground water aquifers in the general area, except the alluvial aquifers, are recharged by

infiltration in outcrop areas, located primarily in the southern and western margins of the Twentymile Park Basin. Recharge is limited, due to low average annual precipitation and the loss of moisture through evapotranspiration and sublimation in this semi-arid climatic zone. Ground water occurrence and movement within the bedrock aquifer system is controlled by geologic structure and lithology. Ground water movement tends to follow the structural dip of the lithologic units toward the basin axis. The general trend of movement in the permit area is to the north and northwest. This results in confined aquifer conditions down gradient from the outcrop area. A detailed discussion of the geology/hydrology for the site is available in the *Twentymile Coal Company, Foidel Creek Mine Permit C-82-056, Volume I, Rules 2.04.6 and 2.04.7.*

The Twentymile Park Basin is underlain by multiple large, high quality coal reserves. The reserves, mined by underground operations, are known as the Wadge Seam (Pre 2015) and the lower Wolf Creek Seam (Post 2015). The Wadge Seam lies within a sequence of sedimentary rocks characterized by shales, claystones, mudstones, siltstones, sandstones, and minor coal stringers referred to as the Wadge Overburden. The Wadge Overburden is hydrologically isolated from the two major bedrock aquifer units in the Twentymile Park Basin, the Twentymile Sandstone aquifer and the Trout Creek Sandstone aquifer, which lie above and below the Wadge Overburden, respectively. Lying above the Twentymile Sandstone is a minor aquifer unit, known as the Fish Creek Sandstone. All these geologic units are monitored within the Foidel Creek Mine permit area.

The Wadge Overburden is directly affected by the mining operation. Dewatering of this zone in the area of mine operations is currently being conducted. The Wadge Overburden sequence varies in thickness from 50 to 100 feet, averaging approximately 75 feet, and is characterized by low permeability (0.01 to 0.1 ft/day), limited continuity, low yield and relatively poor water quality.

Above the Wadge Overburden is the first major regional aquifer, known as the Twentymile Sandstone. The Twentymile Sandstone aquifer is confined above and below by low permeability shale and interbedded siltstone/shale units. The unit varies in thickness from 100 to 200 feet and is hydrologically isolated from the underlying Wadge Overburden sequence by a low permeability marine shale, which has a thickness of up to 700 feet. Approximately 125 feet above the Twentymile Sandstone is the 35-foot thick Fish Creek Sandstone. The Fish Creek Sandstone is a discontinuous minor unit in the area that was the contact for a small coal seam that had been surface mined.

Beneath the Wadge Overburden is a sequence of low permeability siltstones, shales, and coals, approximately 200 feet thick. This is followed by a fine-grained massive sandstone, approximately 250 feet thick, known as the Trout Creek Sandstone. The Trout Creek sandstone is the second major regional aquifer, which exists in the Twentymile Park Basin. There is very little hydrologic connection between the Trout Creek sandstone and the overlying Wadge Overburden.

The Wolf Creek Reserve (WCR) underlies the Wadge Seam. The WCR underlies portions of the EMD and NMD, and is part of the same water-table groundwater system, so the associated effects of mining on groundwater in this area will be similar to those previously considered and evaluated for the EMD and NMD. In the proposed mine area, the Wolf Creek Seam is present at depths ranging from approximately 1,000 to 1,700 feet below the land surface. Approximately 150 feet of shale, claystone, siltstone and lenticular sandstone known as

the Interburden unit separates the Wadge and Wolf Creek seams. Directly below the Wadge Seam in the planned mine area is a persistent and laterally continuous layer of material composed of clay-sized particles called underclay. Beneath this underclay is a zone of alternating thick shales, claystones, siltstones, and intermittent lenticular sandstones. The shales are generally continuous and the sandstones discontinuous. Near the base of this zone of alternating beds is the Wolf Creek Seam. Within the planned mine area, the Wolf Creek Seam splits into four distinct benches separated by rock partings. The combined total seam thickness ranges from 7.5 to 14 feet, and the coal seams are continuous within discrete mining areas. The WC1 Seam is the lowest of the benches, and ranges in thickness from 2 to 4 feet. The interburden between the WC1 and WC2 seams ranges from 0.5 to 1.5 feet. The WC2 Seam ranges from 2 to 5 feet. The WC1 and WC2 benches will be mined over the entire WCR area. The interburden between the WC2 and WC3 ranges from 0.5 to 10 feet, but will not be mined once its thickness is greater than 3 feet. The WC3 Seam ranges from 2.5 to 4 feet. The interburden between WC3 and WC4 ranges from 0.5 feet to 4.5 feet, but will not be mined once its thickness is greater than 3 feet. The WC4 Seam ranges from 2 to 5 feet.

Table 1 presents a summary of bedrock well monitoring frequencies.

Wadge And Wolf Creek Overburden: Seven Overburden wells (009-79-4, 006-82-74C, 91M006, 008-77-58, 93M001, WC008A, and WC013A) are currently monitored. Water quality sampling is required annually. All monitoring requirements were completed at these sites. Tables 2 through 8 provide summaries of the 2019 Water Year data. Tables 2a through 8a provide some historical statistical summaries of collected data at each site through 2019. Figures 3 through 15 provide graphical representations of water levels and selected water quality parameters recorded at each site.

The potentiometric surface in the Wadge Overburden generally slopes from south to north in monitored wells in the vicinity of the TC facilities, as shown by water levels in wells 009-79-4, 006-82-74C, and 91M006. During 2019, the water levels in well 009-79-4 (Figure 3) continue to be comparable to previous years going back to 1984. Well 009-79-4 (Figure 4) had exhibited a general decline in total dissolved solids since 1995, which has stabilized since about 2000. Well 006-82-74C (Figures 5 and 6) water levels have been relatively stable since 1999, although 2008 did exhibit a slight drop, and has subsequently stabilized through 2019. TDS measurement for 2005 indicated a new high and has dropped off to date, with 2016 indicating an historic low. Well 91M006 (Figure 7) has exhibited a steady decline in water level beginning in 1992, which relates to dewatering impacts from the underground mining operation. These levels have appeared relatively stable over the last years. TC was informed by Miller Water Monitoring Services that they could not get a probe down this well, suggesting the well, which is a 2-inch steel pipe may have sheared somewhere below ground surface. TC will discuss this situation with CDRMS.

Well 008-77-58 (Figure 8) has been unaffected by mining and exhibits seasonal water level fluctuations. During 1998, this well experienced an unusually long seasonal decline, and subsequently an established recovering water level trend resumed. In 2019 TDS concentrations (Figure 9) remain at consistent levels seen since the mid 1990s.

The potentiometric surface reflected by well 93M001, has generally been observed to slope from southwest to northeast. Well 93M001 (Figure 10) has exhibited a steep decline in water level from 1994 through 2002. From

2002 TDS appears to be relatively stable, with a drop of 50 feet occurring in 2016 but has increased back to the decreasing trend line in 2019. The earlier declines were associated with underground mining of the Eastern Mining District (EMD). The latest drop may be related to mining of the Wolf creek seam. TDS concentrations (Figure 11) in this well remain very stable.

Two wells monitoring the Wolf Creek Overburden were installed in 2015, WC008A and WC013A. Less groundwater is likely to be encountered during mining of the Wolf Creek Reserve, given the existence of the Wadge workings throughout the area overlying proposed mining of the Wolf Creek Reserve and the lengthy history of dewatering associated with the Wadge seam operations. Both wells exhibit similar results as the wells monitored for the Wadge Overburden. During the first year the well water level equalized and has remained fairly consistent since 2016. No spikes or anomalies have been present for these wells. The TDS values show a slight fluctuation but have been consistent over the recent years.

No anomalous water quality impacts attributable to mining were evident in data collected from Wadge Overburden wells during 2019, as compared to historical results.

Twentymile Sandstone: One well, 006-BRDH-7, requires monitoring for water levels and field parameters on a semi-annual basis, and two wells, FBR-2, and 97013TM, required monitoring for water levels, field parameters, on a semi-annual basis, and water quality parameters on an annual basis. All monitoring requirements were completed at these sites during 2019. Tables 9 through 11 provide summaries of the 2019 Water Year data collected at each site. Tables 7a through 9a provide historical statistical summaries of collected data. Figures 16 through 21 provide graphical representations of water levels and selected water quality parameters recorded at each site.

The potentiometric surface in the Twentymile Sandstone generally slopes from southwest to northeast. The Water levels at well 006-BRDH-7 (Figures 16), show a mild decrease 2002 to 2009, but has since leveled out within 5 feet of variability. The drops and inclines may relate to increased dewatering activities in the EMD (10 RT dewatering well) initiated around these time period. There was also drop in the conductivity in 2017 to an historic low (Figure 17). The reason for this drop is unclear but the levels have remained low. TC will continue to monitor this.

Water levels in well FBR-2 (Figure 18) were consistent through the late 1990s, however, in 2003 water levels dropped by approximately 56 feet, based upon a measurement in April of 2003. Through 2005, the water level dropped an additional 84 feet. In May and June of 2003, work on the eastern end of the 16 Right panel was approaching the general vicinity of FBR-2. This anomaly may be related to work on the 16 right panel and the well's proximity to an adjacent fault zone. In 2005 water levels began to recover and continued through 2017 but dropped approximately 60 feet in 2018 but returned the 60 feet in 2019. TDS values for FBR-2 (Figure 19) went up from typical values in the upper 900's to 1170 in 2006 and were stabile through 2016 and had a drop in 2017 but recovered back to the stable line in 2018. Well 97013TM (Figure 20) water levels appeared to be relatively stable with a downward trend since 2004 but is now trending with a mild upwards trend. The decrease in water levels in 2001 may be related to dewatering from nearby faulting. Water levels since 2012 appear more stable.

TDS values in 2011 dropped to a historic low of 540 mg/l. Since then, TDS concentrations have been rebounding (Figure 21).

Trout Creek Sandstone: During 2019, five Trout Creek Sandstone wells, 001-83-106, 001-83-107, 95M001, FBR-2-E, and 97013TC were monitored. Note that per TR03-42, monitoring frequency for water levels and field parameters were reduced to an annual basis, and water quality sampling to a bi-annual (every other year) basis. As such, monitoring was conducted in the 2019 cycle year. Also, per TR03-42, Trout Creek Sandstone wells 008-75-EFC and 97012TC were deactivated. 2019 data is presented in Tables 12 through 16.

Well FCM#2 was replaced in the fall of 1995 by monitoring well 95M001, with semi-annual monitoring during 2019 occurring at well 95M001 in lieu of FCM #2. Summaries of the Water Year data collected at each site can be found in previous AHRs. Tables 12a through 16a provide the historical statistical summaries of collected data at wells 001-83-106, 001-83-107, 95M001, FBR-2-E, and 97013TC, respectively. Figures 22 through 29 provide graphical representations of water levels and selected water quality parameters recorded at active sites.

The pumping of TC domestic water well 001-83-106 (Figure 22) complicates the potentiometric surface in the Trout Creek Sandstone. Water levels in well 001-83-106 were showing a slight increase since 1998, which appears to have stabilized back in 2003. The water pump was replaced in late 2011, at which time the electrical and support cables presented an obstruction to being able to obtain a water level reading until 2017. The potentiometric surface trends prevalent in the Twentymile Sandstone and Wadge Overburden aquifers are not evident in the monitored Trout Creek wells. The previously monitored well 006-83-48C routinely exhibited water levels in the 7100 ft elevation range while replacement well FCM#2 exhibited levels around the 6520 ft elevation during 1995. In the fall of 1995, well 95M001 was established in part to address the apparent discrepancy in water levels between wells 006-83-48C and FCM#2. Water levels from well 95M001 confirm that levels recorded from well FCM #2 were accurate (Figure 24). Mining in the northern mining district began in 1995, which is down dip of this well. Water levels in well 95M001 declined since 1994, appeared to stabilize since 2002, and again declined in 2007 through 2008 (Figure 24). The declines may have been influenced by the underground mining operation and continue to decline as operations continue.

Significant inflows from the Trout Creek Sandstone into the mine workings have not been encountered to date to account for the apparent lowering of the potentiometric surface in the Trout Creek formation, as indicated by the water level data previously recorded for well 006-83-48C. Some dewatering of the aquifer does occur from the pumping of well 001-83-106 to supply the mine with domestic water.

The southernmost Trout Creek well, 001-83-107 (Figure 23), water levels continued to decline from the early 1990s through 2012, and have appeared to stablize since, with a small rise in 2015 and 2016. Located down dip of the TC facility water well 001-83-106 (Figure 22), had appeared stable since 2000. Declines in water level at that well in the late 1980's into the 1990s reflect effects from longwall mining that began in the western mining district in 1990, in addition to water well use.

Well FBR-2-E (Figure 26), located along the eastern permit boundary exhibited consistent water levels until early 1999, then dropped about 50 feet and immediately stabilized with consistent water levels at the lower depth.

Unfortunately, to due contractor error, well FBR-2-E was not monitored as indicated by the schedule for 2018 and therefore no data for 2018 is available. In 2019 the FBR-2-E dropped approximately 15 feet from the last measurement in 2017. This well is near the current mining area which could be the reason for the decline in the water level although the specific reason for these drops were not apparent. Many historical boreholes have indicated faulting exists in this vicinity. TDS values for FBR-2-E (Figure 27) dropped in 2001, rebounded back to historical values, and began dropping again in 2003 through 2011. 2019 exhibited a historic low TDS of 172 mg/l. The exact reason for this decline is unknown and does not appear to correspond with water levels. The reason for these jumps is unknown, but TC will continue to monitor and assess it.

Well 97013TC (Figure 28) water levels remained consistent from 2004 through 2010. A drop in water level occurred in mid 2010, which is the result of being mined through. The water level continued to drop to date. TDS values for well 97013TC (Figure 29) were within historic values from 1997 through 2012, with a drop in 2013 but rebounded in 2015. This also appears to be related to the well having been mined through.

Fish Creek Sandstone: Two Fish Creek Sandstone wells (91M001 and 91M004) require monitoring on a semiannual basis for water level only. An additional well (Ashley) requires semi-annual monitoring for water levels and field parameters, and annual water quality sampling. Tables 17 through 19 provide summaries of the 2006 Water Year data collected at each site. Tables 17a through 19a provide historical statistical summaries of collected data at each site. Figure 30 provides graphical representation of the period of record water levels measured at sites 91M001 and 91M004. 91M004 was dry 2012 through 2015 and in 2017-2018. Well 91M004 was destroyed in 2019 due to snow removal efforts by Yampa Valley Electric to repair a power line. TC will consult with DRMS to replace this well.

Water levels at the Ashley well (Figure 31) dropped appreciably after subsidence in 1998, but afterward began to recover in 1999. Seasonal changes in water levels have been evident, although water levels have appeared close to the same levels from 2005 through 2019. TDS values at the Ashley well (Figure 28) have exhibited a general decline since 1996, but rose somewhat in 2005, 2014, 2017,and 2018 and a major spike in 2019. The reason for this spike is unknown but it is suspected to be from a high snowfall year that caused a sediment flow up gradient of the well. Field measurements and water quality parameters for the Ashley well are provided on Table 19. Water quality values were within the typical historical range of other wells in this aquifer.

3.2 Alluvial Groundwater Monitoring

Table 20 presents a summary of alluvial well monitoring frequencies.

Alluvial ground water in the Twentymile Park Basin exists under unconfined conditions within the alluvial materials underlying the major surface drainages of the area and backfilled areas of adjacent surface mined areas. Stream flows are the primary source of recharge to the alluvial aquifers. Alluvial deposition is limited in areas where stream gradients are relatively steep and in areas where the stream channel has eroded to or intersects resistant bedrock. Consequently, the alluvial deposits do not tend to be continuous. Shallow wells completed in these deposits indicate that they are usually less than 20 feet thick and the depth to ground water is typically less

than 10 feet. The limited extent of the Foidel Creek alluvial deposits, and the lack of base flow in the creek indicates that these deposits are relatively insignificant to the area ground water hydrologic system.

Alluvial deposits containing groundwater are monitored in the Foidel Creek, Fish Creek, Trout Creek and Middle Creek drainages. In the Foidel Creek drainage, sites both upstream and downstream of the TC portals and support facilities are monitored. In the Fish Creek Drainage, sites upstream and downstream of the Mine 2 area and the Fish Creek Borehole mine dewatering facilities are monitored.

Foidel Creek Alluvial Groundwater: There are four Foidel Creek alluvial wells, 009-S-10, 001-S-5, 008-AV-1, and 008-AV-2. Tables 21 through 24 provide summaries of 2019 data collected at each site. Tables 21a through 24a provide historical statistical summaries of collected data at each site. Figures 33 through 36 provide graphical representations of water levels and selected water quality parameters recorded at these sites.

Water levels during 2019 remained generally consistent with established ranges and patterns and showed the typical seasonal variability of elevated water levels in the spring. Note that the winters of 2007 and 2011 saw some record snow falls, which is exhibited in the higher water level elevations detected. 2012 was a significant drought year. Well 009-S-10 provides data for the alluvial aquifer upgradient from the mine portals. Water levels in 009-S-10 for 2006 (Figure 33) are consistent with observed historical seasonal fluctuations. Conductivity values at well 009-S-10 (Figure 34) remain consistent with historical values with a spike in the spring of 2019 due to high snow melt.

Well 001-S-5 is located just downgradient from the mine portals and surface facilities location and is monitored in conjunction with surface water monitoring site 8. Water levels are within historic levels (Figure 35). Conductivity values in 001-S-5 for 2019 (Figure 36) are consistent with observed historical seasonal fluctuations.

Data for wells 008-AV-1 and 008-AV-2 are provided in Tables 24 and 23, respectively. 2019 data was consistent with historical values. Water levels in these wells and the stream show the typical seasonal interrelationship of relatively rapid increases and declines associated with spring runoff. The longer-term trends in water levels at these sites generally parallel the fluctuations observed in annual stream flows.

Field conductivity measurements in general at well 001-S-5 were noted to be slightly higher than the up gradient site, 009-S-10. There appears to be a general increasing field conductivity trend for well 001-S-5 through 2010 (Figure 32). Conductivity values fluctuate with the seasons, but were still within historic levels. Down gradient, field conductivities at well 008-AV-2 were consistent with previous years for 2019. Field conductivity measurements at wells 008-AV-1 and 008-AV-2 are comparable with 008-AV-1 generally being lower.

Fish Creek Alluvial Groundwater: Monitored water quality parameters exhibited values at the Fish Creek alluvial wells which were typically within previously established ranges. There are four older Fish Creek alluvial wells (006-AY-1, 006-AZ-3, 008-AU-3 and 008-AW-3). Tables 25 through 28 provide summaries of the 2019 Water Year data collected at each site. Tables 25a through 28a provide POR statistical summaries of collected data at each site. Figures 37 through 40 provide graphical representations of water levels and selected water quality parameters recorded at each site.

In addition to the four wells discussed above, three additional alluvial wells, AVF-13 and AVF-14 (installed in August 2001), and AVF-15 (installed June 2002) were added per PR99-05, 4e-7. Monitoring frequencies for these wells are different than that for the four older wells above (see Table 18).

Water levels at well 006-AY-1, located on Fish Creek upstream of the Southwest Mining District and Mine 2, had exhibited a relatively steady increase in water level from approximately 1990 through 1994 (see Figure 37). From 1994 through 1997, that trend has reversed and is generally decreasing from 1994 through 2000, and appears to have subsequently stabilized. POR conductivity data has been relatively consistent the last several years with a slight increase in 2017 followed by a slight decrease in 2018 (Figure 38). Well 006-AZ-3 is situated downstream of 006-AY-1 and below the Fish Creek Borehole. Well 006-AZ-3 is monitored in conjunction with surface water site 307. Several water years are presented to show relative seasonal fluctuations (Figure 39). POR conductivity data has exhibited a general increase since the late 1980's, but appears to have stabilized since 2000 (Figure 40). It appears that during late summer of 2016 someone deliberately destroyed the well, possibly by mistake, as other historic alluvial wells that are not monitored were also removed. TC will consult with DRMS to replace this well.

Downstream of 006-AZ-3 are relatively new alluvial wells, AVF-13, AVF-14, and AVF-15. Data for sites AVF-13, AVF-14, and AVF-15 are provided in Tables 31, 32, and 33, respectively. Figures 41 through 46 provide graphical representations of water levels and selected water quality parameters recorded at each new site. Note that localized mining subsidence along Fish Creek occurred in the area of well AVF-15 during the summer of 2004. The general location area of AVF-15 has subsequently been permanent ponded. Note that per our subsidence plan, alluvial 008-AU3 replaced AVF-15 as the downstream monitoring well for subsidence evaluation in 2006. AVF-13, AVF-14, and AVF-15 all show very consistent water levels. Note that Well AVF-15 was replaced in 2014, and is located in the same general vicinity.

Well 008-AU-3 and surface water site 305 monitor water levels upstream from the Fish Creek Tipple area with data presented on Figure 47. The furthest downgradient Fish Creek alluvial monitoring well is 008-AW-3 (Figure 49) located near the Fish Creek Tipple. No unusual water level fluctuations were noted at any of these sites during 2019. Similarly, conductivity values for these two sites were within historical ranges.

Trout Creek Alluvial Groundwater: There are two Trout Creek alluvial monitoring wells, 008-AT-1, and a privately owned well (Jones well). Note that 008-AT-1 was destroyed sometime in 2013. The well was replaced in 2014. Figures 51 through 54 provide graphical representations of water level and field conductivity information to date. Note that water levels are about 3 feet higher than historical, which may relate to the new well location and proximity to Trout Creek. Tables 29 and 30 provide data for these wells.

Well 008-AT-1 is monitored in conjunction with surface water site 1005. Figure 51 depicts several water years for 008-AT-1 for comparison. Monitoring was initiated on Trout Creek Alluvial wells back in 1994. Figure 52 shows TDS values for 008-AT-1. TDS concentrations had been rising slowly since 2006, but dropped around the time the well was destroyed, and recovered sometime after the well was replaced.

Note that the Jones well has historically been monitored to access potential mine impacts to the Jone's potable water well. In the fall of 2008, TC provided the Jones family with underground water storage tanks, a new plumbing system, and imported water, so that they could discontinue use of the well. At that time, the old plumbing system to the Jones well was decommissioned eliminating alluvial water sampling access. In 2019 TC supplied Jones with a deep fresh water well and a filtration system in place of long term haulage of potable water. TC will evaluate this monitoring point in 2020 and discuss further with CDRMS.

Middle Creek Alluvial Groundwater: TC has no active Middle creek alluvial wells. Two Middle Creek alluvial wells (AVM-1 and AVM-2) were incorporated into the monitoring network during 1996, however, per TR03-42, these wells were abandoned in the Fall of 2003. Refer to previous AHRs for earlier data.

3.21 Points of Compliance

Rule 4.05.13(1)(b) requires formal establishment of ground water points of compliance for coal operation which has the potential for negatively impacting the quality of ground water for which quality standards have been established by the Colorado Water Quality Control Commission. The Commission's Rule 41 sets forth Basic Standards for ground Water. These Standards are applicable to ground water at the Foidel Creek Mine. In the judgment of DRMS, these Standards are applicable to ground water at the Foidel Creek Mine, however it is also the judgment of DRMS, the Foidel Creek Mine does not have the potential to negatively impact bedrock aquifers due to the nature of the geology (i.e. synclinal basin) found at the mine's location.

Wells 008-AV-2 (Foidel Creek alluvium), 008-AU-3 (Fish Creek alluvium), and well 008-AT-1 (Trout Creek alluvium) will satisfy the requirements for alluvial ground water points of compliance.

3.3 Surface Water Monitoring

Monitoring/Sampling Requirements: Table 32 presents a summary of surface water monitoring frequencies. Site locations are shown on Figure 2, Hydrologic Monitoring Plan (as well as in Figure 2 of this AHR). Table A of Exhibit 14 specifies three seasonal monitoring episodes (i.e. October to February, March to May, and June to September), each of which are further divided into two general categories of sampling frequency: 1) "Regular" monitoring that is done continuously, and 2) "Contingent" monitoring that is conducted only when there is a discharge from underground mine pumping at surface discharge sites 109 and/or 115, which discharged briefly in 2018 but not in 2019. Note that discharge from site 109 has not occurred in about 20 years, and is not anticipated to occur in the future.

2019 surface water data is provided in Tables 35 through 51. Water quality parameters for these sites were typically within previously established ranges, unless otherwise discussed below. An historical summary of data has been provided in Tables 35a through 51a. 2019 demonstrated high snowmelt during May and June from a high snow pack winter.

Stream Gaging

Accurately monitoring flow at stream sites can be difficult due to continual damage of gage stations by cows, horses, flooding, and various weather effects. Stations require repair on a regular basis. TC attempts to make repairs as soon as possible. Continuing erosion of stream channel banks impact accurate flow calculations. In the summer of 2007, TC hired consultants (Rivers Unlimited, Inc. of Steamboat Springs) to assist with re-evaluating key stream bed locations, including rating curves for ongoing stream gauging. This on-going study continued into the spring 2017 but due to costly expenditures TC resorted to performing stream gaging with in house staff for the remainder of 2017 and will continue for the foreseeable future.

In 2012, four protective enclosures were constructed by Rivers Unlimited at historic flow meter recorder locations. New recorders were installed and activated in May of 2012 at these sites. The meter locations include sites 16A, downstream of 8, 1003, and site 69. Additional gage station protective steel enclosures were constructed in 2015 at several monitoring sites. Four new flow meters were installed at these sites in 2016, these included sites 900, 29, 1005 and 301. These meter locations are currently not in use due to the costly up-keep and calibration needed for them to properly function.

Foidel Creek: Four surface flow monitoring sites on Foidel Creek (in the vicinity of the TC mine portals and facilities areas) are utilized. Site 800 and site 14 are located upstream of the portal. Site 8 is located off the TC facility, downstream of Pond G. Site 900 is located further downstream on Foidel above the confluence with Middle Creek. Former site 304 was located further downstream of 900. Site 304 was eliminated in 2003 per TR03-42.

Tables 35 through 38 provide summaries of the 2019 Water Year data collected at each site. Tables 35a through 38a provide POR statistical summaries of collected data at each site. Figures 55 to 62 and 105 to 108 provide graphical representations of water levels and selected water quality parameters recorded at each site. Typical flow patterns were exhibited at these sites with spring runoff periods accounting for the peak flows observed. At all of these sites, the inverse relationship between flow and field conductivity continues to be evident. Water quality parameters for these sites were within previously established ranges.

Fish Creek: Nine surface flow monitoring sites are utilized on Fish Creek. Site 16A replaced site 16 in 2000, and is located upstream of the Fish Creek Borehole discharge site 115. Historical data for site 16 may be found in previous AHRs. Site 307 is located approximately one mile downstream of the Fish Creek Borehole mine dewatering site and is monitored in conjunction with alluvial well 006-AZ-3. Site 302 is located approximately two miles downstream of the Fish Creek Borehole mine dewatering site. Site 305 is located upstream of the Fish Creek Tipple and is monitored in conjunction with alluvial well 008-AU-3. Site 27A is located immediately upstream of the Fish Creek Tipple discharge (a.k.a. CDPS discharge site 62). Site 1003 is located downstream of the Fish Creek Tipple site 62.

Monitoring requirements at sites 307 and 305 require monthly water level measurements (March through September), and semi-annual field parameters. However, per PR03-06, site 305 now requires semi-annual water quality testing.

Three relatively new surface sites were added in conjunction with the new Fish Creek Alluvium well sites (AVF-13, AVF-14, and AVF-15), in order to evaluate potential subsidence impacts in the area. These are surface sites SW-13, SW-14 (both added in August 2001), and SW-15 (added in June 2002). These sites require quarterly water level measurements (March through September), and semi-annual field parameters and water quality sampling.

Tables 39 through 47 provide summaries of the 2019 Water Year data collected at Fish Creek surface flow sites. Tables 39a through 47a provide some historical summaries of collected data at each site for comparison. Figures 63 through 94 provide graphical representations of water levels and selected water quality parameters recorded at each site. Again, typical flow patterns were exhibited at these sites with spring runoff periods accounting for the peak flows observed. In general, an inverse relationship between flow and field conductivity was evident. 2019 water quality parameters for these sites were generally within previously established ranges.

Some surface sites (e.g. 1003 and 16A) saw unusual short term spikes in conductivity and TDS in 2013 and 2016. Some of this may be related to very low, almost stagnant flows. TC will continue to monitor this. Site 16A recorded a record high TDS value during September 2019, this was due to cattle present upstream and low flow.

Newer surface sites SW-13, SW-14, and SW-15 (Tables 45-47, Figures 69-80) indicated elevated concentrations for total recoverable (TR) iron in early June 2003, however iron concentrations dropped dramatically (about an order of magnitude) by August 2003. This is typical for historical seasonal fluctuations, with spikes often seen during high runoff period, most likely relating to fresh erosion.

Trout Creek: Three surface flow monitoring sites on Trout Creek are utilized. Site 301 is located on Trout Creek above the confluence with Middle Creek. Site 69 is located on Trout Creek below the confluence with Middle Creek. Site 1005 (established in 1994) is located downstream of the confluence with Fish Creek and is monitored in conjunction with alluvial well 008-AT-1.

Tables 48 through 50 provide summaries of the 2019 Water Year data collected at Trout Creek surface flow sites. Tables 48a and 50a provide historical summaries of collected data at sites 301, 69, and 1005. Figures 95 through 104 provide graphical representations of water levels and selected water quality parameters recorded at each site. Typical seasonal flow patterns were observed. Site 69 showed a historical high flow rate during June which was flowing a big rain fall event in addition to snowmelt. Water quality parameters for these sites are typically within previously established ranges.

In August 2018 a Call was placed on the Yampa River. This resulted in irrigation being turned down or off and flows in Trout Creek increased substantially.

Middle Creek: 2019 data for site 29, located on Middle Creek below the confluence with Foidel Creek, is provided in Table 51. An historical summary of water quality data is provided in Table 51a. Figures 109 through 111 provide graphical representations of water levels and selected water quality parameters recorded at site 29. Water quality parameters for these sites were typically within previously established ranges.

3.4 Spoil Spring Monitoring

Generally, groundwater migrates along bedding planes, faults, joints, or fracture zones. Given adequate head pressure, if these zones of water migration intercept the surface, a spring or seep results. The TC spoil spring monitoring program was initiated in 1986 and is conducted annually. In accordance with the approved plan, the annual mine wide survey is conducted during May, with springs measured for flow and field parameters. If a spring is discharging at or above 35 gallons per minute, it is monitored for the next year in accordance with the monitoring plan. A few samples are typically collected each year even when the 35 GPM mark is not met. Two spoil spring sites, 7 (Twentymile Pit Pond) and 303 (in Fish Creek Tipple area), require monitoring under Exhibit 14-10. In addition to the spoil spring monitoring requirements, Spring 7 is monitored quarterly for field parameters, and sampled on a semi-annual basis for water quality (if flowing). In 2019, site 7 flowed the second third quarters of the 2019 water year. The 303 spring series (303-1 through 303-3) are monitored/sampled semi-annually for field parameters and water quality. The 303 springs series 303-2 and 303-3 were dry in 2019, and have been dry since 2012, when the Fish Creek Tipple area was reclaimed.

Tables 52 provides a summaries of the 2019 Water Year data collected at the 303-1 spoil spring site.

3.5 Natural Spring Monitoring

Two natural springs, SW1 and SW2, located over previously mined areas in the Southwest Mining District required semiannual monitoring during 2019. Prior to mining, SW-1 typically flowed throughout the year, while SW2 flows were sporadic. In recent years flows at SW-1 have been minor, and in the case of SW-2, non-existent. Flow was only observed at site SW-1 during April but no flow was observed at SW-1 or SW-2 in September 2019. See tables 53 and 54.

In April 2016, a spring and seep survey was also conducted in the northern mining district to identify potential discharges to Fish Creek. No new or significant springs were identified in 2016. The northern mining district is located within the Twentymile Park Syncline. The predominant lithologic unit nearest the surface and occupying most of the basin is the Lewis Shale, which can be upwards of 700 feet thick. The lack of significant bedding planes, faulting, or fracture zones in this area may account for the lack of springs in the central portion of this basin. The few seeps observed in the basin may be the result from surface weathering of the Lewis Shale, which may allow some accumulation of water beneath overburden. This may result in a short period of seepage immediately following spring runoff.

3.6 CDPS Discharge Sites

Under State of Colorado Department of Public Health and Environment (CDPHE), Colorado Discharge Permit System (CDPS) permit No.'s CO-0027154, CO-0036684, and CO-0042161, eleven discharge points are monitored throughout the year. Note that CDPS has also been referred to as the National Pollutant Discharge Elimination System (NPDES) in previous AHRs. Monitoring results (CDPHE Colorado Discharge Monitoring Reports, or DMRs) are copied to DRMS in accordance with CDPS requirements. Tables 56 through 62 provide

2019 and historical data summaries for those CDPS outfall points. Figures 114 through 120 provide graphical representations of the 2019 flow rate and field conductivity data for the discharge ponds.

Note that ponds A (former Outfall 001A), and H (former Outfall 009A) were deactivated following Phase III Bond release of the Eckman Park area, and were subsequently removed from the amended CDPS permit on January 1, 2002. In late 2011 and early 2012, the Fish Creek Tipple area was reclaimed. This along with the 2012 drought appears to have resulted in decreased discharge at the site.

Construction Dewatering Permit COG-850051

In July 2006, Twentymile Coal contacted CDPHE regarding the addition of this site (drainage for 6MN Pad area and construction dewatering pond) and later submitted a Temporary Construction Dewatering – Wastewater Discharge Application, which was subsequently approved (Outfall 001A under CO-G072272). CDPHE requested preliminary analyses of this water for alkalinity, COD, pH and TDS. A sample was collected and analyzed for these parameters. A discharge channel was constructed in late July 2006, and weekly monitoring of discharge from outfall 001A began in August 2006. Note that water was pumped from the sedimentation pond through 001A on an as needed/ sporadic basis. Pump flows were estimated. CDPHE Discharge Monitoring Reports are copied to DRMS. TC subsequently applied for a CDPS permit to make 6MN a permanent Outfall. A permit (COG-850051) was subsequently approved in January 2010 by CDPHE, effective February 1, 2010, expiring June 30, 2016. The permit is currently under Administrative Extension with CDPHE.

Outfall 001A only discharged during April and May of 2019 as shown in Table 63.

CDPHE Discharge Permit COG-850054

The 18 Left Vent Fan Pad area drains into two sedimentation ponds which could discharge into a small unnamed tributary leading to Fish Creek. In February 2009, TC submitted an application to CDPHE to make this a permanent CDPS site (also see TR09-70). A permit (COG-850054) was subsequently approved by CDPHE, effective April 15, 2010, expiring June 30, 2016. The permit is currently under Administrative Extension with CDPHE. DRMS is copied on CDPHE DMRs for this site. The site did not discharge in 2019.

3.7 Mine Water Discharge Sites

Four mine water discharge sites are currently associated with the TC operations are monitored. Site 109 (Twentymile Facility) requires quarterly monitoring for flows, field parameters, and water quality samples (when flowing). Note that this site has not discharged in about 20 years, and will not be discharging in the conceivable future. Site 115 (Fish Creek Borehole) is monitored as a CDPS discharge point in accordance with the requirements set forth under CDPS Permit No. CO-0042161.

Two other mine water discharge sites are discussed in greater detail under a subsection to Section 3.6 above. To dewater the old WMD and EMD, pumps and piping were installed to direct mine water from the Fish Creek Vent Shaft (FCVS) and 10RT #1, to the Area # 1 Pit. Overflow from the Pit passes through site 7 to Pond D, and

subsequently through CDPS Outfall 005A to Foidel Creek. Site 7 requires quarterly analyses when flowing per DRMS Permit No. C-82-056. Site 7 did not discharge in 2019 due to the high water demand from the washplant. Outfall 005A requires weekly, twice monthly, monthly, and quarterly water quality sampling when flowing, under CDPS Permit CO-0027154.

Note that mine water is pumped from underground to the surface (from the old WMD), and was historically (beginning in 2005) treated via an electro-coagulation process at the surface, where water enters the 3 former treatment ponds that can also be directed through discharge site 115, that can be directed to Fish Creek. This form of treatment ceased around 2014. This water was pumped directly back into the mine for underground dust suppression. Additional overflow piping was added so the treatments ponds cannot overflow. Overflow water is directed back into the mine via a former pump well.

Site 115 had not discharged to Fish Creek since early 2005, but was reactivated in 2008 and 2009, both for a limited times (i.e. approx. one to three months) with low flows (25 – 500 gpm). Site 115 discharged for a couple of hours one day in early 2015 due to a broken pipeline, which was subsequently repaired. Following approval in 2017 from CDPHE and DRMS to use a flocculant for mine water treatment, the site discharged April through early June of 2017 and briefly in May and June 2018 but did not discharge in 2019.

Historically, when pumping mine water from the Fish Creek Borehole (mine discharge site 115) the flow becomes a contributor to sulfate levels in Fish Creek. Fish Creek in turn contributes to the sulfate levels in Trout Creek. Trout Creek currently had a secondary drinking water standard limiting sulfate concentrations above 250 mg/l.

3.8 2019 Inflow Survey

An inflow study was conducted underground in the fall and winter. Flow rates and field parameters were recorded for measurable inflows from the accessible areas of the underground mine. No changes or new water inflows were noted during 2019 please refer to previous years AHR inflow maps flow locations and discharge notes. Note that these maps also includes historic data for older underground areas, the majority of which have subsequently dried up and since moving to the Wolf Creek coal seam in 2019 only one seep remains active.

Background

WMD: The old WMD was closed in 1996. At that time inflows were 52 gpm. Note that water elevations for the old WMD were monitored periodically at the Fish Creek Borehole. Our best estimate is that inflows for the old WMD are still on the order of 50 to 60 gpm. Freeboard in the old WMD in the fall of 2019 was on the order of 40 feet.

EMD: Longwall mining was completed in the EMD by early-January 2001. Production from the NMD, 12 Rt Longwall Panel, was underway by late January 2001. The EMD was permanently sealed in October 2001 removing all access to the 6 Rt and 7 Rt gate roads. Thus, no measurements are available in this area for 2006.

Historical data is available in previous AHRs. The last flows measured for 2000 showed seasonal variations, with an average annual flow of approximately 65 gpm. Water levels for the EMD are monitored on a periodic basis at the 10RT well shaft. Freeboard in the EMD in the fall of 2019 was on the order of 60 feet.

NMD: At the time of the 2010 inflow study, the mine operation had completed the 23 Rt panel. The primary sources of water came from the two most recent shafts in the 6MN area, and two fault crossings. Total inflow was estimated to be on the order of 80 gpm. Inflows continued in the Northeast Submains, although there appears to be a continued decrease in ceiling dripping. The highest inflows were about 20 gpm for the new 6MN shaft, and about 15 gpm from a floor sump at inflow site 8 (IF8) with a conductivity of 2270 (Trout Creek Water). This may have been impacted by the addition of roof drip collection to the sump system. The next highest inflow was at raise bore area (IF 38 and IF 37), which was on the order of 10-gpm (down from an estimated 20 gpm in 2005), Field conductivity measurements were about 1500 umhos/cm. This site is a blend of Wadge and Twentymile Sandstone water. Inflow at the remaining sites (primarily roof drippers) were either dry or significantly lower, often less than a gallon per minute.

New Western Mining District (new WMD): The most recent inspection along the new gate roads indicated estimated inflows of less than 10 gpm. The majority of sites were modest roof drippers. Sites 70 and 72 exhibiting the highest flow in 2013, are almost dry. The majority of the drippers seen in 2013 and 2014, had dried up by 2015.

Wolf Creek Seam: Inflow notes were made by Twentymile consultant and geologist, Rocky Thompson during 2019. A summary of his observations follows:

Overall there were few long term inflow sites, one floor spring remains in 8 EAST with 0.5 GPM inflow continuing for more than several months, possibly still flowing from fractures in floor. The roof drippers tend to dry out within less than 3,000 feet from active CM face, often in less than three months.

A few roof drippers associated with 15' to 25' deep test holes have been noted but are generally dry within three months. The majorities of roof drippers are less than 0.05 gpm and must be calculated for a larger square area with several often found in one or more entries at the same time. Long term the roof drippers seldom have significant contribution to inflow rates.

10 EAST: 10 East had more roof drippers on development than 9 East. The 10 East roof drippers per the mapping would average about 1 GPM per 1,000 feet of 3-entry gate road. I realize this may seem low - well documented that a small (1/16 gpm) dripper can cause a wet spot in the roadway resulting in a big hole full of mud.

9 EAST: The 9 East roof drippers per the mapping would average about 1 GPM per 1,500 feet of 3-entry gate road, less than observed in 10 East. All active drippers are mostly dry now, 9 East from XC 74+00 into XC 144+00, a distance of 7,000 feet.

3.9 Water Balance

In early 2009, TC conducted a water balance study to better access water use and allocations for mine operations, as well as mine dewatering. A flow chart was provided in the 2009 AHR, illustrating water movement for the mine in early 2009. Note that there have been some changes in flow patterns since this study. Another mine water balance may be performed in 2020, which would require expenditures for flow meters at key locations.

4.0 SUBSIDENCE IMPACTS

Historical subsidence information can be found in previous Annual Hydrology Reports.

No surface water stream were subsided during the 2019 water year.

Wolf Creek Seam Mining:

In 2016, TC hired the consultant SubTerra, Inc. to perform subsidence evaluations for the mine site. Their reports and maps were provided to Tabetha Lynch of DRMS via emails from Michael Berdine of TC, on March 29, 2017. Excerpts from their reports follow in the conclusion section below.

5.0 SUMMARY AND CONCLUSIONS

No significant hydrology impacts, attributable to activities at the Foidel Creek Mine, were noted during 2019. See discussion below, summarizing data assessments.

Water Wells: Water levels monitored in the Twentymile Wadge Overburden wells remained stable and comparable to previously collected data, and no significant water quality influences were evident from data obtained during 2019.

Twentymile Sandstone wells remained stable and comparable to previously collected data, and no significant water quality influences were evident from data obtained during 2019. Localized dewatering of the Trout Creek Sandstone appears evident in the vicinity of the TC potable water well 001-83-106 (Figure 22), although the level stabilized in 2000, and continues to be stable. The historical declining water level trend at well 001-83-107 (Figure 23), has stabilized. This decline may be attributable to the pumping of well 001-83-106. Well monitoring at 95M001 (Figure 24) indicated a continuing decline in water levels which began in 1997 and appears to have stabilized in 2003. No significant inflows from the Trout Creek formation into the mine workings have been encountered to explain this difference in water level or to suggest that dewatering of the formation is directly attributable to mining activities. No readily apparent water quality impacts associated with mining are noted for the Trout Creek Sandstone aquifer based upon data collected during 2019.

Mining related dewatering impacts were noted for the Fish Creek sandstone wells 91M001 and 91M004 (Figure 30), and the Ashley well (Figure 31). Wells 91M001 and 91M004 were undermined in 1995 and exhibited historic water level declines corresponding to mining activity. Water levels in these wells subsequently stabilized, exhibiting only seasonal fluctuations. Two springs (SW-1 and SW-2) are monitored in the same vicinity as

91M001 and 91M004, although SW-1 flowed in April but was not flowing in September, SW-2 did not flow in 2019. The Ashley well was undermined in 1999 and exhibited water level declines corresponding to mining activity. This well appeared to be recovering in 2000, continuing and stabilizing through 2019.

No unusual observations are noted with respect to Foidel Creek alluvium groundwater levels. The historical increasing conductivity trend in well 001-S-5 (Figure 35) stabilized in 2004, and appears to be remaining stable through the end of 2019.

No unusual observations are noted with respect to Fish Creek alluvium groundwater levels. The general water level stability noted in well 006-AY-1 (Figure 37) since 1995, appears to continue in 2019. Overall, fluctuations at this well are insignificant. No other notable water level observations are apparent based upon review of the 2019 data. Field conductivity readings at this well appear stable over the last few years.

Surface Water: 2019 was a high runoff year for Routt County. Flows on Foidel Creek, Fish Creek, and Trout Creek were higher in the spring in comparison to the normal flows. TC is still working to develop stream rating curves for the surface monitoring locations. No new flow meters were installed in 2019. TC implemented in house staff for stream gaging during 2017.

Conductivity concentrations at site 301, 69, and 1005 on Trout Creek appeared somewhat elevated during the spring runoff season in April and again when flow is at a minimum during the early fall. This may be the result of upgradient spring runoff flushing through the old P & M mine area. Fish Creek exhibited some short term spikes in total recoverable iron in the spring. This may be related to an erosion event from a precipitation event or a quick rise in snow melt. No other water quality impacts of concern were evident at any surface water sites monitored during 2019.

Spoil Springs: Spoil spring discharges (303 series) occurred in 2019 only at 303-1. The 2012 reclamation at the Fish Creek Tipple, resulted in the loss of two smaller associated springs in the 303 series (303-2 and 303-3). Thus, they did not constitute a significant portion of discharge from the TC mine area with the potential to impact off-site areas. Discharges from sedimentation ponds predominately occurred in conformance with applicable CDPS permit limitations and therefore did not constitute significant impacts to receiving waters.

Mine Discharge: Mine water discharge site 109 nor 115 did not discharge to Fish Creek in 2019. In 2005, TC began redirecting electro-coagulation treated mine water pumped from the Fish Creek Borehole well, underground locations for dust control. Mine water from the Fish Creek Borehole well (which is treated by electro-coagulation) can also be directed to discharge to Fish Creek via site 115.

The mine pump at 10RT began discharging to Foidel in September 2008 under an emergency discharge permit issued by CDPHE. In early 2009, TC experienced difficulties in consistently meeting WET and iron standards at the pipeline discharge source. In the second quarter of 2009, TC halted all discharge at the discharge source permited under the emergency discharge permit, and re-directed 10RT dewatering to the Area # 1 Pit. The Pit overflow goes via DRMS site 7 to Pond D, which may in turn flow into Foidel Creek via CDPS Outfall 005A (a.k.a. site 84). As indicated earlier, future treatment of 10RT (EMD) mine water is under consideration.

Mine Inflow: No unusual occurrences of inflow were noted as a result of the Annual Mine Inflow study. Inflows are within the projected flows presented in the permit. Water quality has not changed significantly and appears to mirror the quality of the adjacent spoil water. It appears that the elevated EC and iron readings are associated with the water that has pooled in the mine sump, which is in contact with the overlying Marine Shales. This contact has provided the opportunity for additional salts and iron to be leached from this unit. The pumping of mine water and sumps should see a decrease in the elevation of the pool over time, with an anticipated decrease in the EC and concentration of iron in the effluent.

Subsidence: Subsidence data has been submitted with the 2018 report for the subsidence of Fish Creek during the 8 East Panel mining. On Average Fish Creek subsided around 7 feet in the center of the panel out to no subsidence on the edges of the panel. Some pooling was noted on Fish Creek in the area of subsidence, but no major flow obstructions have been observed. See data included in the 2018 AHR report.

Excerpts from the conclusions section of the SubTerra Subsidence report:

8.1. Union Pacific Railroad Energy Spur

Some general conclusions can be drawn from the initial work described in Section 3, including:

1. With the exception of panel 4-East, the majority of the movement associated with each longwall will occur over a one month period starting when the face is about 500-feet from the rail line and ending when the face is about 1,000-feet past the rail line. This distance is measured parallel to face retreat.
2. During pre-ballasting, track differential gradients will generally be maintained below 0.4% between adjacent Stations. Final differential gradients are predicted to be at or below 0.3% following subsidence from each of the planned longwall panels.
3. Both of the two remedial methods outlined in this report have been successfully implemented during undermining of the Energy Spur. There is every reason to conclude that they will continue to be successfully applied to remediating subsidence associated with extraction of the panels in the Wolf Creek Seam.

8.2. County Road 33

Section 4 predicts that County Road 33 will be subject to just under 80-inches of subsidence as it crosses over the shallower panels in the Wolf Creek seam. Gradient changes of just under 1% and surface strains of 0.005 are expected to result in surface cracking of the chip sealed surface. Prior mitigation of similar impacts to County Road 33 has involved sealing of these surface cracks.

8.3. Fish Creek, Foidel Creek, and Middle Creek.

The evaluation presented in Section 5 predicts that Fish Creek will overflow its high bank(s) with the following impacts to Fish Creek and its floodplain:

1. A maximum increase in Fish Creek bottom gradient of 0.024 (2.4%).

2. An increase in the surface area of Fish Creek following coal extraction in Panels 9-East, 8- East, 7-East, and 6-East of under 50 acres. Impacts to Foidel Creek are expected to be minimal with a predicted increase in the surface area of Foidel Creek following coal extraction in Panels 1-East through 4-East of under 5 acres.

It is our understanding that the magnitude of predicted surface water area changes in the Northern Mining District contained in our 1999 and 2002 reports and over the Western Mining district in 2009 were never realized illustrating the conservative nature of these predictions. This is likely due to the dynamic process where differential subsidence displacements are readily accommodated by the natural processes of erosion and deposition that occurs rapidly under the high flow conditions experienced during spring months.

8.4. Power Transmission Lines.

Several conclusions can be drawn from the preliminary work, described in Section 6, including:

1. Structures on the Foidel Creek-Steamboat line are predicted to subside by up to 6-feet
2. Structures on the Archer-Hayden line are predicted to subside by just over 4.5-feet.
3. Structures on the Craig-Hayden-Steamboat line are predicted to subside by just over 4-feet
4. Maximum daily subsidence is predicted to be less than 6-inches per day.
5. The duration of subsidence effects at each structure is expected to be between 25 and 35-days.
6. In the case of the Archer-Hayden and Craig-Hayden-Steamboat lines, the length of the traveling subsidence profile means that each structure will react independently which should for the most part eliminate the potential for complex interactions.
7. Subsidence, tilt and strain magnitude at each Archer-Hayden and Craig-Hayden-Steamboat structure are predicted to be lower than previously experienced by WAPA's line that crossed the Eastern Mining District and by these two lines when they were previously undermined by 19-Right in the Northern Mining District.

8.5. Water Wells

The evaluation presented in Section 7 predicts impacts to wells completed in the Wolf Creek Seam and its immediate overburden. Minor impacts may also occur in shallow overburden wells but are likely to be minor with recovery within one year after undermining.

8.6. Monitoring Requirements

As noted in the introduction, Twentymile Coal, LLC has collected and submitted a large amount of subsidence data from monitoring coal extraction in the Wadge Seam. They have also monitored subsidence of the Power Lines, Fish and Foidel Creek and the Energy Spur railroad track during sequential undermining. We recommend that monitoring both ground subsidence and structure response continue focusing on verifying the predictions made herein. Additional monitoring requirements associated with each of the evaluated structures

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TABLE 1
HYDROLOGIC MONITORING SITES:
BEDROCK WELLS

SITE [1]	MONITORING FREQUENCY	
	WATER LEVEL & FIELD PARAMETERS	WATER QUALITY SAMPLING
Wadge/Wolf Creek Overburden		
009-79-4	Semi-annually	Annual
006-82-74C	Semi-annually	Annual
91M006	Semi-annually	Annual
008-77-58	Semi-annually	Annual
93-M001	Semi-annually	Annual
WC008A	Semi-annually	Annual
WC013A	Semi-annually	Annual
Twentymile Sandstone		
006-BRDH7	Semi-annually	
91M005	Deactivated	Deactivated
97012TM	Deactivated	Deactivated
97013TM	Semi-annually	Annual
FBR-11B	Abandoned	Abandoned
FBR-2	Semi-annually	Annual
Trout Creek Sandstone		
001-83-106	Annual	Bi-annual
001-83-107	Annual	----------
008-75-EFC	Deactivated	Deactivated
95M001	Annual	Bi-annual
97012TC	Deactivated	Deactivated
97013TC	Annual	Bi-annual
FBR-2-E	Annual	Bi-annual
Fish Creek Sandstone		
91M001	Semi-annually (WL only)	----------
91M004	Semi-annually (WL only)	----------
Ashley	Semi-annually	Annually

(1)

Additional wells will be added as the mining operation expands to assure that at least 2 downgradient Wadge Overburden wells exist. Future wells may include: 021-81-26, 021-82-12, 021-81-3, 021-81-8.

Table: 2
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 09794 (009-79-4, Bedrock Well, Wadge Overburden) Datum: 7004.54

Date				4/23/2019		9/4/2019	
Depth to Water (FT)				34.86		36.26	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	358.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N		
ANION	Bicarbonate as HCO3	N	MG/L	437.00	Y		
ANION	Carbonate as CO3	N	MG/L	20.00	N		
ANION	Sulfates	N	MG/L	110.00	Y		
CATION	Calcium	D	MG/L	10.50	Y		
CATION	Magnesium	D	MG/L	6.00	Y		
CATION	Sodium	D	MG/L	185.00	Y		
FIELD	pH, Field	N	S.U.	7.84	Y	7.68	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	900.00	Y	890.00	Y
FIELD	Temperature, Field	N	DEG-C	10.70	Y	10.40	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.06	Y		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.02	Y		
PHYSICAL	pH, Lab	N	S.U.	8.30	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	878.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	570.00	Y		
PRIMARY	Cadmium	D	UG/L	0.30	N		
PRIMARY	Lead	D	UG/L	200.00	N		
PRIMARY	Mercury	D	UG/L	1.00	N		
PRIMARY	Selenium	D	UG/L	0.30	N		
SECONDARY	Iron	D	UG/L	140.00	Y		
SECONDARY	Manganese	D	UG/L	50.00	N		
TRACE	Molybdenum	D	UG/L	100.00	N		

Table: 2a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 09794 (009-79-4, Bedrock Well, Wadge Overburden) Datum: 7004.54

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	5/17/2006	4/23/2019	13	414.00	423.00	478.00	357.00	35.30
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	5/17/2006	4/23/2019	13	14.70	12.00	36.50	3.80	9.18
ANION	Bicarbonate as HCO3	N	MG/L	4/12/2017	4/23/2019	3	435.00	435.00	437.00	433.00	2.00
ANION	Carbonate as CO3	N	MG/L	4/12/2017	4/23/2019	2	15.30	15.30	20.00	10.50	6.72
ANION	Sulfates	N	MG/L	5/17/2006	4/23/2019	13	130.00	130.00	150.00	110.00	13.00
CATION	Calcium	D	MG/L	5/17/2006	4/23/2019	13	12.30	10.50	24.70	9.40	4.19
CATION	Magnesium	D	MG/L	5/17/2006	4/23/2019	13	6.98	6.00	13.70	5.20	2.33
CATION	Sodium	D	MG/L	5/17/2006	4/23/2019	13	194.00	193.00	212.00	176.00	10.90
FIELD	pH, Field	N	S.U.	10/2/2016	9/4/2019	7	7.80	7.60	8.78	7.56	0.44
FIELD	Specific Conductivity, Field	N	UMHOS/CM	10/2/2016	9/4/2019	7	950.00	950.00	1030.00	890.00	52.60
FIELD	Temperature, Field	N	DEG-C	10/2/2016	9/4/2019	7	9.99	9.80	10.90	9.20	0.68
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	5/17/2006	4/23/2019	13	0.16	0.10	0.62	0.03	0.17
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	5/17/2006	4/23/2019	12	0.04	0.02	0.16	0.01	0.04
PHYSICAL	pH, Lab	N	S.U.	5/17/2006	4/23/2019	13	8.30	8.30	8.60	7.80	0.19
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	5/17/2006	4/23/2019	13	930.00	922.00	1010.00	848.00	51.30
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	5/17/2006	4/23/2019	13	584.00	582.00	630.00	540.00	26.60
PRIMARY	Cadmium	D	UG/L	5/17/2006	4/23/2019	13	0.50	0.50	0.50	0.20	0.10
PRIMARY	Lead	D	UG/L	5/17/2006	4/23/2019	13	200.00	200.00	200.00	200.00	0.00
PRIMARY	Mercury	D	UG/L	5/17/2006	4/23/2019	13	1.00	1.00	1.00	1.00	0.00
PRIMARY	Selenium	D	UG/L	5/17/2006	4/23/2019	13	0.30	0.30	0.50	0.10	0.10
SECONDARY	Iron	D	UG/L	5/17/2006	4/23/2019	13	93.00	60.00	350.00	20.00	90.00
SECONDARY	Manganese	D	UG/L	5/17/2006	4/23/2019	13	23.00	30.00	50.00	6.00	14.00
TRACE	Molybdenum	D	UG/L	5/17/2006	4/23/2019	13	80.00	100.00	100.00	50.00	30.00

Table: 3
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 068274C (006-82-74C, Bedrock Well, Wadge Overburden) Datum: 6840.61

Date				4/23/2019		9/4/2019	
Depth to Water (FT)				1.16		2.31	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	20.00	N		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N		
ANION	Bicarbonate as HCO3	N	MG/L	20.00	N		
ANION	Carbonate as CO3	N	MG/L	20.00	N		
ANION	Sulfates	N	MG/L	970.00	Y		
CATION	Calcium	D	MG/L	198.00	Y		
CATION	Magnesium	D	MG/L	46.10	Y		
CATION	Sodium	D	MG/L	201.00	Y		
FIELD	pH, Field	N	S.U.	7.68	Y	7.61	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1910.00	Y	1900.00	Y
FIELD	Temperature, Field	N	DEG-C	10.50	Y	10.30	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.05	N		
PHYSICAL	pH, Lab	N	S.U.	7.40	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	2030.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	1620.00	Y		
PRIMARY	Cadmium	D	UG/L	0.07	Y		
PRIMARY	Lead	D	UG/L	200.00	N		
PRIMARY	Mercury	D	UG/L	1.00	N		
PRIMARY	Selenium	D	UG/L	0.30	N		
SECONDARY	Iron	D	UG/L	410.00	Y		
SECONDARY	Manganese	D	UG/L	160.00	Y		
TRACE	Molybdenum	D	UG/L	100.00	N		

Table: 3a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 068274C (006-82-74C, Bedrock Well, Wadge Overburden) Datum: 6840.61

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	5/8/1987	4/23/2019	43	129.00	39.00	451.00	7.00	145.00
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	5/8/1987	4/23/2019	34	15.00	3.00	190.00	0.00	32.00
ANION	Bicarbonate as HCO3	N	MG/L	4/12/2017	4/23/2019	3	16.90	17.80	20.00	13.00	3.58
ANION	Carbonate as CO3	N	MG/L	4/12/2017	4/23/2019	2	20.00	20.00	20.00	20.00	0.00
ANION	Sulfates	N	MG/L	5/8/1987	4/23/2019	44	1638.00	1820.00	2552.00	43.00	644.90
CATION	Calcium	D	MG/L	5/8/1987	4/23/2019	44	250.00	241.00	447.00	1.00	132.00
CATION	Magnesium	D	MG/L	5/8/1987	4/23/2019	44	170.00	200.00	318.00	0.32	101.00
CATION	Sodium	D	MG/L	5/8/1987	4/23/2019	44	263.00	250.00	566.00	55.80	101.00
FIELD	pH, Field	N	S.U.	5/8/1987	9/4/2019	39	7.99	7.98	9.33	6.90	0.64
FIELD	Specific Conductivity, Field	N	UMHOS/CM	5/8/1987	9/4/2019	39	2840.00	3000.00	3940.00	947.00	648.00
FIELD	Temperature, Field	N	DEG-C	5/8/1987	9/4/2019	39	11.10	10.40	16.00	8.00	2.13
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	5/8/1987	4/23/2019	44	0.05	0.02	0.33	0.01	0.06
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	5/8/1987	4/23/2019	43	0.03	0.01	0.79	0.01	0.12
PHYSICAL	pH, Lab	N	S.U.	5/6/1997	4/23/2019	25	7.75	7.70	9.20	5.90	0.76
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	5/8/1987	4/23/2019	44	2935.00	3085.00	3800.00	1150.00	636.10
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	5/8/1987	4/23/2019	44	2634.00	2919.00	3710.00	618.00	807.80
PRIMARY	Cadmium	D	UG/L	5/8/1987	4/23/2019	43	0.90	0.50	5.00	0.07	1.00
PRIMARY	Lead	D	UG/L	5/8/1987	4/23/2019	44	100.00	50.00	400.00	20.00	100.00
PRIMARY	Mercury	D	UG/L	5/8/1987	4/23/2019	44	0.40	0.20	1.00	0.10	0.40
PRIMARY	Selenium	D	UG/L	5/8/1987	4/23/2019	44	6070.00	1.00	267000.00	0.20	40300.00
SECONDARY	Iron	D	UG/L	5/8/1987	4/23/2019	44	2180.00	230.00	31200.00	5.00	6620.00
SECONDARY	Manganese	D	UG/L	5/8/1987	4/23/2019	44	473.00	423.00	1670.00	10.00	397.00
TRACE	Molybdenum	D	UG/L	5/8/1987	4/23/2019	44	60.00	50.00	200.00	10.00	40.00

Table: 4
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 91M006 Bedrock Well, Wadge Overburden Datum: 7306.9

Well Destroyed in 2016, TC to replace the well in 2020

Table: 4a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 91M006 Bedrock Well, Wadge Overburden Datum: 7306.9

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	9/30/1991	4/16/2015	33	435.10	334.80	1459.00	201.00	284.10
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	9/30/1991	4/16/2015	31	185.70	220.00	278.00	0.00	79.07
ANION	Sulfates	N	MG/L	9/30/1991	4/16/2015	33	117.60	33.00	1083.00	5.00	212.50
CATION	Calcium	D	MG/L	9/30/1991	4/16/2015	31	4.80	1.60	76.00	0.72	13.40
CATION	Magnesium	D	MG/L	9/30/1991	4/16/2015	31	3.40	1.00	58.00	0.03	10.00
CATION	Sodium	D	MG/L	9/30/1991	4/16/2015	31	335.00	324.00	740.00	77.00	106.00
FIELD	pH, Field	N	S.U.	9/30/1991	4/3/2003	23	9.49	9.75	10.14	7.90	0.62
FIELD	Specific Conductivity, Field	N	UMHOS/CM	9/30/1991	4/3/2003	23	1580.00	1510.00	2540.00	1200.00	351.00
FIELD	Temperature, Field	N	DEG-C	9/30/1991	4/3/2003	23	13.50	13.40	18.00	7.00	2.11
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	9/30/1991	4/16/2015	31	0.08	0.06	0.33	0.02	0.07
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	9/30/1991	4/16/2015	30	0.16	0.13	0.78	0.01	0.14
PHYSICAL	pH, Lab	N	S.U.	5/7/1997	4/16/2015	20	9.92	9.95	10.20	9.50	0.20
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	9/30/1991	4/16/2015	31	1487.00	1410.00	2780.00	1190.00	360.10
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	9/30/1991	4/16/2015	31	887.20	800.00	1996.00	670.00	295.90
PRIMARY	Cadmium	D	UG/L	9/30/1991	4/16/2015	31	1.00	0.50	5.00	0.10	1.00
PRIMARY	Lead	D	UG/L	9/30/1991	4/16/2015	31	140.00	90.00	750.00	20.00	150.00
PRIMARY	Mercury	D	UG/L	9/30/1991	4/16/2015	31	0.40	0.20	1.00	0.10	0.40
PRIMARY	Selenium	D	UG/L	9/30/1991	4/16/2015	31	2.00	1.00	10.00	0.10	2.00
SECONDARY	Iron	D	UG/L	9/30/1991	4/16/2015	31	328.00	200.00	1400.00	20.00	379.00
SECONDARY	Manganese	D	UG/L	9/30/1991	4/16/2015	31	17.00	10.00	90.00	5.00	17.00
TRACE	Molybdenum	D	UG/L	9/30/1991	4/16/2015	31	40.00	50.00	70.00	10.00	20.00

Table: 5
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 087758 (008-77-58 Bedrock Well, Wadge Overburden) Datum: 6719.8

Date				4/23/2019		9/4/2019	
Depth to Water (FT)				9.72		10.21	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	431.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N		
ANION	Bicarbonate as HCO3	N	MG/L	526.00	Y		
ANION	Carbonate as CO3	N	MG/L	20.00	N		
ANION	Sulfates	N	MG/L	360.00	Y		
CATION	Calcium	D	MG/L	59.00	Y		
CATION	Magnesium	D	MG/L	41.10	Y		
CATION	Sodium	D	MG/L	215.00	Y		
FIELD	pH, Field	N	S.U.	7.54	Y	7.50	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1390.00	Y	1400.00	Y
FIELD	Temperature, Field	N	DEG-C	10.30	Y	10.10	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.01	Y		
PHYSICAL	pH, Lab	N	S.U.	8.30	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1440.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	996.00	Y		
PRIMARY	Cadmium	D	UG/L	0.30	N		
PRIMARY	Lead	D	UG/L	200.00	N		
PRIMARY	Mercury	D	UG/L	1.00	N		
PRIMARY	Selenium	D	UG/L	0.30	N		
SECONDARY	Iron	D	UG/L	50.00	Y		
SECONDARY	Manganese	D	UG/L	20.00	Y		
TRACE	Molybdenum	D	UG/L	100.00	N		

Table: 5a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 087758 (008-77-58 Bedrock Well, Wadge Overburden) Datum: 6719.8

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	5/17/2006	4/23/2019	12	499.00	511.00	559.00	428.00	43.20
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	5/17/2006	4/23/2019	12	14.70	20.00	20.00	4.00	7.49
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2018	4/23/2019	2	531.00	531.00	536.00	526.00	7.07
ANION	Carbonate as CO3	N	MG/L	4/23/2019	4/23/2019	1	20.00	20.00	20.00	20.00	0.00
ANION	Sulfates	N	MG/L	5/17/2006	4/23/2019	12	480.00	520.00	600.00	360.00	99.00
CATION	Calcium	D	MG/L	5/17/2006	4/23/2019	12	89.20	99.70	131.00	51.20	30.80
CATION	Magnesium	D	MG/L	5/17/2006	4/23/2019	12	61.70	67.00	91.80	35.60	21.20
CATION	Sodium	D	MG/L	5/17/2006	4/23/2019	12	204.00	192.00	278.00	155.00	36.80
FIELD	pH, Field	N	S.U.	10/1/2016	9/4/2019	7	7.55	7.53	7.74	7.49	0.09
FIELD	Specific Conductivity, Field	N	UMHOS/CM	10/1/2016	9/4/2019	7	1530.00	1490.00	1700.00	1390.00	118.00
FIELD	Temperature, Field	N	DEG-C	10/1/2016	9/4/2019	7	10.80	10.80	11.50	10.10	0.50
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	5/17/2006	4/23/2019	12	0.08	0.10	0.15	0.02	0.04
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	5/17/2006	4/23/2019	11	0.04	0.05	0.05	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	5/17/2006	4/23/2019	12	8.20	8.30	8.50	8.00	0.15
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	5/17/2006	4/23/2019	12	1620.00	1670.00	1770.00	1440.00	122.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	5/17/2006	4/23/2019	12	1140.00	1170.00	1280.00	988.00	112.00
PRIMARY	Cadmium	D	UG/L	5/17/2006	4/23/2019	12	0.50	0.50	0.50	0.10	0.10
PRIMARY	Lead	D	UG/L	5/17/2006	4/23/2019	12	200.00	200.00	200.00	200.00	0.00
PRIMARY	Mercury	D	UG/L	5/17/2006	4/23/2019	12	1.00	1.00	1.00	1.00	0.00
PRIMARY	Selenium	D	UG/L	5/17/2006	4/23/2019	12	0.40	0.30	0.50	0.30	0.10
SECONDARY	Iron	D	UG/L	5/17/2006	4/23/2019	12	82.00	55.00	190.00	30.00	47.00
SECONDARY	Manganese	D	UG/L	5/17/2006	4/23/2019	12	17.00	18.00	30.00	10.00	5.90
TRACE	Molybdenum	D	UG/L	5/17/2006	4/23/2019	12	70.00	80.00	100.00	10.00	30.00

Table: 6
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 93M001 Bedrock Well, Wadge Overburden Datum: 7013.5

Date				5/6/2019		9/4/2019	
Depth to Water (FT)				519.71		521.13	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	610.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	332.00	Y		
ANION	Bicarbonate as HCO3	N	MG/L	745.00	Y		
ANION	Carbonate as CO3	N	MG/L	199.00	Y		
ANION	Sulfates	N	MG/L	50.00	N		
CATION	Calcium	D	MG/L	1.40	Y		
CATION	Magnesium	D	MG/L	0.90	Y		
CATION	Sodium	D	MG/L	428.00	Y		
FIELD	pH, Field	N	S.U.	9.37	Y	9.35	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1540.00	Y	1850.00	Y
FIELD	Temperature, Field	N	DEG-C	13.10	Y	12.40	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.02	Y		
PHYSICAL	pH, Lab	N	S.U.	9.60	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1830.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	1110.00	Y		
PRIMARY	Cadmium	D	UG/L	0.30	N		
PRIMARY	Lead	D	UG/L	200.00	N		
PRIMARY	Mercury	D	UG/L	1.00	N		
PRIMARY	Selenium	D	UG/L	0.30	Y		
SECONDARY	Iron	D	UG/L	170.00	Y		
SECONDARY	Manganese	D	UG/L	50.00	N		
TRACE	Molybdenum	D	UG/L	100.00	N		

Table: 6a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 93M001 Bedrock Well, Wadge Overburden Datum: 7013.5

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	12/29/1993	5/6/2019	31	690.40	763.00	908.00	105.00	197.00
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	12/29/1993	5/6/2019	32	219.20	194.00	359.00	111.00	73.32
ANION	Bicarbonate as HCO3	N	MG/L	4/26/2018	5/6/2019	2	676.00	676.00	745.00	606.00	98.30
ANION	Carbonate as CO3	N	MG/L	4/26/2018	5/6/2019	2	469.00	469.00	739.00	199.00	382.00
ANION	Sulfates	N	MG/L	12/29/1993	5/6/2019	32	128.50	10.00	1346.00	1.00	331.10
CATION	Calcium	D	MG/L	12/29/1993	5/6/2019	32	1.94	1.70	4.00	1.30	0.73
CATION	Magnesium	D	MG/L	12/29/1993	5/6/2019	32	1.44	1.10	5.00	0.50	0.97
CATION	Sodium	D	MG/L	12/29/1993	5/6/2019	32	465.00	461.00	723.00	120.00	105.00
FIELD	pH, Field	N	S.U.	12/29/1993	9/4/2019	28	9.43	9.40	10.60	8.40	0.44
FIELD	Specific Conductivity, Field	N	UMHOS/CM	12/29/1993	9/4/2019	28	2050.00	1970.00	2970.00	1540.00	308.00
FIELD	Temperature, Field	N	DEG-C	12/29/1993	9/4/2019	28	11.50	11.80	19.00	8.00	2.03
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	12/29/1993	5/6/2019	32	0.05	0.04	0.10	0.02	0.04
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	12/29/1993	5/6/2019	31	0.02	0.02	0.05	0.01	0.01
PHYSICAL	pH, Lab	N	S.U.	5/6/1997	5/6/2019	24	9.48	9.50	9.90	8.89	0.21
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	12/29/1993	5/6/2019	32	2066.00	1900.00	3950.00	1800.00	479.10
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	12/29/1993	5/6/2019	32	1217.00	1105.00	2564.00	980.00	340.50
PRIMARY	Cadmium	D	UG/L	12/29/1993	5/6/2019	32	1.00	0.50	5.00	0.10	1.00
PRIMARY	Lead	D	UG/L	12/29/1993	5/6/2019	32	100.00	50.00	200.00	20.00	80.00
PRIMARY	Mercury	D	UG/L	12/29/1993	5/6/2019	32	0.50	0.20	1.00	0.20	0.40
PRIMARY	Selenium	D	UG/L	12/29/1993	5/6/2019	32	1.00	1.00	5.00	0.20	1.00
SECONDARY	Iron	D	UG/L	12/29/1993	5/6/2019	32	221.00	50.00	4970.00	5.00	869.00
SECONDARY	Manganese	D	UG/L	12/29/1993	5/6/2019	32	17.00	10.00	50.00	5.00	13.00
TRACE	Molybdenum	D	UG/L	12/29/1993	5/6/2019	32	50.00	40.00	100.00	10.00	30.00

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Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: WC008A Bedrock Well, Wolf Creek Overburden Datum: 6739.0

Date				5/6/2019		9/19/2019	
Depth to Water (FT)				36.90		36.90	
Type	**Parameter**	**Units**	**Fraction**	**Result**	**Detect**	**Result**	**Detect**
ANION	Alkalinity, Bicarbonate as CaCO3	MG/L	N	1330.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	MG/L	N	241.00	Y		
ANION	Bicarbonate as HCO3	MG/L	N	1620.00	Y		
ANION	Carbonate as CO3	MG/L	N	144.00	Y		
CATION	Sulfates	MG/L	D	50.00	N		
CATION	Calcium	MG/L	D	2.50	Y		
CATION	Magnesium	MG/L	D	1.70	Y		
FIELD	Sodium	MG/L	N	671.00	Y		
FIELD	pH, Field	S.U	N	8.98	Y	9.01	Y
FIELD	Specific Conductivity, Field	UMHOS/CM	N	2650.00	Y	2670.00	Y
NUTRIENT	Temperature, Field	DEG-C	N	12.70	Y	12.60	Y
NUTRIENT	NO3-NO2 Nitrogen	MG/L	N	0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	S.U	N	0.05	N		
PHYSICAL	pH, Lab	UMHOS/CM	N	9.00	Y		
PHYSICAL	Specific Conductivity, Lab	MG/L	N	2710.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	UG/L	N	1760.00	Y		
PRIMARY	Cadmium	UG/L	D	0.08	Y		
PRIMARY	Lead	UG/L	D	200.00	N		
PRIMARY	Mercury	UG/L	D	1.00	N		
PRIMARY	Selenium	UG/L	D	1.00	N		
SECONDARY	Iron	UG/L	D	770.00	Y		
SECONDARY	Manganese	UG/L	D	10.00	Y		
TRACE	Molybdenum	UG/L	D	100.00	N		

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Twentymile Coal, LLC

2019 Annual Hydrology Report

Period of Record Summary of Water Quality

Site: WC008A Bedrock Well, Wolf Creek Overburden Datum: 6739.0

Type	Parameter	Fraction	Units	Start Date	End Date	Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	4/26/2018	5/6/2019	2	1320.00	1320.00	1330.00	1310.00	14.14
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	4/26/2018	5/6/2019	2	272.00	272.00	303.00	241.00	43.84
ANION	Bicarbonate as HCO3	N	MG/L	11/21/2014	5/6/2019	14	1125.86	1070.00	1700.00	608.00	377.75
ANION	Carbonate as CO3	N	MG/L	11/21/2014	5/6/2019	14	224.64	249.50	302.00	90.00	64.59
CATION	Sulfates	D	MG/L	11/21/2014	5/6/2019	14	300.71	245.00	890.00	10.00	290.32
CATION	Calcium	D	MG/L	11/21/2014	5/6/2019	14	2.81	2.85	3.80	1.80	0.66
CATION	Magnesium	D	MG/L	11/21/2014	5/6/2019	14	2.54	2.45	3.80	1.70	0.81
FIELD	Sodium	N	MG/L	11/21/2014	5/6/2019	14	696.93	679.00	931.00	457.00	130.64
FIELD	pH, Field	N	S.U	11/19/2014	9/19/2019	18	9.21	9.13	9.90	8.81	0.29
FIELD	Specific Conductivity, Field	N	UMHOS/CM	11/19/2014	9/19/2019	18	3310.00	3060.00	5940.00	2650.00	811.40
NUTRIENT	Temperature, Field	N	DEG-C	11/19/2014	9/19/2019	18	10.90	11.25	13.20	6.40	1.92
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	11/21/2014	5/6/2019	14	0.10	0.10	0.10	0.09	0.00
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	11/21/2014	5/6/2019	14	0.04	0.05	0.07	0.02	0.01
PHYSICAL	pH, Lab	N	S.U	11/21/2014	5/6/2019	14	9.39	9.50	9.60	9.00	0.22
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	11/21/2014	5/6/2019	14	3148.57	3125.00	4380.00	1960.00	620.94
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	11/21/2014	5/6/2019	14	1972.86	1945.00	2770.00	1190.00	399.16
PRIMARY	Cadmium	D	UG/L	11/21/2014	5/6/2019	14	0.68	0.50	1.00	0.08	0.31
PRIMARY	Lead	D	UG/L	11/21/2014	5/6/2019	14	223.57	200.00	300.00	30.00	73.97
PRIMARY	Mercury	D	UG/L	11/21/2014	5/6/2019	14	1.00	1.00	1.00	1.00	0.00
PRIMARY	Selenium	D	UG/L	11/21/2014	5/6/2019	14	0.66	0.35	3.60	0.20	0.88
SECONDARY	Iron	D	UG/L	11/21/2014	5/6/2019	14	660.00	500.00	2880.00	140.00	679.49
SECONDARY	Manganese	D	UG/L	11/21/2014	5/6/2019	14	28.36	26.00	50.00	10.00	16.17
TRACE	Molybdenum	D	UG/L	11/21/2014	5/6/2019	14	140.00	100.00	200.00	60.00	54.91

Table: 8
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: WC013A Bedrock Well, Wolf Creek Overburden Datum: 6770.0

Date				5/6/2019		9/19/2019	
Depth to Water (FT)				1261.10		1262.35	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**Detect**	**Result**	**Detect**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	949.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	95.40	Y		
ANION	Bicarbonate as HCO3	N	MG/L	1160.00	Y		
ANION	Carbonate as CO3	N	MG/L	57.20	Y		
CATION	Sulfates	D	MG/L	50.00	N		
CATION	Calcium	D	MG/L	3.90	Y		
CATION	Magnesium	D	MG/L	1.40	Y		
FIELD	Sodium	N	MG/L	444.00	Y		
FIELD	pH, Field	N	S.U	8.71	Y	8.78	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1810.00	Y	1800.00	Y
NUTRIENT	Temperature, Field	N	DEG-C	18.90	Y	18.20	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.35	Y		
PHYSICAL	pH, Lab	N	S.U	8.70	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1870.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	1180.00	Y		
PRIMARY	Cadmium	D	UG/L	3.00	N		
PRIMARY	Lead	D	UG/L	200.00	N		
PRIMARY	Mercury	D	UG/L	1.00	N		
PRIMARY	Selenium	D	UG/L	11.00	Y		
SECONDARY	Iron	D	UG/L	720.00	Y		
SECONDARY	Manganese	D	UG/L	40.00	Y		
TRACE	Molybdenum	D	UG/L	100.00	N		

Table: 8
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: WC013A Bedrock Well, Wolf Creek Overburden Datum: 6770.0

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	4/26/2018	5/6/2019	2	920.00	920.00	949.00	891.00	41.01
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	4/26/2018	5/6/2019	2	113.70	113.70	132.00	95.40	25.88
ANION	Bicarbonate as HCO3	N	MG/L	4/20/2015	5/6/2019	10	960.92	1090.00	1160.00	85.20	322.74
ANION	Carbonate as CO3	N	MG/L	4/20/2015	5/6/2019	10	84.98	88.10	122.00	20.00	29.86
CATION	Sulfates	D	MG/L	4/20/2015	5/6/2019	10	29.00	25.00	50.00	20.00	11.97
CATION	Calcium	D	MG/L	4/20/2015	5/6/2019	10	3.79	3.70	4.30	3.30	0.28
CATION	Magnesium	D	MG/L	4/20/2015	5/6/2019	10	1.88	1.75	2.90	1.40	0.43
FIELD	Sodium	N	MG/L	4/20/2015	5/6/2019	10	438.70	436.00	487.00	387.00	32.78
FIELD	pH, Field	N	S.U	4/20/2015	9/19/2019	14	8.89	8.85	9.25	8.54	0.21
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4/20/2015	9/19/2019	14	1878.57	1865.00	2170.00	1540.00	178.02
NUTRIENT	Temperature, Field	N	DEG-C	4/20/2015	9/19/2019	14	18.56	19.00	21.40	13.90	2.12
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	4/20/2015	5/6/2019	10	0.10	0.10	0.10	0.10	0.00
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	4/20/2015	5/6/2019	10	0.08	0.05	0.35	0.03	0.10
PHYSICAL	pH, Lab	N	S.U	4/20/2015	5/6/2019	10	8.83	9.00	9.10	7.30	0.55
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	4/20/2015	5/6/2019	10	1894.00	1890.00	2170.00	1630.00	168.87
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	4/20/2015	5/6/2019	10	1164.80	1170.00	1290.00	948.00	105.57
PRIMARY	Cadmium	D	UG/L	4/20/2015	5/6/2019	10	0.75	0.50	3.00	0.50	0.79
PRIMARY	Lead	D	UG/L	4/20/2015	5/6/2019	10	183.00	200.00	200.00	30.00	53.76
PRIMARY	Mercury	D	UG/L	4/20/2015	5/6/2019	10	1.00	1.00	1.00	1.00	0.00
PRIMARY	Selenium	D	UG/L	4/20/2015	5/6/2019	10	1.35	0.30	11.00	0.10	3.39
SECONDARY	Iron	D	UG/L	4/20/2015	5/6/2019	10	500.00	365.00	1300.00	150.00	344.19
SECONDARY	Manganese	D	UG/L	4/20/2015	5/6/2019	10	22.90	20.50	40.00	11.00	10.19
TRACE	Molybdenum	D	UG/L	4/20/2015	5/6/2019	10	100.00	100.00	100.00	100.00	0.00

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Twentymile Coal, LLC
2017 Annual Hydrology Report
Water Year Monitoring Data

Site: 06BR7 (006-BRDH7 Bedrock Well, Twentymile Sandstone) Datum: 6826.5

Date				4/22/2019		9/4/2019	
Depth to Water (FT)				55.75		9.24	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**
FIELD	pH, Field	N	S.U.	7.64	Y	7.72	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	480.00	Y	500.00	Y
FIELD	Temperature, Field	N	DEG-C	7.80	Y	7.90	Y

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Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 06BR7 (006-BRDH7 Bedrock Well, Twentymile Sandstone) Datum: 6826.5

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	12/2/1987	4/30/1998	5	391.20	373.00	430.80	367.20	29.93
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	12/2/1987	4/30/1998	5	24.30	24.60	32.00	17.00	6.34
ANION	Sulfates	N	MG/L	12/2/1987	4/30/1998	5	76.00	70.00	100.00	50.00	23.00
CATION	Calcium	D	MG/L	12/2/1987	4/30/1998	5	2.40	2.00	3.70	1.40	0.94
CATION	Magnesium	D	MG/L	12/2/1987	4/30/1998	5	1.00	1.00	2.00	0.40	0.60
CATION	Sodium	D	MG/L	12/2/1987	4/30/1998	5	201.00	200.00	214.00	186.00	12.40
FIELD	pH, Field	N	S.U.	1/15/1987	9/4/2019	34	8.81	8.95	9.70	7.61	0.55
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1/15/1987	9/4/2019	34	762.50	785.00	1021.00	480.00	142.90
FIELD	Temperature, Field	N	DEG-C	1/15/1987	9/4/2019	34	11.90	11.10	19.00	4.00	3.64
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	12/2/1987	4/30/1998	5	0.04	0.02	0.10	0.02	0.03
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	12/2/1987	4/30/1998	5	0.05	0.04	0.08	0.02	0.02
PHYSICAL	pH, Lab	N	S.U.	4/30/1998	4/30/1998	1	8.60	8.60	8.60	8.60	0.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	12/2/1987	4/30/1998	5	799.00	807.00	855.00	722.00	51.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	12/2/1987	4/30/1998	5	490.00	480.00	540.00	440.00	38.00
PRIMARY	Cadmium	D	UG/L	12/2/1987	4/30/1998	5	0.40	0.50	0.50	0.10	0.20
PRIMARY	Lead	D	UG/L	12/2/1987	4/30/1998	5	60.00	20.00	200.00	20.00	80.00
PRIMARY	Mercury	D	UG/L	12/2/1987	4/30/1998	5	0.20	0.20	0.20	0.20	0.00
PRIMARY	Selenium	D	UG/L	12/2/1987	4/30/1998	5	1.00	1.00	1.00	1.00	0.00
SECONDARY	Iron	D	UG/L	12/2/1987	4/30/1998	5	60.00	50.00	100.00	30.00	30.00
SECONDARY	Manganese	D	UG/L	12/2/1987	4/30/1998	5	18.00	10.00	50.00	5.00	19.00
TRACE	Molybdenum	D	UG/L	12/2/1987	4/30/1998	5	40.00	10.00	100.00	10.00	40.00

Table: 10
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: FBR2 (FBR-2 Bedrock Well, Twentymile Sandstone) Datum: 6794.3

Date				5/6/2019		9/4/2019	
Depth to Water (FT)				427.81		429.38	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	795.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	134.00	Y		
ANION	Bicarbonate as HCO3	N	MG/L	970.00	Y		
ANION	Carbonate as CO3	N	MG/L	80.40	Y		
ANION	Sulfates	N	MG/L	50.00	N		
CATION	Calcium	D	MG/L	4.40	Y		
CATION	Magnesium	D	MG/L	1.90	Y		
CATION	Sodium	D	MG/L	417.00	Y		
FIELD	pH, Field	N	S.U.	8.84	Y	8.81	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1730.00	Y	1720.00	Y
FIELD	Temperature, Field	N	DEG-C	12.90	Y	10.80	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.01	Y		
PHYSICAL	pH, Lab	N	S.U.	9.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1770.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	1100.00	Y		
PRIMARY	Cadmium	D	UG/L	0.30	N		
PRIMARY	Lead	D	UG/L	200.00	N		
PRIMARY	Mercury	D	UG/L	1.00	N		
PRIMARY	Selenium	D	UG/L	0.80	Y		
SECONDARY	Iron	D	UG/L	290.00	Y		
SECONDARY	Manganese	D	UG/L	50.00	N		
TRACE	Molybdenum	D	UG/L	100.00	N		

Table: 10a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: FBR2 (FBR-2 Bedrock Well, Twentymile Sandstone) Datum: 6794.3

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	11/29/1995	4/6/2017	25	891.00	835.00	1190.00	780.00	118.00
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	11/29/1995	4/26/2018	26	68.10	68.00	83.00	54.00	7.93
ANION	Bicarbonate as HCO3	N	MG/L	4/26/2018	4/26/2018	1	768.00	768.00	768.00	768.00	0.00
ANION	Carbonate as CO3	N	MG/L	4/26/2018	4/26/2018	1	937.00	937.00	937.00	937.00	0.00
ANION	Sulfates	N	MG/L	11/29/1995	4/26/2018	26	20.00	10.00	50.00	1.00	20.00
CATION	Calcium	D	MG/L	11/29/1995	4/26/2018	26	4.57	4.25	6.90	3.50	0.87
CATION	Magnesium	D	MG/L	11/29/1995	4/26/2018	26	2.12	2.05	3.10	1.11	0.46
CATION	Sodium	D	MG/L	11/29/1995	4/26/2018	26	399.00	414.00	485.00	100.00	79.60
FIELD	pH, Field	N	S.U.	11/29/1995	9/4/2019	24	8.87	8.84	9.14	8.53	0.16
FIELD	Specific Conductivity, Field	N	UMHOS/CM	11/29/1995	9/4/2019	24	1710.00	1730.00	1910.00	1540.00	73.80
FIELD	Temperature, Field	N	DEG-C	11/29/1995	9/4/2019	24	11.30	11.40	13.00	9.30	0.88
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	11/29/1995	4/26/2018	26	0.05	0.04	0.10	0.02	0.04
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	11/29/1995	4/26/2018	25	0.02	0.01	0.05	0.01	0.01
PHYSICAL	pH, Lab	N	S.U.	5/12/1997	4/26/2018	22	8.95	9.00	9.20	8.60	0.15
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	11/29/1995	4/26/2018	26	1722.00	1695.00	1910.00	1541.00	103.40
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	11/29/1995	4/26/2018	26	1020.00	985.00	1170.00	928.00	80.40
PRIMARY	Cadmium	D	UG/L	11/29/1995	4/26/2018	26	1.00	0.50	5.00	0.50	2.00
PRIMARY	Lead	D	UG/L	11/29/1995	4/26/2018	26	110.00	70.00	200.00	20.00	77.00
PRIMARY	Mercury	D	UG/L	11/29/1995	4/26/2018	26	0.50	0.20	1.00	0.20	0.40
PRIMARY	Selenium	D	UG/L	11/29/1995	4/26/2018	26	1.00	1.00	6.00	0.30	1.00
SECONDARY	Iron	D	UG/L	11/29/1995	4/26/2018	26	186.00	125.00	1190.00	10.00	256.00
SECONDARY	Manganese	D	UG/L	11/29/1995	4/26/2018	26	13.00	7.50	35.00	5.00	10.00
TRACE	Molybdenum	D	UG/L	11/29/1995	4/26/2018	26	50.00	50.00	100.00	10.00	30.00

Table: 11
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 97013TM Bedrock Well, Twentymile Sandstone Datum: 6672.27

Date				5/14/2019		9/4/2019	
Depth to Water (FT)				41.58		34.65	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	309.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	128.00	Y		
ANION	Bicarbonate as HCO3	N	MG/L	377.00	Y		
ANION	Carbonate as CO3	N	MG/L	76.90	Y		
ANION	Sulfates	N	MG/L	130.00	Y		
CATION	Calcium	D	MG/L	1.20	Y		
CATION	Magnesium	D	MG/L	0.40	Y		
CATION	Sodium	D	MG/L	251.00	Y		
FIELD	pH, Field	N	S.U.	9.28	Y	9.41	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1110.00	Y	1120.00	Y
FIELD	Temperature, Field	N	DEG-C	10.80	Y	10.70	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.08	Y		
PHYSICAL	pH, Lab	N	S.U.	9.40	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1090.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	692.00	Y		
PRIMARY	Cadmium	D	UG/L	0.30	N		
PRIMARY	Lead	D	UG/L	200.00	N		
PRIMARY	Mercury	D	UG/L	1.00	N		
PRIMARY	Selenium	D	UG/L	0.30	N		
SECONDARY	Iron	D	UG/L	130.00	Y		
SECONDARY	Manganese	D	UG/L	50.00	N		
TRACE	Molybdenum	D	UG/L	100.00	N		

Table: 11a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 97013TM Bedrock Well, Twentymile Sandstone Datum: 6672.27

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	10/15/1998	5/14/2019	28	322.00	349.00	460.00	2.00	106.00
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	10/15/1998	5/14/2019	28	86.50	85.50	162.00	2.00	31.70
ANION	Bicarbonate as HCO3	N	MG/L	4/24/2018	5/14/2019	2	366.00	366.00	377.00	355.00	15.60
ANION	Carbonate as CO3	N	MG/L	5/14/2019	5/14/2019	1	76.90	76.90	76.90	76.90	0.00
ANION	Sulfates	N	MG/L	10/15/1998	5/14/2019	28	169.00	140.00	490.00	60.00	93.70
CATION	Calcium	D	MG/L	10/15/1998	5/14/2019	28	1.59	1.16	6.30	0.24	1.24
CATION	Magnesium	D	MG/L	10/15/1998	5/14/2019	28	0.44	0.40	1.20	0.01	0.29
CATION	Sodium	D	MG/L	10/15/1998	5/14/2019	28	252.00	248.00	334.00	71.00	49.10
FIELD	pH, Field	N	S.U.	10/15/1998	9/4/2019	22	9.61	9.54	10.89	8.79	0.47
FIELD	Specific Conductivity, Field	N	UMHOS/CM	10/15/1998	9/4/2019	22	1250.00	1220.00	1650.00	1110.00	136.00
FIELD	Temperature, Field	N	DEG-C	10/15/1998	9/4/2019	22	10.60	10.80	14.20	6.10	1.59
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	10/15/1998	5/14/2019	28	0.05	0.03	0.10	0.02	0.04
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	10/15/1998	5/14/2019	27	0.09	0.06	0.29	0.02	0.07
PHYSICAL	pH, Lab	N	S.U.	10/15/1998	5/14/2019	28	9.56	9.49	10.80	9.27	0.34
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	10/15/1998	5/14/2019	28	1176.00	1164.00	1610.00	933.00	149.70
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	10/15/1998	5/14/2019	28	695.00	689.00	960.00	540.00	88.60
PRIMARY	Cadmium	D	UG/L	10/15/1998	5/14/2019	28	2.00	0.50	5.00	0.30	2.00
PRIMARY	Lead	D	UG/L	10/15/1998	5/14/2019	28	100.00	100.00	200.00	40.00	80.00
PRIMARY	Mercury	D	UG/L	10/15/1998	5/14/2019	28	0.60	0.20	1.00	0.20	0.40
PRIMARY	Selenium	D	UG/L	10/15/1998	5/14/2019	28	2.40	1.00	17.00	0.20	4.10
SECONDARY	Iron	D	UG/L	10/15/1998	5/14/2019	28	150.00	120.00	720.00	30.00	150.00
SECONDARY	Manganese	D	UG/L	10/15/1998	5/14/2019	28	20.00	6.00	50.00	5.00	10.00
TRACE	Molybdenum	D	UG/L	10/15/1998	5/14/2019	28	60.00	50.00	100.00	10.00	30.00

Table: 12
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 0183106 (001-83-106, Bedrock Well, Trout Creek Sandstone) Datum: 6892.7

Date				4/23/2019	
Depth to Water (FT)				325.91	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	463.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	75.00	Y
ANION	Bicarbonate as HCO3	N	MG/L	565.00	Y
ANION	Carbonate as CO3	N	MG/L	45.00	Y
ANION	Sulfates	N	MG/L	190.00	Y
CATION	Calcium	D	MG/L	1.70	Y
CATION	Magnesium	D	MG/L	0.40	Y
CATION	Sodium	D	MG/L	325.00	Y
FIELD	pH, Field	N	S.U.	8.31	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1370.00	Y
FIELD	Temperature, Field	N	DEG-C	14.40	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.29	Y
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.04	Y
PHYSICAL	pH, Lab	N	S.U.	8.90	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1370.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	900.00	Y
PRIMARY	Cadmium	D	UG/L	0.30	N
PRIMARY	Lead	D	UG/L	200.00	N
PRIMARY	Mercury	D	UG/L	1.00	N
PRIMARY	Selenium	D	UG/L	0.30	N
SECONDARY	Iron	D	UG/L	30.00	Y
SECONDARY	Manganese	D	UG/L	50.00	N
TRACE	Molybdenum	D	UG/L	100.00	N

Table: 12a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 0183106 (001-83-106, Bedrock Well, Trout Creek Sandstone) Datum: 6892.7

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	4/17/2007	4/23/2019	7	568.00	590.00	635.00	463.00	69.40
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	4/17/2007	4/23/2019	7	40.30	37.30	75.00	24.00	17.30
ANION	Bicarbonate as HCO3	N	MG/L	4/12/2017	4/23/2019	2	578.00	578.00	590.00	565.00	17.70
ANION	Carbonate as CO3	N	MG/L	4/12/2017	4/23/2019	2	45.00	45.00	45.00	44.00	0.71
ANION	Sulfates	N	MG/L	4/17/2007	4/23/2019	7	190.00	190.00	210.00	160.00	16.00
CATION	Calcium	D	MG/L	4/17/2007	4/23/2019	7	2.00	1.80	2.80	1.60	0.45
CATION	Magnesium	D	MG/L	4/17/2007	4/23/2019	7	0.60	0.50	1.00	0.40	0.20
CATION	Sodium	D	MG/L	4/17/2007	4/23/2019	7	326.00	325.00	339.00	306.00	10.30
FIELD	pH, Field	N	S.U.	4/12/2017	4/23/2019	3	8.52	8.51	8.74	8.31	0.22
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4/12/2017	4/23/2019	3	1410.00	1400.00	1450.00	1370.00	40.40
FIELD	Temperature, Field	N	DEG-C	4/12/2017	4/23/2019	3	14.30	14.40	14.80	13.80	0.50
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	4/17/2007	4/23/2019	7	0.30	0.29	0.90	0.05	0.29
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	4/17/2007	4/23/2019	6	0.05	0.04	0.09	0.04	0.02
PHYSICAL	pH, Lab	N	S.U.	4/17/2007	4/23/2019	7	8.80	8.80	9.00	8.60	0.13
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	4/17/2007	4/23/2019	7	1370.00	1380.00	1420.00	1260.00	52.40
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	4/17/2007	4/23/2019	7	867.00	860.00	920.00	820.00	33.90
PRIMARY	Cadmium	D	UG/L	4/17/2007	4/23/2019	7	0.50	0.50	0.50	0.30	0.08
PRIMARY	Lead	D	UG/L	4/17/2007	4/23/2019	7	200.00	200.00	200.00	200.00	0.00
PRIMARY	Mercury	D	UG/L	4/17/2007	4/23/2019	7	1.00	1.00	1.00	1.00	0.00
PRIMARY	Selenium	D	UG/L	4/17/2007	4/23/2019	7	0.30	0.30	0.50	0.30	0.08
SECONDARY	Iron	D	UG/L	4/17/2007	4/23/2019	7	63.00	50.00	110.00	30.00	28.00
SECONDARY	Manganese	D	UG/L	4/17/2007	4/23/2019	7	181.00	30.00	671.00	7.00	267.00
TRACE	Molybdenum	D	UG/L	4/17/2007	4/23/2019	7	80.00	100.00	100.00	50.00	30.00

Table: 13
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 0183107 (001-83-107, Bedrock Well, Trout Creek Sandstone) Datum: 6886.6

Date				4/23/2019	
Depth to Water (FT)				82.85	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**
FIELD	pH, Field	N	S.U.	9.21	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1240.00	Y
FIELD	Temperature, Field	N	DEG-C	10.60	Y

Table: 13a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 0183107 (001-83-107, Bedrock Well, Trout Creek Sandstone) Datum: 6886.6

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
FIELD	pH, Field	N	S.U.	4/12/2017	4/23/2019	3	9.15	9.14	9.21	9.11	0.05
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4/12/2017	4/23/2019	3	1240.00	1240.00	1250.00	1240.00	5.77
FIELD	Temperature, Field	N	DEG-C	4/12/2017	4/23/2019	3	10.30	10.20	10.60	10.10	0.27

Table: 14
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 95M001 Bedrock Well, Trout Creek Sandstone Datum: 7184.68

Date				5/6/2019	
Depth to Water (FT)				1029.71	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	115.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	451.00	Y
ANION	Bicarbonate as HCO3	N	MG/L	141.00	Y
ANION	Carbonate as CO3	N	MG/L	270.00	Y
ANION	Sulfates	N	MG/L	50.00	N
CATION	Calcium	D	MG/L	1.20	Y
CATION	Magnesium	D	MG/L	1.00	N
CATION	Sodium	D	MG/L	228.00	Y
FIELD	pH, Field	N	S.U.	10.47	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1110.00	Y
FIELD	Temperature, Field	N	DEG-C	12.30	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	1.29	Y
PHYSICAL	pH, Lab	N	S.U.	10.30	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1090.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	800.00	Y
PRIMARY	Cadmium	D	UG/L	3.00	N
PRIMARY	Lead	D	UG/L	200.00	N
PRIMARY	Mercury	D	UG/L	1.00	N
PRIMARY	Selenium	D	UG/L	4.00	N
SECONDARY	Iron	D	UG/L	80.00	N
SECONDARY	Manganese	D	UG/L	50.00	N
TRACE	Molybdenum	D	UG/L	40.00	Y

Table: 14a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 95M001 Bedrock Well, Trout Creek Sandstone Datum: 7184.68

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	5/2/1996	4/6/2017	19	158.00	129.00	410.00	62.00	85.60
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	5/2/1996	4/6/2017	20	136.00	134.00	253.00	42.00	65.50
ANION	Sulfates	N	MG/L	5/2/1996	4/6/2017	20	180.00	210.00	430.00	20.00	100.00
CATION	Calcium	D	MG/L	5/2/1996	4/6/2017	20	3.68	3.26	8.20	0.31	2.34
CATION	Magnesium	D	MG/L	5/2/1996	4/6/2017	20	1.30	0.65	5.20	0.01	1.50
CATION	Sodium	D	MG/L	5/2/1996	4/6/2017	20	221.00	228.00	410.00	72.00	70.40
FIELD	pH, Field	N	S.U.	5/2/1996	5/6/2019	17	9.98	9.89	11.14	9.16	0.43
FIELD	Specific Conductivity, Field	N	UMHOS/CM	5/2/1996	5/6/2019	17	1190.00	1240.00	1790.00	700.00	266.00
FIELD	Temperature, Field	N	DEG-C	5/2/1996	5/6/2019	17	12.80	13.10	15.10	10.30	1.20
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	5/2/1996	4/6/2017	20	0.04	0.02	0.10	0.02	0.03
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	5/2/1996	4/6/2017	19	0.95	0.89	4.30	0.02	0.90
PHYSICAL	pH, Lab	N	S.U.	5/7/1997	4/6/2017	18	10.07	9.95	11.39	9.60	0.42
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	5/2/1996	4/6/2017	20	1127.00	1150.00	1761.00	651.00	275.40
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	5/2/1996	4/6/2017	20	665.00	684.00	1010.00	450.00	140.00
PRIMARY	Cadmium	D	UG/L	5/2/1996	4/6/2017	20	3.00	0.50	30.00	0.50	7.00
PRIMARY	Lead	D	UG/L	5/2/1996	4/6/2017	20	80.00	50.00	200.00	20.00	70.00
PRIMARY	Mercury	D	UG/L	5/2/1996	4/6/2017	20	0.40	0.20	1.00	0.20	0.40
PRIMARY	Selenium	D	UG/L	5/2/1996	4/6/2017	20	2.90	1.00	18.00	0.10	4.50
SECONDARY	Iron	D	UG/L	5/2/1996	4/6/2017	20	174.00	95.00	1110.00	5.00	260.00
SECONDARY	Manganese	D	UG/L	5/2/1996	4/6/2017	20	10.00	5.00	30.00	5.00	10.00
TRACE	Molybdenum	D	UG/L	5/2/1996	4/6/2017	20	50	50	70	30	10

Table: 15
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: FBR2E (FBR-2-E, Bedrock Well, Trout Creek Sandstone) Datum: 6794.29

Date				4/23/2019	
Depth to Water (FT)				142.89	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	227.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N
ANION	Bicarbonate as HCO3	N	MG/L	277.00	Y
ANION	Carbonate as CO3	N	MG/L	20.00	N
ANION	Sulfates	N	MG/L	50.00	N
CATION	Calcium	D	MG/L	4.60	Y
CATION	Magnesium	D	MG/L	0.70	Y
CATION	Sodium	D	MG/L	49.50	Y
FIELD	pH, Field	N	S.U.	7.85	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	500.00	Y
FIELD	Temperature, Field	N	DEG-C	10.70	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.19	Y
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.05	N
PHYSICAL	pH, Lab	N	S.U.	8.30	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	466.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	172.00	Y
PRIMARY	Cadmium	D	UG/L	0.30	N
PRIMARY	Lead	D	UG/L	200.00	N
PRIMARY	Mercury	D	UG/L	1.00	N
PRIMARY	Selenium	D	UG/L	0.30	N
SECONDARY	Iron	D	UG/L	210.00	Y
SECONDARY	Manganese	D	UG/L	90.00	Y
TRACE	Molybdenum	D	UG/L	100.00	N

Table: 15a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: FBR2E (FBR-2-E, Bedrock Well, Trout Creek Sandstone) Datum: 6794.29

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	11/29/1995	5/6/2019	25	407.00	393.00	810.00	2.00	270.00
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	11/29/1995	5/6/2019	25	213.00	160.00	497.00	2.00	153.00
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2019	5/6/2019	2	624.00	624.00	970.00	277.00	490.00
ANION	Carbonate as CO3	N	MG/L	4/23/2019	5/6/2019	2	50.20	50.20	80.40	20.00	42.70
ANION	Sulfates	N	MG/L	11/29/1995	5/6/2019	25	31.00	20.00	140.00	4.00	30.00
CATION	Calcium	D	MG/L	11/29/1995	5/6/2019	25	4.16	1.20	44.30	0.70	9.17
CATION	Magnesium	D	MG/L	11/29/1995	5/6/2019	25	3.69	0.65	60.00	0.10	12.00
CATION	Sodium	D	MG/L	11/29/1995	5/6/2019	25	326.00	382.00	454.00	42.80	138.00
FIELD	pH, Field	N	S.U.	11/29/1995	4/23/2019	20	9.57	9.44	11.46	7.76	0.84
FIELD	Specific Conductivity, Field	N	UMHOS/CM	11/29/1995	4/23/2019	20	1600.00	1730.00	1870.00	500.00	379.00
FIELD	Temperature, Field	N	DEG-C	11/29/1995	4/23/2019	20	11.30	11.30	12.70	9.60	0.82
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	11/29/1995	5/6/2019	25	0.06	0.02	0.43	0.02	0.09
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	11/29/1995	5/6/2019	24	0.02	0.01	0.05	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	5/12/1997	5/6/2019	21	9.60	9.60	10.60	8.30	0.62
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	11/29/1995	5/6/2019	25	1473.00	1700.00	1850.00	246.00	472.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	11/29/1995	5/6/2019	25	813.00	960.00	1100.00	96.00	285.00
PRIMARY	Cadmium	D	UG/L	11/29/1995	5/6/2019	25	2.00	0.50	5.00	0.30	2.00
PRIMARY	Lead	D	UG/L	11/29/1995	5/6/2019	25	90.00	50.00	200.00	30.00	70.00
PRIMARY	Mercury	D	UG/L	11/29/1995	5/6/2019	25	0.40	0.20	1.00	0.20	0.40
PRIMARY	Selenium	D	UG/L	11/29/1995	5/6/2019	25	2.20	1.00	29.00	0.30	5.60
SECONDARY	Iron	D	UG/L	11/29/1995	5/6/2019	25	83.00	60.00	290.00	5.00	75.00
SECONDARY	Manganese	D	UG/L	11/29/1995	5/6/2019	25	25.60	6.00	150.00	5.00	37.70
TRACE	Molybdenum	D	UG/L	11/29/1995	5/6/2019	25	40.00	50.00	100.00	10.00	30.00

Table: 16
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 97013TC Bedrock Well, Trout Creek Sandstone Datum: 6685.35

Date				5/14/2019	
Depth to Water (FT)				305.68	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	114.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	400.00	Y
ANION	Bicarbonate as HCO3	N	MG/L	140.00	Y
ANION	Carbonate as CO3	N	MG/L	240.00	Y
ANION	Sulfates	N	MG/L	90.00	Y
CATION	Calcium	D	MG/L	0.50	Y
CATION	Magnesium	D	MG/L	1.00	N
CATION	Sodium	D	MG/L	273.00	Y
FIELD	pH, Field	N	S.U.	10.21	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1280.00	Y
FIELD	Temperature, Field	N	DEG-C	11.60	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.10	Y
PHYSICAL	pH, Lab	N	S.U.	10.30	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1260.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	712.00	Y
PRIMARY	Cadmium	D	UG/L	0.30	N
PRIMARY	Lead	D	UG/L	200.00	N
PRIMARY	Mercury	D	UG/L	1.00	N
PRIMARY	Selenium	D	UG/L	0.30	N
SECONDARY	Iron	D	UG/L	200.00	Y
SECONDARY	Manganese	D	UG/L	50.00	N
TRACE	Molybdenum	D	UG/L	20.00	Y

Table: 16a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 97013TC Bedrock Well, Trout Creek Sandstone Datum: 6685.35

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	10/15/1998	5/14/2019	20	368.00	403.00	534.00	114.00	109.00
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	10/15/1998	5/14/2019	20	131.00	65.50	780.00	2.00	180.00
ANION	Bicarbonate as HCO3	N	MG/L	5/14/2019	5/14/2019	1	140.00	140.00	140.00	140.00	0.00
ANION	Carbonate as CO3	N	MG/L	5/14/2019	5/14/2019	1	240.00	240.00	240.00	240.00	0.00
ANION	Sulfates	N	MG/L	10/15/1998	5/14/2019	20	192.00	205.00	280.00	90.00	52.70
CATION	Calcium	D	MG/L	10/15/1998	5/14/2019	20	1.20	1.20	2.80	0.25	0.62
CATION	Magnesium	D	MG/L	10/15/1998	5/14/2019	20	0.65	0.65	1.60	0.10	0.47
CATION	Sodium	D	MG/L	10/15/1998	5/14/2019	20	276.00	281.00	380.00	77.00	56.80
FIELD	pH, Field	N	S.U.	10/15/1998	5/14/2019	18	9.36	9.24	10.40	8.79	0.49
FIELD	Specific Conductivity, Field	N	UMHOS/CM	10/15/1998	5/14/2019	18	1290.00	1300.00	1340.00	1190.00	41.50
FIELD	Temperature, Field	N	DEG-C	10/15/1998	5/14/2019	18	10.40	10.60	12.40	6.80	1.45
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	10/15/1998	5/14/2019	20	0.05	0.02	0.19	0.02	0.05
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	10/15/1998	5/14/2019	19	0.06	0.05	0.13	0.01	0.04
PHYSICAL	pH, Lab	N	S.U.	10/15/1998	5/14/2019	20	9.44	9.29	10.50	8.87	0.45
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	10/15/1998	5/14/2019	20	1243.00	1275.00	1400.00	820.00	129.40
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	10/15/1998	5/14/2019	20	751.00	755.00	810.00	590.00	52.40
PRIMARY	Cadmium	D	UG/L	10/15/1998	5/14/2019	20	2.00	0.50	5.00	0.30	2.00
PRIMARY	Lead	D	UG/L	10/15/1998	5/14/2019	20	100.00	50.00	200.00	40.00	80.00
PRIMARY	Mercury	D	UG/L	10/15/1998	5/14/2019	20	0.50	0.20	1.00	0.20	0.40
PRIMARY	Selenium	D	UG/L	10/15/1998	5/14/2019	20	4.00	2.00	30.00	0.10	6.80
SECONDARY	Iron	D	UG/L	10/15/1998	5/14/2019	20	140.00	110.00	590.00	10.00	130.00
SECONDARY	Manganese	D	UG/L	10/15/1998	5/14/2019	20	40.00	27.00	250.00	5.00	61.00
TRACE	Molybdenum	D	UG/L	10/15/1998	5/14/2019	20	40.00	50.00	100.00	10.00	20.00

Table: 17
Twentymile Coal, LLC
2018 Annual Hydrology Report
Water Year Monitoring Data

Site: 91M001 Bedrock Well, Fish Creek Sandstone Datum: 6986.9

Date	4/22/2019	9/19/2019
Depth to Water (FT)	3.23	14.93

Table: 17a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 91M001 Bedrock Well, Fish Creek Sandstone Datum: 6986.9

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	3/31/1993	4/30/1996	13	414.90	439.20	531.00	310.00	74.27
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	3/31/1993	4/30/1996	13	1.00	0.00	5.00	0.00	2.00
ANION	Sulfates	N	MG/L	12/30/1992	4/30/1996	14	38.10	23.50	134.00	6.00	35.70
CATION	Calcium	D	MG/L	12/30/1992	4/30/1996	14	80.40	82.50	103.00	54.00	17.60
CATION	Magnesium	D	MG/L	12/30/1992	4/30/1996	14	35.80	36.50	42.10	28.00	5.67
CATION	Sodium	D	MG/L	12/30/1992	4/30/1996	14	16.00	15.10	23.00	11.70	3.43
FIELD	pH, Field	N	S.U.	12/30/1992	11/2/1999	27	7.67	7.67	8.40	6.86	0.37
FIELD	Specific Conductivity, Field	N	UMHOS/CM	12/30/1992	11/2/1999	27	640.00	640.00	860.00	490.00	71.00
FIELD	Temperature, Field	N	DEG-C	12/30/1992	11/2/1999	27	11.30	9.60	56.00	5.00	9.20
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	12/30/1992	4/30/1996	14	0.56	0.09	2.41	0.02	0.84
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	12/30/1992	4/30/1996	14	0.03	0.01	0.13	0.01	0.04
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	12/30/1992	4/30/1996	14	642.00	676.00	755.00	345.00	107.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	12/30/1992	4/30/1996	14	370.00	375.00	452.00	278.00	48.40
PRIMARY	Cadmium	D	UG/L	12/30/1992	4/30/1996	14	0.30	0.20	0.50	0.10	0.20
PRIMARY	Lead	D	UG/L	12/30/1992	4/30/1996	14	20.00	20.00	40.00	20.00	5.00
PRIMARY	Mercury	D	UG/L	12/30/1992	4/30/1996	14	0.20	0.20	0.20	0.10	0.04
PRIMARY	Selenium	D	UG/L	12/30/1992	4/30/1996	14	1.00	1.00	1.00	1.00	0.00
SECONDARY	Iron	D	UG/L	12/30/1992	4/30/1996	14	56.00	45.00	160.00	20.00	47.00
SECONDARY	Manganese	D	UG/L	12/30/1992	4/30/1996	14	47.00	27.00	270.00	10.00	68.00
TRACE	Molybdenum	D	UG/L	12/30/1992	4/30/1996	14	20.00	10.00	50.00	10.00	10.00

Table: 18
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 91M004 Bedrock Well, Fish Creek Sandstone Datum: 7036.79

Date	4/22/2019	9/19/2019
Depth to Water (FT)	-	-

Well Destroyed in 2019, TC to replace the well in 2020

Table: 18a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 91M004 Bedrock Well, Fish Creek Sandstone Datum: 7036.79

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	3/30/1993	4/30/1996	13	499.30	434.00	805.00	393.60	145.50
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	3/30/1993	4/30/1996	13	0.80	0.00	2.00	0.00	1.00
ANION	Sulfates	N	MG/L	12/30/1992	4/30/1996	14	64.00	47.00	220.00	14.00	56.00
CATION	Calcium	D	MG/L	12/30/1992	4/30/1996	14	93.80	91.50	113.00	77.00	11.60
CATION	Magnesium	D	MG/L	12/30/1992	4/30/1996	14	32.20	32.70	38.30	26.00	3.61
CATION	Sodium	D	MG/L	12/30/1992	4/30/1996	14	17.00	14.10	63.70	9.00	14.00
FIELD	pH, Field	N	S.U.	12/30/1992	11/2/1999	27	7.57	7.56	8.60	6.69	0.37
FIELD	Specific Conductivity, Field	N	UMHOS/CM	12/30/1992	11/2/1999	27	700.00	700.00	950.00	510.00	100.00
FIELD	Temperature, Field	N	DEG-C	12/30/1992	11/2/1999	27	11.90	10.20	54.00	5.00	8.75
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	12/30/1992	4/30/1996	14	0.55	0.07	2.78	0.02	0.96
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	12/30/1992	4/30/1996	14	0.01	0.01	0.03	0.01	0.01
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	12/30/1992	4/30/1996	14	702.00	692.00	833.00	568.00	87.80
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	12/30/1992	4/30/1996	14	431.00	407.00	690.00	324.00	99.60
PRIMARY	Cadmium	D	UG/L	12/30/1992	4/30/1996	14	0.20	0.20	0.50	0.10	0.20
PRIMARY	Lead	D	UG/L	12/30/1992	4/30/1996	14	20.00	20.00	40.00	20.00	5.00
PRIMARY	Mercury	D	UG/L	12/30/1992	4/30/1996	14	0.20	0.20	0.50	0.10	0.10
PRIMARY	Selenium	D	UG/L	12/30/1992	4/30/1996	14	4.10	1.00	18.00	1.00	5.50
SECONDARY	Iron	D	UG/L	12/30/1992	4/30/1996	14	91.00	70.00	350.00	20.00	94.00
SECONDARY	Manganese	D	UG/L	12/30/1992	4/30/1996	14	190.00	190.00	520.00	13.00	150.00
TRACE	Molybdenum	D	UG/L	12/30/1992	4/30/1996	14	20.00	10.00	50.00	10.00	10.00

Table: 19
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: Ashley Bedrock Well, Fish Creek Sandstone Datum: 6820.0

Date				4/22/2019		9/4/2019	
Depth to Water (FT)				42.16		43.71	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	370.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	26.40	Y		
ANION	Bicarbonate as HCO3	N	MG/L	451.00	Y		
ANION	Carbonate as CO3	N	MG/L	15.80	Y		
ANION	Sulfates	N	MG/L	40.00	Y		
CATION	Calcium	D	MG/L	9.80	Y		
CATION	Magnesium	D	MG/L	2.60	Y		
CATION	Sodium	D	MG/L	173.00	Y		
FIELD	pH, Field	N	S.U.	7.52	Y	7.56	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	780.00	Y	800.00	Y
FIELD	Temperature, Field	N	DEG-C	9.40	Y	10.60	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.37	Y		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.02	Y		
PHYSICAL	pH, Lab	N	S.U.	8.50	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	777.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	488.00	Y		
PRIMARY	Cadmium	D	UG/L	0.30	N		
PRIMARY	Lead	D	UG/L	200.00	N		
PRIMARY	Mercury	D	UG/L	1.00	N		
PRIMARY	Selenium	D	UG/L	0.30	N		
SECONDARY	Iron	D	UG/L	80.00	N		
SECONDARY	Manganese	D	UG/L	50.00	N		
TRACE	Molybdenum	D	UG/L	100.00	N		

Table: 19a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: Ashley Bedrock Well, Fish Creek Sandstone Datum: 6820.0

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	3/18/1996	4/22/2019	19	415.00	381.00	680.00	327.00	84.00
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	3/18/1996	4/22/2019	20	33.30	20.00	410.00	1.00	89.10
ANION	Bicarbonate as HCO3	N	MG/L	4/26/2018	4/22/2019	2	387.00	387.00	451.00	322.00	91.20
ANION	Carbonate as CO3	N	MG/L	4/26/2018	4/22/2019	2	204.00	204.00	392.00	15.80	266.00
ANION	Sulfates	N	MG/L	3/18/1996	4/22/2019	20	44.00	40.00	70.00	22.00	12.00
CATION	Calcium	D	MG/L	3/18/1996	4/22/2019	20	45.90	37.10	98.20	1.70	31.30
CATION	Magnesium	D	MG/L	3/18/1996	4/22/2019	20	12.50	10.40	33.00	0.38	9.11
CATION	Sodium	D	MG/L	3/18/1996	4/22/2019	20	91.60	76.60	207.00	16.00	59.60
FIELD	pH, Field	N	S.U.	3/18/1996	9/4/2019	18	7.70	7.71	8.20	6.89	0.30
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3/18/1996	9/4/2019	18	771.00	776.00	960.00	610.00	97.70
FIELD	Temperature, Field	N	DEG-C	3/18/1996	9/4/2019	18	10.70	10.50	15.10	8.60	1.63
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	3/18/1996	4/22/2019	20	1.64	0.70	9.10	0.15	2.32
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	3/18/1996	4/22/2019	19	0.03	0.03	0.05	0.01	0.01
PHYSICAL	pH, Lab	N	S.U.	7/2/1997	4/22/2019	19	8.02	8.00	8.66	7.24	0.34
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	3/18/1996	4/22/2019	20	698.00	702.00	841.00	542.00	89.60
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3/18/1996	4/22/2019	20	430.00	420.00	560.00	328.00	67.70
PRIMARY	Cadmium	D	UG/L	3/18/1996	4/22/2019	20	2.80	0.50	39.00	0.10	8.60
PRIMARY	Lead	D	UG/L	3/18/1996	4/22/2019	20	100.00	200.00	200.00	5.00	80.00
PRIMARY	Mercury	D	UG/L	3/18/1996	4/22/2019	20	0.70	1.00	1.00	0.20	0.40
PRIMARY	Selenium	D	UG/L	3/18/1996	4/22/2019	20	1.40	0.80	8.00	0.30	1.90
SECONDARY	Iron	D	UG/L	3/18/1996	4/22/2019	20	45.00	45.00	250.00	6.00	53.00
SECONDARY	Manganese	D	UG/L	3/18/1996	4/22/2019	20	22.00	30.00	50.00	5.00	13.00
TRACE	Molybdenum	D	UG/L	3/18/1996	4/22/2019	20	60.00	50.00	100.00	10.00	30.00

TABLE 20
HYDROLOGIC MONITORING SITES:
ALLUVIAL GROUNDWATER

SITE	MONITORING FREQUENCY	
	WATER LEVEL & FIELD PARAMETERS	WATER QUALITY SAMPLING
Foidel Creek		
009-S-10	Quarterly	Semi-annual
001-S-5	Quarterly	Semi-annual
008-AV-2	Quarterly	Semi-annual
008-AV-1	Quarterly	----------
FO-1	abandoned	abandoned
FO-2	abandoned	abandoned
Fish Creek		
006-AY-1	Quarterly	Semi-annual
006-AZ-3	Quarterly	Semi-annual
006-AW-2	abandoned	abandoned
008-AU-3	Quarterly	Semi-annual
008-AW-3	Quarterly	Semi-annual
AVF-13	Quarterly	Semi-annual
AVF-14	Quarterly	Semi-annual
AVF-15	Quarterly	Semi-annual
Trout Creek		
008-AT-1	Quarterly	Semi-annual
Well Jones	Quarterly	Annual*
Middle Creek		
AVM-1	abandoned	abandoned
AVM-2	abandoned	abandoned

* Sulfate sampling quarterly

Table:21
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 09S10 (009-S-10, Alluvial Well, Foidel Creek Alluvium) Datum: 6906.67

Date				11/4/2018		3/2/2019		4/23/2019		9/3/2019	
Depth to Water (FT)				5.61		4.59		3.02		5.51	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L					412.00	Y	403.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L					13.80	Y	40.40	Y
ANION	Bicarbonate as HCO3	N	MG/L					503.00	Y	491.00	Y
ANION	Carbonate as CO3	N	MG/L					20.00	N	24.20	Y
ANION	Sulfates	N	MG/L					230.00	Y	220.00	Y
CATION	Calcium	D	MG/L					46.70	Y	47.30	Y
CATION	Magnesium	D	MG/L					22.40	Y	23.00	Y
CATION	Sodium	D	MG/L					203.00	Y	213.00	Y
FIELD	pH, Field	N	S.U.	7.76	Y	7.61	Y	7.54	Y	7.58	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1230.00	Y	2120.00	Y	1210.00	Y	1320.00	Y
FIELD	Temperature, Field	N	DEG-C	10.10	Y	7.90	Y	8.40	Y	9.50	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L					0.53	Y	0.54	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L					0.27	Y	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L					0.05	Y	0.10	Y
PHYSICAL	pH, Lab	N	S.U.					8.40	Y	8.50	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					1210.00	Y	1230.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					814.00	Y	804.00	Y
PRIMARY	Cadmium	D	UG/L					0.30	N	0.30	N
PRIMARY	Lead	D	UG/L					200.00	N	200.00	N
PRIMARY	Mercury	D	UG/L					1.00	N	1.00	N
PRIMARY	Selenium	D	UG/L					0.30	N	0.30	N
SECONDARY	Iron	D	UG/L					50.00	Y	130.00	Y
SECONDARY	Manganese	D	UG/L					10.00	Y	210.00	Y
TRACE	Molybdenum	D	UG/L					100.00	N	100.00	N

Table: 21a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 09S10 (009-S-10, Alluvial Well, Foidel Creek Alluvium) Datum: 6906.67

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	6/4/1979	9/3/2019	141	512.02	524.40	625.00	204.00	63.18
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	6/4/1979	9/3/2019	88	11.80	9.10	43.20	0.00	11.50
ANION	Bicarbonate as HCO3	N	MG/L	4/12/2017	9/3/2019	5	504.00	503.00	539.00	485.00	20.90
ANION	Carbonate as CO3	N	MG/L	4/12/2017	9/3/2019	3	18.60	20.00	24.20	11.60	6.42
ANION	Sulfates	N	MG/L	3/8/1979	9/3/2019	144	211.00	208.00	550.00	110.00	62.70
CATION	Calcium	D	MG/L	3/8/1979	9/3/2019	144	43.27	42.30	122.00	13.16	12.63
CATION	Magnesium	D	MG/L	3/8/1979	9/3/2019	144	21.00	21.00	92.00	1.23	8.83
CATION	Sodium	D	MG/L	3/8/1979	9/3/2019	144	214.00	211.00	310.00	20.00	31.50
FIELD	pH, Field	N	S.U.	7/2/1979	9/3/2019	300	7.65	7.70	8.80	6.20	0.46
FIELD	Specific Conductivity, Field	N	UMHOS/CM	6/18/1979	9/3/2019	300	1070.00	1164.00	3220.00	330.00	302.50
FIELD	Temperature, Field	N	DEG-C	6/18/1979	9/3/2019	302	9.09	8.45	20.00	3.00	3.16
NUTRIENT	Ammonia Nitrogen	N	MG/L	7/5/1979	9/3/2019	103	0.27	0.03	3.00	0.00	0.52
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	6/4/1979	9/3/2019	142	0.75	0.71	2.91	0.02	0.52
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	6/18/1979	9/3/2019	116	0.14	0.04	2.36	0.01	0.32
PHYSICAL	pH, Lab	N	S.U.	7/3/1986	9/3/2019	52	8.16	8.20	8.60	7.57	0.28
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	7/3/1986	9/3/2019	92	1198.00	1202.00	1540.00	920.00	80.70
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3/8/1979	9/3/2019	144	760.50	758.00	1220.00	580.00	76.19
PRIMARY	Cadmium	D	UG/L	6/18/1979	9/3/2019	115	3.70	0.50	33.00	0.10	6.70
PRIMARY	Lead	D	UG/L	6/18/1979	9/3/2019	103	80.00	40.00	200.00	10.00	80.00
PRIMARY	Mercury	D	UG/L	6/18/1979	9/3/2019	120	0.48	0.20	3.00	0.10	0.45
PRIMARY	Selenium	D	UG/L	6/18/1979	9/3/2019	119	1.40	1.00	24.00	0.10	2.30
SECONDARY	Iron	D	UG/L	3/8/1979	9/3/2019	144	121.00	40.00	4300.00	5.00	399.00
SECONDARY	Manganese	D	UG/L	3/8/1979	9/3/2019	143	67.30	33.00	568.00	5.00	84.00
TRACE	Molybdenum	D	UG/L	6/18/1979	9/3/2019	103	62.00	50.00	500.00	10.00	72.00

Table: 22
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 01S5 (001-S-5, Alluvial Well, Foidel Creek Alluvium) Datum: 6804.95

Date				11/4/2018		3/2/2019		4/22/2019		9/3/2019	
Depth to Water (FT)				2.98		2.02		1.04		3.04	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L					422.00	Y	435.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L					20.00	N	20.00	N
ANION	Bicarbonate as HCO3	N	MG/L					515.00	Y	530.00	Y
ANION	Carbonate as CO3	N	MG/L					20.00	N	20.00	N
ANION	Sulfates	N	MG/L					1050.00	Y	1030.00	Y
CATION	Calcium	D	MG/L					254.00	Y	259.00	Y
CATION	Magnesium	D	MG/L					106.00	Y	110.00	Y
CATION	Sodium	D	MG/L					215.00	Y	214.00	Y
FIELD	pH, Field	N	S.U.	7.98	Y	7.74	Y	7.13	Y	7.04	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2110.00	Y	1240.00	Y	2340.00	Y	2620.00	Y
FIELD	Temperature, Field	N	DEG-C	10.20	Y	7.40	Y	7.70	Y	10.70	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L					0.63	Y	0.82	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L					1.28	Y	0.14	Y
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L					0.02	Y	0.01	Y
PHYSICAL	pH, Lab	N	S.U.					8.20	Y	8.20	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					2450.00	Y	2470.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					2120.00	Y	2110.00	Y
PRIMARY	Cadmium	D	UG/L					0.50	N	0.50	N
PRIMARY	Lead	D	UG/L					300.00	N	300.00	N
PRIMARY	Mercury	D	UG/L					1.00	N	1.00	N
PRIMARY	Selenium	D	UG/L					0.50	N	0.50	N
SECONDARY	Iron	D	UG/L					370.00	Y	380.00	Y
SECONDARY	Manganese	D	UG/L					80.00	Y	70.00	Y
TRACE	Molybdenum	D	UG/L					200.00	N	200.00	N

Table: 22a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 01S5 (001-S-5, Alluvial Well, Foidel Creek Alluvium) Datum: 6804.95

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	5/8/1979	9/3/2019	132	491.71	495.16	892.80	174.00	97.27
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	5/8/1979	9/3/2019	77	9.42	2.00	33.60	0.00	9.45
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2018	9/3/2019	4	525.00	523.00	564.00	491.00	30.60
ANION	Carbonate as CO3	N	MG/L	4/22/2019	9/3/2019	2	20.00	20.00	20.00	20.00	0.00
ANION	Sulfates	N	MG/L	3/15/1979	9/3/2019	135	602.00	600.00	1190.00	253.00	230.00
CATION	Calcium	D	MG/L	3/15/1979	9/3/2019	133	152.00	145.00	440.00	4.00	57.70
CATION	Magnesium	D	MG/L	3/15/1979	9/3/2019	132	66.10	61.00	156.00	0.65	23.80
CATION	Sodium	D	MG/L	3/15/1979	9/3/2019	132	178.00	185.00	318.00	20.00	46.80
FIELD	pH, Field	N	S.U.	7/18/1979	9/3/2019	287	7.50	7.51	8.50	6.19	0.38
FIELD	Specific Conductivity, Field	N	UMHOS/CM	7/18/1979	9/3/2019	285	1573.00	1530.00	3020.00	225.00	525.70
FIELD	Temperature, Field	N	DEG-C	7/18/1979	9/3/2019	283	9.37	9.00	19.00	4.00	3.36
NUTRIENT	Ammonia Nitrogen	N	MG/L	5/4/1981	9/3/2019	99	1.34	0.05	17.60	0.00	3.18
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	7/18/1979	9/3/2019	129	0.79	0.18	12.75	0.01	1.97
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	5/4/1981	9/3/2019	108	0.18	0.02	1.78	0.01	0.39
PHYSICAL	pH, Lab	N	S.U.	7/2/1986	9/3/2019	51	7.90	7.90	8.30	7.15	0.29
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	4/27/1987	9/3/2019	90	1910.00	1930.00	2810.00	1230.00	368.40
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3/15/1979	9/3/2019	132	1304.00	1265.00	2350.00	728.00	390.60
PRIMARY	Cadmium	D	UG/L	5/4/1981	9/3/2019	112	3.30	0.50	36.00	0.10	6.50
PRIMARY	Lead	D	UG/L	5/4/1981	9/3/2019	95	100.00	50.00	400.00	20.00	90.00
PRIMARY	Mercury	D	UG/L	5/4/1981	9/3/2019	111	0.48	0.20	7.00	0.10	0.73
PRIMARY	Selenium	D	UG/L	5/4/1981	9/3/2019	112	1.84	1.00	35.30	0.10	3.82
SECONDARY	Iron	D	UG/L	3/15/1979	9/3/2019	132	405.00	100.00	15000.00	4.00	1350.00
SECONDARY	Manganese	D	UG/L	3/15/1979	9/3/2019	130	135.00	107.00	640.00	3.00	137.00
TRACE	Molybdenum	D	UG/L	5/4/1981	9/3/2019	95	58.00	50.00	300.00	10.00	53.00

Table: 23
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 08AV2 (008-AV-2, Alluvial Well, Foidel Creek Alluvium) Datum: 6677.1

Date				11/4/2018		3/2/2019		4/22/2019		9/3/2019	
Depth to Water (FT)				10.31		9.08		6.43		9.78	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L					365.00	Y	419.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L					20.00	N	20.00	N
ANION	Bicarbonate as HCO3	N	MG/L					445.00	Y	512.00	Y
ANION	Carbonate as CO3	N	MG/L					20.00	N	20.00	N
ANION	Sulfates	N	MG/L					430.00	Y	440.00	Y
CATION	Calcium	D	MG/L					152.00	Y	164.00	Y
CATION	Magnesium	D	MG/L					63.30	Y	65.80	Y
CATION	Sodium	D	MG/L					94.50	Y	103.00	Y
FIELD	pH, Field	N	S.U.	7.39	Y	7.30	Y	7.08	Y	7.28	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1480.00	Y	1480.00	Y	1430.00	Y	1710.00	Y
FIELD	Temperature, Field	N	DEG-C	11.30	Y	6.70	Y	6.10	Y	10.90	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L					0.20	N	1.06	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L					0.21	Y	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L					0.03	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.					8.30	Y	8.30	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					1450.00	Y	1540.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					1100.00	Y	1170.00	Y
PRIMARY	Cadmium	D	UG/L					0.15	Y	0.30	N
PRIMARY	Lead	D	UG/L					200.00	N	200.00	N
PRIMARY	Mercury	D	UG/L					1.00	N	1.00	N
PRIMARY	Selenium	D	UG/L					1.10	Y	0.20	Y
SECONDARY	Iron	D	UG/L					110.00	Y	2540.00	Y
SECONDARY	Manganese	D	UG/L					60.00	Y	1250.00	Y
TRACE	Molybdenum	D	UG/L					100.00	N	100.00	N

Table: 23a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 08AV2 (008-AV-2, Alluvial Well, Foidel Creek Alluvium) Datum: 6677.1

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	10/7/1980	9/3/2019	114	388.16	395.00	483.12	153.00	55.92
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	10/7/1982	9/3/2019	69	8.56	2.00	20.00	0.00	9.03
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2018	9/3/2019	4	478.00	477.00	512.00	445.00	33.90
ANION	Carbonate as CO3	N	MG/L	4/22/2019	9/3/2019	2	20.00	20.00	20.00	20.00	0.00
ANION	Sulfates	N	MG/L	9/23/1980	9/3/2019	115	602.00	605.00	1070.00	348.00	125.00
CATION	Calcium	D	MG/L	9/23/1980	9/3/2019	114	186.00	186.00	570.00	21.00	47.70
CATION	Magnesium	D	MG/L	9/23/1980	9/3/2019	114	75.30	77.00	120.00	7.40	13.70
CATION	Sodium	D	MG/L	9/23/1980	9/3/2019	114	85.90	87.00	142.00	8.60	15.90
FIELD	pH, Field	N	S.U.	9/23/1980	9/3/2019	273	7.37	7.40	8.37	6.10	0.36
FIELD	Specific Conductivity, Field	N	UMHOS/CM	9/23/1980	9/3/2019	273	1433.00	1520.00	2130.00	560.00	330.60
FIELD	Temperature, Field	N	DEG-C	9/23/1980	9/3/2019	273	9.61	9.00	24.00	2.00	3.72
NUTRIENT	Ammonia Nitrogen	N	MG/L	11/10/1980	9/3/2019	95	0.22	0.05	5.00	0.00	0.61
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	10/7/1980	9/3/2019	114	0.22	0.11	3.10	0.02	0.36
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	11/10/1980	9/3/2019	103	0.02	0.01	0.29	0.01	0.04
PHYSICAL	pH, Lab	N	S.U.	1/11/1987	9/3/2019	51	7.76	7.90	8.30	6.91	0.40
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1/11/1987	9/3/2019	91	1600.00	1600.00	2420.00	1180.00	183.50
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	9/23/1980	9/3/2019	115	1212.00	1220.00	1970.00	808.00	164.50
PRIMARY	Cadmium	D	UG/L	11/10/1980	9/3/2019	104	2.40	0.50	20.00	0.10	4.80
PRIMARY	Lead	D	UG/L	11/10/1980	9/3/2019	96	90.00	50.00	300.00	20.00	80.00
PRIMARY	Mercury	D	UG/L	11/10/1980	9/3/2019	104	0.48	0.20	5.00	0.10	0.59
PRIMARY	Selenium	D	UG/L	11/10/1980	9/3/2019	104	1.60	1.00	16.00	0.10	2.20
SECONDARY	Iron	D	UG/L	9/23/1980	9/3/2019	114	661.00	150.00	23000.00	5.00	2620.00
SECONDARY	Manganese	D	UG/L	9/23/1980	9/3/2019	113	1240.00	1100.00	4310.00	5.00	1000.00
TRACE	Molybdenum	D	UG/L	11/10/1980	9/3/2019	96	53.00	50.00	300.00	10.00	45.00

Table: 24
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 08AV1 (008-AV-1, Alluvial Well, Foidel Creek Alluvium) Datum: 6676.84

Date				11/4/2018		3/2/2019		4/22/2019		9/3/2019	
Depth to Water (FT)				8.89		6.37		1.84		5.15	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	pH, Field	N	S.U.	7.28	Y	7.21	Y	7.08	Y	7.14	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1110.00	Y	1120.00	Y	1080.00	Y	1380.00	Y
FIELD	Temperature, Field	N	DEG-C	11.50	Y	6.60	Y	6.20	Y	10.70	Y

Table: 24a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 08AV1 (008-AV-1, Alluvial Well, Foidel Creek Alluvium) Datum: 6676.84

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	3/19/1986	3/31/1995	9	477.40	483.00	866.00	167.00	249.80
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	3/19/1986	3/31/1995	5	2.00	2.00	8.00	0.00	3.00
ANION	Sulfates	N	MG/L	3/19/1986	3/31/1995	9	616.00	760.00	889.00	280.00	253.00
CATION	Calcium	D	MG/L	3/19/1986	3/31/1995	9	221.00	217.00	255.00	182.00	24.50
CATION	Magnesium	D	MG/L	3/19/1986	3/31/1995	9	83.50	87.60	103.00	57.00	16.10
CATION	Sodium	D	MG/L	3/19/1986	3/31/1995	9	101.00	116.00	127.00	68.00	22.60
FIELD	pH, Field	N	S.U.	8/13/1984	9/3/2019	178	7.47	7.46	8.50	6.70	0.29
FIELD	Specific Conductivity, Field	N	UMHOS/CM	8/13/1984	9/3/2019	178	1651.00	1702.00	2420.00	500.00	351.30
FIELD	Temperature, Field	N	DEG-C	8/13/1984	9/3/2019	178	9.50	9.20	20.00	2.00	3.59
NUTRIENT	Ammonia Nitrogen	N	MG/L	4/13/1986	3/31/1995	6	0.05	0.03	0.10	0.00	0.05
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	3/19/1986	3/31/1995	9	0.97	0.25	5.85	0.02	1.86
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	4/13/1986	3/31/1995	8	0.42	0.28	1.76	0.04	0.57
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	11/28/1990	3/31/1995	5	1770.00	1770.00	2190.00	1040.00	452.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3/19/1986	3/31/1995	9	1270.00	1280.00	1788.00	632.00	412.20
PRIMARY	Cadmium	D	UG/L	4/13/1986	3/31/1995	7	4.00	0.50	20.00	0.10	7.00
PRIMARY	Lead	D	UG/L	11/28/1990	3/31/1995	4	20.00	20.00	30.00	20.00	5.00
PRIMARY	Mercury	D	UG/L	4/13/1986	3/31/1995	7	0.20	0.20	0.40	0.20	0.08
PRIMARY	Selenium	D	UG/L	4/13/1986	3/31/1995	7	3.60	2.00	14.00	1.00	4.70
SECONDARY	Iron	D	UG/L	3/19/1986	3/31/1995	8	200.00	140.00	580.00	50.00	180.00
SECONDARY	Manganese	D	UG/L	3/19/1986	3/31/1995	8	1290.00	462.00	4500.00	10.00	1650.00
TRACE	Molybdenum	D	UG/L	11/28/1990	3/31/1995	4	20.00	10.00	50.00	10.00	20.00

Table: 25
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 06AY1 (006-AY-1, Alluvial Well, Fish Creek Alluvium) Datum: 6827.99

Date				11/4/2018		3/2/2019		4/22/2019		9/3/2019	
Depth to Water (FT)				8.59		7.31		5.71		8.59	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L					298.00	Y	363.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L					20.00	N	10.00	Y
ANION	Bicarbonate as HCO3	N	MG/L					364.00	Y	442.00	Y
ANION	Carbonate as CO3	N	MG/L					20.00	N	6.00	Y
ANION	Sulfates	N	MG/L					110.00	Y	150.00	Y
CATION	Calcium	D	MG/L					73.80	Y	93.30	Y
CATION	Magnesium	D	MG/L					39.60	Y	49.40	Y
CATION	Sodium	D	MG/L					20.60	Y	29.90	Y
FIELD	pH, Field	N	S.U.	7.51	Y	7.26	Y	7.08	Y	7.33	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	940.00	Y	920.00	Y	740.00	Y	960.00	Y
FIELD	Temperature, Field	N	DEG-C	9.70	Y	5.10	Y	4.80	Y	11.60	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L					0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L					0.05	Y	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L					0.03	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.					8.30	Y	8.30	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					702.00	Y	859.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					458.00	Y	586.00	Y
PRIMARY	Cadmium	D	UG/L					0.08	Y	0.13	Y
PRIMARY	Lead	D	UG/L					200.00	N	200.00	N
PRIMARY	Mercury	D	UG/L					1.00	N	1.00	N
PRIMARY	Selenium	D	UG/L					2.00	Y	0.30	Y
SECONDARY	Iron	D	UG/L					80.00	N	50.00	Y
SECONDARY	Manganese	D	UG/L					50.00	N	70.00	Y
TRACE	Molybdenum	D	UG/L					100.00	N	100.00	N

Table: 25a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 06AY1 (006-AY-1, Alluvial Well, Fish Creek Alluvium) Datum: 6827.99

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	1/16/1985	9/3/2019	99	331.81	312.00	604.00	163.00	78.87
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	2/28/1991	9/3/2019	63	8.63	2.00	20.00	0.00	8.81
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2018	9/3/2019	4	417.00	415.00	473.00	364.00	49.90
ANION	Carbonate as CO3	N	MG/L	4/22/2019	9/3/2019	2	10.00	10.00	20.00	6.00	10.00
ANION	Sulfates	N	MG/L	1/16/1985	9/3/2019	99	309.70	171.00	2930.00	40.00	457.70
CATION	Calcium	D	MG/L	1/16/1985	9/3/2019	95	104.00	83.90	520.00	5.10	76.20
CATION	Magnesium	D	MG/L	1/16/1985	9/3/2019	95	53.10	42.60	252.00	2.30	38.10
CATION	Sodium	D	MG/L	1/16/1985	9/3/2019	95	61.60	29.50	609.00	1.40	91.00
FIELD	pH, Field	N	S.U.	2/12/1985	9/3/2019	224	7.60	7.54	10.40	6.53	0.46
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1/16/1985	9/3/2019	225	985.50	810.00	5180.00	410.00	632.20
FIELD	Temperature, Field	N	DEG-C	1/16/1985	9/3/2019	225	8.86	9.00	20.00	2.90	3.33
NUTRIENT	Ammonia Nitrogen	N	MG/L	4/8/1985	9/3/2019	87	0.15	0.05	5.00	0.00	0.55
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	1/16/1985	9/3/2019	94	0.14	0.03	3.39	0.02	0.39
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	4/8/1985	9/3/2019	92	0.05	0.02	0.87	0.01	0.14
PHYSICAL	pH, Lab	N	S.U.	7/9/1986	9/3/2019	50	7.80	8.00	8.40	6.88	0.44
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1/15/1987	9/3/2019	87	851.40	771.00	2390.00	443.00	352.50
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	1/16/1985	9/3/2019	96	717.90	522.00	4592.00	253.00	674.70
PRIMARY	Cadmium	D	UG/L	1/16/1985	9/3/2019	95	1.20	0.50	5.00	0.08	1.80
PRIMARY	Lead	D	UG/L	1/15/1987	9/3/2019	86	80.00	40.00	200.00	20.00	80.00
PRIMARY	Mercury	D	UG/L	1/16/1985	9/3/2019	95	0.50	0.20	5.00	0.10	0.60
PRIMARY	Selenium	D	UG/L	1/16/1985	9/3/2019	95	2.74	1.00	48.80	0.20	5.44
SECONDARY	Iron	D	UG/L	1/16/1985	9/3/2019	96	458.00	70.00	17000.00	5.00	1940.00
SECONDARY	Manganese	D	UG/L	1/16/1985	9/3/2019	94	1130.00	486.00	10200.00	5.00	1920.00
TRACE	Molybdenum	D	UG/L	1/15/1987	9/3/2019	86	48.00	50.00	250.00	10.00	36.00

Table: 26
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 06AZ3 (006-AZ-3, Alluvial Well, Fish Creek Alluvium) Datum: 6749.6

Well Destroyed in 2016, TC to replace the well in 2020

Table: 26a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 06AZ3 (006-AZ-3, Alluvial Well, Fish Creek Alluvium) Datum: 6749.6

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	1/15/1987	5/4/2016	85	406.20	412.00	690.00	168.00	63.84
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	2/28/1991	5/4/2016	59	7.80	2.00	20.00	0.00	8.90
ANION	Sulfates	N	MG/L	1/15/1987	5/4/2016	86	528.00	479.00	1870.00	263.00	218.00
CATION	Calcium	D	MG/L	1/15/1987	5/4/2016	82	132.00	126.00	240.00	19.00	38.60
CATION	Magnesium	D	MG/L	1/15/1987	5/4/2016	82	57.00	53.80	93.50	6.20	16.80
CATION	Sodium	D	MG/L	1/15/1987	5/4/2016	82	139.00	138.00	180.00	13.00	20.70
FIELD	pH, Field	N	S.U.	1/15/1987	4/11/2003	186	7.65	7.67	8.50	6.86	0.33
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1/15/1987	4/11/2003	187	1403.00	1410.00	3490.00	438.20	320.40
FIELD	Temperature, Field	N	DEG-C	1/15/1987	4/11/2003	187	8.74	8.90	18.00	1.80	3.25
NUTRIENT	Ammonia Nitrogen	N	MG/L	1/15/1987	5/4/2016	73	0.59	0.05	4.11	0.00	0.88
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	1/15/1987	5/4/2016	82	0.33	0.20	2.10	0.02	0.37
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	1/15/1987	5/4/2016	79	0.05	0.01	1.05	0.01	0.18
PHYSICAL	pH, Lab	N	S.U.	1/15/1987	5/4/2016	43	7.73	7.68	8.30	7.06	0.37
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1/15/1987	5/4/2016	82	1454.00	1435.00	2070.00	878.00	277.20
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	1/15/1987	5/4/2016	82	1079.00	1041.00	1720.00	596.00	275.40
PRIMARY	Cadmium	D	UG/L	1/15/1987	5/4/2016	81	0.90	0.50	5.00	0.10	1.00
PRIMARY	Lead	D	UG/L	1/15/1987	5/4/2016	81	70.00	40.00	200.00	20.00	70.00
PRIMARY	Mercury	D	UG/L	1/15/1987	5/4/2016	81	0.40	0.20	1.00	0.10	0.40
PRIMARY	Selenium	D	UG/L	1/15/1987	5/4/2016	81	1.00	1.00	6.00	0.10	0.90
SECONDARY	Iron	D	UG/L	1/15/1987	5/4/2016	82	485.00	165.00	13000.00	10.00	1470.00
SECONDARY	Manganese	D	UG/L	1/15/1987	5/4/2016	81	128.00	130.00	680.00	5.00	78.40
TRACE	Molybdenum	D	UG/L	1/15/1987	5/4/2016	81	43.00	50.00	250.00	10.00	34.00

Table: 27
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 08AU3 (008-AU-3, Alluvial Well, Fish Creek Alluvium) Datum: 6609.86

Date				11/4/2018		3/2/2019		4/22/2019		9/3/2019	
Depth to Water (FT)				11.08		8.84		6.78		10.36	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L					310.00	Y	326.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L					20.00	N	15.90	Y
ANION	Bicarbonate as HCO3	N	MG/L					378.00	Y	397.00	Y
ANION	Carbonate as CO3	N	MG/L					20.00	N	9.50	Y
ANION	Sulfates	N	MG/L					310.00	Y	280.00	Y
CATION	Calcium	D	MG/L					109.00	Y	106.00	Y
CATION	Magnesium	D	MG/L					41.80	Y	39.70	Y
CATION	Sodium	D	MG/L					71.60	Y	73.50	Y
FIELD	pH, Field	N	S.U.	7.23	Y	7.17	Y	6.92	Y	7.19	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1000.00	Y	1070.00	Y	1080.00	Y	1110.00	Y
FIELD	Temperature, Field	N	DEG-C	11.10	Y	7.20	Y	7.30	Y	12.10	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L					0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L					0.03	Y	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L					0.02	Y	0.01	Y
PHYSICAL	pH, Lab	N	S.U.					8.30	Y	8.40	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					1060.00	Y	1020.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					770.00	Y	718.00	Y
PRIMARY	Cadmium	D	UG/L					0.30	N	0.30	N
PRIMARY	Lead	D	UG/L					200.00	N	200.00	N
PRIMARY	Mercury	D	UG/L					1.00	N	1.00	N
PRIMARY	Selenium	D	UG/L					0.40	Y	0.30	N
SECONDARY	Iron	D	UG/L					100.00	Y	70.00	Y
SECONDARY	Manganese	D	UG/L					560.00	Y	560.00	Y
TRACE	Molybdenum	D	UG/L					100.00	N	100.00	N

Table: 27a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 08AU3 (008-AU-3, Alluvial Well, Fish Creek Alluvium) Datum: 6609.86

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	9/23/1980	9/3/2019	114	371.05	370.50	756.00	220.00	57.80
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	11/9/1981	9/3/2019	64	8.32	2.00	20.00	0.00	8.76
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2018	9/3/2019	4	396.00	398.00	411.00	378.00	13.60
ANION	Carbonate as CO3	N	MG/L	4/22/2019	9/3/2019	2	15.00	15.00	20.00	9.50	7.40
ANION	Sulfates	N	MG/L	9/23/1980	9/3/2019	115	308.00	280.00	2330.00	97.00	205.00
CATION	Calcium	D	MG/L	9/23/1980	9/3/2019	110	119.00	111.00	475.00	12.00	45.60
CATION	Magnesium	D	MG/L	9/23/1980	9/3/2019	110	48.90	46.10	321.00	3.90	28.30
CATION	Sodium	D	MG/L	9/23/1980	9/3/2019	110	63.00	64.70	200.00	6.00	19.00
FIELD	pH, Field	N	S.U.	9/23/1980	9/3/2019	265	7.40	7.40	8.21	6.20	0.34
FIELD	Specific Conductivity, Field	N	UMHOS/CM	9/23/1980	9/3/2019	265	993.40	1020.00	1425.00	390.00	231.80
FIELD	Temperature, Field	N	DEG-C	9/23/1980	9/3/2019	266	9.63	9.40	20.00	2.60	3.65
NUTRIENT	Ammonia Nitrogen	N	MG/L	5/8/1981	9/3/2019	89	0.13	0.05	5.00	0.00	0.54
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	9/23/1980	9/3/2019	109	0.14	0.06	1.21	0.02	0.25
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	11/10/1980	9/3/2019	101	0.02	0.01	0.22	0.01	0.03
PHYSICAL	pH, Lab	N	S.U.	7/3/1986	9/3/2019	50	7.76	7.75	8.40	7.10	0.39
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	10/3/1986	9/3/2019	87	1076.00	1050.00	3310.00	780.00	275.10
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	9/23/1980	9/3/2019	111	768.60	730.00	3760.00	470.00	324.70
PRIMARY	Cadmium	D	UG/L	11/10/1980	9/3/2019	102	2.60	0.50	20.00	0.10	4.80
PRIMARY	Lead	D	UG/L	11/10/1980	9/3/2019	91	90.00	40.00	300.00	20.00	80.00
PRIMARY	Mercury	D	UG/L	11/10/1980	9/3/2019	102	0.50	0.20	7.00	0.10	0.80
PRIMARY	Selenium	D	UG/L	11/10/1980	9/3/2019	102	1.50	1.00	16.00	0.10	2.00
SECONDARY	Iron	D	UG/L	9/23/1980	9/3/2019	110	1610.00	230.00	52000.00	5.00	6030.00
SECONDARY	Manganese	D	UG/L	9/23/1980	9/3/2019	109	551.00	569.00	1240.00	8.00	217.00
TRACE	Molybdenum	D	UG/L	11/10/1980	9/3/2019	91	56.00	50.00	300.00	10.00	48.00

Table: 28
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 08AW3 (008-AW-3, Alluvial Well, Fish Creek Alluvium) Datum: 6599.39

Date				11/4/2018		3/2/2019		4/22/2019		9/3/2019	
Depth to Water (FT)				4.80		4.21		2.67		4.86	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L					274.00	Y	612.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L					20.00	N	20.00	N
ANION	Bicarbonate as HCO3	N	MG/L					334.00	Y	747.00	Y
ANION	Carbonate as CO3	N	MG/L					20.00	N	20.00	N
ANION	Sulfates	N	MG/L					720.00	Y	1880.00	Y
CATION	Calcium	D	MG/L					178.00	Y	419.00	Y
CATION	Magnesium	D	MG/L					116.00	Y	289.00	Y
CATION	Sodium	D	MG/L					43.90	Y	105.00	Y
FIELD	pH, Field	N	S.U.	6.92	Y	6.90	Y	6.85	Y	6.72	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3010.00	Y	3040.00	Y	1580.00	Y	3480.00	Y
FIELD	Temperature, Field	N	DEG-C	11.30	Y	6.60	Y	6.90	Y	13.20	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L					0.20	N	0.08	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L					0.88	Y	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L					0.02	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.					8.10	Y	8.20	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					1650.00	Y	3380.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					1370.00	Y	3240.00	Y
PRIMARY	Cadmium	D	UG/L					0.08	Y	0.20	Y
PRIMARY	Lead	D	UG/L					200.00	N	300.00	N
PRIMARY	Mercury	D	UG/L					1.00	N	1.00	N
PRIMARY	Selenium	D	UG/L					0.20	Y	0.50	N
SECONDARY	Iron	D	UG/L					80.00	N	70.00	Y
SECONDARY	Manganese	D	UG/L					50.00	N	520.00	Y
TRACE	Molybdenum	D	UG/L					100.00	N	200.00	N

Table: 28a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 08AW3 (008-AW-3, Alluvial Well, Fish Creek Alluvium) Datum: 6599.39

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	1/13/1984	9/3/2019	106	652.06	655.50	983.00	274.00	139.24
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	2/28/1991	9/3/2019	67	9.00	2.00	20.00	0.00	9.00
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2018	9/3/2019	4	561.00	582.00	747.00	334.00	177.00
ANION	Carbonate as CO3	N	MG/L	4/22/2019	9/3/2019	2	20.00	20.00	20.00	20.00	0.00
ANION	Sulfates	N	MG/L	1/13/1984	9/3/2019	107	2123.00	1900.00	23000.00	270.00	2085.00
CATION	Calcium	D	MG/L	1/13/1984	9/3/2019	103	442.00	437.00	1100.00	52.00	116.00
CATION	Magnesium	D	MG/L	1/13/1984	9/3/2019	103	273.00	272.00	448.00	28.00	78.20
CATION	Sodium	D	MG/L	1/13/1984	9/3/2019	101	106.00	113.00	179.00	5.00	31.40
FIELD	pH, Field	N	S.U.	7/8/1983	9/3/2019	240	7.04	6.98	8.30	6.10	0.33
FIELD	Specific Conductivity, Field	N	UMHOS/CM	7/8/1983	9/3/2019	241	3139.00	3300.00	4670.00	950.00	667.90
FIELD	Temperature, Field	N	DEG-C	7/8/1983	9/3/2019	241	10.20	10.00	21.00	2.10	4.06
NUTRIENT	Ammonia Nitrogen	N	MG/L	4/10/1984	9/3/2019	89	1.02	0.05	70.00	0.00	7.42
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	1/13/1984	9/3/2019	101	0.30	0.10	3.38	0.02	0.62
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	4/10/1984	9/3/2019	95	0.02	0.01	0.18	0.01	0.03
PHYSICAL	pH, Lab	N	S.U.	7/3/1986	9/3/2019	54	7.47	7.60	8.20	6.70	0.47
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	10/3/1986	9/3/2019	93	3306.00	3400.00	4130.00	945.00	520.80
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	1/13/1984	9/3/2019	103	3251.00	3260.00	4310.00	706.00	607.70
PRIMARY	Cadmium	D	UG/L	4/10/1984	9/3/2019	97	1.20	0.50	5.00	0.08	1.70
PRIMARY	Lead	D	UG/L	4/15/1987	9/3/2019	90	100.00	50.00	400.00	20.00	100.00
PRIMARY	Mercury	D	UG/L	4/10/1984	9/3/2019	97	0.40	0.20	1.00	0.10	0.40
PRIMARY	Selenium	D	UG/L	4/10/1984	9/3/2019	97	1.60	1.00	15.00	0.10	2.40
SECONDARY	Iron	D	UG/L	1/13/1984	9/3/2019	102	5730.00	310.00	52600.00	5.00	10500.00
SECONDARY	Manganese	D	UG/L	1/13/1984	9/3/2019	102	3069.00	3550.00	7790.00	10.00	2506.00
TRACE	Molybdenum	D	UG/L	4/15/1987	9/3/2019	90	61.00	50.00	250.00	10.00	55.00

Table: 29
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site:08AT1 (008-AT-1, Alluvial Well, Trout Creek Alluvium) Datum: 6580.43

Date				11/4/2018		3/2/2019		4/22/2019		9/3/2019	
Depth to Water (FT)				4.24		3.96		2.59		4.26	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L					202.00	Y	272.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L					20.00	N	20.00	N
ANION	Bicarbonate as HCO3	N	MG/L					246.00	Y	332.00	Y
ANION	Carbonate as CO3	N	MG/L					20.00	N	20.00	N
ANION	Sulfates	N	MG/L					310.00	Y	180.00	Y
CATION	Calcium	D	MG/L					83.40	Y	82.00	Y
CATION	Magnesium	D	MG/L					49.30	Y	40.50	Y
CATION	Sodium	D	MG/L					41.70	Y	34.50	Y
FIELD	pH, Field	N	S.U.	7.32	Y	7.18	Y	7.30	Y	7.29	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	870.00	Y	850.00	Y	950.00	Y	900.00	Y
FIELD	Temperature, Field	N	DEG-C	11.50	Y	7.40	Y	8.20	Y	13.10	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L					0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L					0.04	Y	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L					0.03	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.					8.20	Y	8.30	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					918.00	Y	815.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					662.00	Y	558.00	Y
PRIMARY	Cadmium	D	UG/L					0.30	N	0.30	N
PRIMARY	Lead	D	UG/L					200.00	N	200.00	N
PRIMARY	Mercury	D	UG/L					1.00	N	1.00	N
PRIMARY	Selenium	D	UG/L					2.00	Y	6.80	Y
SECONDARY	Iron	D	UG/L					1070.00	Y	900.00	Y
SECONDARY	Manganese	D	UG/L					770.00	Y	750.00	Y
TRACE	Molybdenum	D	UG/L					100.00	N	100.00	N

Table: 29a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site:08AT1 (008-AT-1, Alluvial Well, Trout Creek Alluvium) Datum: 6580.43

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	3/18/1994	9/3/2019	68	309.20	299.50	476.00	178.00	60.88
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	3/18/1994	9/3/2019	68	10.00	2.00	20.00	0.00	9.00
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2018	9/3/2019	4	284.00	280.00	332.00	246.00	37.00
ANION	Carbonate as CO3	N	MG/L	4/22/2019	9/3/2019	2	20.00	20.00	20.00	20.00	0.00
ANION	Sulfates	N	MG/L	3/18/1994	9/3/2019	68	295.00	282.00	901.00	110.00	111.00
CATION	Calcium	D	MG/L	3/18/1994	9/3/2019	68	113.00	117.00	240.00	10.00	33.50
CATION	Magnesium	D	MG/L	3/18/1994	9/3/2019	68	49.40	51.70	105.00	3.70	13.50
CATION	Sodium	D	MG/L	3/18/1994	9/3/2019	68	33.90	32.70	122.00	2.60	13.20
FIELD	pH, Field	N	S.U.	2/17/1994	9/3/2019	120	7.50	7.50	8.21	6.59	0.33
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2/17/1994	9/3/2019	120	1020.00	1010.00	1350.00	460.00	155.00
FIELD	Temperature, Field	N	DEG-C	2/17/1994	9/3/2019	120	9.20	9.10	19.00	3.50	3.00
NUTRIENT	Ammonia Nitrogen	N	MG/L	12/28/1994	9/3/2019	64	0.23	0.06	5.00	0.01	0.66
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	3/18/1994	9/3/2019	68	0.07	0.05	0.37	0.02	0.06
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	3/18/1994	9/3/2019	65	0.02	0.01	0.12	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	3/4/1997	9/3/2019	56	7.68	7.85	8.30	6.81	0.40
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	3/18/1994	9/3/2019	68	945.40	949.50	1250.00	643.00	146.70
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3/18/1994	9/3/2019	68	680.00	685.00	980.00	426.00	125.00
PRIMARY	Cadmium	D	UG/L	3/18/1994	9/3/2019	68	1.00	0.50	5.00	0.10	2.00
PRIMARY	Lead	D	UG/L	3/18/1994	9/3/2019	68	100.00	50.00	200.00	20.00	80.00
PRIMARY	Mercury	D	UG/L	3/18/1994	9/3/2019	68	0.60	0.20	1.00	0.02	0.40
PRIMARY	Selenium	D	UG/L	3/18/1994	9/3/2019	68	1.30	1.00	15.00	0.10	1.90
SECONDARY	Iron	D	UG/L	3/18/1994	9/3/2019	68	790.00	440.00	4350.00	5.00	908.00
SECONDARY	Manganese	D	UG/L	3/18/1994	9/3/2019	68	909.00	807.00	2550.00	5.00	470.00
TRACE	Molybdenum	D	UG/L	3/18/1994	9/3/2019	68	50.00	50.00	100.00	10.00	40.00

Table: 30
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: JONES (Alluvial Well, Lower Trout Creek Alluvium) Datum: 6600

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	5/15/1996	10/20/2008	14	224.00	231.00	317.00	21.00	75.20
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	5/15/1996	10/20/2008	14	9.00	2.00	20.00	1.00	10.00
ANION	Sulfates	N	MG/L	5/15/1996	10/20/2008	39	206.00	210.00	320.00	30.00	49.40
CATION	Calcium	D	MG/L	5/15/1996	10/20/2008	14	87.80	91.30	130.00	4.10	28.60
CATION	Magnesium	D	MG/L	5/15/1996	10/20/2008	14	30.40	32.40	48.30	0.60	13.00
CATION	Sodium	D	MG/L	5/15/1996	10/20/2008	14	25.10	24.70	49.00	11.80	8.98
FIELD	pH, Field	N	S.U.	5/15/1996	12/29/2003	29	7.63	7.60	8.47	6.74	0.40
FIELD	Specific Conductivity, Field	N	UMHOS/CM	5/15/1996	12/29/2003	29	819.00	830.00	1010.00	540.00	93.50
FIELD	Temperature, Field	N	DEG-C	5/15/1996	8/21/2003	28	11.60	11.70	19.40	1.50	4.44
NUTRIENT	Ammonia Nitrogen	N	MG/L	5/15/1996	10/20/2008	13	0.36	0.08	3.00	0.01	0.81
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	5/15/1996	10/20/2008	14	0.18	0.08	1.05	0.02	0.29
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	5/15/1996	4/23/2008	13	0.02	0.01	0.05	0.01	0.01
PHYSICAL	pH, Lab	N	S.U.	4/7/1997	10/20/2008	14	7.74	7.70	8.20	7.20	0.40
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	5/15/1996	10/20/2008	17	717.00	751.00	1080.00	82.00	214.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	5/15/1996	10/20/2008	14	500.00	525.00	720.00	50.00	153.00
PRIMARY	Cadmium	D	UG/L	5/15/1996	10/20/2008	14	1.00	0.50	5.00	0.50	2.00
PRIMARY	Lead	D	UG/L	5/15/1996	10/20/2008	13	100.00	80.00	200.00	20.00	80.00
PRIMARY	Mercury	D	UG/L	5/15/1996	10/20/2008	14	0.40	0.20	1.00	0.20	0.40
PRIMARY	Selenium	D	UG/L	5/15/1996	10/20/2008	14	1.50	1.00	7.20	0.10	1.80
SECONDARY	Iron	D	UG/L	5/15/1996	10/20/2008	14	302.00	55.00	2190.00	10.00	584.00
SECONDARY	Manganese	D	UG/L	5/15/1996	10/20/2008	14	620.00	547.00	1220.00	29.00	379.00
TRACE	Molybdenum	D	UG/L	5/15/1996	10/20/2008	14	40.00	50.00	50.00	10.00	20.00

Table: 31
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: AVF13 (AVF-13, Alluvial Well, Fish Creek Alluvium) Datum: 6685.68

Date				11/4/2018		3/2/2019		4/23/2019		9/3/2019	
Depth to Water (FT)				7.14		6.11		3.91		6.43	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L					351.00	Y	302.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L					20.00	N	6.80	Y
ANION	Bicarbonate as HCO3	N	MG/L					428.00	Y	369.00	Y
ANION	Carbonate as CO3	N	MG/L					20.00	N	4.10	Y
ANION	Sulfates	N	MG/L					330.00	Y	140.00	Y
CATION	Calcium	D	MG/L					123.00	Y	77.10	Y
CATION	Magnesium	D	MG/L					54.70	Y	37.30	Y
CATION	Sodium	D	MG/L					74.80	Y	49.90	Y
FIELD	pH, Field	N	S.U.	7.41	Y	7.31	Y	7.38	Y	7.34	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	920.00	Y	930.00	Y	1200.00	Y	910.00	Y
FIELD	Temperature, Field	N	DEG-C	10.50	Y	7.20	Y	8.40	Y	11.10	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L					0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L					0.04	Y	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L					0.04	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.					8.20	Y	8.30	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					1190.00	Y	814.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					880.00	Y	552.00	Y
PRIMARY	Cadmium	D	UG/L					0.30	N	0.30	N
PRIMARY	Lead	D	UG/L					200.00	N	200.00	N
PRIMARY	Mercury	D	UG/L					1.00	N	1.00	N
PRIMARY	Selenium	D	UG/L					0.50	Y	0.60	Y
SECONDARY	Iron	D	UG/L					60.00	Y	60.00	Y
SECONDARY	Manganese	D	UG/L					10.00	Y	90.00	Y
TRACE	Molybdenum	D	UG/L					100.00	N	100.00	N

Table: 31a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: AVF13 (AVF-13, Alluvial Well, Fish Creek Alluvium) Datum: 6685.68

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	8/27/2001	9/3/2019	31	430.00	402.00	587.00	302.00	72.40
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	8/27/2001	9/3/2019	31	16.00	20.00	20.00	1.00	7.90
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2018	9/3/2019	4	465.00	420.00	649.00	369.00	125.00
ANION	Carbonate as CO3	N	MG/L	4/23/2019	9/3/2019	2	12.00	12.00	20.00	4.10	11.00
ANION	Sulfates	N	MG/L	8/27/2001	9/3/2019	31	250.00	230.00	460.00	120.00	88.00
CATION	Calcium	D	MG/L	8/27/2001	9/3/2019	31	108.00	98.60	240.00	72.70	35.10
CATION	Magnesium	D	MG/L	8/27/2001	9/3/2019	31	48.90	48.40	72.10	13.00	13.00
CATION	Sodium	D	MG/L	8/27/2001	9/3/2019	31	73.00	74.30	100.00	49.60	17.20
FIELD	pH, Field	N	S.U.	8/27/2001	9/3/2019	20	7.55	7.41	8.50	7.03	0.32
FIELD	Specific Conductivity, Field	N	UMHOS/CM	8/27/2001	9/3/2019	20	1107.00	1090.00	1460.00	795.00	207.40
FIELD	Temperature, Field	N	DEG-C	8/27/2001	9/3/2019	20	9.35	8.35	14.20	2.80	3.18
NUTRIENT	Ammonia Nitrogen	N	MG/L	8/27/2001	9/3/2019	31	0.44	0.15	5.00	0.05	1.00
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	8/27/2001	9/3/2019	31	0.07	0.10	0.17	0.02	0.04
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	8/27/2001	9/3/2019	28	0.04	0.02	0.17	0.01	0.04
PHYSICAL	pH, Lab	N	S.U.	8/27/2001	9/3/2019	31	7.95	8.10	8.40	7.22	0.33
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	8/27/2001	9/3/2019	31	1058.00	950.00	1550.00	786.00	218.90
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	8/27/2001	9/3/2019	31	732.00	712.00	1110.00	510.00	175.00
PRIMARY	Cadmium	D	UG/L	8/27/2001	9/3/2019	31	1.00	0.50	5.00	0.10	1.00
PRIMARY	Lead	D	UG/L	8/27/2001	9/3/2019	31	200.00	200.00	200.00	50.00	60.00
PRIMARY	Mercury	D	UG/L	8/27/2001	9/3/2019	31	0.80	1.00	1.00	0.20	0.30
PRIMARY	Selenium	D	UG/L	8/27/2001	9/3/2019	31	0.70	0.30	3.00	0.10	0.80
SECONDARY	Iron	D	UG/L	8/27/2001	9/3/2019	31	711.00	140.00	15000.00	5.00	2680.00
SECONDARY	Manganese	D	UG/L	8/27/2001	9/3/2019	31	872.00	870.00	2000.00	5.00	595.00
TRACE	Molybdenum	D	UG/L	8/27/2001	9/3/2019	31	70.00	50.00	100.00	50.00	30.00

Table: 30
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: AVF14 (AVF-14, Alluvial Well, Fish Creek Alluvium) Datum: 6650.39

Date				11/4/2018		3/2/2019		5/14/2019		9/3/2019	
Depth to Water (FT)				8.05		7.16		5.81		8.07	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L					285.00	Y	294.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L					10.00	N	11.20	Y
ANION	Bicarbonate as HCO3	N	MG/L					348.00	Y	358.00	Y
ANION	Carbonate as CO3	N	MG/L					10.00	N	6.70	Y
ANION	Sulfates	N	MG/L					190.00	Y	150.00	Y
CATION	Calcium	D	MG/L					81.30	Y	80.20	Y
CATION	Magnesium	D	MG/L					35.20	Y	34.30	Y
CATION	Sodium	D	MG/L					49.60	Y	52.70	Y
FIELD	pH, Field	N	S.U.	7.32	Y	7.18	Y	7.50	Y	7.18	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	850.00	Y	860.00	Y	850.00	Y	870.00	Y
FIELD	Temperature, Field	N	DEG-C	10.70	Y	7.40	Y	10.20	Y	11.30	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L					0.20	N	0.07	Y
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L					0.10	N	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L					0.05	N	0.01	Y
PHYSICAL	pH, Lab	N	S.U.					8.20	Y	8.40	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					832.00	Y	819.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					574.00	Y	542.00	Y
PRIMARY	Cadmium	D	UG/L					0.06	Y	0.30	N
PRIMARY	Lead	D	UG/L					30.00	Y	200.00	N
PRIMARY	Mercury	D	UG/L					1.00	N	1.00	N
PRIMARY	Selenium	D	UG/L					0.30	N	0.20	Y
SECONDARY	Iron	D	UG/L					210.00	Y	240.00	Y
SECONDARY	Manganese	D	UG/L					20.00	Y	70.00	Y
TRACE	Molybdenum	D	UG/L					100.00	N	100.00	N

Table: 32a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: AVF14 (AVF-14, Alluvial Well, Fish Creek Alluvium) Datum: 6650.39

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	8/27/2001	9/3/2019	29	331.00	332.00	388.00	284.00	26.50
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	8/27/2001	9/3/2019	29	14.90	20.00	20.00	1.00	8.02
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2018	9/3/2019	3	367.00	367.00	377.00	358.00	9.50
ANION	Carbonate as CO3	N	MG/L	9/3/2019	9/3/2019	1	6.70	6.70	6.70	6.70	0.00
ANION	Sulfates	N	MG/L	8/27/2001	9/3/2019	28	190.00	170.00	330.00	140.00	44.00
CATION	Calcium	D	MG/L	8/27/2001	9/3/2019	29	87.10	85.40	130.00	71.10	12.30
CATION	Magnesium	D	MG/L	8/27/2001	9/3/2019	29	35.20	34.20	54.00	14.00	7.20
CATION	Sodium	D	MG/L	8/27/2001	9/3/2019	29	54.60	52.90	94.00	44.70	9.08
FIELD	pH, Field	N	S.U.	8/27/2001	9/3/2019	19	7.57	7.51	8.55	7.05	0.37
FIELD	Specific Conductivity, Field	N	UMHOS/CM	8/27/2001	9/3/2019	19	951.10	960.00	1359.00	820.00	119.90
FIELD	Temperature, Field	N	DEG-C	8/27/2001	9/3/2019	19	9.27	8.40	15.00	2.70	3.22
NUTRIENT	Ammonia Nitrogen	N	MG/L	8/27/2001	9/3/2019	29	0.54	0.20	5.00	0.05	1.20
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	8/27/2001	9/3/2019	29	0.10	0.10	0.87	0.02	0.15
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	8/27/2001	9/3/2019	26	0.03	0.03	0.05	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	8/27/2001	9/3/2019	29	8.03	8.10	8.40	7.31	0.29
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	8/27/2001	9/3/2019	29	838.00	819.00	990.00	723.00	81.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	8/27/2001	9/3/2019	29	558.00	540.00	710.00	450.00	69.50
PRIMARY	Cadmium	D	UG/L	8/27/2001	9/3/2019	29	1.00	0.50	5.00	0.30	1.00
PRIMARY	Lead	D	UG/L	8/27/2001	9/3/2019	29	200.00	200.00	200.00	50.00	60.00
PRIMARY	Mercury	D	UG/L	8/27/2001	9/3/2019	29	0.80	1.00	1.00	0.20	0.30
PRIMARY	Selenium	D	UG/L	8/27/2001	9/3/2019	29	0.96	0.30	13.00	0.10	2.40
SECONDARY	Iron	D	UG/L	8/27/2001	9/3/2019	29	300.00	130.00	4500.00	5.00	820.00
SECONDARY	Manganese	D	UG/L	8/27/2001	9/3/2019	29	99.30	83.00	310.00	5.00	65.70
TRACE	Molybdenum	D	UG/L	8/27/2001	9/3/2019	29	70.00	50.00	100.00	50.00	30.00

Table: 33
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: AVF15 (AVF-15, Alluvial Well, Fish Creek Alluvium) Datum: 6628.4

Date				11/4/2018		3/2/2019		4/22/2019		9/3/2019	
Depth to Water (FT)				**DRY**		5.42		2.52		**DRY**	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L					277.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L					20.00	N		
ANION	Bicarbonate as HCO3	N	MG/L					338.00	Y		
ANION	Carbonate as CO3	N	MG/L					20.00	N		
ANION	Sulfates	N	MG/L					380.00	Y		
CATION	Calcium	D	MG/L					105.00	Y		
CATION	Magnesium	D	MG/L					58.90	Y		
CATION	Sodium	D	MG/L					78.60	Y		
FIELD	pH, Field	N	S.U.			7.19	Y	6.94	Y		
FIELD	Specific Conductivity, Field	N	UMHOS/CM			1310.00	Y	1240.00	Y		
FIELD	Temperature, Field	N	DEG-C			6.10	Y	6.40	Y		
NUTRIENT	Ammonia Nitrogen	N	MG/L					0.45	Y		
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L					0.21	Y		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L					0.05	N		
PHYSICAL	pH, Lab	N	S.U.					8.10	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					1210.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					908.00	Y		
PRIMARY	Cadmium	D	UG/L					0.30	N		
PRIMARY	Lead	D	UG/L					200.00	N		
PRIMARY	Mercury	D	UG/L					1.00	N		
PRIMARY	Selenium	D	UG/L					0.20	Y		
SECONDARY	Iron	D	UG/L					1620.00	Y		
SECONDARY	Manganese	D	UG/L					420.00	Y		
TRACE	Molybdenum	D	UG/L					100.00	N		

Table: 33a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: AVF15 (AVF-15, Alluvial Well, Fish Creek Alluvium) Datum: 6628.4

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	7/23/2014	4/22/2019	17	420.00	434.00	497.00	277.00	69.00
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	7/23/2014	4/22/2019	17	19.00	20.00	20.00	3.40	4.00
ANION	Bicarbonate as HCO3	N	MG/L	4/23/2018	4/22/2019	2	366.00	366.00	393.00	338.00	38.90
ANION	Carbonate as CO3	N	MG/L	4/22/2019	4/22/2019	1	20.00	20.00	20.00	20.00	0.00
ANION	Sulfates	N	MG/L	7/23/2014	4/22/2019	17	220.00	160.00	400.00	110.00	100.00
CATION	Calcium	D	MG/L	7/23/2014	4/22/2019	17	96.00	92.20	138.00	71.50	17.40
CATION	Magnesium	D	MG/L	7/23/2014	4/22/2019	17	43.60	39.60	62.50	33.60	9.18
CATION	Sodium	D	MG/L	7/23/2014	4/22/2019	17	55.70	43.60	89.20	32.90	22.00
FIELD	pH, Field	N	S.U.	4/13/2017	4/22/2019	5	7.14	7.19	7.38	6.84	0.25
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4/13/2017	4/22/2019	5	1280.00	1290.00	1370.00	1200.00	65.30
FIELD	Temperature, Field	N	DEG-C	4/13/2017	4/22/2019	5	7.40	7.60	9.00	6.10	1.20
NUTRIENT	Ammonia Nitrogen	N	MG/L	7/23/2014	4/22/2019	17	0.25	0.20	0.73	0.09	0.15
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	7/23/2014	4/22/2019	17	0.09	0.10	0.21	0.03	0.04
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	7/23/2014	4/22/2019	17	0.03	0.03	0.05	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	7/23/2014	4/22/2019	17	7.90	7.80	8.30	7.60	0.20
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	7/23/2014	4/22/2019	17	986.00	926.00	1400.00	765.00	179.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	7/23/2014	4/22/2019	17	676.00	624.00	986.00	480.00	149.00
PRIMARY	Cadmium	D	UG/L	7/23/2014	4/22/2019	17	0.50	0.50	0.50	0.10	0.10
PRIMARY	Lead	D	UG/L	7/23/2014	4/22/2019	17	200.00	200.00	200.00	200.00	0.00
PRIMARY	Mercury	D	UG/L	7/23/2014	4/22/2019	17	1.00	1.00	1.00	1.00	0.00
PRIMARY	Selenium	D	UG/L	7/23/2014	4/22/2019	17	0.85	0.30	4.20	0.10	1.30
SECONDARY	Iron	D	UG/L	7/23/2014	4/22/2019	17	983.00	180.00	6690.00	40.00	1750.00
SECONDARY	Manganese	D	UG/L	7/23/2014	4/22/2019	17	542.00	460.00	1210.00	217.00	265.00
TRACE	Molybdenum	D	UG/L	7/23/2014	4/22/2019	17	100.00	100.00	100.00	100.00	0.00

TABLE 34 (continued)
MONITORING SITES & FREQUENCY
SURFACE FLOW *MARCH - MAY*

	REGULAR SAMPLING		CONTINGENT SAMPLING (sample only when pumping site 109 or 115 is discharging, between 24 hours after the discharge begins and 36 hours after it ends)	
SITE	**WATER LEVEL & FIELD PARAMETERS**	**WATER QUALITY (see note, below)**	**WATER LEVEL & FIELD EC**	**LAB SULFATE & LAB EC**
Foidel Creek				
USGS 09243800	Schedule A	Once in March		
8	Schedule A	Once in March		
14	Schedule A	Once in March		
USGS 09243900	Schedule A	Once in March		
Fish Creek				
16A	Schedule A	Once in March	Weekly	
302				
27A	Schedule A	Once in March		
1003	Schedule A	Once in March	Weekly	Monthly
SW-13	Quarterly - Flow only, fields semi-annually	semi-annually		
SW-14	Quarterly - Flow only, fields semi-annually	semi-annually		
SW-15	Quarterly - Flow only, fields semi-annually	semi-annually		
307	Monthly - Flow only, fields semi-annually			
305	Monthly - Flow only, fields semi-annually			
Trout Creek				
301	Monthly	Once in March	Weekly	Monthly
69	Monthly	Once in March	Weekly	Monthly
1005	Monthly	Once in March	Weekly	Monthly
Middle Creek				
29	Schedule A	Once in March	Weekly	Monthly

Schedule A
March - Monthly
April - Two times during month
May - Monthly

Note: If site is frozen, March quality sample may be taken in April.

TABLE 34 (continued)
MONITORING SITES & FREQUENCY
SURFACE FLOW *JUNE - SEPTEMBER*

	REGULAR SAMPLING		CONTINGENT SAMPLING (sample only when pumping site 109 or 115 is discharging, between 24 hours after the discharge begins and 36 hours after it ends)	
SITE	**WATER LEVEL & FIELD PARAMETERS**	**WATER QUALITY**	**WATER LEVEL & FIELD EC**	**LAB SULFATE AND LAB EC**
Foidel Creek				
USGS 09243800	Schedule B	Monthly only in Jun, Aug, Sept		
8	Schedule B	Monthly only in Jun, Aug, Sept		
14	Schedule B	Monthly only in Jun, Aug, Sept		
USGS 09243900	Schedule B	Monthly only in Jun, Aug, Sept		
Fish Creek				
16A	Schedule B	Monthly only in Jun, Aug, Sept	Weekly	
302	Monthly	One time only: During Jun-Sept.		
SW-13	Quarterly - Flow only, fields semi-annually	semi-annually		
SW-14	Quarterly - Flow only, fields semi-annually	semi-annually		
SW-15	Quarterly - Flow only, fields semi-annually	semi-annually		
27A	Schedule B	Monthly only in Jun, Aug, Sept		
1003	Schedule B	Monthly only in Jun, Aug, Sept	Weekly	Monthly
307	Monthly - Flow only, fields semi-annually			
305	Monthly - Flow only, fields semi-annually			
Trout Creek				
301	Monthly	Monthly	Weekly	Monthly
69	Monthly	Monthly	Weekly	Monthly
1005	Monthly	Monthly	Weekly (EC only)	Monthly
Middle Creek				
29	Schedule B	Monthly only in Jun, Aug, Sept	Weekly	Monthly

Schedule B
June- Monthly
July - Monthly
August - Weekly
Sept. - First two weeks of month

TABLE 34 (continued)
MONITORING SITES & FREQUENCY
SURFACE FLOW *OCTOBER - FEBRUARY*

	REGULAR SAMPLING		CONTINGENT SAMPLING (sample only when pumping site 109 or 115 is discharging, between 24 hours after the discharge begins and 36 hours after it ends)	
SITE	**WATER LEVEL & FIELD PARAMETERS**	**WATER QUALITY**	**WATER LEVEL & FIELD EC**	**LAB SULFATE & LAB EC**
Foidel Creek				
USGS 09243800				
8				
14				
USGS 09243900				
Fish Creek				
16A			Weekly	
302				
SW-13	Quarterly - Flow only, fields semi-annually	semi-annually		
SW-14	Quarterly - Flow only, fields semi-annually	semi-annually		
SW-15	Quarterly - Flow only, fields semi-annually	semi-annually		
27A				
1003			Weekly	Monthly
307				
305				
Trout Creek				
301			Weekly (EC only	Monthly
69			Weekly	Monthly
1005			Weekly	Monthly
Middle Creek				
29			Weekly	Monthly

Table: 35
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 800 (USGS 09243800, Surface Water, Foidel Creek) Datum: 6940

Date				3/27/2019		4/16/2019		5/7/2019		5/31/2019		6/20/2019		7/23/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	476.00	Y							348.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N							20.00	N		
ANION	Bicarbonate as HCO3	N	MG/L	580.00	Y							424.00	Y		
ANION	Carbonate as CO3	N	MG/L	20.00	N							20.00	N		
ANION	Sulfates	N	MG/L	1980.00	Y							1820.00	Y		
CATION	Calcium	D	MG/L	418.00	Y							335.00	Y		
CATION	Magnesium	D	MG/L	336.00	Y							309.00	Y		
CATION	Sodium	D	MG/L	42.70	Y							38.40	Y		
FIELD	Flow	N	CFS	0.97	Y	10.47	Y	12.05	Y	7.87	Y	3.30	Y	2.91	Y
FIELD	pH, Field	N	S.U.	7.70	Y	7.50	Y	7.90	Y	7.90	Y	8.00	Y	8.00	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3690.00	Y	1060.00	Y	2100.00	Y	2580.00	Y	3070.00	Y	2970.00	Y
FIELD	Temperature, Field	N	DEG-C	5.30	Y	7.00	Y	15.50	Y	16.90	Y	18.40	Y	26.40	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N							0.20	N		
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.05	Y							0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.02	Y							0.02	Y		
PHYSICAL	pH, Lab	N	S.U.	8.30	Y							8.30	Y		
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.38	Y							0.37	Y		
PHYSICAL	Solids, Total Suspended	N	MG/L	20.00	N							7.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	3350.00	Y							3010.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3290.00	Y							2880.00	Y		
PRIMARY	Cadmium	TR	MG/L	0.00	N							0.00	N		
PRIMARY	Selenium	TR	UG/L	0.30	Y							0.50	N		
SECONDARY	Iron	TR	UG/L	230.00	Y							230.00	Y		
SECONDARY	Manganese	TR	UG/L	970.00	Y							80.00	Y		
SECONDARY	Silver	TR	UG/L	1.00	N							1.00	N		
SECONDARY	Zinc	TR	UG/L	100.00	N							100.00	N		
TRACE	Molybdenum	TR	UG/L	200.00	N							200.00	N		

Table: 35
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

On 9/5/19 could not obtain flow due to beaver dam.

Site: 800 (USGS 09243800, Surface Water, Foidel Creek) Datum: 694(

Date				8/7/2019		8/15/2019		8/22/2019		8/28/2019		9/5/2019		9/11/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	254.00	Y									285.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N									20.00	N
ANION	Bicarbonate as HCO3	N	MG/L	310.00	Y									348.00	Y
ANION	Carbonate as CO3	N	MG/L	20.00	N									20.00	N
ANION	Sulfates	N	MG/L	2100.00	Y									2200.00	Y
CATION	Calcium	D	MG/L	321.00	Y									371.00	Y
CATION	Magnesium	D	MG/L	341.00	Y									405.00	Y
CATION	Sodium	D	MG/L	39.10	Y									52.10	Y
FIELD	Flow	N	CFS	1.63	Y	1.54	Y	0.97	Y	0.97	Y			1.37	Y
FIELD	pH, Field	N	S.U.	7.80	Y	7.80	Y	7.70	Y	7.30	Y	7.90	Y	7.30	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3450.00	Y	3390.00	Y	3110.00	Y	3720.00	Y	3330.00	Y	3620.00	Y
FIELD	Temperature, Field	N	DEG-C	20.50	Y	22.30	Y	21.60	Y	23.50	Y	24.20	Y	16.90	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N									0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N									0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.01	Y									0.05	Y
PHYSICAL	pH, Lab	N	S.U.	8.20	Y									8.20	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.37	Y									0.45	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	5.00	Y									6.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	3270.00	Y									3500.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3200.00	Y									3510.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	Y									0.00	N
PRIMARY	Selenium	TR	UG/L	0.20	Y									0.50	Y
SECONDARY	Iron	TR	UG/L	110.00	Y									140.00	Y
SECONDARY	Manganese	TR	UG/L	220.00	Y									350.00	Y
SECONDARY	Silver	TR	UG/L	0.50	N									1.00	N
SECONDARY	Zinc	TR	UG/L	50.00	N									50.00	N
TRACE	Molybdenum	TR	UG/L	100.00	N									100.00	N

Table: 35a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 800 (USGS 09243800, Surface Water, Foidel Creek) Datum: 6940

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	3/5/1976	9/11/2019	124	334.70	329.50	564.00	140.00	94.14
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	6/25/1992	9/11/2019	91	9.74	3.30	31.00	0.00	9.12
ANION	Bicarbonate as HCO3	N	MG/L	8/15/2017	9/11/2019	9	356.00	310.00	580.00	227.00	138.00
ANION	Carbonate as CO3	N	MG/L	8/15/2017	9/11/2019	7	57.30	20.00	281.00	20.00	98.60
ANION	Sulfates	N	MG/L	3/5/1976	9/11/2019	173	1267.00	1380.00	2530.00	46.00	758.10
CATION	Calcium	D	MG/L	3/5/1976	9/11/2019	173	260.00	285.00	730.00	25.00	119.00
CATION	Magnesium	D	MG/L	3/5/1976	9/11/2019	174	197.00	183.00	429.00	10.00	119.00
CATION	Sodium	D	MG/L	3/5/1976	9/11/2019	173	49.00	46.50	160.00	6.10	20.50
FIELD	Flow	N	CFS	3/5/1976	9/11/2019	154	2.89	0.97	56.00	0.01	6.79
FIELD	pH, Field	N	S.U.	3/5/1976	9/11/2019	281	7.97	8.00	9.20	6.80	0.36
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3/5/1976	9/11/2019	285	2351.00	2550.00	4300.00	210.00	927.60
FIELD	Temperature, Field	N	DEG-C	4/8/1976	9/11/2019	277	13.00	14.20	26.70	0.00	6.55
NUTRIENT	Ammonia Nitrogen	N	MG/L	2/12/1985	9/11/2019	122	0.16	0.08	0.50	0.00	0.17
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	3/5/1976	9/11/2019	169	1.29	0.10	66.00	0.01	6.21
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	3/5/1976	9/11/2019	163	0.02	0.01	0.21	0.01	0.03
PHYSICAL	pH, Lab	N	S.U.	11/5/1986	9/11/2019	84	8.14	8.20	8.70	7.68	0.20
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	3/5/1976	9/11/2019	177	18.69	0.57	3200.00	0.06	240.50
PHYSICAL	Solids, Total Suspended	N	MG/L	3/5/1976	9/11/2019	168	89.20	20.00	2400.00	2.00	254.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	10/2/1980	9/11/2019	147	2482.00	2720.00	4400.00	660.00	888.20
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	11/5/1986	9/11/2019	114	2692.00	2977.00	3830.00	8.00	796.10
PRIMARY	Cadmium	TR	MG/L	3/31/2006	9/11/2019	44	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	4/9/1979	8/2/2011	82	0.20	0.20	1.00	0.00	0.10
PRIMARY	Selenium	TR	UG/L	6/17/1987	9/11/2019	105	1.60	1.00	20.00	0.10	2.70
SECONDARY	Iron	TR	UG/L	4/9/1979	9/11/2019	166	1290.00	415.00	33000.00	30.00	3530.00
SECONDARY	Manganese	TR	UG/L	4/9/1979	9/11/2019	150	320.00	190.00	4080.00	10.00	486.00
SECONDARY	Silver	TR	UG/L	11/5/1986	9/11/2019	113	0.70	0.50	5.00	0.00	1.00
SECONDARY	Zinc	TR	UG/L	4/9/1979	9/11/2019	129	42.00	20.00	240.00	5.00	39.00
TRACE	Molybdenum	TR	UG/L	4/9/1979	9/11/2019	126	63.00	50.00	300.00	1.00	66.00

Table: 36
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 8 (Surface Water, Foidel Creek) Datum: 6789.95

Date				4/16/2019		5/7/2019		5/23/2019		6/19/2019		7/23/2019		8/7/2019		8/16/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	224.00	Y					314.00	Y			258.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	5.70	Y					26.20	Y			7.10	Y		
ANION	Bicarbonate as HCO3	N	MG/L	273.00	Y					383.00	Y			315.00	Y		
ANION	Carbonate as CO3	N	MG/L	3.40	Y					15.70	Y			4.30	Y		
ANION	Sulfates	N	MG/L	950.00	Y					1790.00	Y			2100.00	Y		
CATION	Calcium	D	MG/L	172.00	Y					294.00	Y			310.00	Y		
CATION	Magnesium	D	MG/L	132.00	Y					270.00	Y			330.00	Y		
CATION	Sodium	D	MG/L	110.00	Y					108.00	Y			94.40	Y		
FIELD	Flow	N	CFS	0.49	Y	16.95	Y	12.23	Y	4.33	Y	2.61	Y	1.31	Y	1.57	Y
FIELD	pH, Field	N	S.U.	7.70	Y	8.10	Y	8.00	Y	8.30	Y	8.40	Y	8.30	Y	8.30	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2050.00	Y	1709.00	Y	2820.00	Y	3090.00	Y	307.00	Y	3070.00	Y	3540.00	Y
FIELD	Temperature, Field	N	DEG-C	11.80	Y	17.00	Y	14.20	Y	21.00	Y	29.30	Y	22.50	Y	22.80	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N					0.20	N			0.20	N		
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.08	Y					0.10	N			0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.03	Y					0.04	Y			0.04	Y		
PHYSICAL	pH, Lab	N	S.U.	8.30	Y					8.40	Y			8.30	Y		
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	1.60	Y					1.10	Y			0.90	Y		
PHYSICAL	Solids, Total Suspended	N	MG/L	25.00	Y					15.00	Y			37.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	1970.00	Y					3110.00	Y			3330.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	1650.00	Y					2940.00	Y			3210.00	Y		
PRIMARY	Cadmium	TR	MG/L	0.00	N					0.00	N			0.00	N		
PRIMARY	Selenium	TR	UG/L	1.10	Y					0.20	Y			0.40	Y		
SECONDARY	Iron	TR	UG/L	850.00	Y					440.00	Y			960.00	Y		
SECONDARY	Manganese	TR	UG/L	160.00	Y					190.00	Y			270.00	Y		
SECONDARY	Silver	TR	UG/L	0.50	N					1.00	N			1.00	N		
SECONDARY	Zinc	TR	UG/L	50.00	N					100.00	N			10.00	Y		
TRACE	Molybdenum	TR	UG/L	100.00	N					200.00	N			100.00	N		

Table: 36
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 8 (Surface Water, Foidel Creek) Datum: 6789.95

Date				8/21/2019		8/28/2019		9/6/2019		9/11/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L							282.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L							20.00	N
ANION	Bicarbonate as HCO3	N	MG/L							345.00	Y
ANION	Carbonate as CO3	N	MG/L							20.00	N
ANION	Sulfates	N	MG/L							2300.00	Y
CATION	Calcium	D	MG/L							342.00	Y
CATION	Magnesium	D	MG/L							378.00	Y
CATION	Sodium	D	MG/L							99.40	Y
FIELD	Flow	N	CFS	1.05	Y	0.94	Y	1.47	Y	1.46	Y
FIELD	pH, Field	N	S.U.	8.40	Y	8.30	Y	8.20	Y	8.20	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3540.00	Y	3750.00	Y	3990.00	Y	3450.00	Y
FIELD	Temperature, Field	N	DEG-C	24.80	Y	23.40	Y	16.30	Y	14.60	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L							0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L							0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L							0.06	Y
PHYSICAL	pH, Lab	N	S.U.							8.30	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO							0.89	Y
PHYSICAL	Solids, Total Suspended	N	MG/L							23.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM							3560.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L							3570.00	Y
PRIMARY	Cadmium	TR	MG/L							0.00	N
PRIMARY	Selenium	TR	UG/L							0.30	Y
SECONDARY	Iron	TR	UG/L							650.00	Y
SECONDARY	Manganese	TR	UG/L							230.00	Y
SECONDARY	Silver	TR	UG/L							1.00	N
SECONDARY	Zinc	TR	UG/L							50.00	N
TRACE	Molybdenum	TR	UG/L							100.00	N

Table: 36a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 8 (Surface Water, Foidel Creek) Datum: 6789.95

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	10/20/1980	9/11/2019	286	334.06	315.99	900.00	115.90	109.97
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	3/19/1981	9/11/2019	151	13.00	10.80	52.20	0.00	11.60
ANION	Bicarbonate as HCO3	N	MG/L	8/15/2017	9/11/2019	9	343.00	327.00	474.00	266.00	68.60
ANION	Carbonate as CO3	N	MG/L	8/15/2017	9/11/2019	8	16.20	16.90	31.30	3.40	9.26
ANION	Sulfates	N	MG/L	10/20/1980	9/11/2019	292	1343.00	1265.00	2690.00	20.00	645.10
CATION	Calcium	D	MG/L	10/20/1980	9/11/2019	288	245.00	250.00	770.00	65.00	97.80
CATION	Magnesium	D	MG/L	10/20/1980	9/11/2019	288	184.00	170.00	458.00	38.00	93.50
CATION	Sodium	D	MG/L	10/20/1980	9/11/2019	289	136.00	91.00	880.00	30.00	131.00
FIELD	Flow	N	CFS	4/9/1979	9/11/2019	196	3.60	1.78	52.00	0.01	5.66
FIELD	pH, Field	N	S.U.	3/15/1979	9/11/2019	449	7.83	7.95	8.74	6.10	0.45
FIELD	Specific Conductivity, Field	N	UMHOS/CM	5/1/1979	9/11/2019	437	2213.00	2280.00	5350.00	100.00	1083.00
FIELD	Temperature, Field	N	DEG-C	3/15/1979	9/11/2019	450	12.20	13.00	29.30	0.00	6.63
NUTRIENT	Ammonia Nitrogen	N	MG/L	4/1/1981	9/11/2019	140	0.48	0.05	44.00	0.00	3.70
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	10/20/1980	9/11/2019	285	1.99	0.65	18.70	0.01	2.84
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	10/20/1980	9/11/2019	192	0.42	0.02	30.00	0.00	3.11
PHYSICAL	pH, Lab	N	S.U.	7/14/1986	9/11/2019	131	8.23	8.30	8.60	7.30	0.22
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	10/20/1980	9/11/2019	283	1.69	1.20	13.00	0.13	1.73
PHYSICAL	Solids, Total Suspended	N	MG/L	3/15/1979	9/11/2019	355	62.10	26.00	1352.00	2.00	120.80
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	7/14/1986	9/11/2019	172	3043.00	3160.00	8400.00	434.00	920.20
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3/15/1979	9/11/2019	349	2149.00	2100.00	4590.00	330.00	1028.00
PRIMARY	Cadmium	TR	MG/L	3/31/2006	9/11/2019	65	0.00	0.00	0.01	0.00	0.00
PRIMARY	Mercury	TR	UG/L	4/15/1987	5/21/2012	79	0.20	0.20	4.00	0.00	0.50
PRIMARY	Selenium	TR	UG/L	4/15/1987	9/11/2019	144	2.15	1.00	20.00	0.20	3.14
SECONDARY	Iron	TR	UG/L	4/15/1987	9/11/2019	145	718.00	430.00	11000.00	20.00	1060.00
SECONDARY	Manganese	TR	UG/L	2/3/1987	9/11/2019	171	312.00	202.00	2020.00	5.00	329.00
SECONDARY	Silver	TR	UG/L	4/15/1987	9/11/2019	143	0.72	0.50	17.00	0.00	1.60
SECONDARY	Zinc	TR	UG/L	4/15/1987	9/11/2019	143	54.00	30.00	340.00	5.00	62.00
TRACE	Molybdenum	TR	UG/L	4/15/1987	9/11/2019	143	80.00	50.00	500.00	10.00	80.00

Table: 37
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 900 (USGS 09243900, Surface Water, Foidel Creek) Datum: 6730

Date				3/26/2019		4/16/2019		5/7/2019		5/23/2019		6/19/2019		7/23/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	394.00	Y							306.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	10.60	Y							38.60	Y		
ANION	Bicarbonate as HCO3	N	MG/L	481.00	Y							373.00	Y		
ANION	Carbonate as CO3	N	MG/L	6.40	Y							23.20	Y		
ANION	Sulfates	N	MG/L	1690.00	Y							1320.00	Y		
CATION	Calcium	D	MG/L	254.00	Y							233.00	Y		
CATION	Magnesium	D	MG/L	224.00	Y							204.00	Y		
CATION	Sodium	D	MG/L	302.00	Y							112.00	Y		
FIELD	Flow	N	CFS	ICE	N	16.39	Y	25.19	Y	16.03	Y	8.20	Y	2.14	Y
FIELD	pH, Field	N	S.U.	7.40	Y	7.90	Y	7.90	Y	8.10	Y	8.30	Y	8.40	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2970.00	Y	2320.00	Y	2040.00	Y	2430.00	Y	2490.00	Y	2290.00	Y
FIELD	Temperature, Field	N	DEG-C	6.10	Y	10.20	Y	15.50	Y	14.00	Y	21.00	Y	26.40	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N							0.20	N		
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.15	Y							0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.23	Y							0.04	Y		
PHYSICAL	pH, Lab	N	S.U.	8.30	Y							8.50	Y		
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	3.40	Y							1.30	Y		
PHYSICAL	Solids, Total Suspended	N	MG/L	27.00	Y							16.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	3400.00	Y							2500.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3120.00	Y							2210.00	Y		
PRIMARY	Cadmium	TR	MG/L	0.00	N							0.00	N		
PRIMARY	Selenium	TR	UG/L	0.50	Y							0.50	N		
SECONDARY	Iron	TR	UG/L	920.00	Y							410.00	Y		
SECONDARY	Manganese	TR	UG/L	470.00	Y							50.00	Y		
SECONDARY	Silver	TR	UG/L	1.00	N							1.00	N		
SECONDARY	Zinc	TR	UG/L	100.00	N							100.00	N		
TRACE	Molybdenum	TR	UG/L	200.00	N							200.00	N		

Table: 37
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 900 (USGS 09243900, Surface Water, Foidel Creek) Datum: 6730

Date				8/7/2019		8/16/2019		8/21/2019		8/28/2019		9/6/2019		9/12/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	288.00	Y									258.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	16.80	Y									30.80	Y
ANION	Bicarbonate as HCO3	N	MG/L	351.00	Y									314.00	Y
ANION	Carbonate as CO3	N	MG/L	10.10	Y									18.50	Y
ANION	Sulfates	N	MG/L	1500.00	Y									1710.00	Y
CATION	Calcium	D	MG/L	216.00	Y									273.00	Y
CATION	Magnesium	D	MG/L	214.00	Y									282.00	Y
CATION	Sodium	D	MG/L	130.00	Y									132.00	Y
FIELD	Flow	N	CFS	2.06	Y	1.79	Y	1.70	Y	1.73	Y	1.26	Y	1.89	Y
FIELD	pH, Field	N	S.U.	8.30	Y	8.40	Y	8.40	Y	8.40	Y	7.50	Y	7.90	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2520.00	Y	2790.00	Y	2520.00	Y	2470.00	Y	3210.00	Y	3180.00	Y
FIELD	Temperature, Field	N	DEG-C	21.10	Y	19.10	Y	23.00	Y	23.50	Y	15.10	Y	17.70	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N									0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N									0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.05	Y									0.05	Y
PHYSICAL	pH, Lab	N	S.U.	8.40	Y									8.50	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	1.50	Y									1.40	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	42.00	Y									16.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	2640.00	Y									2970.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	2340.00	Y									2580.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	N									0.00	N
PRIMARY	Selenium	TR	UG/L	0.30	Y									0.40	Y
SECONDARY	Iron	TR	UG/L	1150.00	Y									420.00	Y
SECONDARY	Manganese	TR	UG/L	190.00	Y									70.00	Y
SECONDARY	Silver	TR	UG/L	1.00	N									1.00	N
SECONDARY	Zinc	TR	UG/L	10.00	Y									50.00	N
TRACE	Molybdenum	TR	UG/L	100.00	N									100.00	N

Table: 37a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 900 (USGS 09243900, Surface Water, Foidel Creek) Datum: 6730

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	4/8/1976	9/12/2019	133	343.40	339.00	790.00	106.00	91.31
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	6/25/1992	9/12/2019	96	12.20	8.00	48.60	0.00	12.00
ANION	Bicarbonate as HCO3	N	MG/L	8/15/2017	9/12/2019	9	358.00	351.00	481.00	268.00	73.40
ANION	Carbonate as CO3	N	MG/L	8/15/2017	9/12/2019	8	20.90	19.00	47.70	6.40	13.10
ANION	Sulfates	N	MG/L	4/8/1976	9/12/2019	181	1075.00	1100.00	2150.00	100.00	528.20
CATION	Calcium	D	MG/L	4/8/1976	9/12/2019	179	195.00	190.00	430.00	45.00	87.50
CATION	Magnesium	D	MG/L	4/8/1976	9/12/2019	180	137.00	135.00	325.00	16.00	73.30
CATION	Sodium	D	MG/L	4/9/1979	9/12/2019	146	163.00	115.00	750.00	18.60	131.00
FIELD	Flow	N	CFS	9/2/1975	9/12/2019	180	6.52	1.62	82.00	0.01	12.10
FIELD	pH, Field	N	S.U.	9/2/1975	9/12/2019	291	8.10	8.10	9.30	7.00	0.32
FIELD	Specific Conductivity, Field	N	UMHOS/CM	9/2/1975	9/12/2019	305	2212.00	2240.00	4970.00	400.00	799.80
FIELD	Temperature, Field	N	DEG-C	10/4/1983	9/12/2019	248	14.00	15.10	26.40	0.20	6.67
NUTRIENT	Ammonia Nitrogen	N	MG/L	10/4/1983	9/12/2019	133	0.16	0.09	0.77	0.00	0.17
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	10/4/1983	9/12/2019	144	0.72	0.10	6.40	0.01	1.32
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	10/4/1983	9/12/2019	139	0.06	0.03	1.00	0.01	0.14
PHYSICAL	pH, Lab	N	S.U.	3/20/1986	9/12/2019	92	8.36	8.38	8.80	7.95	0.21
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	4/9/1979	9/12/2019	198	2.11	1.29	11.00	0.21	2.15
PHYSICAL	Solids, Total Suspended	N	MG/L	10/4/1983	9/12/2019	143	78.70	28.00	1510.00	2.00	188.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	12/2/1985	9/12/2019	127	2479.00	2450.00	4300.00	693.00	670.50
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	11/5/1986	9/12/2019	120	2144.00	2207.00	3760.00	480.00	676.90
PRIMARY	Cadmium	TR	MG/L	3/31/2006	9/12/2019	50	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	9/2/1975	8/2/2011	76	0.20	0.20	0.50	0.00	0.08
PRIMARY	Selenium	TR	UG/L	6/17/1987	9/12/2019	111	1.50	1.00	11.00	0.10	1.90
SECONDARY	Iron	TR	UG/L	9/2/1975	9/12/2019	170	2450.00	715.00	68000.00	20.00	7200.00
SECONDARY	Manganese	TR	UG/L	9/2/1975	9/12/2019	151	371.00	276.00	1800.00	20.00	336.00
SECONDARY	Silver	TR	UG/L	11/5/1986	9/12/2019	116	0.71	0.50	11.00	0.10	1.20
SECONDARY	Zinc	TR	UG/L	4/15/1981	9/12/2019	116	42.00	20.00	410.00	5.00	48.00
TRACE	Molybdenum	TR	UG/L	11/5/1986	9/12/2019	118	60.00	50.00	200.00	1.00	60.00

Table: 38
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 14 (Surface Water, Foidel Creek) Datum: 6915

Date				4/16/2019		5/7/2019		5/14/2019		5/31/2019		6/20/2019		7/23/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	91.70	Y			285.00	Y			261.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N			20.00	N			26.30	Y		
ANION	Bicarbonate as HCO3	N	MG/L	112.00	Y			348.00	Y			318.00	Y		
ANION	Carbonate as CO3	N	MG/L	20.00	N			20.00	N			15.80	Y		
ANION	Sulfates	N	MG/L	140.00	Y			190.00	Y			230.00	Y		
CATION	Calcium	D	MG/L	38.10	Y			81.30	Y			96.80	Y		
CATION	Magnesium	D	MG/L	22.10	Y			35.20	Y			46.60	Y		
CATION	Sodium	D	MG/L	18.50	Y			49.60	Y			36.10	Y		
FIELD	Flow	N	CFS	6.64	Y	1.95	Y			1.16	Y	0.44	Y	0.05	Y
FIELD	pH, Field	N	S.U.	7.20	Y	8.10	Y			8.20	Y	8.20	Y	8.20	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	490.00	Y	530.00	Y			780.00	Y	950.00	Y	820.00	Y
FIELD	Temperature, Field	N	DEG-C	8.20	Y	17.10	Y			15.80	Y	13.80	Y	28.40	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N			0.20	N			0.20	N		
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.16	Y			0.10	N			0.04	Y		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.11	Y			0.05	N			0.04	Y		
PHYSICAL	pH, Lab	N	S.U.	8.20	Y			8.20	Y			8.50	Y		
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.60	Y							0.76	Y		
PHYSICAL	Solids, Total Suspended	N	MG/L	50.00	Y							20.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	457.00	Y			832.00	Y			891.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	384.00	Y			574.00	Y			606.00	Y		
PRIMARY	Cadmium	TR	MG/L	0.00	Y							0.00	N		
PRIMARY	Selenium	TR	UG/L	0.70	Y							0.20	Y		
SECONDARY	Iron	TR	UG/L	2770.00	Y							570.00	Y		
SECONDARY	Manganese	TR	UG/L	30.00	Y							70.00	Y		
SECONDARY	Silver	TR	UG/L	0.50	N							0.50	N		
SECONDARY	Zinc	TR	UG/L	10.00	Y							50.00	N		
TRACE	Molybdenum	TR	UG/L	100.00	N							100.00	N		

Table: 38a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 14 (Surface Water, Foidel Creek) Datum: 6915

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	6/18/1979	6/20/2019	186	245.28	243.00	437.00	15.00	84.85
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	6/18/1979	6/20/2019	80	10.70	4.90	48.00	0.00	11.30
ANION	Bicarbonate as HCO3	N	MG/L	4/5/2018	6/20/2019	4	235.00	240.00	348.00	112.00	116.00
ANION	Carbonate as CO3	N	MG/L	4/16/2019	6/20/2019	3	18.60	20.00	20.00	15.80	2.42
ANION	Sulfates	N	MG/L	6/18/1979	6/20/2019	187	273.00	247.00	1470.00	33.00	154.00
CATION	Calcium	D	MG/L	6/18/1979	6/20/2019	189	93.70	91.00	342.00	30.00	41.30
CATION	Magnesium	D	MG/L	6/18/1979	6/20/2019	190	47.50	47.00	175.00	10.00	20.60
CATION	Sodium	D	MG/L	6/18/1979	6/20/2019	185	35.90	35.00	140.00	10.00	17.60
FIELD	Flow	N	CFS	5/26/1981	7/23/2019	191	0.99	0.29	11.57	0.01	1.70
FIELD	pH, Field	N	S.U.	4/5/1979	7/23/2019	258	7.79	7.86	9.60	6.30	0.48
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4/30/1979	7/23/2019	256	760.80	700.00	3910.00	190.00	412.30
FIELD	Temperature, Field	N	DEG-C	4/5/1979	7/23/2019	261	9.20	9.00	28.40	0.40	5.25
NUTRIENT	Ammonia Nitrogen	N	MG/L	4/1/1983	6/20/2019	67	0.15	0.05	3.00	0.00	0.38
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	6/18/1979	6/20/2019	185	0.32	0.09	22.40	0.01	1.69
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	4/15/1982	6/20/2019	120	0.05	0.03	0.50	0.01	0.06
PHYSICAL	pH, Lab	N	S.U.	6/30/1986	6/20/2019	53	8.05	8.10	8.60	6.90	0.35
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	6/18/1979	6/20/2019	174	0.74	0.72	2.25	0.34	0.25
PHYSICAL	Solids, Total Suspended	N	MG/L	4/5/1979	6/20/2019	225	48.00	24.00	1390.00	2.00	110.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	8/26/1986	6/20/2019	86	820.60	800.00	2770.00	294.00	347.20
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	4/5/1979	6/20/2019	226	613.00	584.00	2790.00	140.00	310.00
PRIMARY	Cadmium	TR	MG/L	5/5/2006	6/20/2019	19	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	4/15/1987	6/1/2010	57	0.20	0.20	0.50	0.00	0.07
PRIMARY	Selenium	TR	UG/L	4/15/1987	6/20/2019	76	1.40	1.00	10.00	0.20	1.60
SECONDARY	Iron	TR	UG/L	4/15/1987	6/20/2019	82	1660.00	1000.00	7120.00	140.00	1590.00
SECONDARY	Manganese	TR	UG/L	1/15/1987	6/20/2019	95	128.00	72.00	1910.00	10.00	217.00
SECONDARY	Silver	TR	UG/L	4/15/1987	6/20/2019	76	0.80	0.50	10.00	0.00	2.00
SECONDARY	Zinc	TR	UG/L	4/15/1987	6/20/2019	76	23.00	20.00	80.00	5.00	16.00
TRACE	Molybdenum	TR	UG/L	4/15/1987	6/20/2019	75	40.00	50.00	100.00	10.00	30.00

Table: 39
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 16A (Surface Water, Fish Creek) Datum: 6915

Date				3/26/2019		4/19/2019		5/7/2019		5/23/2019		6/19/2019		7/23/2019		8/7/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	153.00	Y							129.00	Y			236.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	9.00	Y							20.00	N			29.80	Y
ANION	Bicarbonate as HCO3	N	MG/L	186.00	Y							157.00	Y			288.00	Y
ANION	Carbonate as CO3	N	MG/L	5.40	Y							20.00	N			17.90	Y
ANION	Sulfates	N	MG/L	90.00	Y							60.00	Y			100.00	Y
CATION	Calcium	D	MG/L	42.80	Y							35.50	Y			64.70	Y
CATION	Magnesium	D	MG/L	23.10	Y							16.00	Y			34.10	Y
CATION	Sodium	D	MG/L	20.70	Y							8.80	Y			19.30	Y
FIELD	Flow	N	CFS	ICE	N	47.39	Y	87.77	Y	63.68	Y	92.28	Y	9.50	Y	7.37	Y
FIELD	pH, Field	N	S.U.	7.80	Y	7.80	Y	7.90	Y	8.10	Y	8.30	Y	8.60	Y	8.50	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	470.00	Y	620.00	Y	400.00	Y	330.00	Y	340.00	Y	740.00	Y	580.00	Y
FIELD	Temperature, Field	N	DEG-C	4.60	Y	6.10	Y	13.80	Y	12.80	Y	17.20	Y	28.40	Y	22.10	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N							0.20	N			0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.09	Y							0.10	N			0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.04	Y							0.03	Y			0.02	Y
PHYSICAL	pH, Lab	N	S.U.	8.50	Y							8.40	Y			8.60	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.64	Y							0.31	Y			0.49	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	101.00	Y							323.00	Y			20.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	487.00	Y							332.00	Y			634.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	318.00	Y							218.00	Y			404.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	N							0.00	Y			0.00	N
PRIMARY	Selenium	TR	UG/L	0.60	Y							0.20	Y			0.40	Y
SECONDARY	Iron	TR	UG/L	2890.00	Y							8100.00	Y			710.00	Y
SECONDARY	Manganese	TR	UG/L	74.00	Y							120.00	Y			40.00	Y
SECONDARY	Silver	TR	UG/L	0.50	N							0.50	N			0.50	N
SECONDARY	Zinc	TR	UG/L	10.00	Y							30.00	Y			50.00	N
TRACE	Molybdenum	TR	UG/L	100.00	N							100.00	N			100.00	N

Table: 39
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 16A (Surface Water, Fish Creek) Datum: 6915

Date				8/16/2019		8/21/2019		8/28/2019		9/5/2019		9/11/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L									265.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L									10.40	Y
ANION	Bicarbonate as HCO3	N	MG/L									324.00	Y
ANION	Carbonate as CO3	N	MG/L									6.20	Y
ANION	Sulfates	N	MG/L									150.00	Y
CATION	Calcium	D	MG/L									71.60	Y
CATION	Magnesium	D	MG/L									44.70	Y
CATION	Sodium	D	MG/L									29.60	Y
FIELD	Flow	N	CFS	7.95	Y	4.68	Y	2.91	Y	1.91	Y	4.59	Y
FIELD	pH, Field	N	S.U.	8.60	Y	8.40	Y	8.40	Y	8.50	Y	8.30	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	660.00	Y	740.00	Y	780.00	Y	930.00	Y	1330.00	Y
FIELD	Temperature, Field	N	DEG-C	22.70	Y	26.10	Y	23.40	Y	25.30	Y	14.50	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L									0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L									0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L									0.03	Y
PHYSICAL	pH, Lab	N	S.U.									8.50	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO									0.68	Y
PHYSICAL	Solids, Total Suspended	N	MG/L									12.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM									753.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L									506.00	Y
PRIMARY	Cadmium	TR	MG/L									0.00	N
PRIMARY	Selenium	TR	UG/L									0.40	Y
SECONDARY	Iron	TR	UG/L									540.00	Y
SECONDARY	Manganese	TR	UG/L									40.00	Y
SECONDARY	Silver	TR	UG/L									0.50	N
SECONDARY	Zinc	TR	UG/L									50.00	N
TRACE	Molybdenum	TR	UG/L									100.00	N

Table: 39a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 16A (Surface Water, Fish Creek) Datum: 6915

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	5/15/2001	9/11/2019	63	245.00	240.00	360.00	100.00	58.60
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	5/15/2001	9/11/2019	63	13.40	12.20	38.90	1.00	9.98
ANION	Bicarbonate as HCO3	N	MG/L	8/15/2017	9/11/2019	9	270.00	289.00	330.00	157.00	62.70
ANION	Carbonate as CO3	N	MG/L	8/15/2017	9/11/2019	7	16.90	19.30	26.10	5.40	8.06
ANION	Sulfates	N	MG/L	5/15/2001	9/11/2019	75	123.00	120.00	290.00	26.00	47.80
CATION	Calcium	D	MG/L	5/15/2001	9/11/2019	63	59.70	59.10	200.00	27.40	21.70
CATION	Magnesium	D	MG/L	5/15/2001	9/11/2019	63	35.90	35.20	59.00	12.30	12.20
CATION	Sodium	D	MG/L	5/15/2001	9/11/2019	63	26.10	24.00	85.00	8.80	12.20
FIELD	Flow	N	CFS	7/28/2017	9/11/2019	29	18.64	3.72	92.28	0.25	29.73
FIELD	pH, Field	N	S.U.	11/7/2000	9/11/2019	231	8.28	8.31	8.74	7.25	0.22
FIELD	Specific Conductivity, Field	N	UMHOS/CM	11/7/2000	9/11/2019	240	587.00	560.00	4600.00	179.20	339.60
FIELD	Temperature, Field	N	DEG-C	11/7/2000	9/11/2019	222	11.68	11.00	28.80	0.10	6.35
NUTRIENT	Ammonia Nitrogen	N	MG/L	5/15/2001	9/11/2019	64	0.25	0.20	0.50	0.00	0.19
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	5/15/2001	9/11/2019	64	0.11	0.10	0.44	0.02	0.08
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	5/15/2001	9/11/2019	60	0.04	0.03	0.12	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	5/15/2001	9/11/2019	92	8.45	8.50	8.80	7.62	0.24
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	5/15/2001	9/11/2019	63	0.67	0.61	2.80	0.31	0.33
PHYSICAL	Solids, Total Suspended	N	MG/L	5/15/2001	9/11/2019	86	80.20	20.50	678.00	5.00	125.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	5/15/2001	9/11/2019	84	620.00	631.00	1900.00	205.00	212.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	5/15/2001	9/11/2019	66	448.00	407.00	3500.00	150.00	397.00
PRIMARY	Cadmium	TR	MG/L	3/31/2006	9/11/2019	48	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	5/15/2001	8/2/2011	16	0.10	0.20	0.20	0.00	0.10
PRIMARY	Selenium	TR	UG/L	5/15/2001	9/11/2019	64	1.00	0.55	4.00	0.20	0.84
SECONDARY	Iron	TR	UG/L	5/15/2001	9/11/2019	65	2300.00	1150.00	11000.00	55.00	2670.00
SECONDARY	Manganese	TR	UG/L	5/15/2001	9/11/2019	64	75.70	53.50	440.00	9.00	69.20
SECONDARY	Silver	TR	UG/L	5/15/2001	9/11/2019	64	0.50	0.30	5.00	0.00	0.80
SECONDARY	Zinc	TR	UG/L	5/15/2001	9/11/2019	64	32.00	35.00	56.00	5.00	19.00
TRACE	Molybdenum	TR	UG/L	5/15/2001	9/11/2019	63	70.00	50.00	300.00	10.00	40.00

Table: 40
Twentymile Coal, LLC
2017 Annual Hydrology Report
Water Year Monitoring Data

Site: 302 (Surface Water, Fish Creek) Datum: 6705.97

Date				6/19/2019		8/7/2019		9/11/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	129.00	Y	243.00	Y	265.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N	27.00	Y	10.40	Y
ANION	Bicarbonate as HCO3	N	MG/L	157.00	Y	297.00	Y	324.00	Y
ANION	Carbonate as CO3	N	MG/L	20.00	N	16.20	Y	6.20	Y
ANION	Sulfates	N	MG/L	60.00	Y	160.00	Y	150.00	Y
CATION	Calcium	D	MG/L	35.50	Y	75.30	Y	71.60	Y
CATION	Magnesium	D	MG/L	16.00	Y	40.10	Y	44.70	Y
CATION	Sodium	D	MG/L	8.80	Y	29.00	Y	29.60	Y
FIELD	Flow	N	CFS	92.28	Y	7.26	Y	4.59	Y
FIELD	pH, Field	N	S.U.	8.30	Y	8.40	Y	8.30	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	340.00	Y	860.00	Y	1330.00	Y
FIELD	Temperature, Field	N	DEG-C	17.20	Y	19.00	Y	14.50	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N	0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N	0.10	N	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.03	Y	0.02	Y	0.03	Y
PHYSICAL	pH, Lab	N	S.U.	8.40	Y	8.50	Y	8.50	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.31	Y	0.68	Y	0.68	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	323.00	Y	9.00	Y	12.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	332.00	Y	759.00	Y	753.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	218.00	Y	490.00	Y	506.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	Y	0.00	N	0.00	N
PRIMARY	Selenium	TR	UG/L	0.20	Y	0.40	Y	0.40	Y
SECONDARY	Iron	TR	UG/L	8100.00	Y	360.00	Y	540.00	Y
SECONDARY	Manganese	TR	UG/L	120.00	Y	40.00	Y	40.00	Y
SECONDARY	Silver	TR	UG/L	0.50	N	0.50	N	0.50	N
SECONDARY	Zinc	TR	UG/L	30.00	Y	50.00	N	50.00	N
TRACE	Molybdenum	TR	UG/L	100.00	N	100.00	N	100.00	N

Table: 40a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 302 (Surface Water, Fish Creek) Datum: 6705.97

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	7/31/1990	8/7/2019	64	315.90	323.00	508.00	5.00	81.33
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	7/31/1990	8/7/2019	61	10.10	9.00	28.20	0.00	8.44
ANION	Bicarbonate as HCO3	N	MG/L	8/7/2019	8/7/2019	1	297.00	297.00	297.00	297.00	0.00
ANION	Carbonate as CO3	N	MG/L	8/7/2019	8/7/2019	1	16.20	16.20	16.20	16.20	0.00
ANION	Sulfates	N	MG/L	7/31/1990	8/7/2019	65	273.60	190.00	1852.00	40.00	293.60
CATION	Calcium	D	MG/L	7/31/1990	8/7/2019	65	76.30	75.90	219.00	24.00	25.30
CATION	Magnesium	D	MG/L	7/31/1990	8/7/2019	65	50.10	49.60	141.00	10.00	17.40
CATION	Sodium	D	MG/L	7/31/1990	8/7/2019	65	70.70	33.20	728.00	6.00	109.00
FIELD	Flow	N	CFS	8/23/1990	8/7/2019	17	3.36	0.91	30.50	0.03	7.26
FIELD	pH, Field	N	S.U.	7/31/1990	8/7/2019	94	8.27	8.32	8.80	7.19	0.30
FIELD	Specific Conductivity, Field	N	UMHOS/CM	7/31/1990	8/7/2019	94	1151.00	860.00	3750.00	200.00	758.40
FIELD	Temperature, Field	N	DEG-C	7/31/1990	8/7/2019	94	16.60	17.70	27.00	0.10	5.55
NUTRIENT	Ammonia Nitrogen	N	MG/L	7/31/1990	8/7/2019	55	0.11	0.05	0.50	0.00	0.15
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	7/31/1990	8/7/2019	65	0.07	0.03	0.65	0.02	0.09
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	7/31/1990	8/7/2019	64	0.02	0.01	0.09	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	6/11/1997	8/7/2019	38	8.43	8.41	8.70	8.00	0.17
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	7/31/1990	8/7/2019	66	1.46	0.78	12.12	0.26	1.95
PHYSICAL	Solids, Total Suspended	N	MG/L	7/31/1990	8/7/2019	65	34.10	13.00	378.00	2.00	67.30
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	7/31/1990	8/7/2019	66	951.40	829.00	4010.00	246.00	530.20
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	7/31/1990	8/7/2019	65	738.90	560.00	5960.00	156.00	764.60
PRIMARY	Cadmium	TR	MG/L	6/13/2006	8/7/2019	13	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	7/31/1990	6/20/2003	52	0.20	0.20	0.20	0.10	0.04
PRIMARY	Selenium	TR	UG/L	7/31/1990	8/7/2019	65	1.00	1.00	4.00	0.30	0.70
SECONDARY	Iron	TR	UG/L	7/31/1990	8/7/2019	76	990.00	360.00	11900.00	60.00	1910.00
SECONDARY	Manganese	TR	UG/L	7/31/1990	8/7/2019	65	91.10	50.00	1500.00	15.00	192.00
SECONDARY	Silver	TR	UG/L	7/31/1990	8/7/2019	65	0.90	0.50	5.00	0.10	1.00
SECONDARY	Zinc	TR	UG/L	7/31/1990	8/7/2019	65	28.00	14.00	210.00	5.00	31.00
TRACE	Molybdenum	TR	UG/L	7/31/1990	8/7/2019	65	40.00	50.00	100.00	10.00	30.00

Table: 41
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 27A (Surface Water, Fish Creek) Datum: 6589.05

Date				3/26/2019		4/18/2019		5/7/2019		5/23/2019		6/20/2019		7/23/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	168.00	Y							144.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	32.00	Y							20.00	N		
ANION	Bicarbonate as HCO3	N	MG/L	205.00	Y							175.00	Y		
ANION	Carbonate as CO3	N	MG/L	19.20	Y							20.00	N		
ANION	Sulfates	N	MG/L	160.00	Y							110.00	Y		
CATION	Calcium	D	MG/L	53.60	Y							43.50	Y		
CATION	Magnesium	D	MG/L	29.10	Y							22.10	Y		
CATION	Sodium	D	MG/L	32.80	Y							17.30	Y		
FIELD	Flow	N	CFS	ICE	N	291.87	Y	96.94	Y	88.98	Y	72.72	Y	11.78	Y
FIELD	pH, Field	N	S.U.	7.70	Y			7.70	Y	8.20	Y	8.20	Y	8.10	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	710.00	Y			530.00	Y	570.00	Y	480.00	Y	906.00	Y
FIELD	Temperature, Field	N	DEG-C	2.60	Y			14.30	Y	12.50	Y	20.50	Y	25.00	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N							0.20	N		
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.11	Y							0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.03	Y							0.03	Y		
PHYSICAL	pH, Lab	N	S.U.	8.40	Y							8.40	Y		
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.91	Y							0.54	Y		
PHYSICAL	Solids, Total Suspended	N	MG/L	20.00	N							159.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	623.00	Y							459.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	404.00	Y							308.00	Y		
PRIMARY	Cadmium	TR	MG/L	0.00	N							0.00	N		
PRIMARY	Selenium	TR	UG/L	0.50	Y							0.20	Y		
SECONDARY	Iron	TR	UG/L	510.00	Y							5580.00	Y		
SECONDARY	Manganese	TR	UG/L	39.00	Y							90.00	Y		
SECONDARY	Silver	TR	UG/L	0.50	N							0.50	N		
SECONDARY	Zinc	TR	UG/L	50.00	N							20.00	Y		
TRACE	Molybdenum	TR	UG/L	100.00	N							100.00	N		

Table: 41
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 27A (Surface Water, Fish Creek) Datum: 6589.05

Date				8/7/2019		8/16/2019		8/21/2019		8/28/2019		9/5/2019		9/12/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	241.00	Y									247.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	33.60	Y									19.70	Y
ANION	Bicarbonate as HCO3	N	MG/L	294.00	Y									301.00	Y
ANION	Carbonate as CO3	N	MG/L	20.20	Y									11.80	Y
ANION	Sulfates	N	MG/L	180.00	Y									310.00	Y
CATION	Calcium	D	MG/L	72.50	Y									77.50	Y
CATION	Magnesium	D	MG/L	42.70	Y									59.60	Y
CATION	Sodium	D	MG/L	36.00	Y									66.40	Y
FIELD	Flow	N	CFS	8.34	Y	7.01	Y	3.44	Y	1.97	Y	1.56	Y	1.49	Y
FIELD	pH, Field	N	S.U.	8.50	Y	8.30	Y	8.40	Y	8.40	Y	8.30	Y	8.40	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	880.00	Y	830.00	Y	780.00	Y	1310.00	Y	1210.00	Y	1370.00	Y
FIELD	Temperature, Field	N	DEG-C	26.90	Y	21.80	Y	24.00	Y	23.20	Y	25.50	Y	18.80	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N									0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N									0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.02	Y									0.02	Y
PHYSICAL	pH, Lab	N	S.U.	8.60	Y									8.40	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.84	Y									1.40	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	14.00	Y									17.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	799.00	Y									989.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	546.00	Y									676.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	N									0.00	N
PRIMARY	Selenium	TR	UG/L	0.40	Y									0.40	Y
SECONDARY	Iron	TR	UG/L	550.00	Y									790.00	Y
SECONDARY	Manganese	TR	UG/L	50.00	Y									70.00	Y
SECONDARY	Silver	TR	UG/L	0.50	N									0.50	N
SECONDARY	Zinc	TR	UG/L	50.00	N									50.00	N
TRACE	Molybdenum	TR	UG/L	100.00	N									100.00	N

Table: 41a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 27A (Surface Water, Fish Creek) Datum: 6589.05

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	1/20/1981	9/12/2019	214	250.74	251.88	1428.00	78.00	105.05
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	3/20/1981	9/12/2019	122	13.60	12.00	84.00	0.00	11.60
ANION	Bicarbonate as HCO3	N	MG/L	8/15/2017	9/12/2019	8	293.00	262.00	613.00	175.00	138.00
ANION	Carbonate as CO3	N	MG/L	8/15/2017	9/12/2019	6	17.60	19.60	20.20	11.80	3.58
ANION	Sulfates	N	MG/L	1/20/1981	9/12/2019	218	298.40	260.00	1470.00	10.00	200.00
CATION	Calcium	D	MG/L	1/20/1981	9/12/2019	214	72.40	70.60	307.00	27.00	25.30
CATION	Magnesium	D	MG/L	1/20/1981	9/12/2019	214	50.40	50.10	232.00	13.00	21.10
CATION	Sodium	D	MG/L	1/20/1981	9/12/2019	214	59.70	46.30	390.00	8.00	50.70
FIELD	Flow	N	CFS	4/16/1985	9/12/2019	107	17.18	5.00	291.87	0.01	34.41
FIELD	pH, Field	N	S.U.	1/20/1981	9/12/2019	319	8.07	8.20	8.91	6.30	0.44
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1/20/1981	9/12/2019	320	931.40	820.00	4160.00	210.00	575.90
FIELD	Temperature, Field	N	DEG-C	1/20/1981	9/12/2019	320	14.15	14.95	29.00	0.00	7.67
NUTRIENT	Ammonia Nitrogen	N	MG/L	4/1/1981	9/12/2019	107	0.18	0.05	3.00	0.00	0.33
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	1/20/1981	9/12/2019	214	0.53	0.16	3.32	0.01	0.71
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	4/1/1981	9/12/2019	149	0.03	0.02	0.17	0.01	0.03
PHYSICAL	pH, Lab	N	S.U.	7/28/1986	9/12/2019	85	8.39	8.40	8.80	7.60	0.24
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	1/20/1981	9/12/2019	197	1.26	1.00	7.70	0.31	0.94
PHYSICAL	Solids, Total Suspended	N	MG/L	1/20/1981	9/12/2019	213	141.70	34.00	1692.00	2.00	233.30
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	7/28/1986	9/12/2019	125	935.60	850.00	2950.00	297.00	401.20
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	1/20/1981	9/12/2019	214	642.60	591.00	2660.00	182.00	293.90
PRIMARY	Cadmium	TR	MG/L	3/31/2006	9/12/2019	45	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	10/3/1986	5/21/2012	69	0.20	0.20	0.50	0.00	0.08
PRIMARY	Selenium	TR	UG/L	10/3/1986	9/12/2019	114	1.40	1.00	9.00	0.20	1.40
SECONDARY	Iron	TR	UG/L	10/3/1986	9/12/2019	114	2770.00	970.00	29900.00	220.00	4670.00
SECONDARY	Manganese	TR	UG/L	10/3/1986	9/12/2019	114	136.00	85.50	3430.00	5.00	322.00
SECONDARY	Silver	TR	UG/L	4/1/1981	9/12/2019	115	2.00	0.40	50.00	0.00	7.00
SECONDARY	Zinc	TR	UG/L	10/3/1986	9/12/2019	114	31.00	20.00	140.00	5.00	24.00
TRACE	Molybdenum	TR	UG/L	10/3/1986	9/12/2019	114	50.00	50.00	200.00	10.00	30.00

Table: 42
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 1003 (Surface Water, Fish Creek) Datum: 6572

Date				4/16/2019		4/29/2019		5/23/2019		6/19/2019		7/23/2019		8/7/2019		8/16/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	114.00	Y					135.00	Y			254.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N					20.00	N			30.40	Y		
ANION	Bicarbonate as HCO3	N	MG/L	139.00	Y					165.00	Y			310.00	Y		
ANION	Carbonate as CO3	N	MG/L	20.00	N					20.00	N			18.20	Y		
ANION	Sulfates	N	MG/L	280.00	Y					110.00	Y			200.00	Y		
CATION	Calcium	D	MG/L	51.10	Y					45.20	Y			75.10	Y		
CATION	Magnesium	D	MG/L	37.10	Y					23.00	Y			46.30	Y		
CATION	Sodium	D	MG/L	52.50	Y					18.10	Y			37.50	Y		
FIELD	Flow	N	CFS	146.26	Y	102.19	Y	81.05	Y	64.94	Y	11.13	Y	8.96	Y	7.46	Y
FIELD	pH, Field	N	S.U.	8.00	Y	7.50	Y	8.10	Y	8.20	Y	8.30	Y	8.40	Y	8.20	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	790.00	Y	610.00	Y	630.00	Y	420.00	Y	860.00	Y	820.00	Y	920.00	Y
FIELD	Temperature, Field	N	DEG-C	9.30	Y	11.20	Y	11.80	Y	19.60	Y	24.40	Y	26.70	Y	18.70	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N					0.20	N			0.20	N		
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.50	Y					0.10	N			0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.07	Y					0.05	Y			0.01	Y		
PHYSICAL	pH, Lab	N	S.U.	8.30	Y					8.30	Y			8.60	Y		
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	1.40	Y					0.55	Y			0.85	Y		
PHYSICAL	Solids, Total Suspended	N	MG/L	352.00	Y					140.00	Y			10.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	770.00	Y					469.00	Y			822.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	588.00	Y					320.00	Y			546.00	Y		
PRIMARY	Cadmium	TR	MG/L	0.00	Y					0.00	N			0.00	N		
PRIMARY	Selenium	TR	UG/L	2.50	Y					0.20	Y			0.50	Y		
SECONDARY	Iron	TR	UG/L	14200.00	Y					4560.00	Y			410.00	Y		
SECONDARY	Manganese	TR	UG/L	240.00	Y					80.00	Y			50.00	Y		
SECONDARY	Silver	TR	UG/L	0.50	N					0.50	N			0.50	N		
SECONDARY	Zinc	TR	UG/L	50.00	Y					10.00	Y			50.00	N		
TRACE	Molybdenum	TR	UG/L	100.00	N					100.00	N			100.00	N		

Table: 42
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 1003 (Surface Water, Fish Creek) Datum: 6572

Date				8/21/2019		8/28/2019		9/5/2019		9/12/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L							239.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L							20.50	Y
ANION	Bicarbonate as HCO3	N	MG/L							292.00	Y
ANION	Carbonate as CO3	N	MG/L							12.30	Y
ANION	Sulfates	N	MG/L							370.00	Y
CATION	Calcium	D	MG/L							88.90	Y
CATION	Magnesium	D	MG/L							69.00	Y
CATION	Sodium	D	MG/L							69.90	Y
FIELD	Flow	N	CFS	3.66	Y	1.69	Y	0.72	Y	2.42	Y
FIELD	pH, Field	N	S.U.	7.90	Y	8.40	Y	8.30	Y	8.40	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1030.00	Y	1090.00	Y	1330.00	Y	1160.00	Y
FIELD	Temperature, Field	N	DEG-C	21.60	Y	26.10	Y	26.60	Y	18.90	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L							0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L							0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L							0.02	Y
PHYSICAL	pH, Lab	N	S.U.							8.40	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO							1.40	Y
PHYSICAL	Solids, Total Suspended	N	MG/L							15.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM							1100.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L							756.00	Y
PRIMARY	Cadmium	TR	MG/L							0.00	N
PRIMARY	Selenium	TR	UG/L							0.40	Y
SECONDARY	Iron	TR	UG/L							660.00	Y
SECONDARY	Manganese	TR	UG/L							70.00	Y
SECONDARY	Silver	TR	UG/L							0.50	N
SECONDARY	Zinc	TR	UG/L							50.00	N
TRACE	Molybdenum	TR	UG/L							100.00	N

Table: 42a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 1003 (Surface Water, Fish Creek) Datum: 6572

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	4/5/1982	9/12/2019	231	240.56	250.00	430.00	34.16	71.43
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	5/17/1982	9/12/2019	124	12.00	11.00	38.00	0.00	8.53
ANION	Bicarbonate as HCO3	N	MG/L	4/4/2018	9/12/2019	6	240.00	247.00	331.00	139.00	81.50
ANION	Carbonate as CO3	N	MG/L	6/26/2018	9/12/2019	5	16.50	18.20	20.00	12.10	4.01
ANION	Sulfates	N	MG/L	4/5/1982	9/12/2019	322	296.80	267.50	2045.00	37.00	191.40
CATION	Calcium	D	MG/L	4/5/1982	9/12/2019	235	74.50	76.00	161.00	20.00	23.50
CATION	Magnesium	D	MG/L	4/5/1982	9/12/2019	235	50.50	50.50	147.00	11.00	21.30
CATION	Sodium	D	MG/L	4/5/1982	9/12/2019	235	58.50	48.00	286.00	9.00	41.50
FIELD	Flow	N	CFS	4/6/1984	9/12/2019	160	42.79	15.00	272.00	0.25	56.05
FIELD	pH, Field	N	S.U.	4/5/1982	9/12/2019	635	8.12	8.20	9.10	6.80	0.39
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4/5/1982	9/12/2019	665	890.93	830.00	2650.00	20.00	381.04
FIELD	Temperature, Field	N	DEG-C	4/5/1982	9/12/2019	597	12.20	11.60	29.00	0.00	7.12
NUTRIENT	Ammonia Nitrogen	N	MG/L	10/12/1982	9/12/2019	115	0.23	0.05	5.00	0.00	0.56
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	4/5/1982	9/12/2019	233	0.55	0.16	3.21	0.01	0.74
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	4/13/1982	9/12/2019	166	0.03	0.02	0.26	0.01	0.03
PHYSICAL	pH, Lab	N	S.U.	7/28/1986	9/12/2019	110	8.38	8.40	8.90	7.43	0.26
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	4/5/1982	9/12/2019	239	1.29	1.07	7.14	0.29	0.93
PHYSICAL	Solids, Total Suspended	N	MG/L	4/5/1982	9/12/2019	301	184.80	40.00	2190.00	2.00	310.80
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	7/28/1986	9/12/2019	201	929.00	894.00	2810.00	293.00	361.90
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	4/5/1982	9/12/2019	237	658.70	630.00	2190.00	200.00	294.70
PRIMARY	Cadmium	TR	MG/L	3/31/2006	9/12/2019	50	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	4/15/1987	5/21/2012	72	0.20	0.20	0.20	0.00	0.06
PRIMARY	Selenium	TR	UG/L	4/15/1987	9/12/2019	122	1.40	1.00	17.00	0.01	1.90
SECONDARY	Iron	TR	UG/L	4/15/1987	9/12/2019	122	2670.00	815.00	28700.00	100.00	4180.00
SECONDARY	Manganese	TR	UG/L	4/15/1987	9/12/2019	135	116.00	90.00	510.00	5.00	78.30
SECONDARY	Silver	TR	UG/L	4/15/1987	9/12/2019	122	0.60	0.40	5.00	0.05	1.00
SECONDARY	Zinc	TR	UG/L	4/15/1987	9/12/2019	122	29.00	20.00	100.00	5.00	20.00
TRACE	Molybdenum	TR	UG/L	4/15/1987	9/12/2019	122	50.00	50.00	100.00	10.00	30.00

Table: 43
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 307 (Surface Water, Fish Creek) Datum: 6742.29

Date				4/19/2019		5/7/2019		5/23/2019		6/19/2019		7/23/2019		8/7/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	47.39	Y	87.77	Y	63.68	Y	92.28	Y	9.50	Y	7.37	Y
FIELD	pH, Field	N	S.U.	7.80	Y	7.90	Y	8.10	Y	8.30	Y	8.60	Y	8.50	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	620.00	Y	400.00	Y	330.00	Y	340.00	Y	740.00	Y	580.00	Y
FIELD	Temperature, Field	N	DEG-C	6.10	Y	13.80	Y	12.80	Y	17.20	Y	28.40	Y	22.10	Y

* Flow obtained from upstream site 16A

Table: 43
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 307 (Surface Water, Fish Creek) Datum: 6742.29

Date				8/16/2019		8/21/2019		8/28/2019		9/5/2019		9/11/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	7.95	Y	4.68	Y	2.91	Y	1.91	Y	4.59	Y
FIELD	pH, Field	N	S.U.	8.60	Y	8.40	Y	8.40	Y	8.50	Y	8.30	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	660.00	Y	740.00	Y	780.00	Y	930.00	Y	1330.00	Y
FIELD	Temperature, Field	N	DEG-C	22.70	Y	26.10	Y	23.40	Y	25.30	Y	14.50	Y

* Flow obtained from upstream site 16A

Table: 43a

Twentymile Coal, LLC

2019 Annual Hydrology Report

Period of Record Summary of Water Quality

Site: 307 (Surface Water, Fish Creek) Datum: 6742.29

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	9/28/1994	8/10/2010	2	298.00	298.00	317.00	278.00	27.60
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	9/28/1994	8/10/2010	2	17.00	17.00	33.00	0.00	23.00
ANION	Sulfates	N	MG/L	9/28/1994	8/10/2010	2	134.00	134.00	140.00	128.00	8.49
CATION	Calcium	D	MG/L	9/28/1994	8/10/2010	2	67.90	67.90	70.00	65.80	2.97
CATION	Magnesium	D	MG/L	9/28/1994	8/10/2010	2	45.90	45.90	47.70	44.00	2.62
CATION	Sodium	D	MG/L	9/28/1994	8/10/2010	2	32.00	32.00	33.00	30.90	1.48
FIELD	Flow	N	CFS	7/28/2017	7/28/2017	1	3.31	3.31	3.31	3.31	0.00
FIELD	pH, Field	N	S.U.	7/29/1993	7/28/2017	83	8.19	8.30	8.74	7.05	0.34
FIELD	Specific Conductivity, Field	N	UMHOS/CM	7/29/1993	7/28/2017	83	1272.00	934.00	3820.00	340.00	904.90
FIELD	Temperature, Field	N	DEG-C	7/29/1993	7/28/2017	83	12.30	12.90	25.00	0.10	7.11
NUTRIENT	Ammonia Nitrogen	N	MG/L	4/5/1999	8/10/2010	9	0.16	0.08	0.50	0.05	0.16
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	9/28/1994	8/10/2010	2	0.06	0.06	0.10	0.02	0.06
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	9/28/1994	8/10/2010	2	0.03	0.03	0.05	0.01	0.03
PHYSICAL	pH, Lab	N	S.U.	4/5/1999	8/10/2010	12	8.36	8.45	8.80	7.80	0.33
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	9/28/1994	8/10/2010	2	0.73	0.73	0.75	0.71	0.03
PHYSICAL	Solids, Total Suspended	N	MG/L	9/28/1994	8/10/2010	10	82.70	23.50	396.00	5.00	126.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	9/28/1994	8/10/2010	13	937.20	839.00	2220.00	315.00	475.20
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	9/28/1994	8/10/2010	10	667.00	628.00	1640.00	180.00	415.00
PRIMARY	Cadmium	TR	MG/L	8/10/2010	8/10/2010	1	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	9/28/1994	9/28/1994	1	0.20	0.20	0.20	0.20	0.00
PRIMARY	Selenium	TR	UG/L	9/28/1994	8/10/2010	2	0.80	0.80	1.00	0.50	0.40
SECONDARY	Iron	TR	UG/L	7/29/1993	8/10/2010	27	1030.00	290.00	11600.00	150.00	2300.00
SECONDARY	Manganese	TR	UG/L	9/28/1994	8/10/2010	2	37.00	37.00	60.00	14.00	33.00
SECONDARY	Silver	TR	UG/L	9/28/1994	8/10/2010	2	0.40	0.40	0.50	0.30	0.10
SECONDARY	Zinc	TR	UG/L	9/28/1994	8/10/2010	2	30.00	30.00	50.00	10.00	30.00
TRACE	Molybdenum	TR	UG/L	9/28/1994	8/10/2010	2	30.00	30.00	50.00	10.00	30.00

* Flow obtained from upstream site 16A

Table: 44
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 305 (Surface Water, Fish Creek) Datum: 6598.45

Date				5/23/2019		6/20/2019		7/23/2019		8/7/2019		9/19/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	160.00	Y			264.00	Y	223.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	10.30	Y			30.60	Y	34.30	Y		
ANION	Bicarbonate as HCO3	N	MG/L	195.00	Y			323.00	Y	272.00	Y		
ANION	Carbonate as CO3	N	MG/L	20.00	N			18.40	Y	20.60	Y		
ANION	Sulfates	N	MG/L	180.00	Y			170.00	Y	160.00	Y		
CATION	Calcium	D	MG/L	58.20	Y			84.00	Y	72.40	Y		
CATION	Magnesium	D	MG/L	35.30	Y			47.20	Y	42.60	Y		
CATION	Sodium	D	MG/L	31.60	Y			40.70	Y	36.50	Y		
FIELD	Flow	N	CFS	96.60	Y	57.55	Y	9.43	Y	12.13	Y	1.22	Y
FIELD	pH, Field	N	S.U.	8.10	Y			8.50	Y	8.50	Y	8.40	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	590.00	Y			810.00	Y	740.00	Y	1320.00	Y
FIELD	Temperature, Field	N	DEG-C	12.10	Y			28.60	Y	27.60	Y	16.00	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N			0.20	N	0.20	N		
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.02	Y			0.10	N	0.10	N		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.02	Y			0.01	Y	0.02	Y		
PHYSICAL	pH, Lab	N	S.U.	8.50	Y			8.50	Y	8.60	Y		
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.82	Y			0.89	Y	0.85	Y		
PHYSICAL	Solids, Total Suspended	N	MG/L	57.00	Y			25.00	Y	13.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	662.00	Y			643.00	Y	766.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	482.00	Y			574.00	Y	514.00	Y		
PRIMARY	Cadmium	TR	MG/L	0.00	Y			0.00	N	0.00	N		
PRIMARY	Selenium	TR	UG/L	0.70	Y			0.50	Y	0.50	Y		
SECONDARY	Iron	TR	UG/L	2500.00	Y			560.00	Y	480.00	Y		
SECONDARY	Manganese	TR	UG/L	50.00	Y			60.00	Y	40.00	Y		
SECONDARY	Silver	TR	UG/L	0.50	N			0.50	N	0.50	N		
SECONDARY	Zinc	TR	UG/L	50.00	N			50.00	N	10.00	Y		
TRACE	Molybdenum	TR	UG/L	100.00	N			100.00	N	100.00	N		

Table: 44a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 305 (Surface Water, Fish Creek) Datum: 6598.45

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	8/15/1994	8/7/2019	47	268.00	273.00	672.00	122.00	86.90
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	8/15/1994	8/7/2019	47	14.80	14.00	34.30	1.00	7.99
ANION	Bicarbonate as HCO3	N	MG/L	6/26/2018	8/7/2019	4	280.00	298.00	329.00	195.00	62.00
ANION	Carbonate as CO3	N	MG/L	6/26/2018	8/7/2019	4	19.00	19.20	20.60	17.00	1.62
ANION	Sulfates	N	MG/L	8/15/1994	8/7/2019	48	272.00	230.00	1790.00	62.00	244.00
CATION	Calcium	D	MG/L	8/15/1994	8/7/2019	47	72.70	64.80	386.00	37.00	49.10
CATION	Magnesium	D	MG/L	8/15/1994	8/7/2019	47	52.30	48.90	279.00	17.00	36.60
CATION	Sodium	D	MG/L	8/15/1994	8/7/2019	47	55.60	44.90	172.00	12.00	35.10
FIELD	Flow	N	CFS	6/13/2017	9/19/2019	8	23.10	6.87	96.60	1.22	35.13
FIELD	pH, Field	N	S.U.	7/29/1994	9/19/2019	35	8.20	8.25	8.55	7.00	0.32
FIELD	Specific Conductivity, Field	N	UMHOS/CM	7/29/1994	9/19/2019	36	937.70	861.00	1840.00	297.00	338.50
FIELD	Temperature, Field	N	DEG-C	7/29/1994	9/19/2019	36	14.50	14.20	29.00	0.00	8.79
NUTRIENT	Ammonia Nitrogen	N	MG/L	8/5/2003	8/7/2019	45	0.28	0.20	0.50	0.00	0.19
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	8/15/1994	8/7/2019	47	0.11	0.10	0.52	0.02	0.12
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	8/15/1994	8/7/2019	44	0.04	0.03	0.32	0.01	0.05
PHYSICAL	pH, Lab	N	S.U.	8/5/2003	8/7/2019	49	8.48	8.50	8.90	7.90	0.22
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	8/15/1994	8/7/2019	47	1.24	1.00	4.05	0.39	0.74
PHYSICAL	Solids, Total Suspended	N	MG/L	8/15/1994	8/7/2019	47	89.20	22.00	880.00	6.00	171.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	8/15/1994	8/7/2019	51	901.90	827.00	3390.00	310.00	429.80
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	8/15/1994	8/7/2019	47	634.00	560.00	3140.00	130.00	414.00
PRIMARY	Cadmium	TR	MG/L	6/12/2006	8/7/2019	37	0.00	0.00	0.01	0.00	0.00
PRIMARY	Mercury	TR	UG/L	8/15/1994	8/2/2011	10	0.08	0.00	0.20	0.00	0.10
PRIMARY	Selenium	TR	UG/L	8/15/1994	8/7/2019	47	1.40	0.60	10.00	0.20	1.90
SECONDARY	Iron	TR	UG/L	8/15/1994	8/7/2019	47	3390.00	1000.00	28800.00	390.00	6020.00
SECONDARY	Manganese	TR	UG/L	8/15/1994	8/7/2019	47	177.00	67.00	3270.00	30.00	473.00
SECONDARY	Silver	TR	UG/L	8/15/1994	8/7/2019	47	0.30	0.30	0.50	0.06	0.09
SECONDARY	Zinc	TR	UG/L	8/15/1994	8/7/2019	47	41.00	50.00	100.00	5.00	25.00
TRACE	Molybdenum	TR	UG/L	8/15/1994	8/7/2019	47	70.00	50.00	100.00	10.00	30.00

Table: 45
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: SW13 (Surface Water, Fish Creek) Datum: 6685.68

Date				March		5/23/2019		8/7/2019	
Type	**Parameter**	**Fraction**	**Units**	**FROZEN**		**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L			149.00	Y	257.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L			20.00	N	27.40	Y
ANION	Bicarbonate as HCO3	N	MG/L			182.00	Y	314.00	Y
ANION	Carbonate as CO3	N	MG/L			20.00	N	16.50	Y
ANION	Sulfates	N	MG/L			110.00	Y	150.00	Y
CATION	Calcium	D	MG/L			46.60	Y	75.00	Y
CATION	Magnesium	D	MG/L			23.40	Y	40.80	Y
CATION	Sodium	D	MG/L			20.00	Y	30.40	Y
FIELD	Flow	N	CFS			71.92	Y	8.81	Y
FIELD	pH, Field	N	S.U.			8.30	Y	8.50	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM			490.00	Y	760.00	Y
FIELD	Temperature, Field	N	DEG-C			12.30	Y	22.10	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L			0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L			0.10	N	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L			0.02	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.			8.50	Y	8.60	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO			0.60	Y	0.71	Y
PHYSICAL	Solids, Total Suspended	N	MG/L			100.00	Y	10.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM			487.00	Y	761.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L			340.00	Y	510.00	Y
PRIMARY	Cadmium	TR	MG/L			0.00	Y	0.00	N
PRIMARY	Selenium	TR	UG/L			0.50	Y	0.40	Y
SECONDARY	Iron	TR	UG/L			3600.00	Y	410.00	Y
SECONDARY	Manganese	TR	UG/L			80.00	Y	30.00	Y
SECONDARY	Silver	TR	UG/L			0.50	N	0.50	N
SECONDARY	Zinc	TR	UG/L			10.00	Y	50.00	N
TRACE	Molybdenum	TR	UG/L			100.00	N	100.00	N

Table: 45a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: SW13 (Surface Water, Fish Creek) Datum: 6685.68

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	8/29/2006	8/7/2019	32	251.00	255.00	400.00	123.00	61.20
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	8/29/2006	8/7/2019	32	15.60	16.80	34.90	1.00	8.52
ANION	Bicarbonate as HCO3	N	MG/L	6/27/2018	8/7/2019	4	291.00	312.00	357.00	182.00	75.50
ANION	Carbonate as CO3	N	MG/L	6/27/2018	8/7/2019	4	16.90	18.30	20.90	10.00	4.95
ANION	Sulfates	N	MG/L	8/29/2006	8/7/2019	32	160.00	150.00	460.00	5.00	84.00
CATION	Calcium	D	MG/L	8/29/2006	8/7/2019	32	62.20	62.70	93.00	32.80	14.00
CATION	Magnesium	D	MG/L	8/29/2006	8/7/2019	32	40.40	40.60	150.00	15.30	23.30
CATION	Sodium	D	MG/L	8/29/2006	8/7/2019	32	39.70	29.20	249.00	11.20	43.10
FIELD	Flow	N	CFS	7/28/2017	8/7/2019	5	17.11	3.35	71.92	0.05	30.82
FIELD	pH, Field	N	S.U.	6/20/2017	8/7/2019	6	8.32	8.32	8.68	8.03	0.25
FIELD	Specific Conductivity, Field	N	UMHOS/CM	6/20/2017	8/7/2019	6	892.00	800.00	1340.00	490.00	313.00
FIELD	Temperature, Field	N	DEG-C	6/20/2017	8/7/2019	6	19.70	19.50	28.00	12.30	5.32
NUTRIENT	Ammonia Nitrogen	N	MG/L	8/29/2006	8/7/2019	32	0.29	0.20	0.50	0.00	0.18
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	8/29/2006	8/7/2019	32	0.11	0.10	0.52	0.02	0.10
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	8/29/2006	8/7/2019	28	0.04	0.03	0.16	0.01	0.03
PHYSICAL	pH, Lab	N	S.U.	8/29/2006	8/7/2019	34	8.54	8.50	8.80	8.17	0.14
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	8/29/2006	8/7/2019	32	0.96	0.71	5.86	0.39	0.99
PHYSICAL	Solids, Total Suspended	N	MG/L	8/29/2006	8/7/2019	32	101.00	20.50	920.00	5.00	183.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	8/29/2006	8/7/2019	34	728.00	743.00	1560.00	335.00	236.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	8/29/2006	8/7/2019	32	476.00	477.00	1100.00	200.00	169.00
PRIMARY	Cadmium	TR	MG/L	8/29/2006	8/7/2019	30	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	7/22/2010	8/2/2011	2	0.00	0.00	0.00	0.00	0.00
PRIMARY	Selenium	TR	UG/L	8/29/2006	8/7/2019	32	0.68	0.50	2.00	0.20	0.48
SECONDARY	Iron	TR	UG/L	8/29/2006	8/7/2019	32	3360.00	900.00	27400.00	120.00	5550.00
SECONDARY	Manganese	TR	UG/L	8/29/2006	8/7/2019	32	79.20	52.50	539.00	11.00	98.30
SECONDARY	Silver	TR	UG/L	8/29/2006	8/7/2019	32	0.30	0.30	0.50	0.06	0.09
SECONDARY	Zinc	TR	UG/L	8/29/2006	8/7/2019	32	44.00	50.00	160.00	5.00	35.00
TRACE	Molybdenum	TR	UG/L	8/29/2006	8/7/2019	32	70.00	80.00	100.00	10.00	30.00

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Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: SW14 (Surface Water, Fish Creek) Datum: 6650.39

Date				March		5/23/2019		8/7/2019	
Type	**Parameter**	**Fraction**	**Units**	**FROZEN**		**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L			150.00	Y	245.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L			20.00	N	29.20	Y
ANION	Bicarbonate as HCO3	N	MG/L			183.00	Y	299.00	Y
ANION	Carbonate as CO3	N	MG/L			20.00	N	17.50	Y
ANION	Sulfates	N	MG/L			110.00	Y	170.00	Y
CATION	Calcium	D	MG/L			46.70	Y	75.30	Y
CATION	Magnesium	D	MG/L			23.70	Y	41.30	Y
CATION	Sodium	D	MG/L			20.70	Y	31.70	Y
FIELD	Flow	N	CFS			65.91	Y	8.10	Y
FIELD	pH, Field	N	S.U.			8.20	Y	8.50	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM			460.00	Y	730.00	Y
FIELD	Temperature, Field	N	DEG-C			13.10	Y	21.40	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L			0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L			0.10	N	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L			0.02	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.			8.50	Y	8.60	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO			0.62	Y	0.74	Y
PHYSICAL	Solids, Total Suspended	N	MG/L			113.00	Y	16.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM			498.00	Y	779.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L			352.00	Y	510.00	Y
PRIMARY	Cadmium	TR	MG/L			0.00	Y	0.00	N
PRIMARY	Selenium	TR	UG/L			0.60	Y	0.40	Y
SECONDARY	Iron	TR	UG/L			3810.00	Y	480.00	Y
SECONDARY	Manganese	TR	UG/L			70.00	Y	30.00	Y
SECONDARY	Silver	TR	UG/L			0.50	N	0.50	N
SECONDARY	Zinc	TR	UG/L			10.00	Y	50.00	N
TRACE	Molybdenum	TR	UG/L			100.00	N	100.00	N

Table: 46a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: SW14 (Surface Water, Fish Creek) Datum: 6650.39

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	4/4/2007	8/7/2019	29	264.00	266.00	374.00	125.00	56.30
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	4/4/2007	8/7/2019	29	18.70	18.50	35.00	3.00	7.42
ANION	Bicarbonate as HCO3	N	MG/L	6/27/2018	8/7/2019	4	285.00	308.00	340.00	183.00	69.90
ANION	Carbonate as CO3	N	MG/L	6/27/2018	8/7/2019	4	17.20	18.80	20.60	10.80	4.49
ANION	Sulfates	N	MG/L	4/4/2007	8/7/2019	29	180.00	170.00	440.00	50.00	97.00
CATION	Calcium	D	MG/L	4/4/2007	8/7/2019	29	64.20	65.80	101.00	32.10	15.40
CATION	Magnesium	D	MG/L	4/4/2007	8/7/2019	29	42.00	41.80	72.50	15.00	13.90
CATION	Sodium	D	MG/L	4/4/2007	8/7/2019	29	43.80	32.00	235.00	10.90	43.40
FIELD	Flow	N	CFS	7/28/2017	8/7/2019	4	20.21	6.39	65.91	2.13	30.57
FIELD	pH, Field	N	S.U.	7/28/2017	8/7/2019	5	8.29	8.20	8.69	8.04	0.29
FIELD	Specific Conductivity, Field	N	UMHOS/CM	7/28/2017	8/7/2019	5	922.00	830.00	1430.00	460.00	379.00
FIELD	Temperature, Field	N	DEG-C	7/28/2017	8/7/2019	5	19.80	21.20	26.60	13.10	5.16
NUTRIENT	Ammonia Nitrogen	N	MG/L	4/4/2007	8/7/2019	29	0.33	0.21	0.50	0.05	0.17
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	4/4/2007	8/7/2019	29	0.12	0.10	0.83	0.02	0.14
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	4/4/2007	8/7/2019	26	0.03	0.02	0.07	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	4/4/2007	8/7/2019	30	8.60	8.60	8.90	8.30	0.14
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	4/4/2007	8/7/2019	30	1.02	0.76	5.58	0.40	0.97
PHYSICAL	Solids, Total Suspended	N	MG/L	4/4/2007	8/7/2019	29	99.30	22.00	1020.00	9.00	208.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	4/4/2007	8/7/2019	29	771.00	767.00	1500.00	329.00	247.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	4/4/2007	8/7/2019	29	513.00	490.00	1050.00	210.00	184.00
PRIMARY	Cadmium	TR	MG/L	4/4/2007	8/7/2019	29	0.00	0.00	0.01	0.00	0.00
PRIMARY	Selenium	TR	UG/L	4/4/2007	8/7/2019	29	0.52	0.40	1.40	0.30	0.26
SECONDARY	Iron	TR	UG/L	4/4/2007	8/7/2019	29	3100.00	1190.00	26700.00	320.00	5700.00
SECONDARY	Manganese	TR	UG/L	4/4/2007	8/7/2019	29	79.70	50.00	518.00	12.00	101.00
SECONDARY	Silver	TR	UG/L	4/4/2007	8/7/2019	29	0.30	0.30	0.50	0.08	0.08
SECONDARY	Zinc	TR	UG/L	4/4/2007	8/7/2019	29	50.00	50.00	130.00	10.00	24.00
TRACE	Molybdenum	TR	UG/L	4/4/2007	8/7/2019	29	70.00	50.00	100.00	10.00	30.00

Table: 47
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: SW15 (Surface Water, Fish Creek) Datum: 6628.4

Date				5/23/2019		8/7/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	158.00	Y	250.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	11.00	Y	27.10	Y
ANION	Bicarbonate as HCO3	N	MG/L	193.00	Y	305.00	Y
ANION	Carbonate as CO3	N	MG/L	20.00	N	16.20	Y
ANION	Sulfates	N	MG/L	180.00	Y	170.00	Y
CATION	Calcium	D	MG/L	54.80	Y	70.40	Y
CATION	Magnesium	D	MG/L	32.40	Y	40.30	Y
CATION	Sodium	D	MG/L	28.80	Y	33.90	Y
FIELD	Flow	N	CFS	69.08	Y	10.01	Y
FIELD	pH, Field	N	S.U.	8.10	Y	8.50	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	480.00	Y	700.00	Y
FIELD	Temperature, Field	N	DEG-C	14.40	Y	25.50	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.03	Y	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.02	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.	8.50	Y	8.60	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.77	Y	0.81	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	63.00	Y	36.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	619.00	Y	766.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	436.00	Y	512.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	N	0.00	N
PRIMARY	Selenium	TR	UG/L	0.60	Y	0.50	Y
SECONDARY	Iron	TR	UG/L	2670.00	Y	1240.00	Y
SECONDARY	Manganese	TR	UG/L	60.00	Y	60.00	Y
SECONDARY	Silver	TR	UG/L	0.50	N	0.50	N
SECONDARY	Zinc	TR	UG/L	50.00	N	10.00	Y
TRACE	Molybdenum	TR	UG/L	100.00	N	100.00	N

Table: 47a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: SW15 (Surface Water, Fish Creek) Datum: 6628.4

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	4/4/2007	8/7/2019	30	246.00	248.00	374.00	155.00	53.90
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	4/4/2007	8/7/2019	30	14.50	14.50	33.90	2.00	9.23
ANION	Bicarbonate as HCO3	N	MG/L	6/26/2018	8/7/2019	3	266.00	299.00	305.00	193.00	63.00
ANION	Carbonate as CO3	N	MG/L	6/26/2018	8/7/2019	3	18.80	20.00	20.30	16.20	2.29
ANION	Sulfates	N	MG/L	4/4/2007	8/7/2019	30	170.00	170.00	440.00	5.00	86.00
CATION	Calcium	D	MG/L	4/4/2007	8/7/2019	30	60.70	62.00	83.30	39.80	11.20
CATION	Magnesium	D	MG/L	4/4/2007	8/7/2019	30	39.40	39.20	69.00	20.30	12.40
CATION	Sodium	D	MG/L	4/4/2007	8/7/2019	30	42.50	32.20	234.00	15.20	40.20
FIELD	Flow	N	CFS	6/20/2017	8/7/2019	5	17.02	2.27	69.08	1.67	29.31
FIELD	pH, Field	N	S.U.	6/20/2017	8/7/2019	5	8.37	8.38	8.65	8.10	0.22
FIELD	Specific Conductivity, Field	N	UMHOS/CM	6/20/2017	8/7/2019	5	816.00	840.00	1140.00	480.00	246.00
FIELD	Temperature, Field	N	DEG-C	6/20/2017	8/7/2019	5	22.60	24.60	28.30	14.40	5.41
NUTRIENT	Ammonia Nitrogen	N	MG/L	4/4/2007	8/7/2019	30	0.35	0.50	0.50	0.05	0.18
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	4/4/2007	8/7/2019	30	0.20	0.10	3.46	0.02	0.62
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	4/4/2007	8/7/2019	25	0.03	0.03	0.09	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	4/4/2007	8/7/2019	31	8.58	8.60	8.90	8.30	0.14
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	4/4/2007	8/7/2019	30	1.03	0.79	5.55	0.48	0.93
PHYSICAL	Solids, Total Suspended	N	MG/L	4/4/2007	8/7/2019	30	79.10	24.50	480.00	7.00	111.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	4/4/2007	8/7/2019	31	752.00	744.00	1510.00	414.00	226.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	4/4/2007	8/7/2019	30	493.00	490.00	1050.00	270.00	157.00
PRIMARY	Cadmium	TR	MG/L	4/4/2007	8/7/2019	29	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	7/22/2010	7/22/2010	1	0.00	0.00	0.00	0.00	0.00
PRIMARY	Selenium	TR	UG/L	4/4/2007	8/7/2019	30	0.60	0.50	2.00	0.20	0.41
SECONDARY	Iron	TR	UG/L	4/4/2007	8/7/2019	30	2730.00	1170.00	13600.00	390.00	3280.00
SECONDARY	Manganese	TR	UG/L	4/4/2007	8/7/2019	30	77.20	60.00	250.00	18.00	50.70
SECONDARY	Silver	TR	UG/L	4/4/2007	8/7/2019	30	0.30	0.30	0.50	0.06	0.08
SECONDARY	Zinc	TR	UG/L	4/4/2007	8/7/2019	30	38.00	50.00	50.00	9.50	16.00
TRACE	Molybdenum	TR	UG/L	4/4/2007	8/7/2019	30	70.00	50.00	100.00	20.00	30.00

Table: 48
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 301 (Surface Water, Trout Creek) Datum: 6666.9

Flow too high, not safe.

Date				4/16/2019		5/23/2019		6/19/2019		7/23/2019		8/7/2019		9/19/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	121.00	Y			61.40	Y	137.00	Y	124.00	Y	90.40	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	5.10	Y			20.00	N	20.00	N	6.00	Y	20.00	N
ANION	Bicarbonate as HCO3	N	MG/L	148.00	Y			74.90	Y	168.00	Y	151.00	Y	110.00	Y
ANION	Carbonate as CO3	N	MG/L	3.10	Y			20.00	N	20.00	N	3.60	Y	20.00	N
ANION	Sulfates	N	MG/L	250.00	Y			50.00	Y	140.00	Y	140.00	Y	80.00	Y
CATION	Calcium	D	MG/L	69.90	Y			21.70	Y	50.90	Y	50.70	Y	32.80	Y
CATION	Magnesium	D	MG/L	41.60	Y			10.70	Y	27.80	Y	28.60	Y	17.70	Y
CATION	Sodium	D	MG/L	13.70	Y			3.40	Y	6.50	Y	6.30	Y	4.50	Y
FIELD	Flow	N	CFS	51.57	Y	96.60	Y	-	N	59.38	Y	45.13	Y	38.10	Y
FIELD	pH, Field	N	S.U.	7.90	Y	7.90	Y	8.20	Y	8.40	Y	8.50	Y	8.70	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	760.00	Y	620.00	Y	180.00	Y	420.00	Y	480.00	Y	510.00	Y
FIELD	Temperature, Field	N	DEG-C	9.10	Y	14.00	Y	14.50	Y	25.00	Y	23.10	Y	16.60	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N			0.20	N	0.20	N	0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.10	N			0.10	N	0.10	N	0.10	N	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.01	Y			0.03	Y	0.02	Y	0.02	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.	8.40	Y			8.10	Y	8.30	Y	8.40	Y	8.20	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.32	Y			0.15	Y	0.18	Y	0.18	Y	0.16	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	11.00	Y			56.00	Y	15.00	Y	7.00	Y	20.00	N
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	699.00	Y			214.00	Y	346.00	Y	506.00	Y	316.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	506.00	Y			144.00	Y	336.00	Y	338.00	Y	218.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	N			0.00	N	0.00	N	0.00	N	0.00	N
PRIMARY	Selenium	TR	UG/L	0.60	Y			0.30	N	0.30	N	0.20	Y	0.30	N
SECONDARY	Iron	TR	UG/L	680.00	Y			2260.00	Y	700.00	Y	570.00	Y	350.00	Y
SECONDARY	Manganese	TR	UG/L	60.00	Y			100.00	Y	60.00	Y	40.00	Y	50.00	N
SECONDARY	Silver	TR	UG/L	0.50	N			0.50	N	0.50	N	0.50	N	0.50	N
SECONDARY	Zinc	TR	UG/L	50.00	N			50.00	N	50.00	N	50.00	N	50.00	N
TRACE	Molybdenum	TR	UG/L	100.00	N			100.00	N	100.00	N	100.00	N	100.00	N

Table: 48a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 301 (Surface Water, Trout Creek) Datum: 6666.9

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	7/14/1987	9/19/2019	120	147.60	150.00	430.00	0.00	47.86
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	7/31/1990	9/19/2019	113	8.20	6.00	20.00	0.00	7.08
ANION	Bicarbonate as HCO3	N	MG/L	8/15/2017	9/19/2019	11	159.00	168.00	199.00	74.90	37.50
ANION	Carbonate as CO3	N	MG/L	8/15/2017	9/19/2019	8	10.60	7.30	20.00	3.10	8.15
ANION	Sulfates	N	MG/L	7/14/1987	9/19/2019	206	169.00	150.00	702.00	5.00	97.20
CATION	Calcium	D	MG/L	7/14/1987	9/19/2019	122	56.00	55.70	220.00	20.40	24.80
CATION	Magnesium	D	MG/L	7/14/1987	9/19/2019	122	30.00	29.20	100.00	8.70	13.60
CATION	Sodium	D	MG/L	7/14/1987	9/19/2019	122	9.37	8.55	40.00	3.00	5.24
FIELD	Flow	N	CFS	6/26/1987	9/19/2019	57	33.75	24.00	147.20	1.00	32.73
FIELD	pH, Field	N	S.U.	2/3/1987	9/19/2019	338	8.30	8.34	9.20	6.70	0.33
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2/3/1987	9/19/2019	343	593.61	541.00	1370.00	150.00	201.79
FIELD	Temperature, Field	N	DEG-C	2/3/1987	9/19/2019	300	12.20	12.70	27.20	0.10	7.09
NUTRIENT	Ammonia Nitrogen	N	MG/L	7/14/1987	9/19/2019	113	0.21	0.06	3.00	0.00	0.33
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	7/14/1987	9/19/2019	121	0.09	0.07	2.63	0.02	0.24
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	7/14/1987	9/19/2019	116	0.02	0.02	0.11	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	6/12/1997	9/19/2019	108	8.33	8.40	9.00	6.80	0.32
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	7/14/1987	9/19/2019	122	0.24	0.23	1.00	0.00	0.10
PHYSICAL	Solids, Total Suspended	N	MG/L	7/14/1987	9/19/2019	188	17.40	10.00	154.00	2.00	21.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	7/14/1987	9/19/2019	190	538.00	520.00	1270.00	189.00	196.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	7/14/1987	9/19/2019	123	355.60	354.00	1064.00	128.00	141.20
PRIMARY	Cadmium	TR	MG/L	3/31/2006	9/19/2019	55	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	7/14/1987	5/21/2012	65	0.17	0.20	1.10	0.00	0.13
PRIMARY	Selenium	TR	UG/L	7/14/1987	9/19/2019	120	1.00	1.00	10.00	0.10	1.00
SECONDARY	Iron	TR	UG/L	7/14/1987	9/19/2019	121	701.00	470.00	6350.00	90.00	758.00
SECONDARY	Manganese	TR	UG/L	1/15/1987	9/19/2019	142	50.20	40.00	272.00	10.00	37.20
SECONDARY	Silver	TR	UG/L	7/14/1987	9/19/2019	120	0.80	0.40	20.00	0.10	2.00
SECONDARY	Zinc	TR	UG/L	7/14/1987	9/19/2019	119	34.00	38.00	220.00	5.00	30.00
TRACE	Molybdenum	TR	UG/L	7/14/1987	9/19/2019	120	50.00	50.00	100.00	10.00	30.00

Table: 49
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 69 (Surface Water, Trout Creek) Datum: 6586.44

Date				3/26/2019		4/16/2019		5/23/2019		6/19/2019		7/23/2019		8/7/2019		9/19/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	139.00	Y					72.60	Y	136.00	Y	131.00	Y	99.60	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	6.00	Y					20.00	N	20.00	N	12.10	Y	20.00	N
ANION	Bicarbonate as HCO3	N	MG/L	170.00	Y					88.60	Y	166.00	Y	160.00	Y	121.00	Y
ANION	Carbonate as CO3	N	MG/L	3.60	Y					20.00	N	20.00	N	7.30	Y	20.00	N
ANION	Sulfates	N	MG/L	270.00	Y					90.00	Y	170.00	Y	190.00	Y	120.00	Y
CATION	Calcium	D	MG/L	68.90	Y					28.80	Y	57.30	Y	58.60	Y	39.20	Y
CATION	Magnesium	D	MG/L	45.10	Y					15.70	Y	32.80	Y	34.70	Y	23.70	Y
CATION	Sodium	D	MG/L	34.60	Y					6.30	Y	11.80	Y	11.30	Y	7.90	Y
FIELD	Flow	N	CFS	ICE	N	79.11	Y	121.32	Y	307.21	Y	64.74	Y	56.74	Y	60.07	Y
FIELD	pH, Field	N	S.U.	7.80	Y	7.80	Y	8.00	Y	8.10	Y	8.00	Y	8.60	Y	8.10	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	820.00	Y	1010.00	Y	940.00	Y	240.00	Y	510.00	Y	560.00	Y	860.00	Y
FIELD	Temperature, Field	N	DEG-C	2.60	Y	9.70	Y	11.00	Y	16.20	Y	21.00	Y	26.60	Y	18.20	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N					0.20	N	0.20	N	0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.03	Y					0.06	Y	0.10	N	0.10	N	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.04	Y					0.03	Y	0.02	Y	0.02	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.	8.40	Y					8.20	Y	8.30	Y	8.50	Y	8.30	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	0.81	Y					0.24	Y	0.31	Y	0.29	Y	0.25	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	7.00	Y					132.00	Y	15.00	Y	14.00	Y	20.00	N
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	821.00	Y					309.00	Y	417.00	Y	590.00	Y	406.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	566.00	Y					200.00	Y	392.00	Y	414.00	Y	284.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	N					0.00	N	0.00	N	0.00	N	0.00	N
PRIMARY	Selenium	TR	UG/L	0.10	Y					0.30	N	0.10	Y	0.20	Y	0.30	N
SECONDARY	Iron	TR	UG/L	520.00	Y					2130.00	Y	680.00	Y	660.00	Y	340.00	Y
SECONDARY	Manganese	TR	UG/L	59.00	Y					90.00	Y	40.00	Y	40.00	Y	50.00	N
SECONDARY	Silver	TR	UG/L	0.50	N					0.50	N	0.50	N	0.50	N	0.50	N
SECONDARY	Zinc	TR	UG/L	50.00	N					50.00	N	50.00	N	50.00	N	50.00	N
TRACE	Molybdenum	TR	UG/L	100.00	N					100.00	N	100.00	N	100.00	N	100.00	N

Table: 49a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 69 (Surface Water, Trout Creek) Datum: 6586.44

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	10/20/1980	9/19/2019	258	165.60	164.70	363.56	14.64	46.15
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	10/20/1980	9/19/2019	153	12.30	9.60	86.40	0.00	11.20
ANION	Bicarbonate as HCO3	N	MG/L	8/16/2017	9/19/2019	11	163.00	170.00	207.00	88.60	33.50
ANION	Carbonate as CO3	N	MG/L	8/16/2017	9/19/2019	8	13.80	14.40	20.00	3.60	6.24
ANION	Sulfates	N	MG/L	10/20/1980	9/19/2019	349	218.00	190.00	704.00	7.00	128.00
CATION	Calcium	D	MG/L	10/20/1980	9/19/2019	263	70.40	62.00	1100.00	15.00	69.70
CATION	Magnesium	D	MG/L	10/20/1980	9/19/2019	263	35.90	33.00	99.00	10.00	16.90
CATION	Sodium	D	MG/L	10/20/1980	9/19/2019	263	21.50	16.00	170.00	1.00	17.50
FIELD	Flow	N	CFS	3/14/1979	9/19/2019	212	57.40	27.15	333.00	0.60	71.25
FIELD	pH, Field	N	S.U.	3/14/1979	9/19/2019	711	8.10	8.23	9.01	6.30	0.50
FIELD	Specific Conductivity, Field	N	UMHOS/CM	5/1/1979	9/19/2019	754	597.35	600.00	1333.97	17.00	230.89
FIELD	Temperature, Field	N	DEG-C	3/14/1979	9/19/2019	666	11.30	10.30	29.90	0.00	6.78
NUTRIENT	Ammonia Nitrogen	N	MG/L	10/20/1980	9/19/2019	124	0.20	0.07	3.00	0.00	0.32
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	10/20/1980	9/19/2019	261	0.45	0.10	3.94	0.01	0.71
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	10/20/1980	9/19/2019	131	0.02	0.02	0.35	0.01	0.03
PHYSICAL	pH, Lab	N	S.U.	6/12/1997	9/19/2019	116	8.43	8.40	9.20	7.20	0.29
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	10/20/1980	9/19/2019	254	0.50	0.41	3.60	0.04	0.33
PHYSICAL	Solids, Total Suspended	N	MG/L	3/14/1979	9/19/2019	388	75.10	20.00	1640.00	1.00	158.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	6/12/1987	9/19/2019	198	646.00	610.00	1400.00	226.00	227.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3/14/1979	9/19/2019	321	463.20	430.00	1370.00	100.00	217.10
PRIMARY	Cadmium	TR	MG/L	3/31/2006	9/19/2019	61	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	6/12/1987	5/21/2012	66	0.20	0.20	0.50	0.00	0.08
PRIMARY	Selenium	TR	UG/L	6/12/1987	9/19/2019	127	0.96	1.00	10.00	0.00	1.20
SECONDARY	Iron	TR	UG/L	6/12/1987	9/19/2019	127	968.00	460.00	7640.00	50.00	1260.00
SECONDARY	Manganese	TR	UG/L	6/12/1987	9/19/2019	127	72.50	45.00	460.00	8.00	75.40
SECONDARY	Silver	TR	UG/L	6/12/1987	9/19/2019	127	1.00	0.40	50.00	0.00	4.00
SECONDARY	Zinc	TR	UG/L	6/12/1987	9/19/2019	127	33.70	23.00	566.00	5.00	51.50
TRACE	Molybdenum	TR	UG/L	6/12/1987	9/19/2019	127	50.00	50.00	300.00	10.00	40.00

Table: 50
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitioring Data

Site: 1005 (Surface Water, Trout Creek) Datum: 6568.88

Date				4/16/2019		5/23/2019		6/19/2019		7/23/2019		8/7/2019		9/19/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	142.00	Y			88.30	Y	154.00	Y	148.00	Y	112.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	2.30	Y			20.00	N	5.80	Y	6.40	Y	20.00	N
ANION	Bicarbonate as HCO3	N	MG/L	173.00	Y			108.00	Y	188.00	Y	180.00	Y	137.00	Y
ANION	Carbonate as CO3	N	MG/L	20.00	N			20.00	N	3.50	Y	3.90	Y	20.00	N
ANION	Sulfates	N	MG/L	310.00	Y			110.00	Y	180.00	Y	170.00	Y	130.00	Y
CATION	Calcium	D	MG/L	63.30	Y			31.60	Y	61.90	Y	60.50	Y	41.50	Y
CATION	Magnesium	D	MG/L	43.00	Y			17.00	Y	35.60	Y	36.30	Y	25.50	Y
CATION	Sodium	D	MG/L	47.80	Y			8.40	Y	16.20	Y	15.40	Y	9.90	Y
FIELD	Flow	N	CFS	262.04	Y	199.70	Y	404.15	Y	72.15	Y	58.30	Y	51.96	Y
FIELD	pH, Field	N	S.U.	7.90	Y	7.90	Y	8.30	Y	7.10	Y	8.60	Y	7.00	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	940.00	Y	810.00	Y	380.00	Y	640.00	Y	590.00	Y	720.00	Y
FIELD	Temperature, Field	N	DEG-C	9.50	Y	9.50	Y	17.10	Y	19.10	Y	6.10	Y	16.30	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N			0.20	N	0.20	N	0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.35	Y			0.10	N	0.10	N	0.10	N	0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.06	Y			0.04	Y	0.02	Y	0.02	Y	0.02	Y
PHYSICAL	pH, Lab	N	S.U.	8.30	Y			8.30	Y	8.40	Y	8.40	Y	8.30	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	1.10	Y			0.30	Y	0.41	Y	0.39	Y	0.30	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	316.00	Y			86.00	Y	12.00	Y	11.00	Y	6.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	833.00	Y			342.00	Y	399.00	Y	628.00	Y	440.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	652.00	Y			232.00	Y	422.00	Y	432.00	Y	306.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	Y			0.00	N	0.00	N	0.00	N	0.00	N
PRIMARY	Selenium	TR	UG/L	1.90	Y			0.30	N	0.20	Y	0.20	Y	0.10	Y
SECONDARY	Iron	TR	UG/L	10400.00	Y			3260.00	Y	610.00	Y	630.00	Y	370.00	Y
SECONDARY	Manganese	TR	UG/L	210.00	Y			100.00	Y	40.00	Y	40.00	Y	20.00	Y
SECONDARY	Silver	TR	UG/L	0.50	N			0.50	N	0.50	N	0.50	N	0.50	N
SECONDARY	Zinc	TR	UG/L	30.00	Y			50.00	N	50.00	N	10.00	Y	50.00	N
TRACE	Molybdenum	TR	UG/L	100.00	N			100.00	N	100.00	N	100.00	N	100.00	N

Table: 50a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 1005 (Surface Water, Trout Creek) Datum: 6568.88

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	6/16/1994	9/19/2019	110	170.50	173.50	280.00	44.00	40.46
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	6/16/1994	9/19/2019	110	9.61	9.00	21.90	0.00	6.74
ANION	Bicarbonate as HCO3	N	MG/L	8/16/2017	9/19/2019	11	173.00	177.00	220.00	108.00	29.60
ANION	Carbonate as CO3	N	MG/L	8/16/2017	9/19/2019	8	12.40	11.30	20.00	3.50	7.01
ANION	Sulfates	N	MG/L	6/16/1994	9/19/2019	197	227.00	200.00	2200.00	31.00	171.00
CATION	Calcium	D	MG/L	6/16/1994	9/19/2019	110	61.80	61.70	140.00	10.90	19.60
CATION	Magnesium	D	MG/L	6/16/1994	9/19/2019	110	37.20	35.90	83.30	0.70	14.00
CATION	Sodium	D	MG/L	6/16/1994	9/19/2019	110	35.50	19.10	1060.00	7.00	100.00
FIELD	Flow	N	CFS	7/27/2017	9/19/2019	15	92.93	51.96	404.15	3.21	114.49
FIELD	pH, Field	N	S.U.	6/16/1994	9/19/2019	558	8.30	8.31	8.94	7.00	0.25
FIELD	Specific Conductivity, Field	N	UMHOS/CM	6/16/1994	9/19/2019	639	680.39	672.00	1558.00	31.00	180.75
FIELD	Temperature, Field	N	DEG-C	6/16/1994	9/19/2019	497	11.20	10.10	29.00	0.00	6.45
NUTRIENT	Ammonia Nitrogen	N	MG/L	6/7/1995	9/19/2019	107	0.27	0.20	3.00	0.00	0.42
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	6/16/1994	9/19/2019	110	0.24	0.10	14.40	0.02	1.39
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	6/16/1994	9/19/2019	103	0.03	0.02	0.12	0.01	0.02
PHYSICAL	pH, Lab	N	S.U.	6/12/1997	9/19/2019	121	8.42	8.49	9.20	7.00	0.30
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	6/16/1994	9/19/2019	110	1.39	0.47	84.10	0.00	7.97
PHYSICAL	Solids, Total Suspended	N	MG/L	6/16/1994	9/19/2019	110	45.70	15.50	480.00	2.00	82.80
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	6/16/1994	9/19/2019	182	680.00	667.00	1310.00	242.00	205.00
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	6/16/1994	9/19/2019	110	465.00	436.00	1040.00	110.00	171.00
PRIMARY	Cadmium	TR	MG/L	3/31/2006	9/19/2019	65	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	6/16/1994	5/21/2012	45	0.19	0.20	1.20	0.00	0.17
PRIMARY	Selenium	TR	UG/L	6/16/1994	9/19/2019	110	0.97	0.75	10.00	0.10	1.20
SECONDARY	Iron	TR	UG/L	6/16/1994	9/19/2019	110	1580.00	575.00	19300.00	130.00	2610.00
SECONDARY	Manganese	TR	UG/L	6/16/1994	9/19/2019	110	86.40	51.50	1100.00	5.00	119.00
SECONDARY	Silver	TR	UG/L	6/16/1994	9/19/2019	110	0.60	0.30	5.00	0.07	1.00
SECONDARY	Zinc	TR	UG/L	6/16/1994	9/19/2019	110	45.00	50.00	1400.00	5.00	130.00
TRACE	Molybdenum	TR	UG/L	6/16/1994	9/19/2019	110	60.00	50.00	100.00	10.00	30.00

Table: 51
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 29 (Surface Water, Middle Creek) Datum: 6666.85

Date				3/26/2019		4/16/2019		4/29/2019		5/23/2019		6/19/2019		7/23/2019		8/7/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	341.00	Y							236.00	Y			207.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	15.00	Y							18.20	Y			8.70	Y
ANION	Bicarbonate as HCO3	N	MG/L	415.00	Y							289.00	Y			252.00	Y
ANION	Carbonate as CO3	N	MG/L	9.00	Y							10.90	Y			5.20	Y
ANION	Sulfates	N	MG/L	1310.00	Y							590.00	Y			370.00	Y
CATION	Calcium	D	MG/L	209.00	Y							137.00	Y			93.20	Y
CATION	Magnesium	D	MG/L	172.00	Y							100.00	Y			65.20	Y
CATION	Sodium	D	MG/L	226.00	Y							57.30	Y			40.00	Y
FIELD	Flow	N	CFS	ICE	N	22.85	Y	49.29	Y	34.98	Y	21.77	Y	7.74	Y	5.92	Y
FIELD	pH, Field	N	S.U.	7.90	Y	7.80	Y	7.90	Y	8.00	Y	8.30	Y	8.30	Y	8.30	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2970.00	Y	1670.00	Y	910.00	Y	1500.00	Y	1360.00	Y	980.00	Y	1010.00	Y
FIELD	Temperature, Field	N	DEG-C	2.70	Y	10.20	Y	8.60	Y	12.90	Y	19.90	Y	26.50	Y	21.10	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N							0.20	N			0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.16	Y							0.10	N			0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.15	Y							0.04	Y			0.05	Y
PHYSICAL	pH, Lab	N	S.U.	8.40	Y							8.40	Y			8.40	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	2.80	Y							0.92	Y			0.79	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	26.00	Y							56.00	Y			54.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	2750.00	Y							1440.00	Y			1060.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	2440.00	Y							1130.00	Y			784.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	N							0.00	N			0.00	Y
PRIMARY	Selenium	TR	UG/L	0.60	Y							0.20	Y			0.40	Y
SECONDARY	Iron	TR	UG/L	910.00	Y							1580.00	Y			1690.00	Y
SECONDARY	Manganese	TR	UG/L	370.00	Y							110.00	Y			120.00	Y
SECONDARY	Silver	TR	UG/L	0.50	N							0.50	N			0.50	N
SECONDARY	Zinc	TR	UG/L	50.00	N							50.00	N			10.00	Y
TRACE	Molybdenum	TR	UG/L	100.00	N							100.00	N			100.00	N

Table: 51
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 29 (Surface Water, Middle Creek) Datum: 6666.85

Date				8/16/2019		8/21/2019		8/28/2019		9/6/2019		9/12/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L									199.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L									10.30	Y
ANION	Bicarbonate as HCO3	N	MG/L									243.00	Y
ANION	Carbonate as CO3	N	MG/L									6.20	Y
ANION	Sulfates	N	MG/L									630.00	Y
CATION	Calcium	D	MG/L									127.00	Y
CATION	Magnesium	D	MG/L									107.00	Y
CATION	Sodium	D	MG/L									55.10	Y
FIELD	Flow	N	CFS	5.76	Y	4.37	Y	2.93	Y	2.92	Y	4.15	Y
FIELD	pH, Field	N	S.U.	8.10	Y	8.40	Y	8.40	Y	7.00	Y	8.40	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1250.00	Y	1160.00	Y	1460.00	Y	1720.00	Y	1480.00	Y
FIELD	Temperature, Field	N	DEG-C	19.10	Y	23.70	Y	21.00	Y	14.30	Y	17.40	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L									0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L									0.10	N
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L									0.06	Y
PHYSICAL	pH, Lab	N	S.U.									8.50	Y
PHYSICAL	Sodium Adsorption Ratio	N	RATIO									0.88	Y
PHYSICAL	Solids, Total Suspended	N	MG/L									34.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM									1410.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L									1070.00	Y
PRIMARY	Cadmium	TR	MG/L									0.00	N
PRIMARY	Selenium	TR	UG/L									0.30	Y
SECONDARY	Iron	TR	UG/L									1410.00	Y
SECONDARY	Manganese	TR	UG/L									90.00	Y
SECONDARY	Silver	TR	UG/L									0.50	N
SECONDARY	Zinc	TR	UG/L									50.00	N
TRACE	Molybdenum	TR	UG/L									100.00	N

Table: 51a
Twentymile Coal, LLC
2019 Annual Hydrology Report
Period of Record Summary of Water Quality

Site: 29 (Surface Water, Middle Creek) Datum: 6666.85

Type	Parameter	Fraction	Units	Start Date	End Date	Sample Count	Average	Median	MAX	MIN	STDEV
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	10/20/1980	9/12/2019	287	270.63	270.00	660.00	91.00	81.39
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	3/25/1981	9/12/2019	158	10.40	7.45	74.40	0.00	10.70
ANION	Bicarbonate as HCO3	N	MG/L	8/15/2017	9/12/2019	9	277.00	267.00	415.00	209.00	58.80
ANION	Carbonate as CO3	N	MG/L	8/15/2017	9/12/2019	8	5.98	4.95	10.90	3.60	2.63
ANION	Sulfates	N	MG/L	10/20/1980	9/12/2019	362	577.10	508.50	3700.00	5.00	381.90
CATION	Calcium	D	MG/L	10/20/1980	9/12/2019	287	132.00	121.00	402.00	21.00	62.40
CATION	Magnesium	D	MG/L	10/20/1980	9/12/2019	287	79.80	67.00	242.00	18.00	44.70
CATION	Sodium	D	MG/L	10/20/1980	9/12/2019	287	70.00	57.00	590.00	13.00	56.90
FIELD	Flow	N	CFS	8/14/1984	9/12/2019	131	9.24	6.70	49.29	0.14	9.43
FIELD	pH, Field	N	S.U.	3/9/1979	9/12/2019	567	7.92	8.00	18.80	6.20	0.62
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4/25/1979	9/12/2019	568	1319.00	1245.00	3750.00	250.00	642.30
FIELD	Temperature, Field	N	DEG-C	3/26/1979	9/12/2019	558	11.93	12.15	27.00	0.00	6.82
NUTRIENT	Ammonia Nitrogen	N	MG/L	10/20/1980	9/12/2019	127	0.19	0.05	5.00	0.00	0.47
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	10/20/1980	9/12/2019	272	0.80	0.36	6.50	0.01	1.03
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	10/20/1980	9/12/2019	155	0.04	0.02	0.60	0.01	0.07
PHYSICAL	pH, Lab	N	S.U.	4/7/1997	9/12/2019	105	8.35	8.40	8.90	7.82	0.22
PHYSICAL	Sodium Adsorption Ratio	N	RATIO	10/20/1980	9/12/2019	286	1.19	0.94	9.30	0.35	0.88
PHYSICAL	Solids, Total Suspended	N	MG/L	3/9/1979	9/12/2019	408	143.00	45.00	4560.00	2.00	337.00
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	4/15/1987	9/12/2019	189	1574.00	1510.00	3400.00	450.00	590.60
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3/9/1979	9/12/2019	340	1042.00	880.00	3860.00	101.00	593.00
PRIMARY	Cadmium	TR	MG/L	3/31/2006	9/12/2019	55	0.00	0.00	0.00	0.00	0.00
PRIMARY	Mercury	TR	UG/L	3/17/1986	5/21/2012	92	0.20	0.20	0.40	0.00	0.07
PRIMARY	Selenium	TR	UG/L	3/17/1986	9/12/2019	148	1.40	1.00	10.00	0.10	1.70
SECONDARY	Iron	TR	UG/L	3/3/1986	9/12/2019	150	1700.00	835.00	14700.00	20.00	2220.00
SECONDARY	Manganese	TR	UG/L	3/3/1986	9/12/2019	150	280.00	237.00	1100.00	30.00	173.00
SECONDARY	Silver	TR	UG/L	4/15/1987	9/12/2019	126	0.59	0.40	5.00	0.06	0.95
SECONDARY	Zinc	TR	UG/L	3/17/1986	9/12/2019	147	31.00	20.00	150.00	5.00	25.00
TRACE	Molybdenum	TR	UG/L	3/17/1986	9/12/2019	147	50.00	50.00	200.00	10.00	40.00

Table: 52
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 303-1 (5863031) Datum: 6605

Date				4/22/2019		9/19/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	505.00	Y	592.00	Y
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N	20.00	N
ANION	Bicarbonate as HCO3	N	MG/L	616.00	Y	722.00	Y
ANION	Carbonate as CO3	N	MG/L	20.00	N	20.00	N
ANION	Sulfates	N	MG/L	1910.00	Y	2400.00	Y
CATION	Calcium	D	MG/L	388.00	Y	458.00	Y
CATION	Magnesium	D	MG/L	284.00	Y	365.00	Y
CATION	Sodium	D	MG/L	105.00	Y	165.00	Y
FIELD	Flow	N	CFS	0.01	Y	0.00	Y
FIELD	pH, Field	N	S.U.	6.98	Y	7.01	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2940.00	Y	4210.00	Y
FIELD	Temperature, Field	N	DEG-C	11.80	Y	14.10	Y
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N	0.20	N
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	0.27	Y	0.27	Y
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.02	Y	0.01	Y
PHYSICAL	pH, Lab	N	S.U.	8.10	Y	8.00	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	5.00	Y	6.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	3390.00	Y	3990.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3320.00	Y	3800.00	Y
PRIMARY	Cadmium	TR	MG/L	0.00	Y	0.00	Y
PRIMARY	Selenium	TR	UG/L	0.50	Y	0.30	N
SECONDARY	Iron	TR	UG/L	130.00	Y	700.00	Y
SECONDARY	Manganese	TR	UG/L	410.00	Y	410.00	Y
SECONDARY	Silver	TR	UG/L	1.00	N	0.50	N
SECONDARY	Zinc	TR	UG/L	50.00	Y	50.00	N
TRACE	Molybdenum	TR	UG/L	200.00	N	100.00	N

Table: 53
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

SITE: SW1 (SPRING SW-1, SW MINING DISTRICT) Datum: 6970

Date				4/22/2019		9/19/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**		
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L	191.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L	20.00	N		
ANION	Bicarbonate as HCO3	N	MG/L	233.00	Y		
ANION	Carbonate as CO3	N	MG/L	20.00	N		
ANION	Sulfates	N	MG/L	30.00	Y		
CATION	Calcium	D	MG/L	56.30	Y		
CATION	Magnesium	D	MG/L	19.90	Y		
CATION	Sodium	D	MG/L	5.20	Y		
FIELD	Flow	N	CFS	0.03	Y	No	Flow
FIELD	pH, Field	N	S.U.	7.31	Y		
FIELD	Specific Conductivity, Field	N	UMHOS/CM	470.00	Y		
FIELD	Temperature, Field	N	DEG-C	7.20	Y		
NUTRIENT	Ammonia Nitrogen	N	MG/L	0.20	N		
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L	4.33	Y		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L	0.02	Y		
PHYSICAL	pH, Lab	N	S.U.	8.40	Y		
PHYSICAL	Solids, Total Suspended	N	MG/L	20.00	N		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	435.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	280.00	Y		
PRIMARY	Cadmium	TR	MG/L	0.00	N		
PRIMARY	Selenium	TR	UG/L	0.50	Y		
SECONDARY	Iron	TR	UG/L	80.00	N		
SECONDARY	Manganese	TR	UG/L	50.00	N		
SECONDARY	Silver	TR	UG/L	0.50	N		
SECONDARY	Zinc	TR	UG/L	50.00	N		
TRACE	Molybdenum	TR	UG/L	100.00	N		

Table: 54
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

SITE: SW2 (SPRING SW-2, SW MINING DISTRICT) Datum: 6940

Date				4/22/2019		9/19/2019	
Type	**Parameter**	**Fraction**	**Units**	**No Flow**		**No Flow**	
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L				
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L				
ANION	Bicarbonate as HCO3	N	MG/L				
ANION	Carbonate as CO3	N	MG/L				
ANION	Sulfates	N	MG/L				
CATION	Calcium	D	MG/L				
CATION	Magnesium	D	MG/L				
CATION	Sodium	D	MG/L				
FIELD	Flow	N	CFS	**No Flow**		**No Flow**	
FIELD	pH, Field	N	S.U.				
FIELD	Specific Conductivity, Field	N	UMHOS/CM				
FIELD	Temperature, Field	N	DEG-C				
NUTRIENT	Ammonia Nitrogen	N	MG/L				
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L				
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L				
PHYSICAL	pH, Lab	N	S.U.				
PHYSICAL	Solids, Total Suspended	N	MG/L				
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM				
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L				
PRIMARY	Cadmium	TR	MG/L				
PRIMARY	Selenium	TR	UG/L				
SECONDARY	Iron	TR	UG/L				
SECONDARY	Manganese	TR	UG/L				
SECONDARY	Silver	TR	UG/L				
SECONDARY	Zinc	TR	UG/L				
TRACE	Molybdenum	TR	UG/L				

Table: 55
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: NPDES 115, Mine Discharge Datum: 6777.58

Site 115 did not discharge in 2019.

Table: 56
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

SITE: NPDES Site 84, Mine Discharge, Pond D

Date				10/4/2018		10/11/2018		10/18/2018		10/25/2018		10/30/2018		10/31/2018		11/7/2018	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.01	Y	0.03	Y	0.03	Y	0.02	Y	0.01	Y	0.02	Y	0.01	Y
FIELD	pH, Field	N	S.U.	8.50	Y	8.30	Y	8.70	Y	8.50	Y	8.50	Y	8.40	Y	7.10	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4970.00	Y	4770.00	Y	4790.00	Y	4550.00	Y	4700.00	Y	4720.00	Y	4760.00	Y
FIELD	Temperature, Field	N	DEG-C	14.40	Y	9.00	Y	8.20	Y	14.20	Y	11.30	Y	9.30	Y	5.00	Y
PHYSICAL	pH, Lab	N	S.U.	8.60	Y					8.70	Y					8.60	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N			0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	15.00	Y	6.00	Y	10.00	Y	7.00	Y	6.00	Y			6.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM									5050.00	Y				
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L									3920.00	Y				
PRIMARY	Chromium	PD	MG/L					0.00	N								
PRIMARY	Chromium-6	D	MG/L					0.02	N								
PRIMARY	Lead	PD	MG/L					0.00	Y								
PRIMARY	Mercury	T	UG/L									1.00	N				
PRIMARY	Selenium	PD	UG/L					1.60	Y								
SECONDARY	Arsenic	T	MG/L					0.00	Y								
SECONDARY	Copper	PD	UG/L									100.00	N				
SECONDARY	Iron	T	UG/L									50.00	Y				
SECONDARY	Iron	TR	UG/L	200.00	Y					30.00	Y					80.00	Y
SECONDARY	Nickel	PD	UG/L					53.00	Y								
SECONDARY	Zinc	PD	UG/L					50.00	N								

Table: 56
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

SITE: NPDES Site 84, Mine Discharge, Pond D

Date				11/14/2018		11/19/2018		11/27/2018		12/5/2018		12/12/2018		12/20/2018		12/27/2018	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.01	Y	0.01	Y	0.02	Y	0.02	Y	0.02	Y	0.03	Y	0.09	Y
FIELD	pH, Field	N	S.U.	7.50	Y	8.30	Y	8.00	Y	7.60	Y	8.30	Y	8.40	Y	8.40	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	5040.00	Y	4960.00	Y	5040.00	Y	5040.00	Y	5190.00	Y	5170.00	Y	5210.00	Y
FIELD	Temperature, Field	N	DEG-C	5.60	Y	6.30	Y	4.60	Y	0.80	Y	0.80	Y	3.60	Y	3.40	Y
PHYSICAL	pH, Lab	N	S.U.									8.50	Y	8.50	Y	8.60	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N			0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	5.00	Y			30.00	Y	17.00	Y	6.00	Y	8.00	Y	36.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM														
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L														
PRIMARY	Chromium	PD	MG/L	0.00	N					0.00	N						
PRIMARY	Chromium-6	D	MG/L	0.02	N					0.02	N						
PRIMARY	Lead	PD	MG/L	0.00	Y					0.00	Y						
PRIMARY	Mercury	T	UG/L														
PRIMARY	Selenium	PD	UG/L	1.70	Y					3.90	Y						
SECONDARY	Arsenic	T	MG/L	0.00	Y					0.00	Y						
SECONDARY	Copper	PD	UG/L														
SECONDARY	Iron	T	UG/L														
SECONDARY	Iron	TR	UG/L									50.00	N	50.00	Y	980.00	Y
SECONDARY	Nickel	PD	UG/L	52.00	Y					54.00	Y						
SECONDARY	Zinc	PD	UG/L	50.00	N					20.00	Y						

Table: 56
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

SITE: NPDES Site 84, Mine Discharge, Pond D

Date				1/3/2019		1/10/2019		1/16/2019		1/23/2019		1/30/2019		2/7/2019		2/13/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.14	Y	0.19	Y	0.02	Y	0.04	Y	0.07	Y	0.05	Y	0.04	Y
FIELD	pH, Field	N	S.U.	8.50	Y	8.50	Y	8.30	Y	8.60	Y	8.50	Y	8.60	Y	7.90	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	5070.00	Y	4840.00	Y	5320.00	Y	5480.00	Y	5520.00	Y	5200.00	Y	5160.00	Y
FIELD	Temperature, Field	N	DEG-C	2.10	Y	3.00	Y	2.80	Y	0.80	Y	1.10	Y	3.70	Y	3.60	Y
PHYSICAL	pH, Lab	N	S.U.	8.60	Y					8.60	Y			8.50	Y		
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	66.00	Y	8.00	Y	37.00	Y	30.00	Y	13.00	Y	43.00	Y	53.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM														
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L														
PRIMARY	Chromium	PD	MG/L					0.00	N							0.00	N
PRIMARY	Chromium-6	D	MG/L					0.02	N							0.02	N
PRIMARY	Lead	PD	MG/L					0.00	Y							0.00	Y
PRIMARY	Mercury	T	UG/L														
PRIMARY	Selenium	PD	UG/L					1.00	Y							0.90	Y
SECONDARY	Arsenic	T	MG/L					0.00	Y							0.00	Y
SECONDARY	Copper	PD	UG/L														
SECONDARY	Iron	T	UG/L														
SECONDARY	Iron	TR	UG/L	940.00	Y					360.00	Y			550.00	Y		
SECONDARY	Nickel	PD	UG/L					57.00	Y							53.00	Y
SECONDARY	Zinc	PD	UG/L					50.00	N							10.00	Y

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SITE: NPDES Site 84, Mine Discharge, Pond D

Date				2/21/2019		2/28/2019		3/7/2019		3/13/2019		3/15/2019		3/20/2019		3/27/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.02	Y	0.15	Y	0.23	Y	0.07	Y	0.09	Y	0.09	Y	0.23	Y
FIELD	pH, Field	N	S.U.	8.30	Y	8.40	Y	8.10	Y	8.20	Y			8.10	Y	8.10	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	5150.00	Y	4330.00	Y	4220.00	Y	4430.00	Y			4010.00	Y	2660.00	Y
FIELD	Temperature, Field	N	DEG-C	2.30	Y	6.10	Y	4.90	Y	4.30	Y			2.30	Y	6.70	Y
PHYSICAL	pH, Lab	N	S.U.	8.50	Y			8.40	Y								
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N			0.50	N		
PHYSICAL	Solids, Total Suspended	N	MG/L	20.00	N	20.00	Y	16.00	Y	13.00	Y			6.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM											3500.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L											2710.00	Y		
PRIMARY	Chromium	PD	MG/L							0.00	N						
PRIMARY	Chromium-6	D	MG/L							0.02	N						
PRIMARY	Lead	PD	MG/L							0.00	Y						
PRIMARY	Mercury	T	UG/L											1.00	N		
PRIMARY	Selenium	PD	UG/L							1.80	Y						
SECONDARY	Arsenic	T	MG/L							0.00	Y						
SECONDARY	Copper	PD	UG/L											100.00	N		
SECONDARY	Iron	T	UG/L											150.00	Y		
SECONDARY	Iron	TR	UG/L	570.00	Y			370.00	Y								
SECONDARY	Nickel	PD	UG/L							46.00	Y						
SECONDARY	Zinc	PD	UG/L							50.00	N						

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Twentymile Coal, LLC
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Water Year Monitoring Data

SITE: NPDES Site 84, Mine Discharge, Pond D

Date				4/4/2019		4/11/2019		4/18/2019		4/24/2019		5/2/2019		5/9/2019		5/16/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.35	Y	0.76	Y	0.62	Y	1.76	Y	1.98	Y	1.04	Y	0.91	Y
FIELD	pH, Field	N	S.U.	8.00	Y	8.20	Y	8.10	Y	8.00	Y	7.90	Y	8.00	Y	8.00	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3820.00	Y	4170.00	Y	4070.00	Y	4280.00	Y	4070.00	Y	4240.00	Y	4000.00	Y
FIELD	Temperature, Field	N	DEG-C	10.90	Y	7.80	Y	12.90	Y	15.60	Y	13.20	Y	11.80	Y	16.30	Y
PHYSICAL	pH, Lab	N	S.U.	8.40	Y			8.50	Y			8.40	Y				
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	7.00	Y	27.00	Y	16.00	Y	9.00	Y	10.00	Y	11.00	Y	10.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM											4350.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L											3940.00	Y		
PRIMARY	Chromium	PD	MG/L			0.00	N									0.00	N
PRIMARY	Chromium-6	D	MG/L			0.02	N									0.02	N
PRIMARY	Lead	PD	MG/L			0.00	Y									0.00	Y
PRIMARY	Mercury	T	UG/L											1.00	N		
PRIMARY	Selenium	PD	UG/L			10.10	Y									5.50	Y
SECONDARY	Arsenic	T	MG/L			0.00	Y									0.00	Y
SECONDARY	Copper	PD	UG/L											100.00	N		
SECONDARY	Iron	T	UG/L											70.00	Y		
SECONDARY	Iron	TR	UG/L	330.00	Y			410.00	Y			180.00	Y				
SECONDARY	Nickel	PD	UG/L			20.00	Y									29.00	Y
SECONDARY	Zinc	PD	UG/L			50.00	N									50.00	N

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SITE: NPDES Site 84, Mine Discharge, Pond D

Date				5/22/2019		5/30/2019		6/5/2019		6/13/2019		6/20/2019		6/26/2019		7/2/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	1.30	Y	1.26	Y	0.91	Y	0.19	Y	0.09	Y	0.83	Y	0.43	Y
FIELD	pH, Field	N	S.U.	7.90	Y	8.00	Y	8.10	Y	8.20	Y	8.30	Y	8.10	Y	8.10	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3750.00	Y	3670.00	Y	3750.00	Y	3990.00	Y	4250.00	Y	4120.00	Y	4650.00	Y
FIELD	Temperature, Field	N	DEG-C	12.40	Y	16.90	Y	21.30	Y	19.10	Y	20.70	Y	24.40	Y	22.40	Y
PHYSICAL	pH, Lab	N	S.U.	8.40	Y	8.30	Y	8.40	Y			8.40	Y			8.40	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	10.00	Y	11.00	Y	8.00	Y	11.00	Y	20.00	N	9.00	Y	10.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM														
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L														
PRIMARY	Chromium	PD	MG/L							0.00	N						
PRIMARY	Chromium-6	D	MG/L							0.02	N						
PRIMARY	Lead	PD	MG/L							0.00	Y						
PRIMARY	Mercury	T	UG/L														
PRIMARY	Selenium	PD	UG/L							5.80	Y						
SECONDARY	Arsenic	T	MG/L							0.00	Y						
SECONDARY	Copper	PD	UG/L														
SECONDARY	Iron	T	UG/L														
SECONDARY	Iron	TR	UG/L	50.00	Y	90.00	Y	50.00	Y			60.00	Y			40.00	Y
SECONDARY	Nickel	PD	UG/L							22.00	Y						
SECONDARY	Zinc	PD	UG/L							50.00	N						

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SITE: NPDES Site 84, Mine Discharge, Pond D

Date				7/10/2019		7/18/2019		7/24/2019		7/31/2019		8/7/2019		8/15/2019		8/22/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.23	Y	0.00	Y	0.09	Y	0.00	Y	0.19	Y	0.21	Y	0.15	Y
FIELD	pH, Field	N	S.U.	8.10	Y	8.10	Y	8.30	Y	8.10	Y	8.30	Y	8.50	Y	8.30	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4240.00	Y	4910.00	Y	4560.00	Y	4900.00	Y	4920.00	Y	4860.00	Y	4780.00	Y
FIELD	Temperature, Field	N	DEG-C	28.80	Y	20.50	Y	25.20	Y	21.50	Y	20.10	Y	24.40	Y	20.60	Y
PHYSICAL	pH, Lab	N	S.U.			8.30	Y					8.30	Y			8.40	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	6.00	Y	5.00	Y	8.00	Y	10.00	Y	6.00	Y	5.00	Y	20.00	N
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					2420.00	Y								
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					4250.00	Y								
PRIMARY	Chromium	PD	MG/L	0.00	N									0.00	N		
PRIMARY	Chromium-6	D	MG/L	0.02	N									0.02	N		
PRIMARY	Lead	PD	MG/L	0.00	N									0.00	N		
PRIMARY	Mercury	T	UG/L					1.00	N								
PRIMARY	Selenium	PD	UG/L	5.40	Y									3.50	Y		
SECONDARY	Arsenic	T	MG/L	0.00	Y									0.00	Y		
SECONDARY	Copper	PD	UG/L					300.00	N								
SECONDARY	Iron	T	UG/L					400.00	N								
SECONDARY	Iron	TR	UG/L			80.00	N					120.00	Y			80.00	N
SECONDARY	Nickel	PD	UG/L	18.00	Y									24.00	Y		
SECONDARY	Zinc	PD	UG/L	50.00	N									50.00	N		

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Twentymile Coal, LLC
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SITE: NPDES Site 84, Mine Discharge, Pond D

Date				8/28/2019		9/5/2019		9/11/2019		9/18/2019		9/26/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.23	Y	0.30	Y	0.07	Y	0.00	Y	0.07	Y
FIELD	pH, Field	N	S.U.	8.30	Y	8.10	Y	8.10	Y	7.30	Y	8.40	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4770.00	Y	4780.00	Y	5080.00	Y	5030.00	Y	4560.00	Y
FIELD	Temperature, Field	N	DEG-C	24.30	Y	21.50	Y	14.00	Y	13.40	Y	16.20	Y
PHYSICAL	pH, Lab	N	S.U.			8.40	Y			8.20	Y		
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	3.30	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	7.00	Y	14.00	Y	6.00	Y	7.00	Y	5.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM										
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L										
PRIMARY	Chromium	PD	MG/L					0.00	N				
PRIMARY	Chromium-6	D	MG/L					0.02	N				
PRIMARY	Lead	PD	MG/L					0.00	Y				
PRIMARY	Mercury	T	UG/L										
PRIMARY	Selenium	PD	UG/L					3.20	Y				
SECONDARY	Arsenic	T	MG/L					0.00	Y				
SECONDARY	Copper	PD	UG/L										
SECONDARY	Iron	T	UG/L										
SECONDARY	Iron	TR	UG/L			50.00	Y			80.00	Y		
SECONDARY	Nickel	PD	UG/L					22.00	Y				
SECONDARY	Zinc	PD	UG/L					10.00	Y				

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Twentymile Coal, LLC
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Water Year Monitoring Data

SITE: NPDES Site 62, Fish Creek Tipple

Date				10/4/2018		10/18/2018		10/26/2018		10/29/2018		10/31/2018		11/2/2018		11/7/2018	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.01	Y	0.01	Y	0.01	Y	0.01	Y	0.01	Y	0.01	Y	0.01	Y
FIELD	pH, Field	N	S.U.	7.80	Y	7.90	Y	7.90	Y	7.80	Y	7.80	Y	7.80	Y	7.90	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3950.00	Y	3900.00	Y	3400.00	Y	3920.00	Y	3650.00	Y	3560.00	Y	3690.00	Y
FIELD	Temperature, Field	N	DEG-C	14.60	Y	10.10	Y	11.40	Y	9.60	Y	10.80	Y	11.70	Y	7.50	Y
PHYSICAL	pH, Lab	N	S.U.	8.20	Y	8.10	Y									8.20	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N									0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	20.00	N	7.00	Y									20.00	N
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	4010.00	Y	3800.00	Y									3830.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3940.00	Y	3780.00	Y									3770.00	Y
PRIMARY	Chromium	PD	MG/L			0.00	N										
PRIMARY	Lead	PD	MG/L			0.00	N										
PRIMARY	Mercury	T	UG/L			1.00	N										
PRIMARY	Selenium	PD	UG/L			0.50	N										
SECONDARY	Arsenic	T	MG/L			0.00	N										
SECONDARY	Copper	PD	UG/L			4.00	N										
SECONDARY	Iron	TR	UG/L	290.00	Y	230.00	Y									240.00	Y
SECONDARY	Manganese	PD	UG/L			60.00	Y										
SECONDARY	Nickel	PD	UG/L			80.00	N										
SECONDARY	Silver	PD	UG/L			1.00	N										
SECONDARY	Zinc	PD	UG/L			20.00	Y										

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SITE: NPDES Site 62, Fish Creek Tipple

Date				11/14/2018		11/19/2018		11/27/2018		12/5/2018		12/12/2018		12/20/2018		12/27/2018	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.01	Y	0.01	Y	0.01	Y	0.01	Y	0.01	Y	0.01	Y	0.01	Y
FIELD	pH, Field	N	S.U.	7.70	Y	7.50	Y	7.50	Y	7.60	Y	7.50	Y	7.80	Y	7.70	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4130.00	Y	4110.00	Y	4300.00	Y	4130.00	Y	4120.00	Y	3700.00	Y	3650.00	Y
FIELD	Temperature, Field	N	DEG-C	5.50	Y	6.00	Y	4.40	Y	1.00	Y	1.40	Y	1.00	Y	1.70	Y
PHYSICAL	pH, Lab	N	S.U.			8.10	Y			8.10	Y			8.20	Y	8.20	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.10	N			0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	20.00	N	5.00	N			5.00	Y	6.00	Y	6.00	Y	7.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	4220.00	Y	4250.00	Y	4290.00	Y	4040.00	Y	4000.00	Y	4010.00	Y	3910.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	4150.00	Y	4300.00	Y	4270.00	Y	4040.00	Y	3910.00	Y	3790.00	Y	3880.00	Y
PRIMARY	Chromium	PD	MG/L	0.00	N							0.00	N				
PRIMARY	Lead	PD	MG/L	0.00	N							0.00	N				
PRIMARY	Mercury	T	UG/L	1.00	N							1.00	N				
PRIMARY	Selenium	PD	UG/L	0.50	N							7.00	Y				
SECONDARY	Arsenic	T	MG/L	0.01	N							0.00	N				
SECONDARY	Copper	PD	UG/L	2.00	N							2.00	N				
SECONDARY	Iron	TR	UG/L	330.00	Y	0.40	Y			1000.00	Y	700.00	Y	900.00	Y	960.00	Y
SECONDARY	Manganese	PD	UG/L	100.00	Y							2250.00	Y				
SECONDARY	Nickel	PD	UG/L	80.00	N							80.00	N				
SECONDARY	Silver	PD	UG/L	1.00	N							0.50	N				
SECONDARY	Zinc	PD	UG/L	100.00	N							100.00	N				

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Water Year Monitoring Data

SITE: NPDES Site 62, Fish Creek Tipple

Date				1/3/2019		1/11/2019		1/16/2019		1/23/2019		1/30/2019		2/8/2019		2/13/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.01	Y	0.01	Y	0.01	Y	0.01	Y	0.01	Y	0.01	Y	0.01	Y
FIELD	pH, Field	N	S.U.	8.00	Y	7.70	Y	7.40	Y	7.40	Y	7.50	Y	7.60	Y	7.40	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3950.00	Y	3784.00	Y	4380.00	Y	4320.00	Y	4210.00	Y	4300.00	Y	4360.00	Y
FIELD	Temperature, Field	N	DEG-C	1.30	Y	1.70	Y	1.30	Y	2.30	Y	2.10	Y	1.70	Y	1.40	Y
PHYSICAL	pH, Lab	N	S.U.	8.10	Y					8.10	Y					8.10	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N			0.50	N	0.50	N					0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	5.00	Y			5.00	Y	20.00	N					5.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	4020.00	Y			4030.00	Y	3870.00	Y					3930.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3990.00	Y			3810.00	Y	3810.00	Y					3750.00	Y
PRIMARY	Chromium	PD	MG/L					0.00	N								
PRIMARY	Lead	PD	MG/L					0.00	N								
PRIMARY	Mercury	T	UG/L					1.00	N								
PRIMARY	Selenium	PD	UG/L					48.90	Y								
SECONDARY	Arsenic	T	MG/L					0.00	N								
SECONDARY	Copper	PD	UG/L					2.00	N								
SECONDARY	Iron	TR	UG/L	490.00	Y			1180.00	Y	1150.00	Y					1210.00	Y
SECONDARY	Manganese	PD	UG/L					1370.00	Y								
SECONDARY	Nickel	PD	UG/L					40.00	N								
SECONDARY	Silver	PD	UG/L					0.50	N								
SECONDARY	Zinc	PD	UG/L					20.00	Y								

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Water Year Monitoring Data

SITE: NPDES Site 62, Fish Creek Tipple

Date				2/21/2019		2/28/2019		3/7/2019		3/15/2019		3/18/2019		3/20/2019		3/27/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.01	Y	0.01	Y			0.0023	Y	0.0023	Y			0.01	Y
FIELD	pH, Field	N	S.U.	7.50	Y	7.40	Y	7.30	Y	7.40	Y			7.50	Y	7.30	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4340.00	Y	4370.00	Y	3910.00	Y	4020.00	Y			2270.00	Y	3500.00	Y
FIELD	Temperature, Field	N	DEG-C	3.40	Y	4.30	Y	4.20	Y	3.20	Y			0.00	Y	6.30	Y
PHYSICAL	pH, Lab	N	S.U.			8.00	Y	8.00	Y							8.20	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N					0.50	N	0.99	Y
PHYSICAL	Solids, Total Suspended	N	MG/L	20.00	N	5.00	Y	20.00	N					5.00	Y	5.00	N
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	3860.00	Y	3770.00	Y	3490.00	Y					3610.00	Y	3340.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3700.00	Y	3750.00	Y	3290.00	Y					3620.00	Y	3220.00	Y
PRIMARY	Chromium	PD	MG/L	0.00	N									0.02	N		
PRIMARY	Lead	PD	MG/L	0.00	N									0.00	Y		
PRIMARY	Mercury	T	UG/L	1.00	N									1.00	N		
PRIMARY	Selenium	PD	UG/L	6.80	Y									2.00	Y		
SECONDARY	Arsenic	T	MG/L	0.00	N									0.00	Y		
SECONDARY	Copper	PD	UG/L	2.00	N									20.00	N		
SECONDARY	Iron	TR	UG/L	1500.00	Y	1010.00	Y	840.00	Y					710.00	Y	0.75	Y
SECONDARY	Manganese	PD	UG/L	670.00	Y									250.00	Y		
SECONDARY	Nickel	PD	UG/L	80.00	N									80.00	N		
SECONDARY	Silver	PD	UG/L	1.00	N									5.00	N		
SECONDARY	Zinc	PD	UG/L	100.00	N									100.00	N		

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SITE: NPDES Site 62, Fish Creek Tipple

Date				4/5/2019		4/11/2019		4/18/2019		4/24/2019		5/2/2019		5/9/2019		5/16/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.02	Y	0.08	Y	0.10	Y	0.16	Y	0.16	Y	0.05	Y	0.08	Y
FIELD	pH, Field	N	S.U.	7.50	Y	7.40	Y	7.10	Y	7.50	Y	7.10	Y	7.70	Y	7.50	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2890.00	Y	2490.00	Y	1610.00	Y	3560.00	Y	3100.00	Y	3490.00	Y	3540.00	Y
FIELD	Temperature, Field	N	DEG-C	7.70	Y	7.00	Y	8.80	Y	13.30	Y	13.80	Y	11.60	Y	16.60	Y
PHYSICAL	pH, Lab	N	S.U.			8.30	Y			8.10	Y	8.10	Y				
PHYSICAL	Solids, Settleable	N	ML/L			0.50	N	0.50	N	0.50	N	0.50	N	0.50	N		
PHYSICAL	Solids, Total Suspended	N	MG/L			5.00	Y	10.00	Y	5.00	Y	20.00	N	20.00	N		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM			2250.00	Y	1580.00	Y	3320.00	Y	3230.00	Y	3850.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L			1970.00	Y	1260.00	Y	3310.00	Y	3090.00	Y	3670.00	Y		
PRIMARY	Chromium	PD	MG/L					0.00	N					0.00	N		
PRIMARY	Lead	PD	MG/L					0.00	Y					0.00	N		
PRIMARY	Mercury	T	UG/L					1.00	N					1.00	N		
PRIMARY	Selenium	PD	UG/L					1.10	Y					0.50	N		
SECONDARY	Arsenic	T	MG/L					0.00	Y					0.00	N		
SECONDARY	Copper	PD	UG/L					1.10	Y					4.00	N		
SECONDARY	Iron	TR	UG/L			450.00	Y	760.00	Y	580.00	Y	460.00	Y	420.00	Y		
SECONDARY	Manganese	PD	UG/L					160.00	Y					250.00	Y		
SECONDARY	Nickel	PD	UG/L					40.00	N					80.00	N		
SECONDARY	Silver	PD	UG/L					0.50	N					1.00	N		
SECONDARY	Zinc	PD	UG/L					40.00	Y					100.00	N		

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SITE: NPDES Site 62, Fish Creek Tipple

Date				5/20/2019		5/22/2019		5/31/2019		6/5/2019		6/13/2019		6/20/2019		6/28/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS			0.08	Y	0.05	Y	0.03	Y	0.01	Y	0.01	Y	0.05	Y
FIELD	pH, Field	N	S.U.	7.50	Y	7.50	Y	7.40	Y	7.70	Y	7.80	Y	7.90	Y	7.70	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3580.00	Y	3390.00	Y	3120.00	Y	3390.00	Y	3320.00	Y	3790.00	Y	3840.00	Y
FIELD	Temperature, Field	N	DEG-C	12.40	Y	14.00	Y	15.80	Y	23.10	Y	20.40	Y	22.70	Y	23.20	Y
PHYSICAL	pH, Lab	N	S.U.			8.20	Y			8.20	Y			8.20	Y		
PHYSICAL	Solids, Settleable	N	ML/L			0.50	N			0.50	N	0.50	N	0.50	N		
PHYSICAL	Solids, Total Suspended	N	MG/L			8.00	Y			8.00	Y	9.00	Y	20.00	N		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM			3490.00	Y			3880.00	Y	3980.00	Y	3840.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L			3600.00	Y			3950.00	Y	3880.00	Y	3830.00	Y		
PRIMARY	Chromium	PD	MG/L									0.00	N				
PRIMARY	Lead	PD	MG/L									0.00	N				
PRIMARY	Mercury	T	UG/L									1.00	N				
PRIMARY	Selenium	PD	UG/L									0.30	N				
SECONDARY	Arsenic	T	MG/L									0.00	Y				
SECONDARY	Copper	PD	UG/L									2.00	N				
SECONDARY	Iron	TR	UG/L			500.00	Y			560.00	Y	370.00	Y	610.00	Y		
SECONDARY	Manganese	PD	UG/L									120.00	Y				
SECONDARY	Nickel	PD	UG/L									40.00	N				
SECONDARY	Silver	PD	UG/L									0.50	N				
SECONDARY	Zinc	PD	UG/L									50.00	N				

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SITE: NPDES Site 62, Fish Creek Tipple

Date				7/2/2019		7/10/2019		7/18/2019		7/23/2019		7/31/2019		8/7/2019		8/15/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.03	Y	0.03	Y	0.01	Y	0.034	Y	0.03	Y	0.03	Y	0.03	Y
FIELD	pH, Field	N	S.U.	7.80	Y	7.70	Y	7.50	Y	7.90	Y	7.70	Y	7.90	Y	7.70	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3950.00	Y	3750.00	Y	3940.00	Y	3580.00	Y	3780.00	Y	3540.00	Y	4090.00	Y
FIELD	Temperature, Field	N	DEG-C	21.20	Y	25.30	Y	21.40	Y	22.40	Y	23.30	Y	26.00	Y	22.90	Y
PHYSICAL	pH, Lab	N	S.U.	8.20	Y			8.10	Y					8.20	Y		
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N					0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	6.00	Y	5.00	Y	20.00	N					20.00	N	20.00	N
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	3650.00	Y	3870.00	Y	3460.00	Y					4030.00	Y	4060.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	3790.00	Y	3850.00	Y	3910.00	Y					4090.00	Y	4040.00	Y
PRIMARY	Chromium	PD	MG/L			0.00	N									0.00	N
PRIMARY	Lead	PD	MG/L			0.00	N									0.00	N
PRIMARY	Mercury	T	UG/L					1.00	N								
PRIMARY	Selenium	PD	UG/L			0.50	N									0.10	Y
SECONDARY	Arsenic	T	MG/L			0.00	N									0.00	Y
SECONDARY	Copper	PD	UG/L			4.00	N									2.00	N
SECONDARY	Iron	TR	UG/L	520.00	Y	280.00	Y	230.00	Y					240.00	Y	180.00	Y
SECONDARY	Manganese	PD	UG/L			120.00	Y									150.00	Y
SECONDARY	Nickel	PD	UG/L			40.00	N									40.00	N
SECONDARY	Silver	PD	UG/L			1.00	N									0.50	N
SECONDARY	Zinc	PD	UG/L			50.00	N									50.00	N

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SITE: NPDES Site 62, Fish Creek Tipple

Date				8/22/2019		8/28/2019		9/5/2019		9/8/2019		9/11/2019		9/18/2019		9/26/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.03	Y	0.01	Y	0.03	Y	0.01	Y	0.01	Y	0.01	Y	0.01	Y
FIELD	pH, Field	N	S.U.	7.90	Y	8.20	Y	8.00	Y	7.60	Y	8.20	Y	7.80	Y	7.30	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3540.00	Y	3960.00	Y	3930.00	Y	3920.00	Y	4080.00	Y	4220.00	Y	3960.00	Y
FIELD	Temperature, Field	N	DEG-C	21.00	Y	20.00	Y	23.50	Y	19.40	Y	14.00	Y	15.40	Y	14.10	Y
PHYSICAL	pH, Lab	N	S.U.	8.20	Y			8.20	Y					8.20	Y		
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N			3.60	N			0.50	N	0.50	N		
PHYSICAL	Solids, Total Suspended	N	MG/L	5.00	Y			9.00	Y			20.00	N	5.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	4030.00	Y			4050.00	Y			4040.00	Y	4020.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	4200.00	Y			4160.00	Y			3990.00	Y	4100.00	Y		
PRIMARY	Chromium	PD	MG/L									0.00	N				
PRIMARY	Lead	PD	MG/L									0.00	N				
PRIMARY	Mercury	T	UG/L	1.00	N									1.00	N		
PRIMARY	Selenium	PD	UG/L									0.10	Y				
SECONDARY	Arsenic	T	MG/L									0.00	Y				
SECONDARY	Copper	PD	UG/L									2.00	N				
SECONDARY	Iron	TR	UG/L	400.00	N			500.00	Y			150.00	Y	140.00	Y		
SECONDARY	Manganese	PD	UG/L									120.00	Y				
SECONDARY	Nickel	PD	UG/L									40.00	N				
SECONDARY	Silver	PD	UG/L									0.50	N				
SECONDARY	Zinc	PD	UG/L									10.00	Y				

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SITE: NPDES Site 63, Pond B

Date				10/4/2018		10/11/2018		10/18/2018		10/25/2018		11/7/2018		11/14/2018	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.002	Y	0.02	Y	0.01	Y	0.01	Y	0.01	Y	0.00	Y
FIELD	pH, Field	N	S.U.	8.500	Y	8.30	Y	8.50	Y	8.40	Y	8.20	Y	8.00	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	5410.000	Y	4790.00	Y	4240.00	Y	3870.00	Y	4090.00	Y	4440.00	Y
FIELD	Temperature, Field	N	DEG-C	14.400	Y	10.20	Y	10.40	Y	12.80	Y	6.40	Y	8.10	Y
PHYSICAL	pH, Lab	N	S.U.	8.600	Y	8.00	Y	8.60	Y	8.50	Y	8.50	Y	8.40	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.500	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	24.000	Y	12.00	Y	16.00	Y	15.00	Y	15.00	Y	13.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					4360.00	Y						
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					3530.00	Y						
SECONDARY	Iron	T	UG/L	430.000	Y	240.00	Y	270.00	Y	430.00	Y	220.00	Y	210.00	Y

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SITE: NPDES Site 63, Pond B

Date				11/19/2018		11/27/2018		12/5/2018		12/12/2018		12/20/2018		12/27/2018	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.00	Y	0.00	Y	0.01	Y	0.00	Y	0.01	Y	0.01	Y
FIELD	pH, Field	N	S.U.	8.20	Y	8.10	Y	7.60	Y	7.80	Y	7.70	Y	7.70	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	4450.00	Y	5030.00	Y	5010.00	Y	5100.00	Y	5050.00	Y	5180.00	Y
FIELD	Temperature, Field	N	DEG-C	6.50	Y	4.80	Y	3.00	Y	1.40	Y	4.30	Y	1.60	Y
PHYSICAL	pH, Lab	N	S.U.	8.40	Y	8.40	Y	8.30	Y	8.20	Y	8.20	Y	8.20	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	6.00	Y	13.00	Y	7.00	Y	9.00	Y	8.00	Y	30.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM												
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L												
SECONDARY	Iron	T	UG/L			160.00	Y	40.00	Y	100.00	Y	60.00	Y	510.00	Y

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Water Year Monitoring Data

SITE: NPDES Site 63, Pond B

Date				1/3/2019		1/10/2019		1/16/2019		1/23/2019		3/20/2019		3/27/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.01	Y	0.01	Y	0.01	Y	0.01	Y	0.05	Y	0.04	Y
FIELD	pH, Field	N	S.U.	7.90	Y	7.60	Y	7.70	Y	7.90	Y	7.90	Y	7.90	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3530.00	Y	3240.00	Y	3130.00	Y	4090.00	Y	1370.00	Y	1180.00	Y
FIELD	Temperature, Field	N	DEG-C	1.40	Y	4.40	Y	2.60	Y	7.80	Y	1.00	Y	4.30	Y
PHYSICAL	pH, Lab	N	S.U.	8.10	Y	8.10	Y	8.10	Y	8.20	Y	8.30	Y	8.40	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	12.00	Y	9.00	Y	20.00	N	20.00	N	13.00	Y	16.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM									1380.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L									1000.00	Y		
SECONDARY	Iron	T	UG/L	130.00	Y	160.00	Y	40.00	Y	150.00	Y	1090.00	Y		

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SITE: NPDES Site 63, Pond B

Date				4/4/2019		4/11/2019		4/18/2019		4/24/2019		5/2/2019		5/9/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.08	Y	0.20	Y	0.03	Y	0.01	Y	0.13	Y	0.04	Y
FIELD	pH, Field	N	S.U.	7.70	Y	7.80	Y	7.90	Y	8.10	Y	8.00	Y	7.90	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	980.00	Y	1080.00	Y	880.00	Y	1150.00	Y	1560.00	Y	1840.00	Y
FIELD	Temperature, Field	N	DEG-C	8.80	Y	5.60	Y	12.30	Y	16.20	Y	14.00	Y	12.50	Y
PHYSICAL	pH, Lab	N	S.U.	8.40	Y	8.40	Y	8.40	Y	8.50	Y	8.50	Y	8.50	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	25.00	Y	51.00	Y	32.00	Y	15.00	Y	15.00	Y	21.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM												
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L												
SECONDARY	Iron	T	UG/L	1390.00	Y	2130.00	Y	1940.00	Y	1030.00	Y	780.00	Y	590.00	Y

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SITE: NPDES Site 63, Pond B

Date				5/16/2019		5/22/2019		5/30/2019		6/5/2019		6/13/2019		6/20/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.01	Y	0.02	Y	0.02	Y	0.01	Y	0.00	Y	0.01	Y
FIELD	pH, Field	N	S.U.	7.70	Y	8.10	Y	8.20	Y	7.70	Y	8.20	Y	8.20	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2150.00	Y	1930.00	Y	1960.00	Y	1980.00	Y	2270.00	Y	260.00	Y
FIELD	Temperature, Field	N	DEG-C	18.80	Y	12.50	Y	17.30	Y	20.50	Y	17.70	Y	20.10	Y
PHYSICAL	pH, Lab	N	S.U.	8.50	Y	8.60	Y	8.50	Y	8.50	Y	8.50	Y	8.30	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	21.00	Y	12.00	Y	12.00	Y	11.00	Y	31.00	Y	20.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	2230.00	Y										
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	1630.00	Y										
SECONDARY	Iron	T	UG/L	640.00	Y	290.00	Y	360.00	Y	340.00	Y	670.00	Y	540.00	Y

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Water Year Monitoring Data

SITE: NPDES Site 63, Pond B

Date				6/26/2019		7/2/2019		7/10/2019		7/24/2019		9/5/2019		9/11/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.02	Y	0.02	Y	0.01	Y	0.01	Y	0.00	Y	0.00	Y
FIELD	pH, Field	N	S.U.	8.10	Y	8.40	Y	8.30	Y	8.30	Y	8.20	Y	8.10	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1370.00	Y	1750.00	Y	2280.00	Y	2630.00	Y	4790.00	Y	4830.00	Y
FIELD	Temperature, Field	N	DEG-C	22.80	Y	22.70	Y	26.90	Y	23.50	Y	23.50	Y	14.70	Y
PHYSICAL	pH, Lab	N	S.U.	8.50	Y	8.50	Y	8.50	Y	8.50	Y	8.50	Y	8.40	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	1.00	Y	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	12.00	Y	16.00	Y	12.00	Y	22.00	Y	20.00	Y	38.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					2090.00	Y						
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					1580.00	Y						
SECONDARY	Iron	T	UG/L	710.00	Y	480.00	Y	630.00	Y	370.00	Y	400.00	Y	660.00	Y

Table: 59
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

SITE: NPDES Site 85, Pond E

Date				4/4/2019		4/11/2019		4/18/2019		4/24/2019		5/2/2019		5/9/2019		5/16/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.01	Y	0.01	Y	0.00	Y	0.00	Y	0.01	Y	0.00	Y	0.00	Y
FIELD	pH, Field	N	S.U.	7.30	Y	7.80	Y	7.70	Y	7.90	Y	7.90	Y	7.90	Y	8.00	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1290.00	Y	2230.00	Y	2710.00	Y	3200.00	Y	2270.00	Y	2950.00	Y	2870.00	Y
FIELD	Temperature, Field	N	DEG-C	12.10	Y	8.10	Y	15.40	Y	16.30	Y	14.00	Y	10.50	Y	16.00	Y
PHYSICAL	pH, Lab	N	S.U.	8.20	Y	8.30	Y	8.30	Y	8.30	Y	8.30	Y	8.20	Y	8.30	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	27.00	Y	8.00	Y	13.00	Y	11.00	Y	26.00	Y	10.00	Y	10.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM					2460.00	Y								
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L					1860.00	Y								
SECONDARY	Iron	T	UG/L	980.00	Y	880.00	Y	840.00	Y	1110.00	Y	1090.00	Y	1260.00	Y	940.00	Y

Table: 59
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

SITE: NPDES Site 85, Pond E

Date				5/22/2019		5/30/2019		6/5/2019		6/13/2019		6/20/2019		6/26/2019		7/2/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.03	Y	0.03	Y	0.00	Y	0.00	Y	0.03	Y	0.01	Y	0.01	Y
FIELD	pH, Field	N	S.U.	7.90	Y	7.90	Y	7.90	Y	8.00	Y	8.00	Y	8.00	Y	8.00	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	2340.00	Y	2460.00	Y	2640.00	Y	2030.00	Y	2570.00	Y	2330.00	Y	2730.00	Y
FIELD	Temperature, Field	N	DEG-C	12.50	Y	17.40	Y	22.50	Y	18.00	Y	21.20	Y	23.90	Y	21.40	Y
PHYSICAL	pH, Lab	N	S.U.	8.40	Y	8.30	Y	8.40	Y	8.30	Y	8.20	Y	8.30	Y	8.40	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	9.00	Y	10.00	Y	10.00	Y	18.00	Y	20.00	N	12.00	Y	14.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM														
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L														
SECONDARY	Iron	T	UG/L	320.00	Y	340.00	Y	960.00	Y	1030.00	Y	340.00	Y	460.00	Y	600.00	Y

Table: 60
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: NPDES Site 55, Pond G

Date				4/18/2019		4/24/2019		5/2/2019		5/9/2019		5/16/2019		5/22/2019		5/30/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.07	Y	0.00	Y	0.20	Y	0.02	Y	0.01	Y	0.00	Y	0.01	Y
FIELD	pH, Field	N	S.U.	8.10	Y	8.30	Y	8.20	Y	8.10	Y	8.20	Y	8.30	Y	8.20	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	770.00	Y	850.00	Y	1050.00	Y	1230.00	Y	1310.00	Y	1390.00	Y	1380.00	Y
FIELD	Temperature, Field	N	DEG-C	11.80	Y	12.80	Y	14.10	Y	12.70	Y	16.80	Y	11.20	Y	13.60	Y
PHYSICAL	pH, Lab	N	S.U.	8.50	Y	8.50	Y	8.50	Y	8.50	Y	8.60	Y	8.60	Y	8.60	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	20.00	N	5.00	Y	20.00	N	20.00	N	9.00	Y	20.00	N	20.00	N
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM	714.00	Y												
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	486.00	Y												
SECONDARY	Iron	T	UG/L	310.00	Y	280.00	Y	190.00	Y	70.00	Y	60.00	Y	80.00	Y	90.00	Y

Table: 61
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: NPDES Site 87, Pond F

Date				4/4/2019		4/11/2019		4/18/2019		4/24/2019		5/2/2019		5/9/2019		5/16/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.11	Y	0.04	Y	0.00	Y	0.01	Y	0.08	Y	0.10	Y	0.20	Y
FIELD	pH, Field	N	S.U.	7.20	Y	8.00	Y	8.20	Y	7.80	Y	8.20	Y	8.00	Y	7.90	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	690.00	Y	1570.00	Y	1810.00	Y	1750.00	Y	1880.00	Y	2040.00	Y	3450.00	Y
FIELD	Temperature, Field	N	DEG-C	13.40	Y	6.00	Y	13.00	Y	18.00	Y	13.70	Y	10.90	Y	16.20	Y
PHYSICAL	pH, Lab	N	S.U.	8.20	Y			8.50	Y			8.20	Y			8.30	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N	0.50	N		
PHYSICAL	Solids, Total Suspended	N	MG/L	7.00	Y	5.00	Y	20.00	N	5.00	Y	11.00	Y	20.00	N		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM											2020.00	Y	3820.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L											1650.00	Y	3700.00	Y
PRIMARY	Chromium	PD	MG/L			0.00	N					0.00	N				
PRIMARY	Chromium-6	D	MG/L			0.02	N					0.02	N				
PRIMARY	Lead	PD	MG/L			0.00	N					0.00	Y				
PRIMARY	Mercury	T	UG/L											1.00	N		
PRIMARY	Selenium	PD	UG/L			2.70	Y					1.70	Y				
SECONDARY	Arsenic	T	MG/L			0.00	Y					0.00	Y				
SECONDARY	Copper	PD	UG/L											50.00	N		
SECONDARY	Iron	T	UG/L											140.00	Y		
SECONDARY	Iron	TR	UG/L	600.00	Y			90.00	Y			290.00	Y			90.00	Y
SECONDARY	Nickel	PD	UG/L			40.00	N					40.00	N				
SECONDARY	Zinc	PD	UG/L			50.00	N					50.00	N				

Table: 61
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: NPDES Site 87, Pond F

Date				5/22/2019		5/30/2019		6/5/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.10	Y	0.01	Y	0.00	Y
FIELD	pH, Field	N	S.U.	8.00	Y	8.10	Y	8.00	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	3500.00	Y	3320.00	Y	3270.00	Y
FIELD	Temperature, Field	N	DEG-C	11.70	Y	16.50	Y	22.20	Y
PHYSICAL	pH, Lab	N	S.U.					8.20	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	6.00	Y	6.00	Y	9.00	Y
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM						
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L						
PRIMARY	Chromium	PD	MG/L						
PRIMARY	Chromium-6	D	MG/L						
PRIMARY	Lead	PD	MG/L						
PRIMARY	Mercury	T	UG/L						
PRIMARY	Selenium	PD	UG/L						
SECONDARY	Arsenic	T	MG/L						
SECONDARY	Copper	PD	UG/L						
SECONDARY	Iron	T	UG/L						
SECONDARY	Iron	TR	UG/L					130.00	Y
SECONDARY	Nickel	PD	UG/L						
SECONDARY	Zinc	PD	UG/L						

Table: 62
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

Site: 7

Date				1st Quarter		3/7/2019		5/2/2019		4th Quarter	
Type	**Parameter**	**Fraction**	**Units**	**No Flow**		**Result**	**DETN**	**Result**	**DETN**	**No Flow**	
ANION	Alkalinity, Bicarbonate as CaCO3	N	MG/L			856.00	Y	540.00	Y		
ANION	Alkalinity, Carbonate as CaCO3	N	MG/L			25.70	Y	20.00	N		
ANION	Bicarbonate as HCO3	N	MG/L			1040.00	Y	659.00	Y		
ANION	Carbonate as CO3	N	MG/L			15.40	Y	20.00	N		
ANION	Sulfates	N	MG/L			1720.00	Y	2100.00	Y		
CATION	Calcium	D	MG/L			101.00	Y	233.00	Y		
CATION	Magnesium	D	MG/L			74.40	Y	216.00	Y		
CATION	Sodium	D	MG/L			920.00	Y	563.00	Y		
FIELD	Flow	N	CFS	**No Flow**		ICE	N	1.26	Y	**No Flow**	
FIELD	pH, Field	N	S.U.			ICE	N	7.60	Y		
FIELD	Specific Conductivity, Field	N	UMHOS/CM			ICE	N	4320.00	Y		
FIELD	Temperature, Field	N	DEG-C			ICE	N	15.40	Y		
NUTRIENT	Ammonia Nitrogen	N	MG/L			2.03	Y	0.48	Y		
NUTRIENT	NO3-NO2 Nitrogen	N	MG/L			0.18	Y	1.76	Y		
NUTRIENT	Phosphorus, Orthophosphorus	N	MG/L			0.05	N	0.02	Y		
PHYSICAL	pH, Lab	N	S.U.			8.30	Y	8.30	Y		
PHYSICAL	Sodium Adsorption Ratio	N	RATIO			17.00	Y	6.50	Y		
PHYSICAL	Solids, Total Suspended	N	MG/L			6.00	Y	19.00	Y		
PHYSICAL	Specific Conductivity, Lab	N	UMHOS/CM			4640.00	Y	4280.00	Y		
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L			3510.00	Y	3890.00	Y		
PRIMARY	Cadmium	TR	MG/L			0.00	N	0.00	N		
PRIMARY	Selenium	TR	UG/L			0.30	Y	5.30	Y		
SECONDARY	Iron	TR	UG/L			210.00	Y	230.00	Y		
SECONDARY	Manganese	TR	UG/L			176.00	Y	400.00	Y		
SECONDARY	Silver	TR	UG/L			1.00	N	1.00	N		
SECONDARY	Zinc	TR	UG/L			50.00	N	100.00	N		
TRACE	Molybdenum	TR	UG/L			100.00	N	200.00	N		

Table: 63
Twentymile Coal, LLC
2019 Annual Hydrology Report
Water Year Monitoring Data

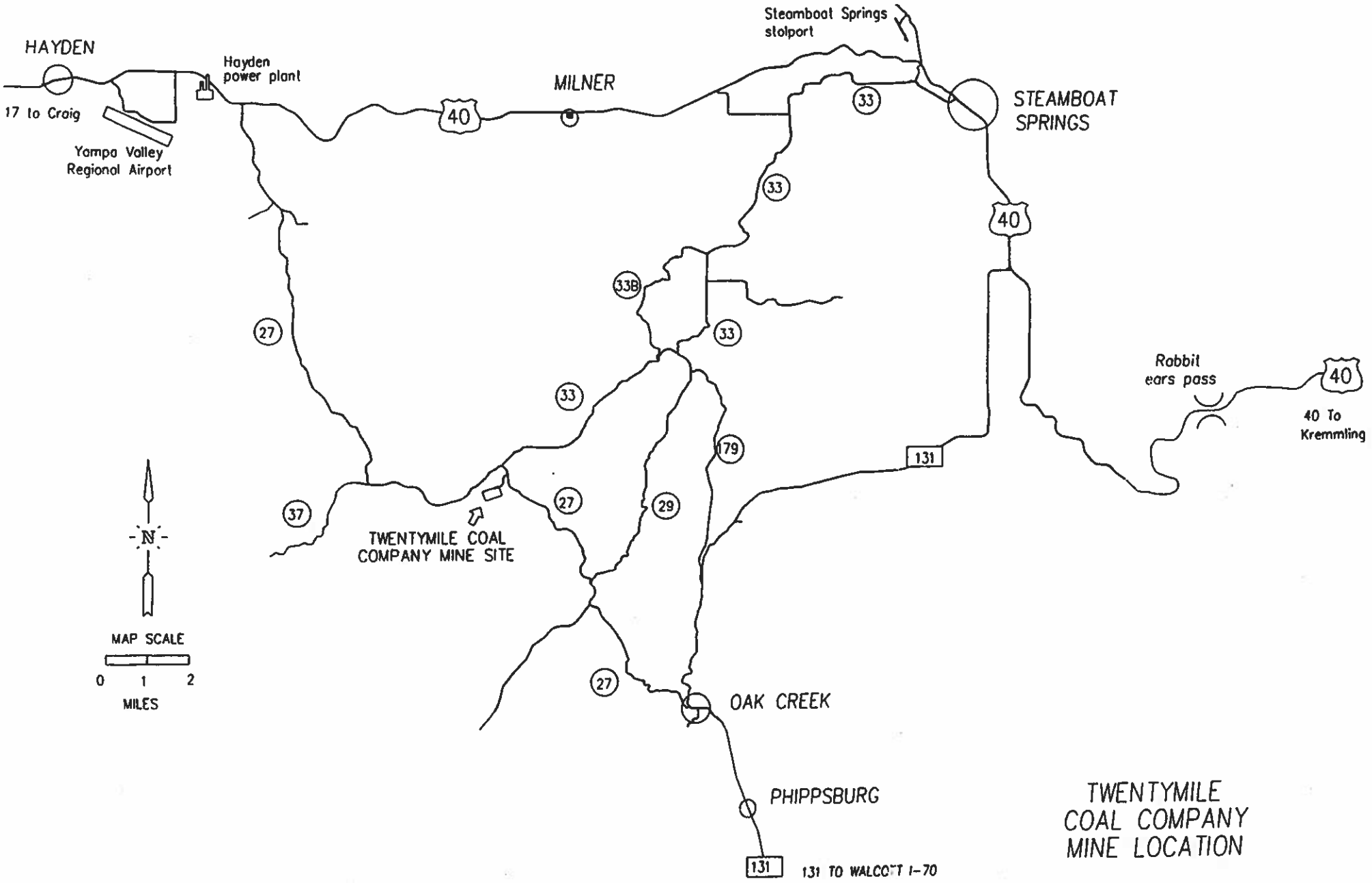
Site: 6MN

Date				4/24/2019		5/2/2019		5/9/2019		5/30/2019	
Type	**Parameter**	**Fraction**	**Units**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**	**Result**	**DETN**
FIELD	Flow	N	CFS	0.09	Y	0.10	Y	0.01	Y	0.01	Y
FIELD	pH, Field	N	S.U.	8.20	Y	7.90	Y	8.30	Y	8.20	Y
FIELD	Specific Conductivity, Field	N	UMHOS/CM	1160.00	Y	1170.00	Y	1430.00	Y	1660.00	Y
FIELD	Temperature, Field	N	DEG-C	15.40	Y	14.00	Y	12.50	Y	15.00	Y
PHYSICAL	pH, Lab	N	S.U.	8.80	Y	8.60	Y	8.60	Y	8.50	Y
PHYSICAL	Solids, Settleable	N	ML/L	0.50	N	0.50	N	0.50	N	0.50	N
PHYSICAL	Solids, Total Suspended	N	MG/L	8.00	Y	8.00	Y	9.00	Y	8.00	Y
PHYSICAL	Total Dissolved Solids, Lab	N	MG/L	548.00	Y	780.00	Y	1020.00	Y	1310.00	Y

FOIDEL CREEK
2019 ANNUAL HYDROLOGY REPORT
LIST OF FIGURES

FOIDEL CREEK
2019 ANNUAL HYDROLOGY REPORT
LIST OF FIGURES

FOIDEL CREEK
2019 ANNUAL HYDROLOGY REPORT
LIST OF FIGURES


HAYDEN
17 to Craig
Yampa Valley
Regional Airport
Hayden
power plant
MILNER
40
Steamboat Springs
stolport
STEAMBOAT
SPRINGS
33
33
40
33B
33
27
33
Robbit
ears pass
40
40 To
Kremmling
79
131
37
27
29
TWENTYMILE COAL
COMPANY MINE SITE
N
MAP SCALE
0 1 2
MILES
27
OAK CREEK
PHIPPSBURG
131
131 TO WALCOTT I-70
TWENTYMILE
COAL COMPANY
MINE LOCATION
D:\SURFACE\MINE LOCATION FROM SS.DWG

BED ROCK WELLS

- WADGE OVERBURDEN
- TWENTYMILE SANDSTONE
- TROUT CREEK SANDSTONE
- FISH CREEK SANDSTONE

ALLUVIAL WELLS

- FOIDEL CREEK
- FISH CREEK
- TROUT CREEK

SURFACE SITES

- FOIDEL CREEK
- FISH CREEK
- TROUT CREEK
- MIDDLE CREEK

OTHERS

- SPRINGS
- SPRINGS OR SEEPS
- DISCHARGE POINTS

NOTE: IN ORDER TO MONITOR UPSTREAM AND DOWNSTREAM CONDITIONS, SEVERAL ADJACENT AREA HYDROLOGIC MONITORING SITES ARE LOCATED OUTSIDE THE MINE PERMIT BOUNDARY.

MAP 13 A (FIGURE 2)

TWENTYMILE COAL CO.

FOIDEL CREEK MINE

DESIGNATED LOCATIONS HYDROLOGIC MONITORING PROGRAM

ROUTT COUNTY, COLORADO

29515 ROUTT COUNTY ROAD # 27, OAK CREEK, COLORADO 80467

DRAWN	
DATE	BY
2/14/94	KEVIN
DESIGNED	
DATE	BY
10/26/94	KEVIN
REVISED	

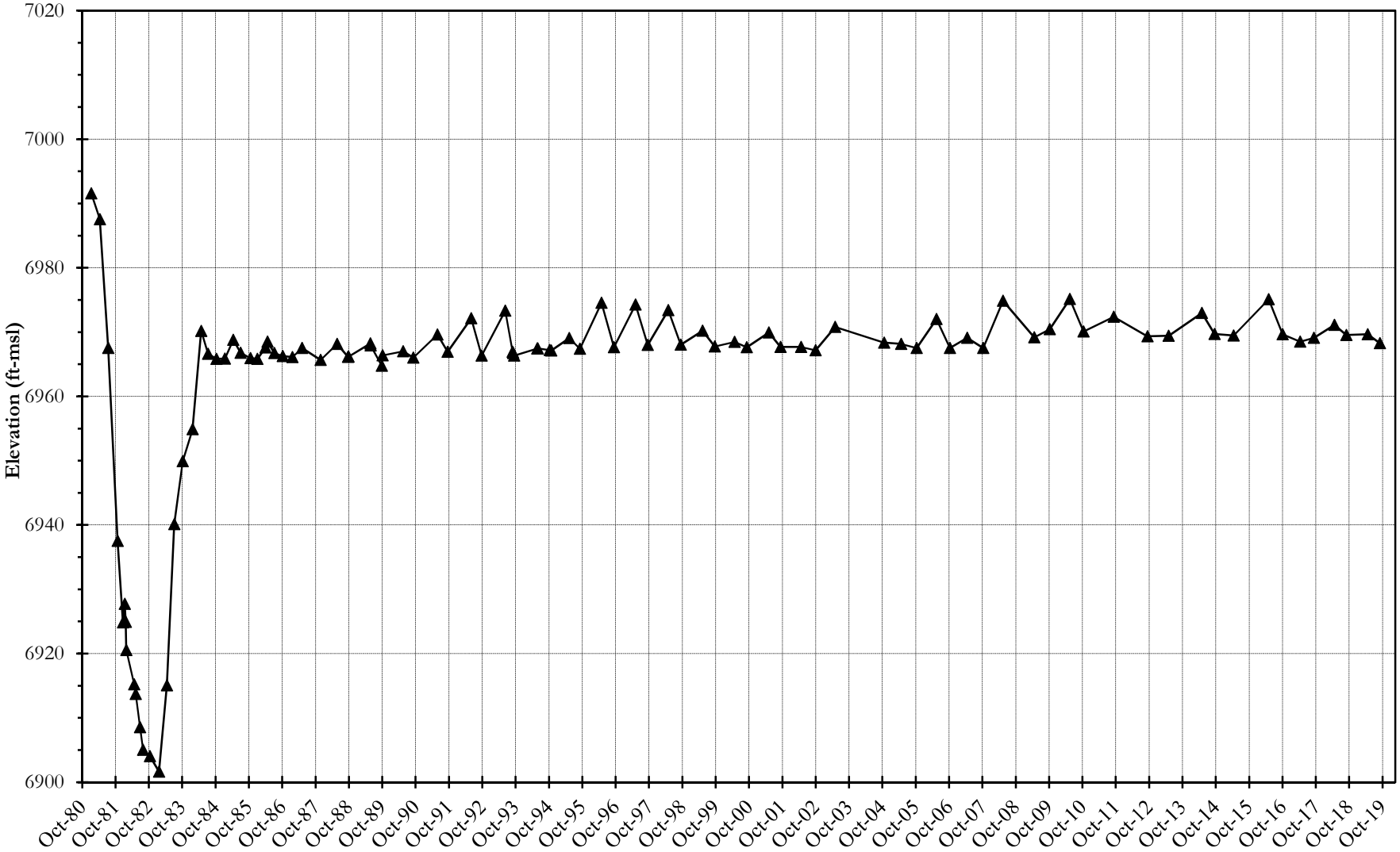
REVISION #	DATE	BY
	5/2/95	KEVIN
	12/29/95	KEVIN
	2/26/02	KEVIN
	10/23/02	KEVIN
	5/12/03	KEVIN
TR05-51	03/13/06	KEVIN
MR06-208	03/13/06	KEVIN
	11/07/06	KEVIN

DRAWN BY KEC | SCALE 1" = 2000'

PATH J:FLIGHT96\TOPOS\QUADS\QUADBASE.DWG (TAB: FIG 2 HYDROLOGY MAP)
EXREF. D:\HYDROLOG\FIGURE 2 DESIGNATED LOCATIONS5.DWG

Well 009-79-4, Wadge Overburden

Period of Record Water Level Data



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\009-79-4

FIGURE 3

Well 009-79-4, Wadge Overburden

Period of Record TDS Data

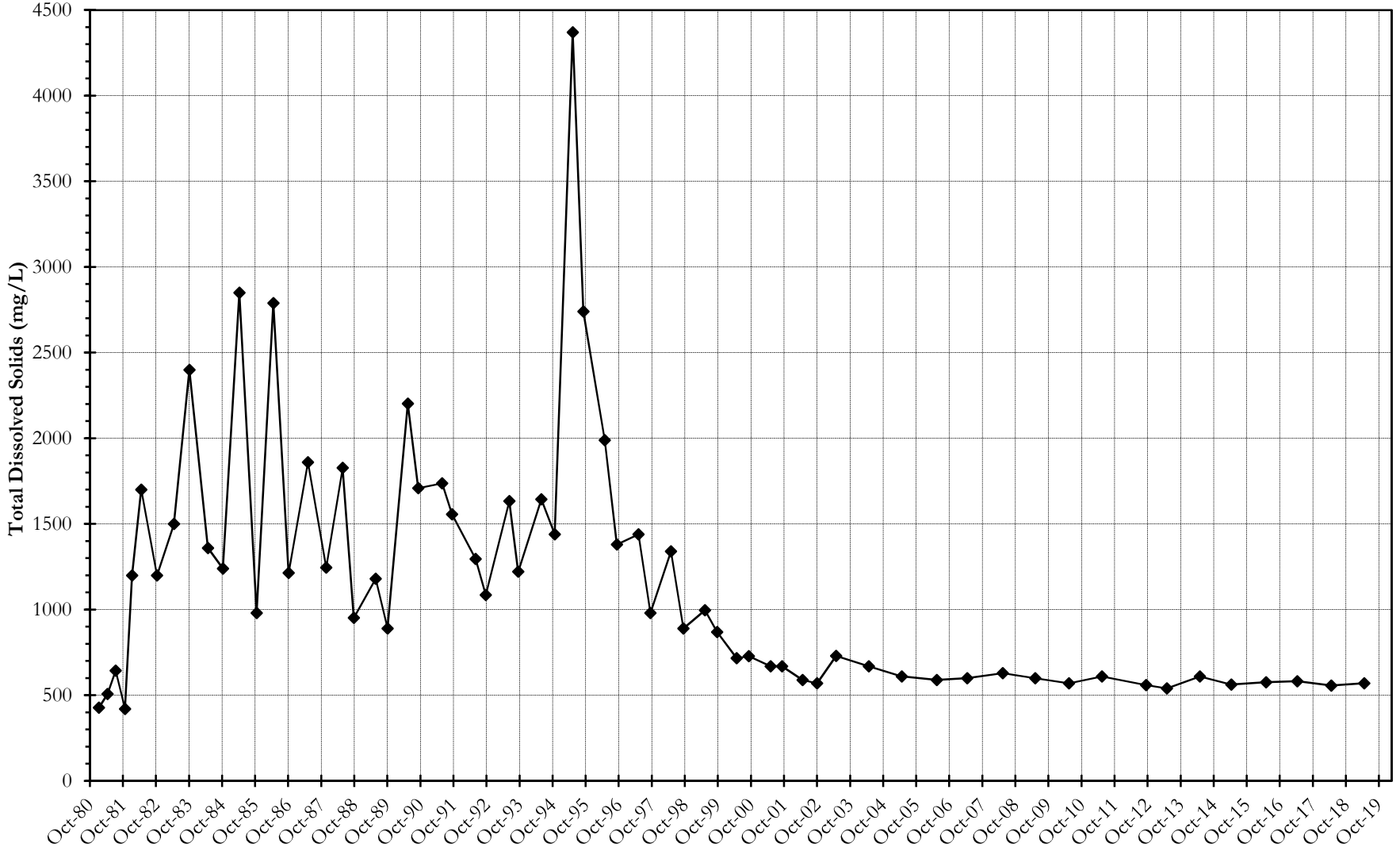


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FIGURE 4

Well 006-82-74C, Wadge Overburden

Period of Record Water Level Data

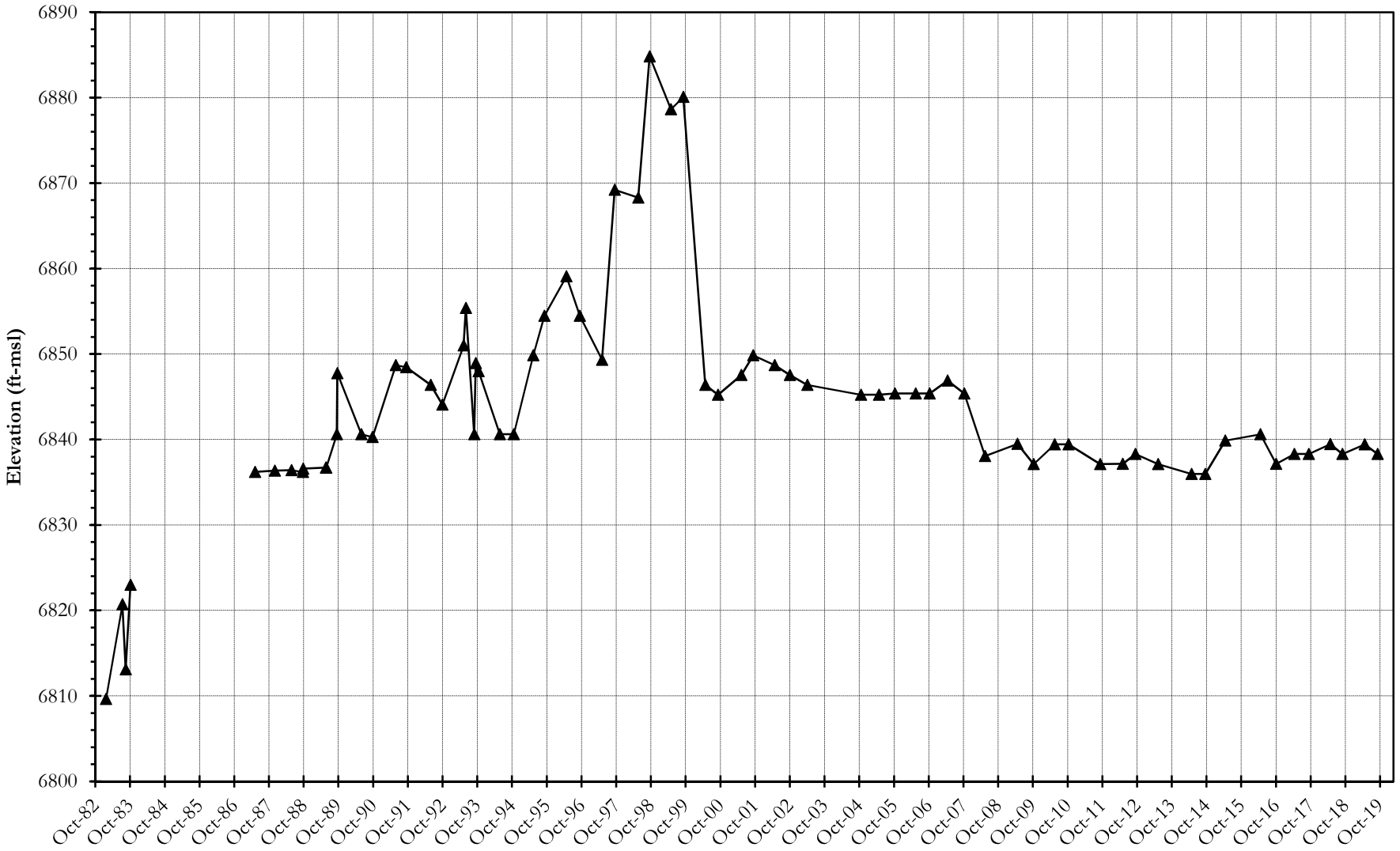

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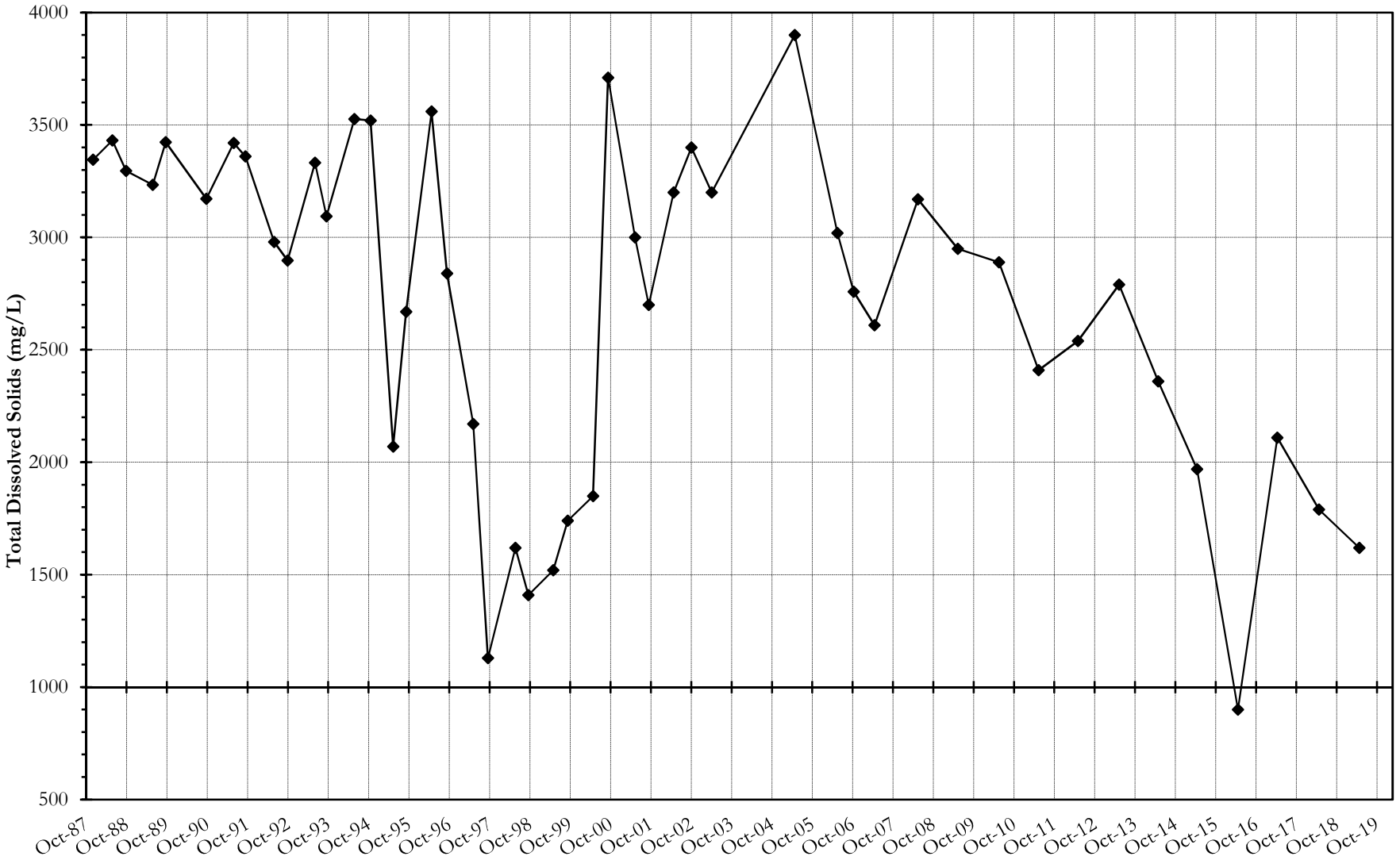
FIGURE 5

Well 006-82-74C, Wadge Overburden

Period of Record TDS Data

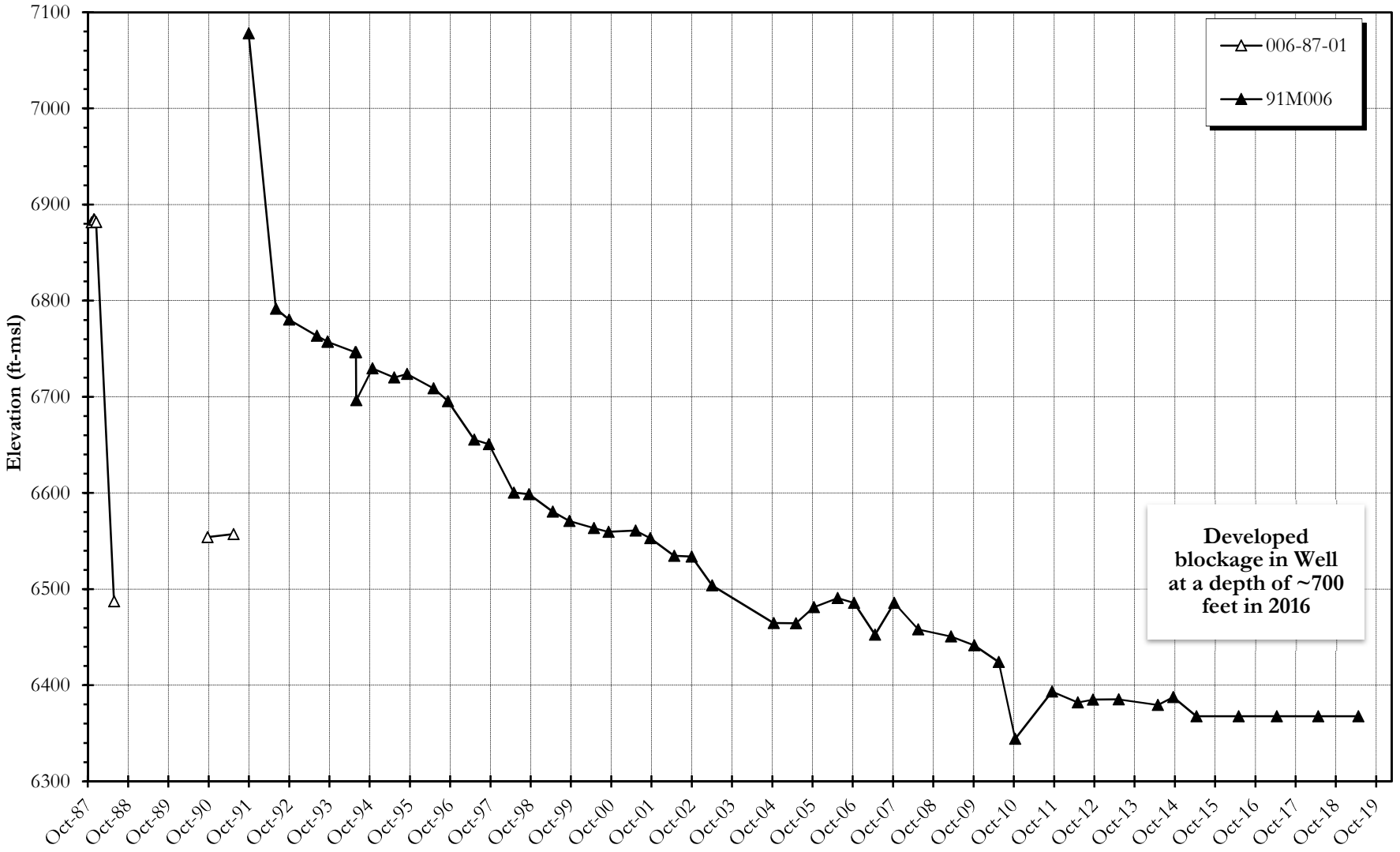


I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\006-82-74C

FIGURE 6

Well 006-87-01 and Well 91M006, Wadge Overburden

Period of Record Water Level Data



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\006-87-01 & 91M006

FIGURE 7

Well 008-77-58, Wadge Overburden

Period of Record Water Level Data

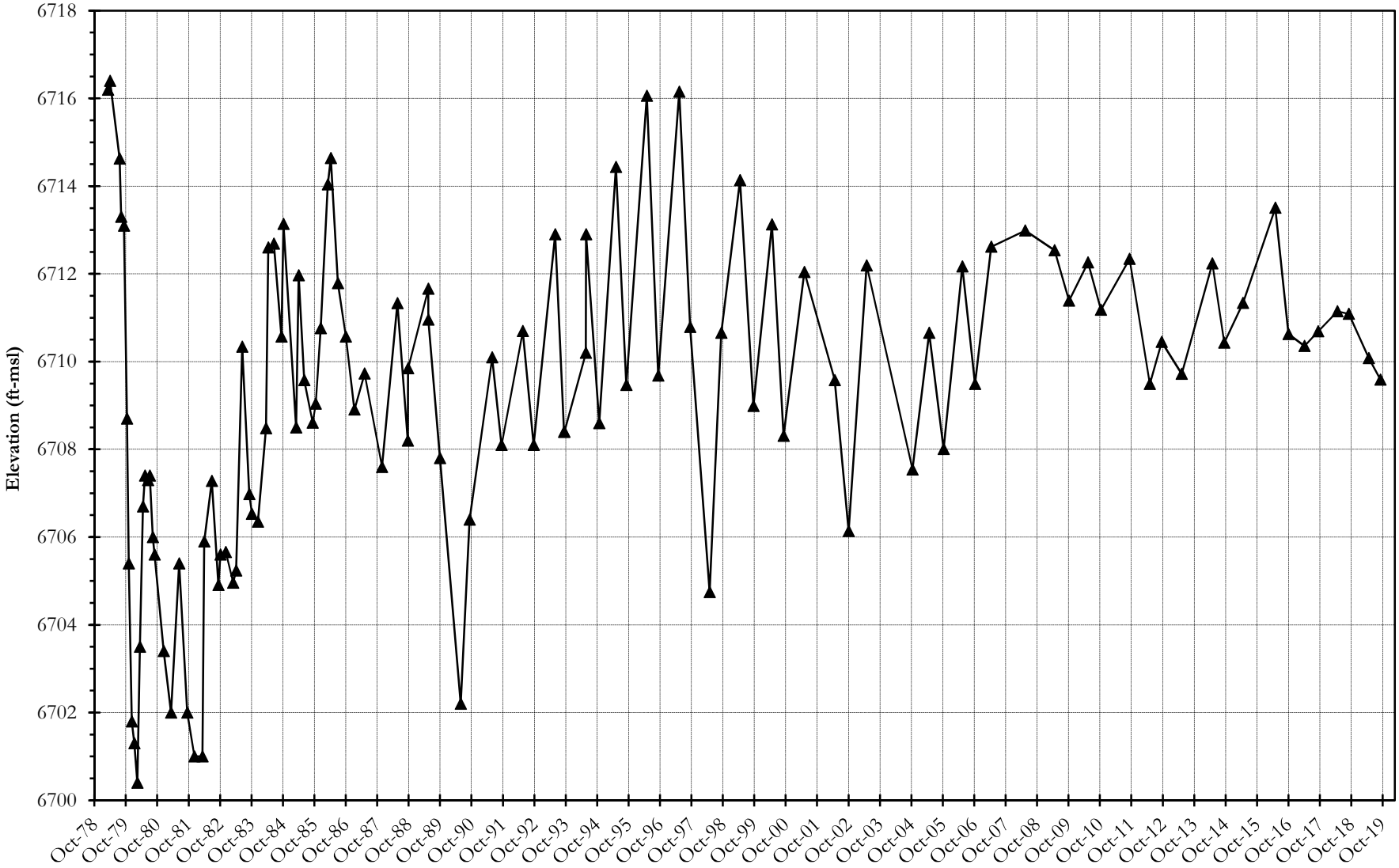


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FIGURE 8

Well 008-77-58, Wadge Overburden
Period of Record TDS Data

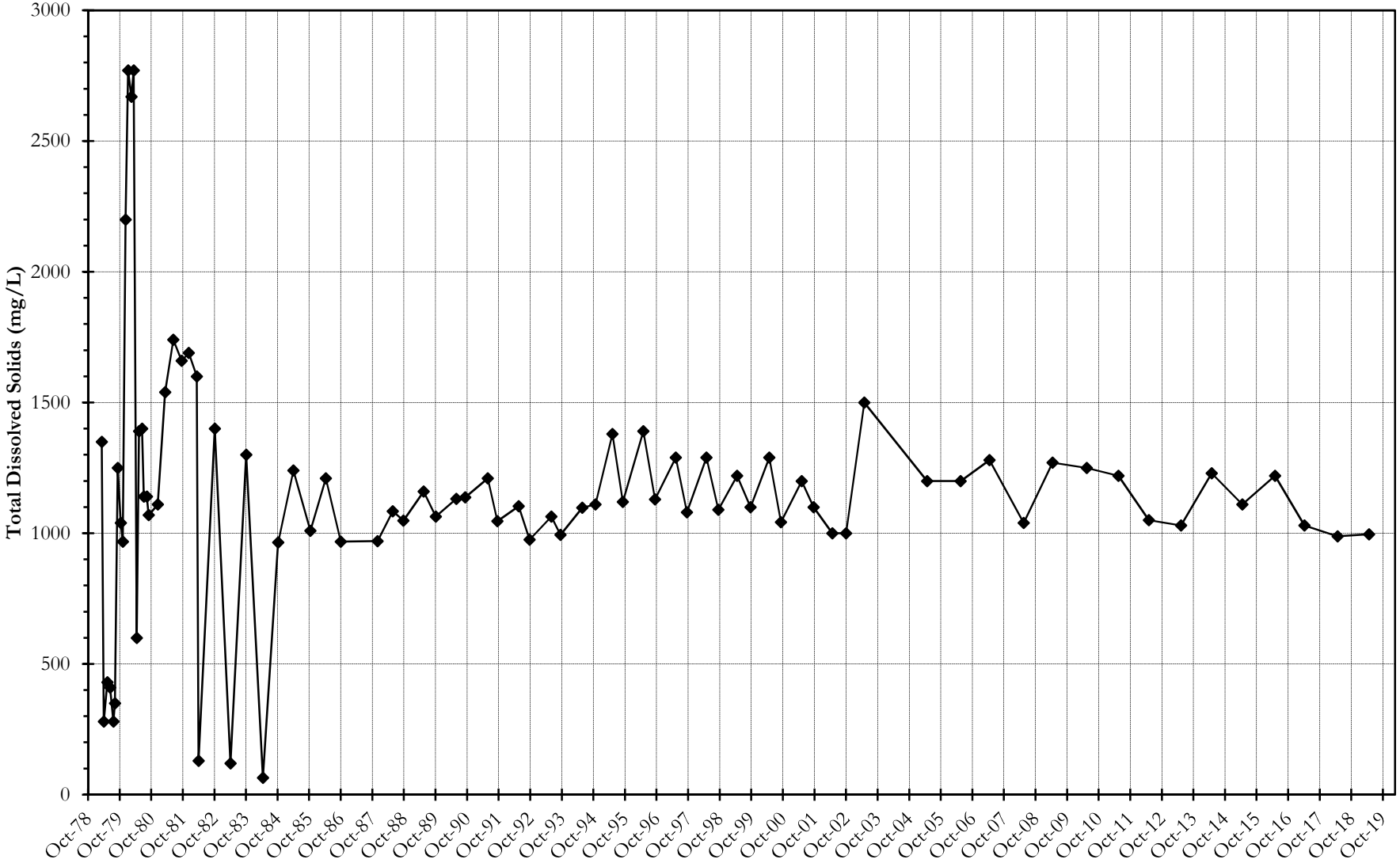

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FIGURE 9

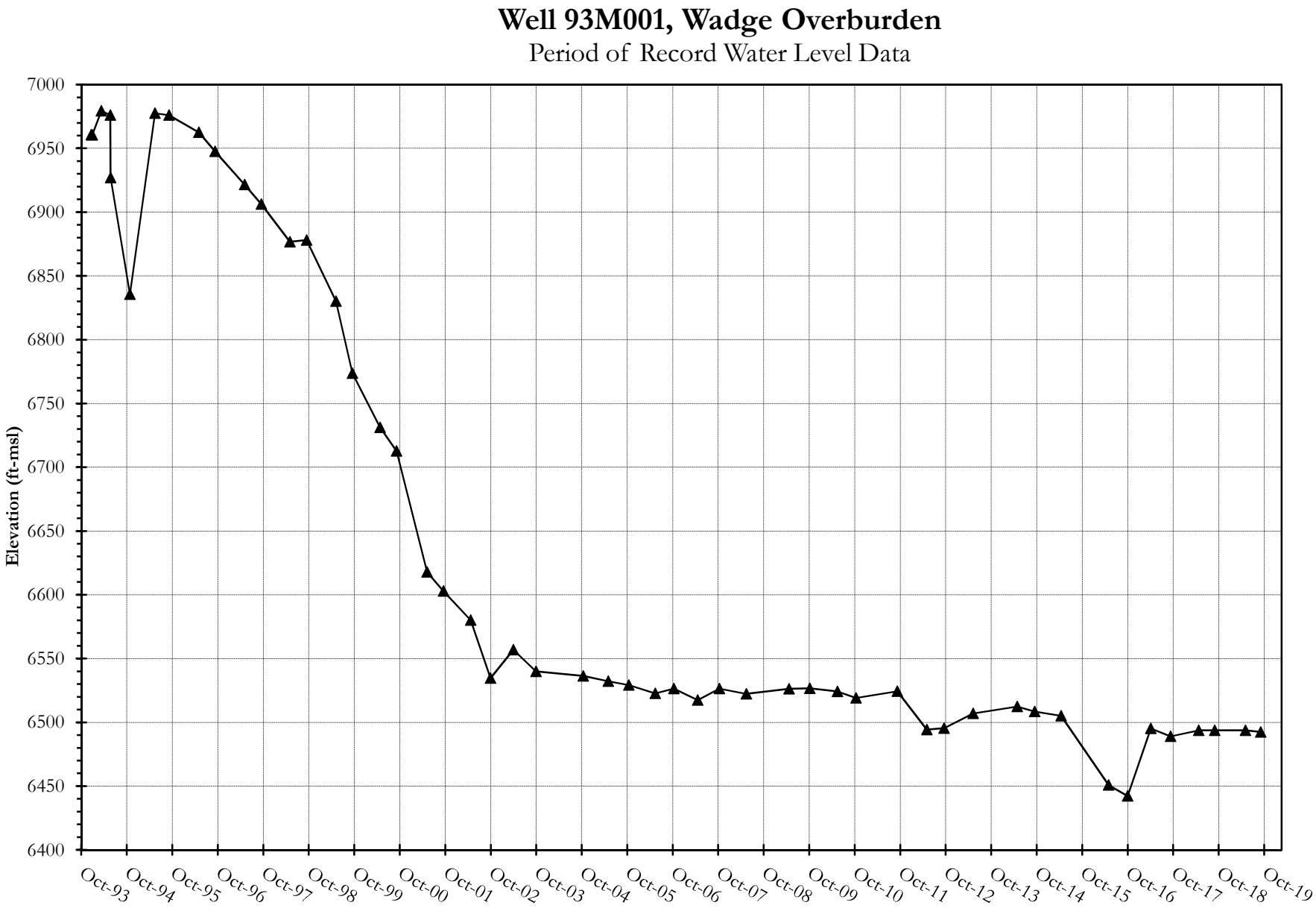

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FIGURE 10

Well 93M001, Wadge Overburden

Period of Record TDS Data

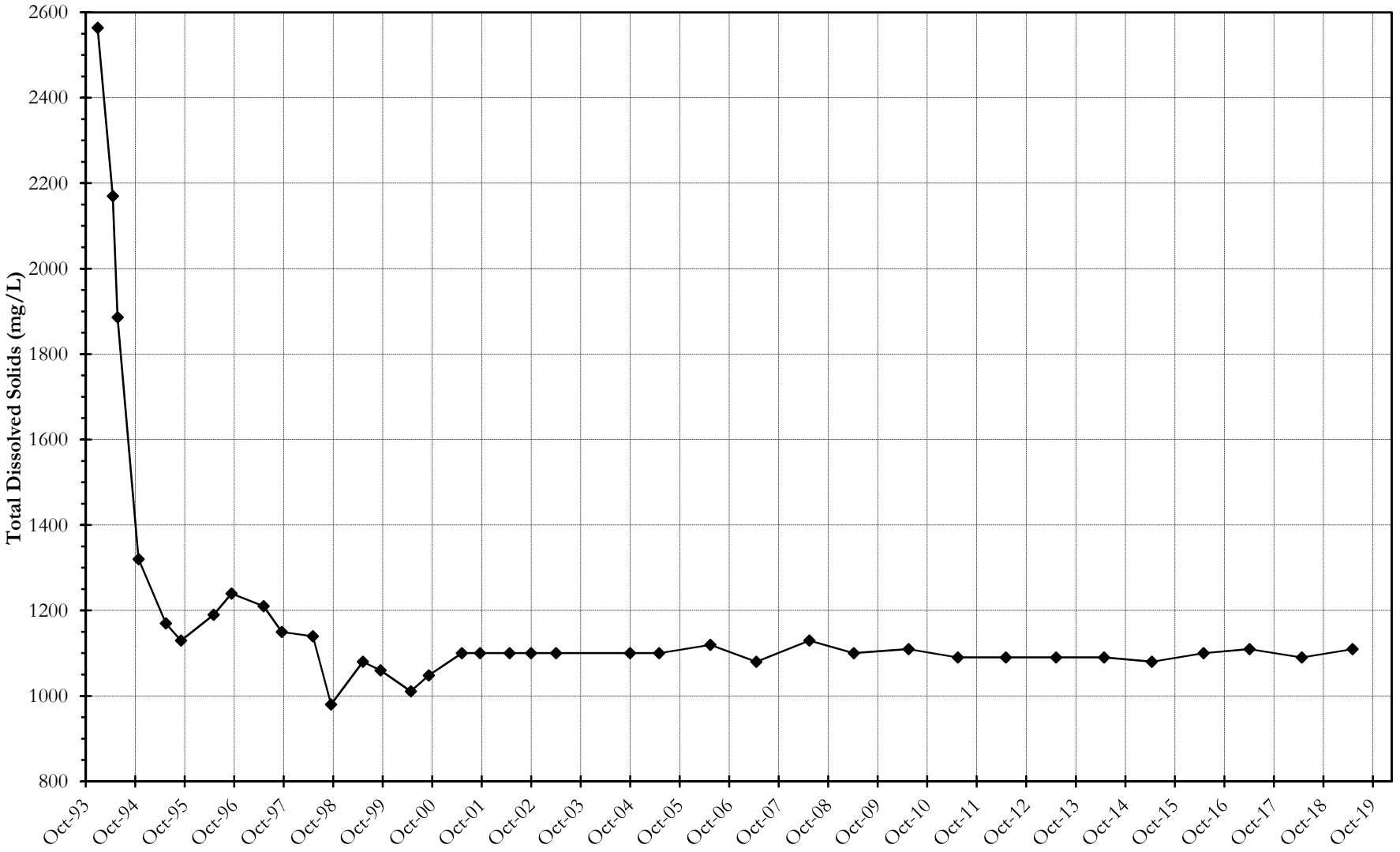

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FIGURE 11

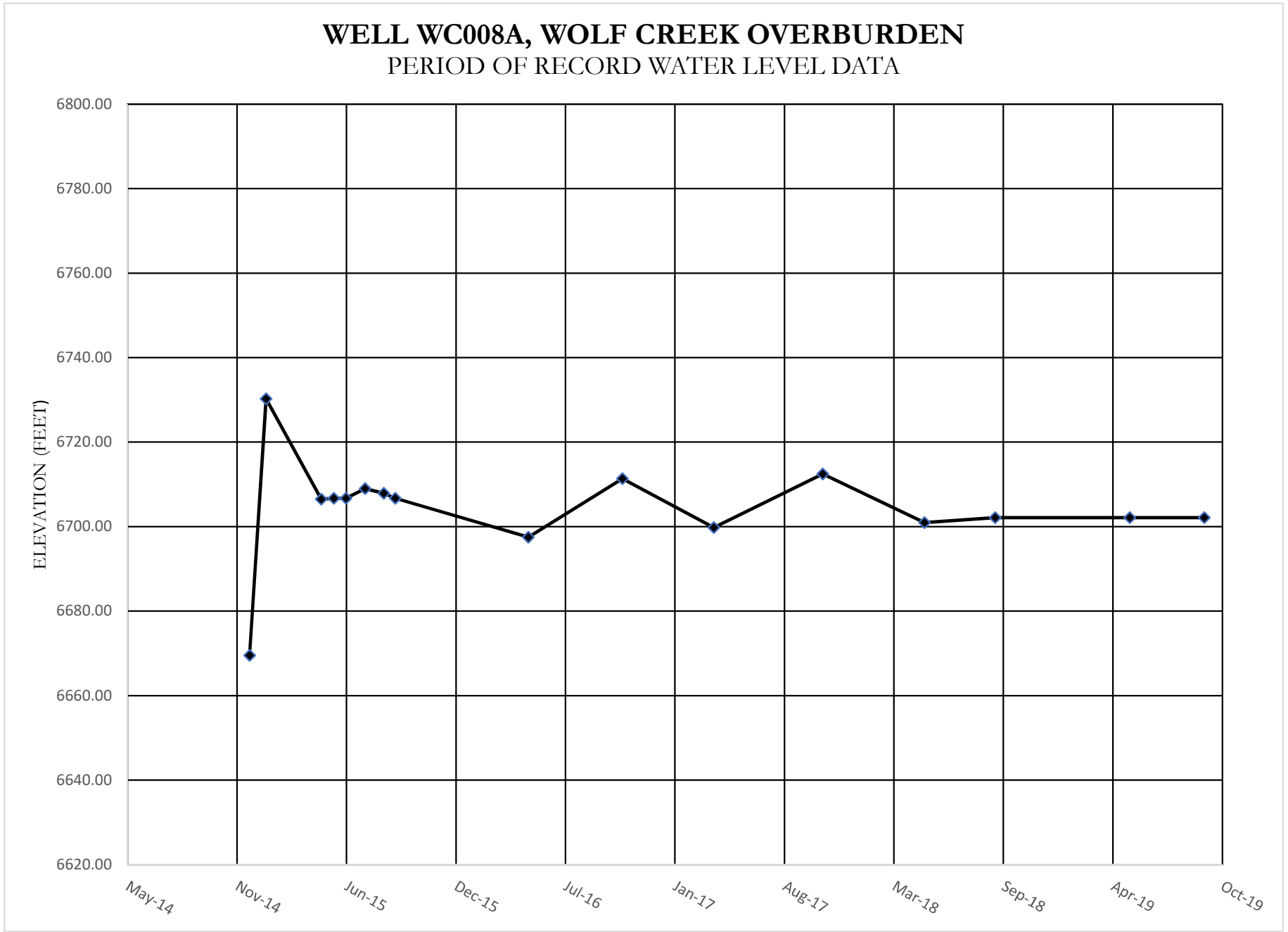

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FIGURE 12

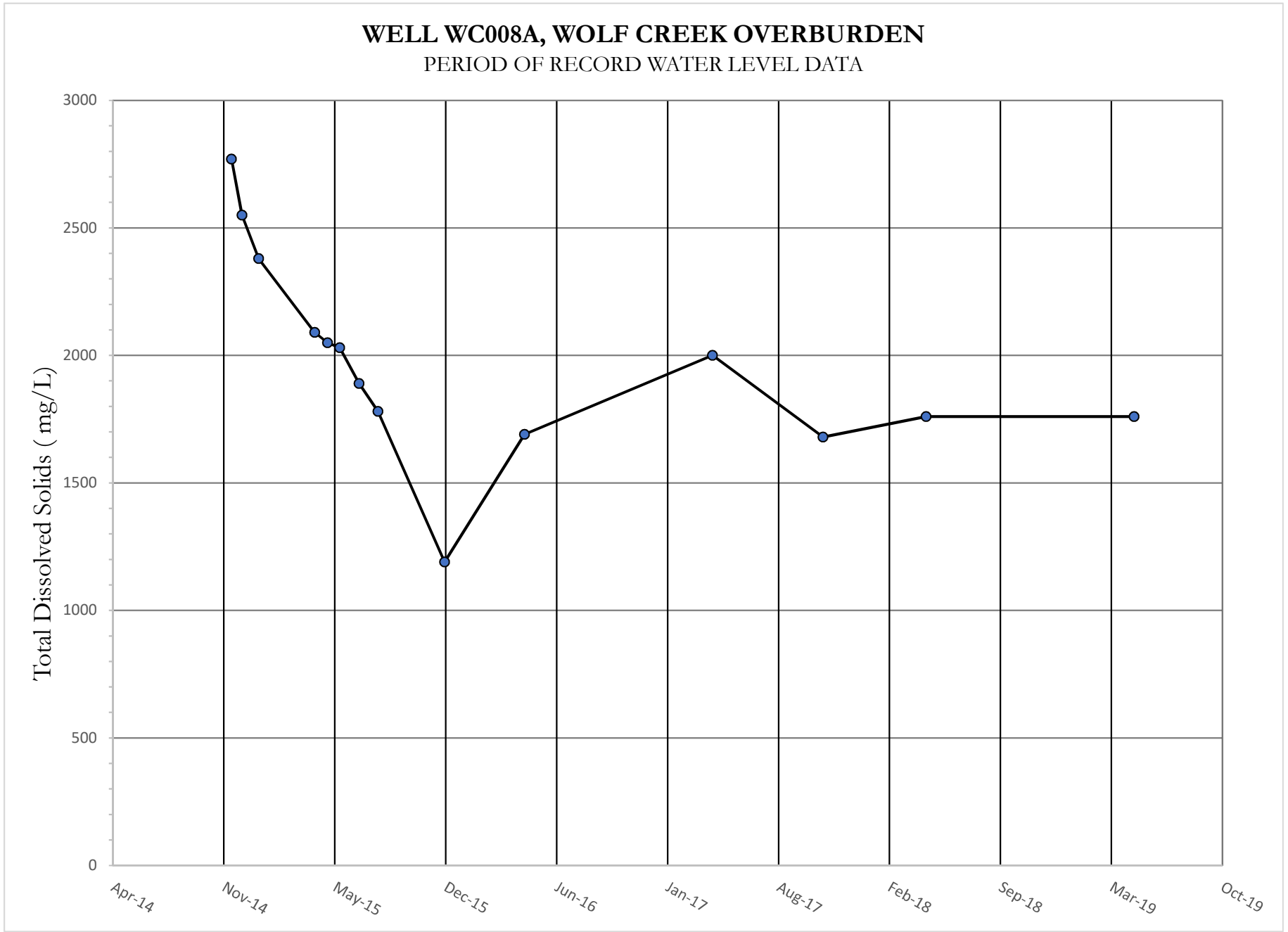

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FIGURE 13

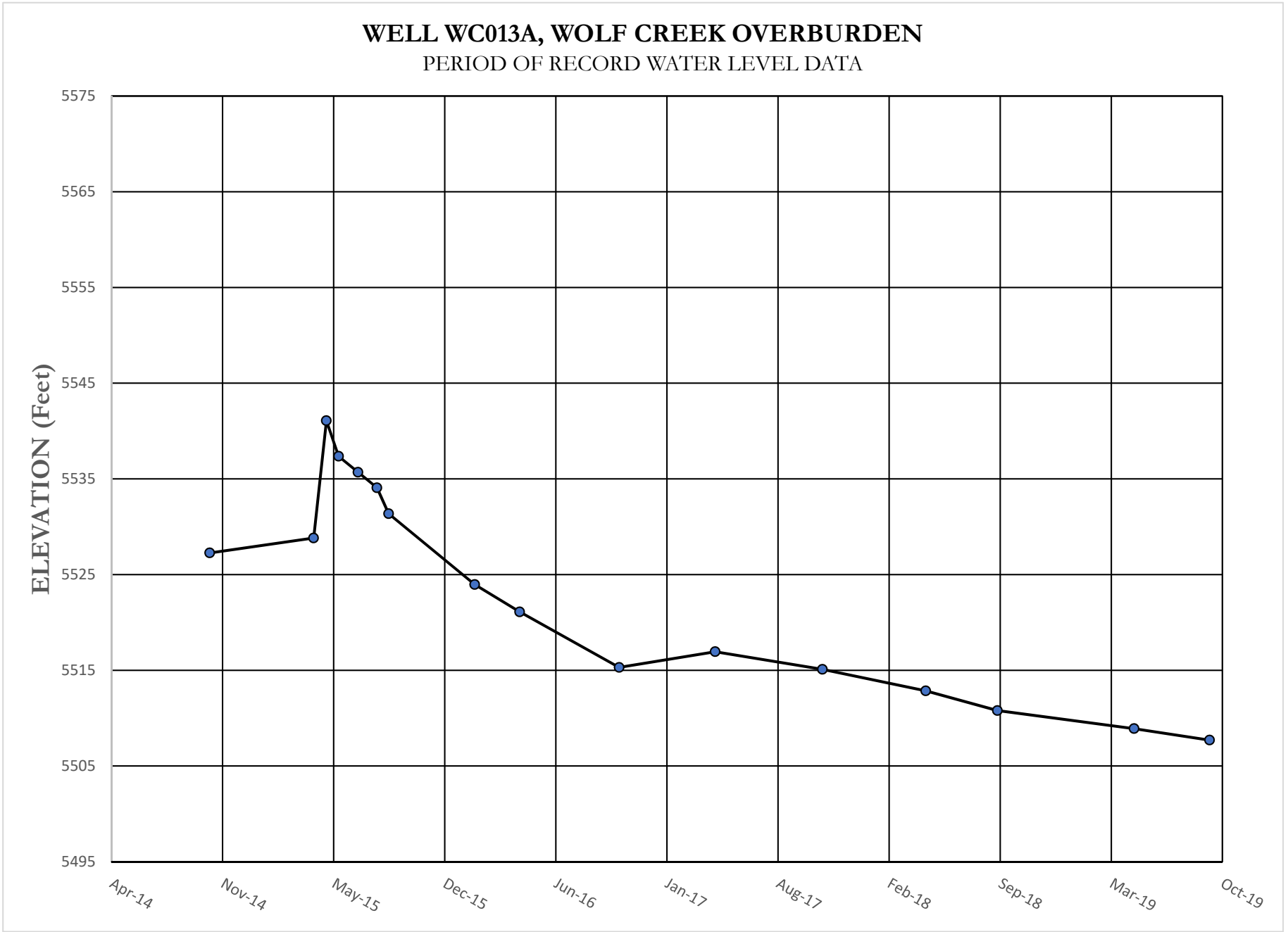

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FIGURE 14

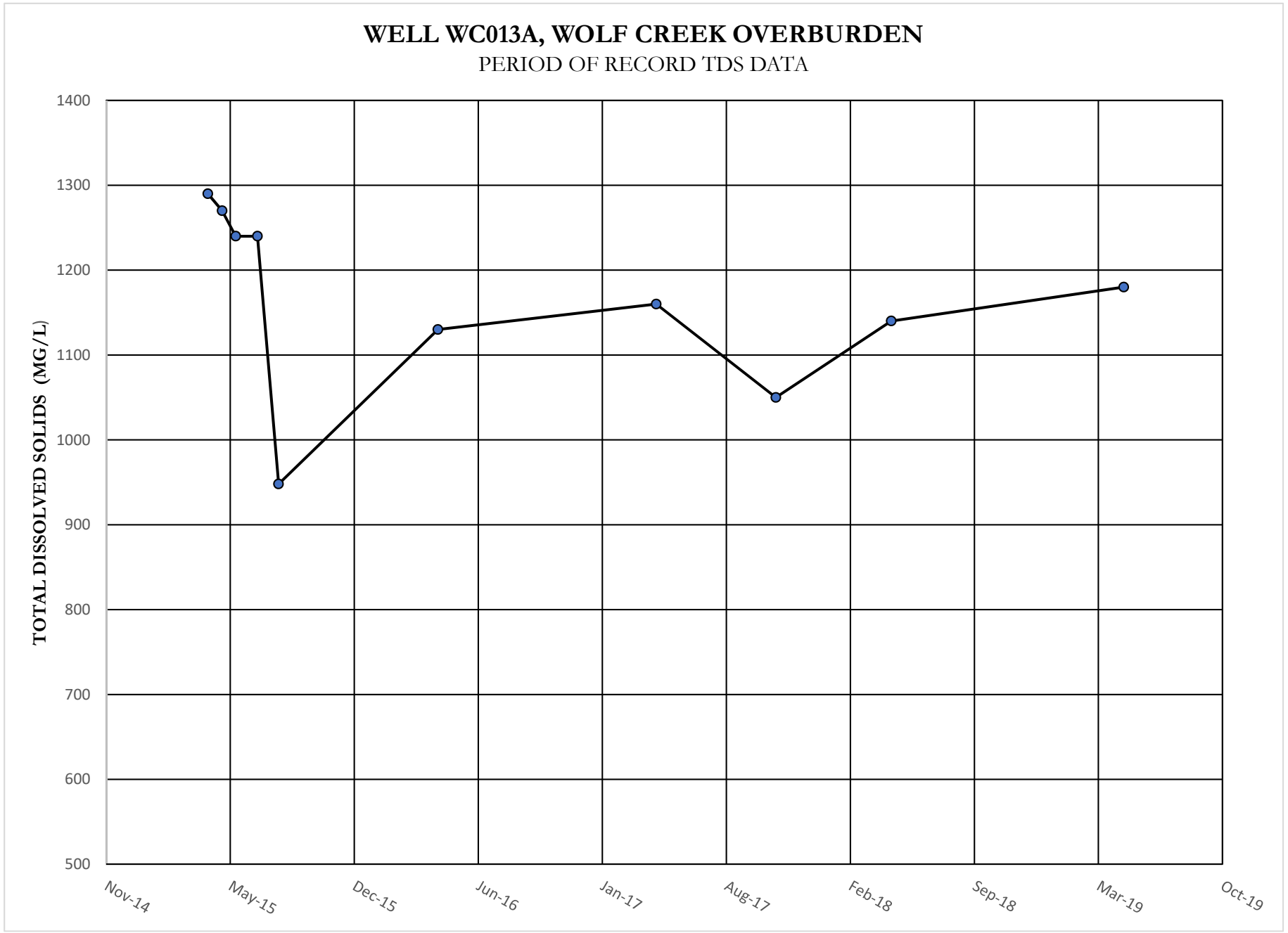

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FIGURE 15

Well 006-BRDH-7, Twentymile Sandstone

Period of Record Water Level Data

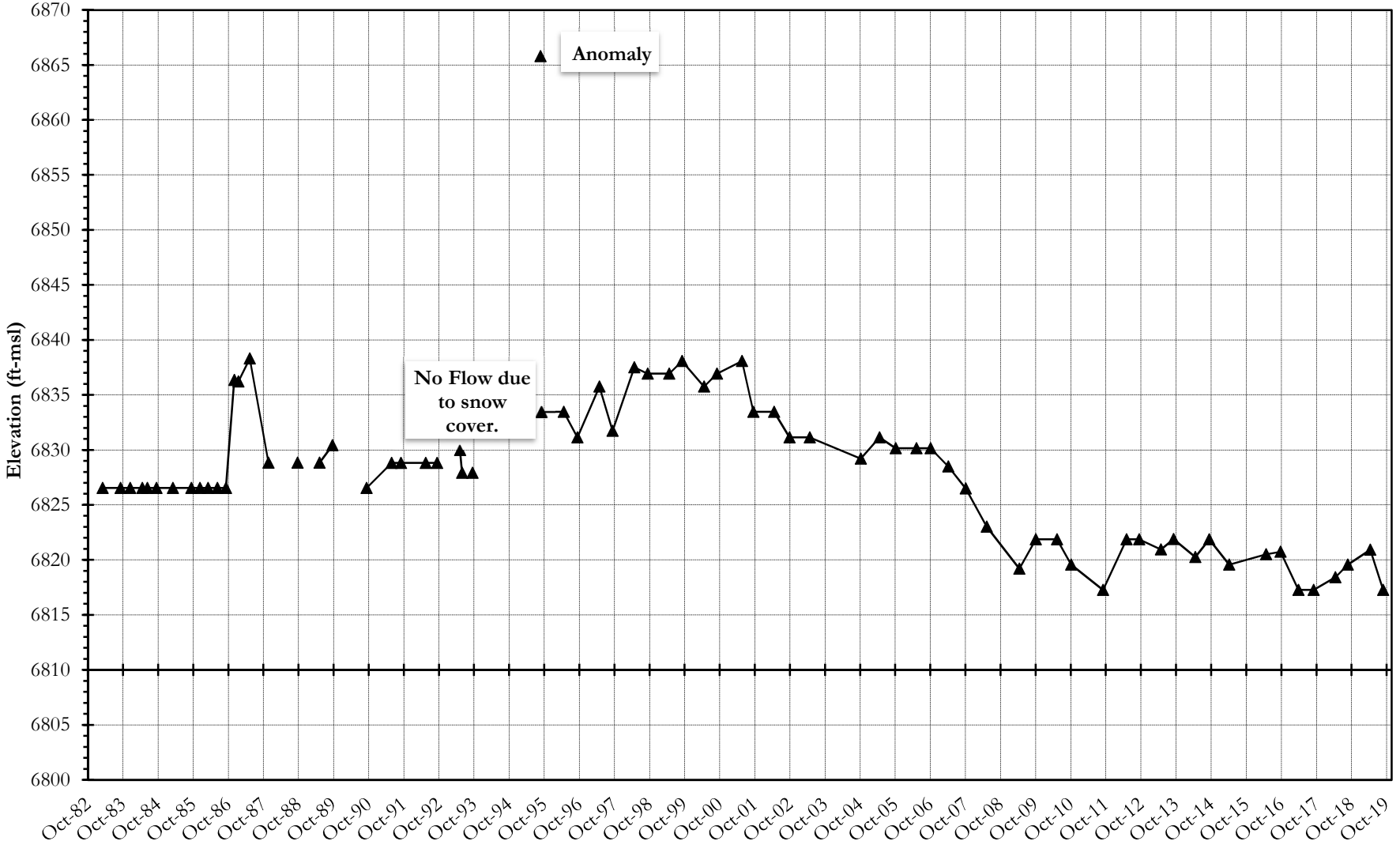

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FIGURE 16

Well 006-BRDH-7, Twentymile Sandstone

Period of Record Field Conductivity Data

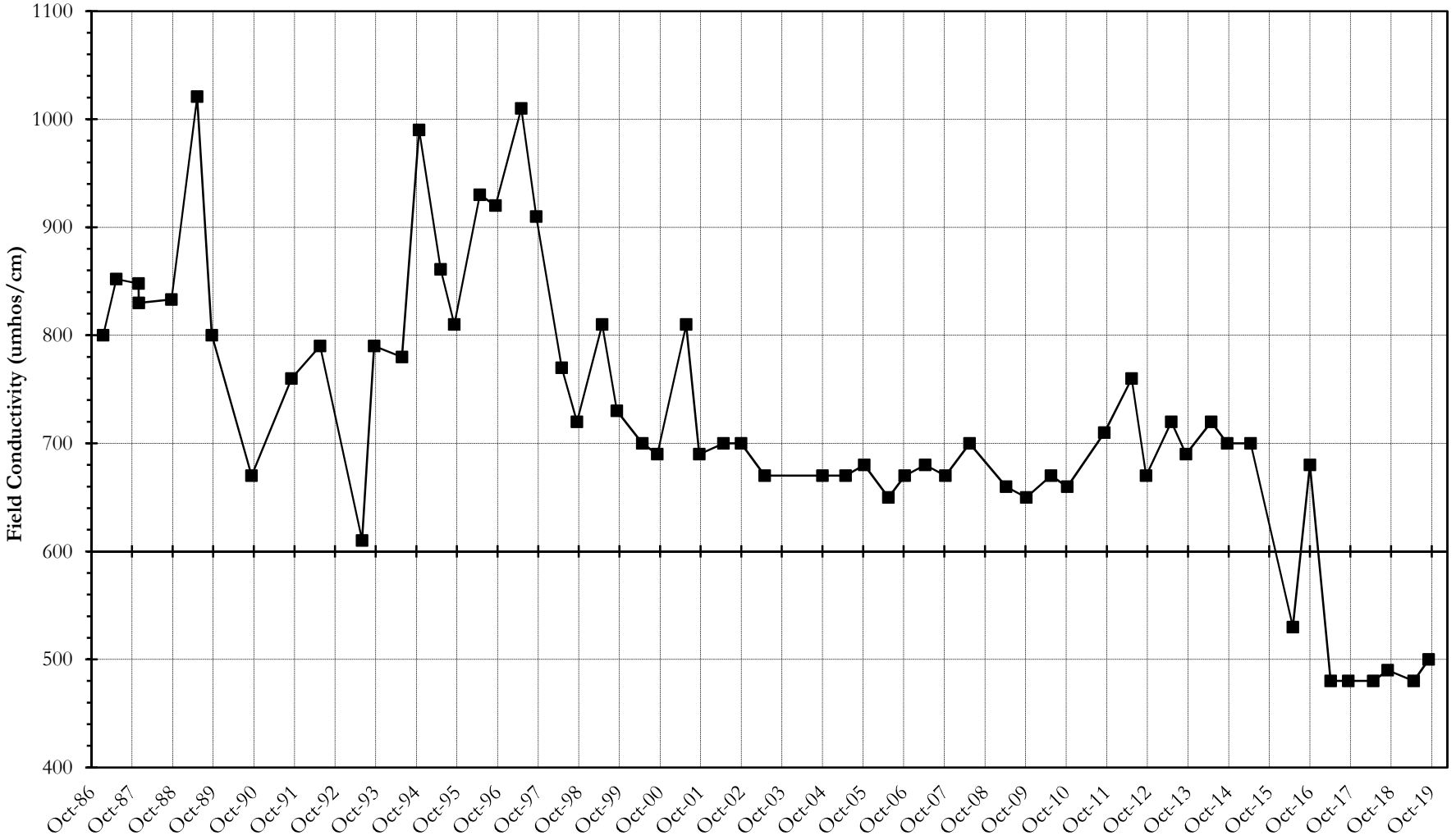

FIGURE 17

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Well 001-83-106, Trout Creek Sandstone

Period of Record Water Level Data

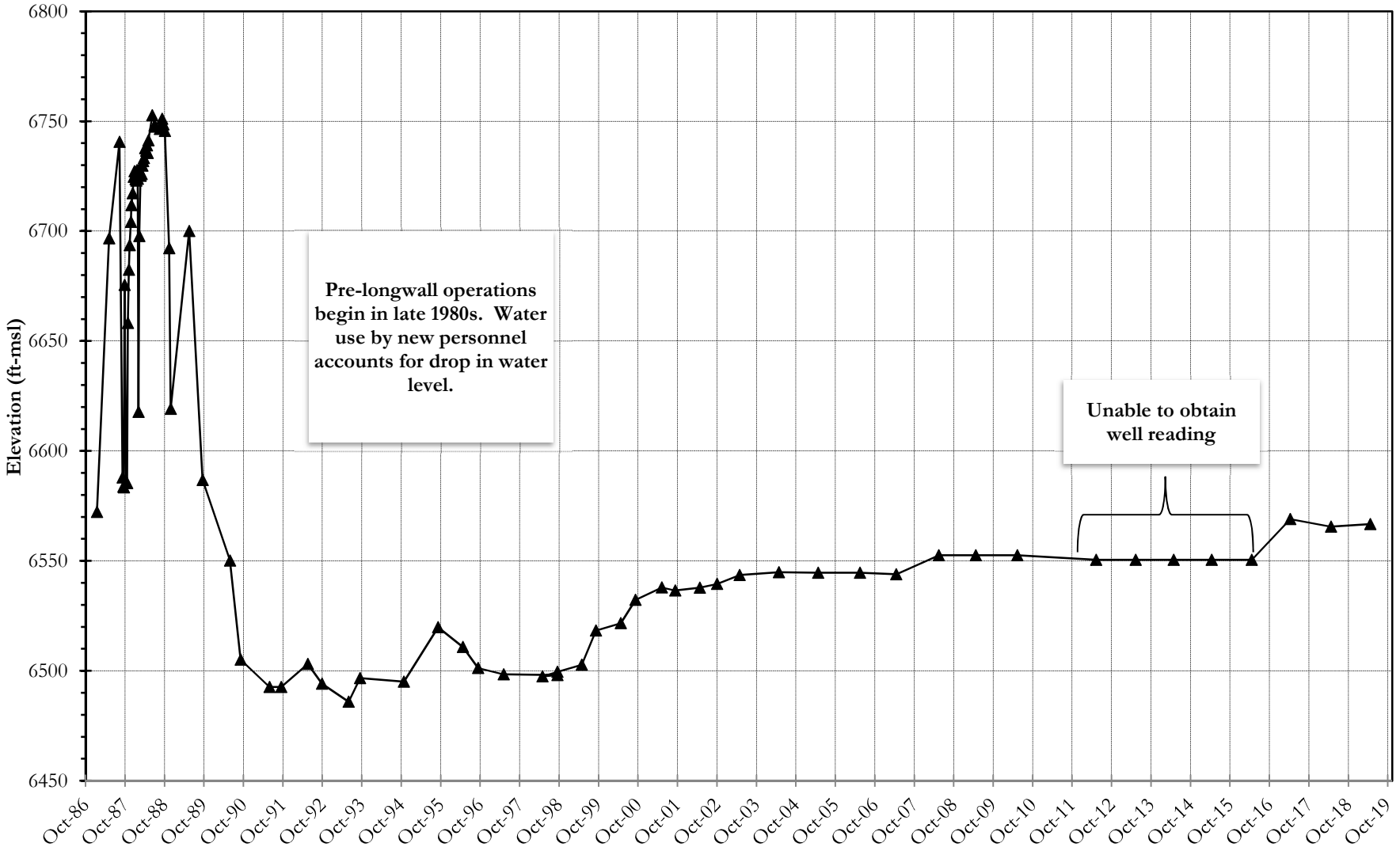

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FIGURE 18

Well FBR-2, Twentymile Sandstone

Period of Record Water Level Data

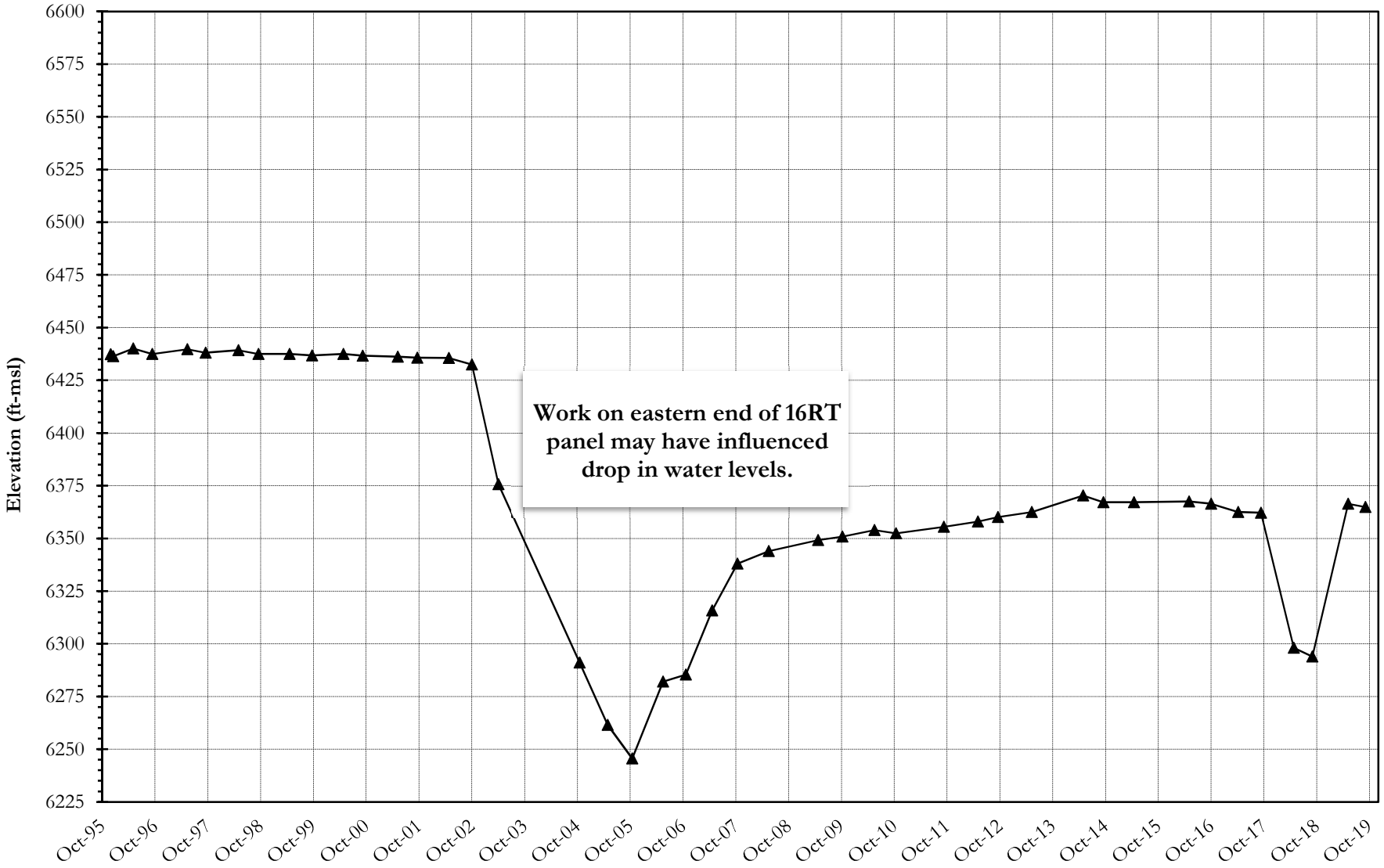

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FIGURE 18

Well FBR-2, Twentymile Sandstone

Period of Record TDS Data

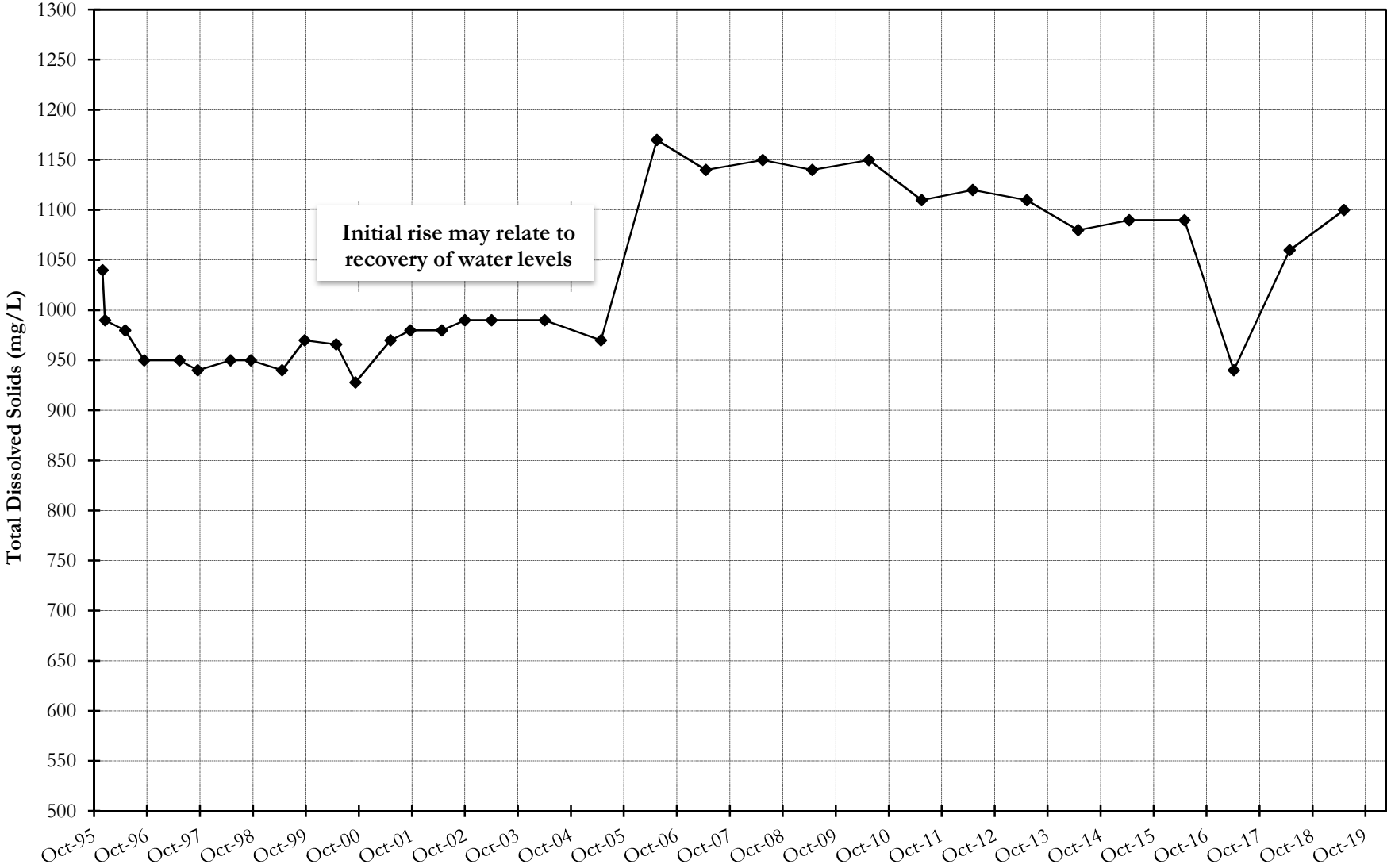

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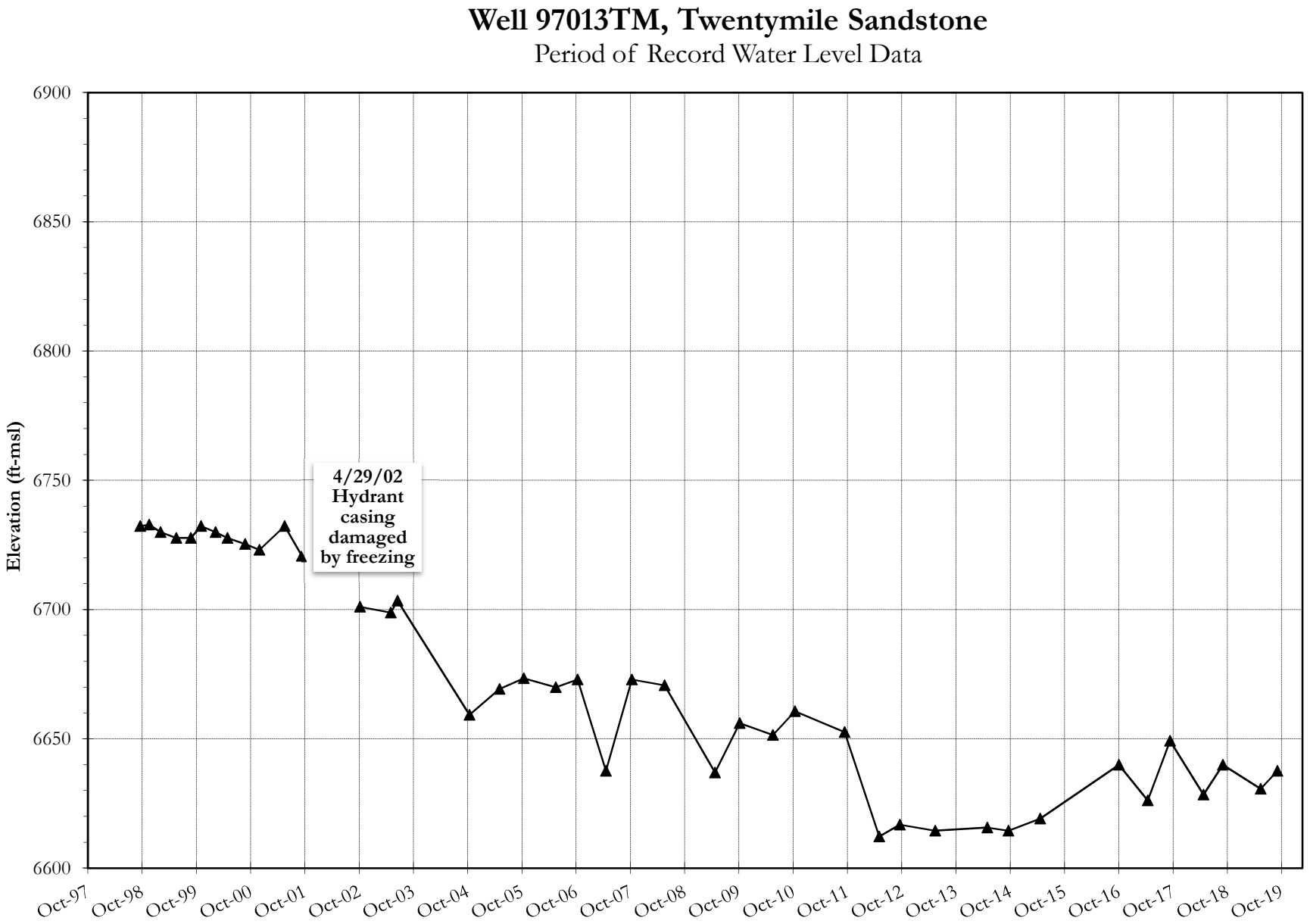
FIGURE 19



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\97013TM fig

FIGURE 20

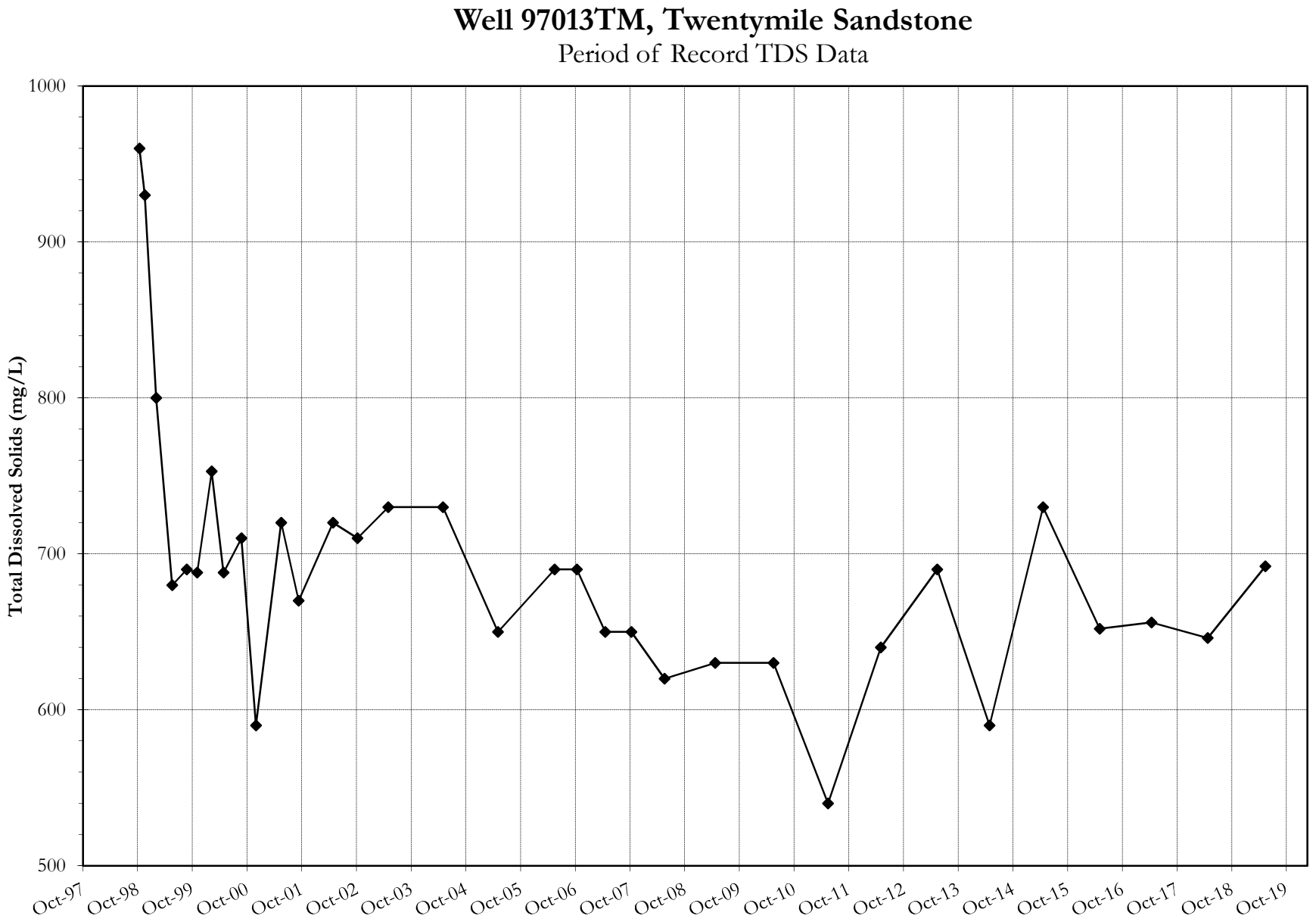


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FIGURE 21

Well 001-83-106, Trout Creek Sandstone

Period of Record Water Level Data

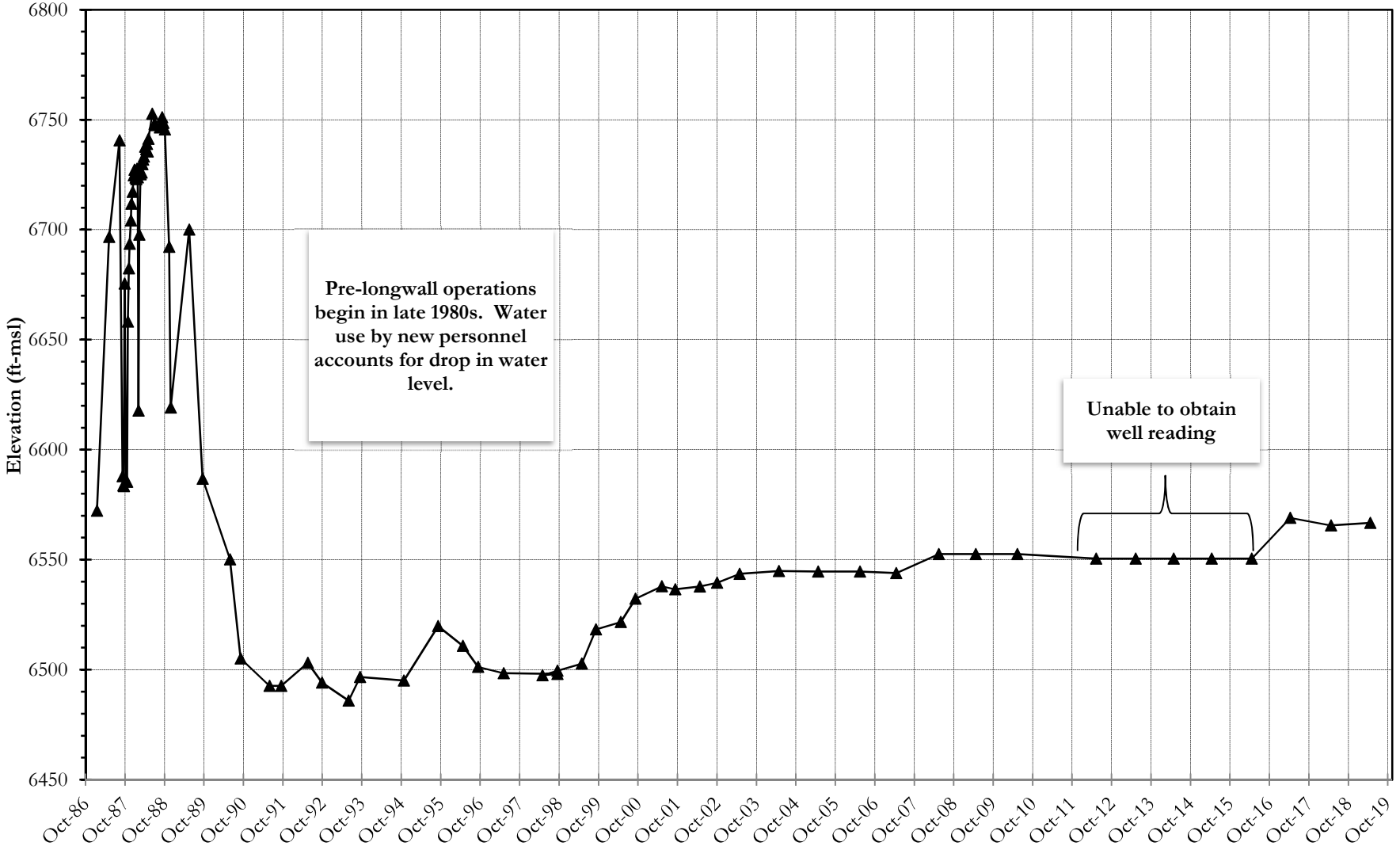

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FIGURE 22

Well 001-83-107, Trout Creek Sandstone

Period of Record Water Level Data

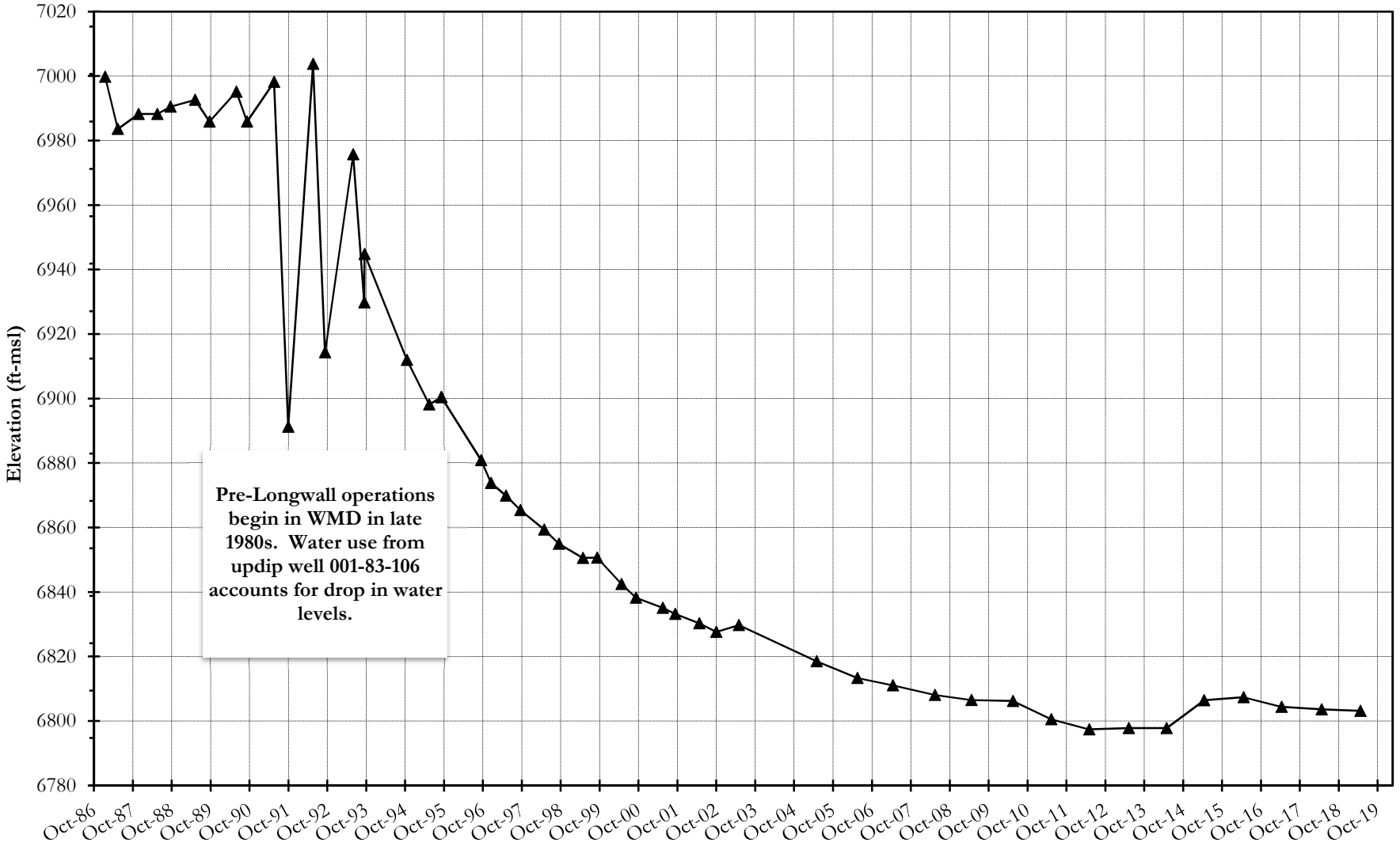

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FIGURE 23

Well 006-83-48C, Well FCM#2, and Well 95M001 - Trout Creek Sandstone

Period of Record Water Level

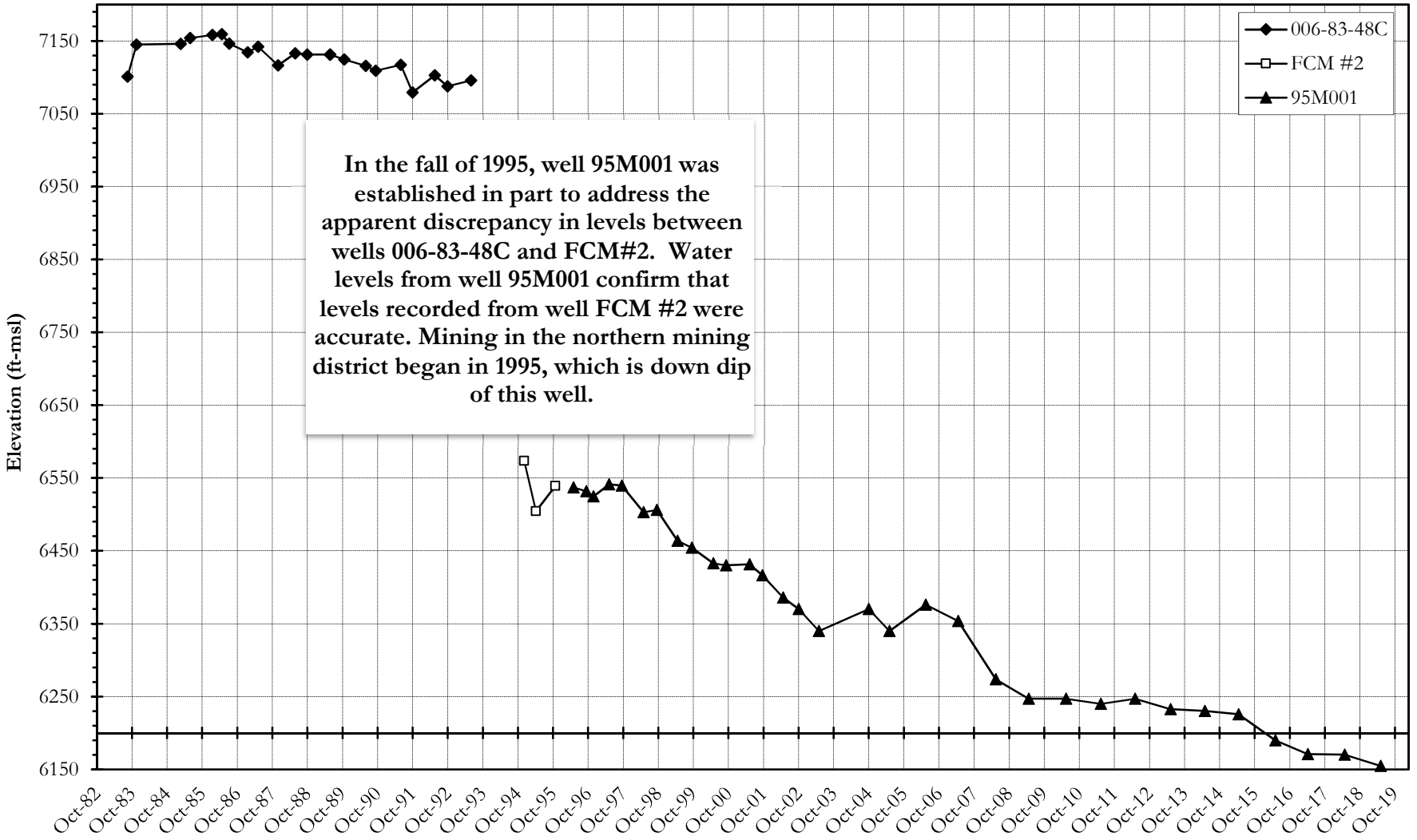

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FIGURE 24

Well 001-83-106, Well 001-83-107, and Well 006-83-48C - Trout Creek Sandstone

Period of Record Field Conductivity Data

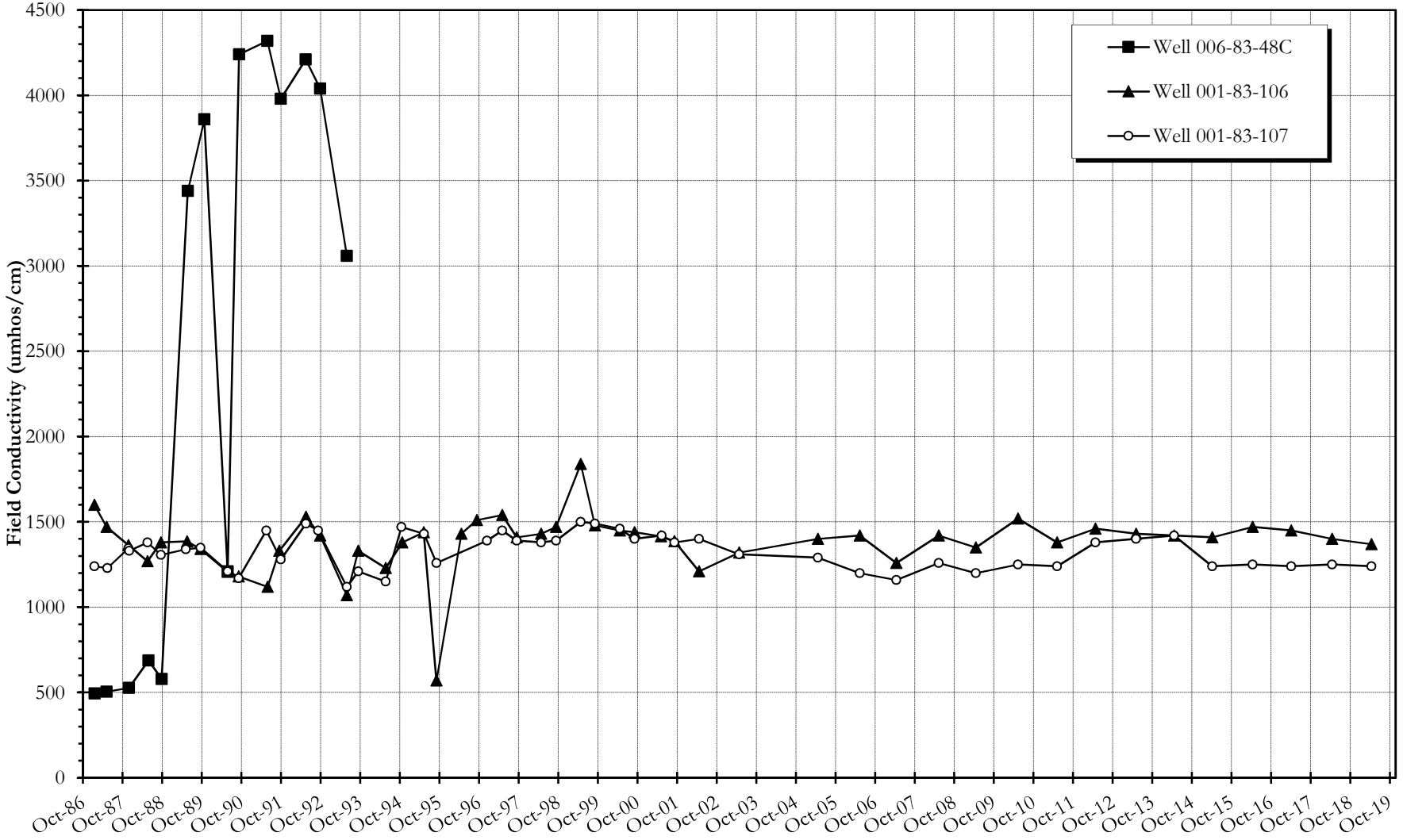

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FIGURE 25

Well FBR-2-E, Trout Creek Sandstone

Period of Record Water Level Data

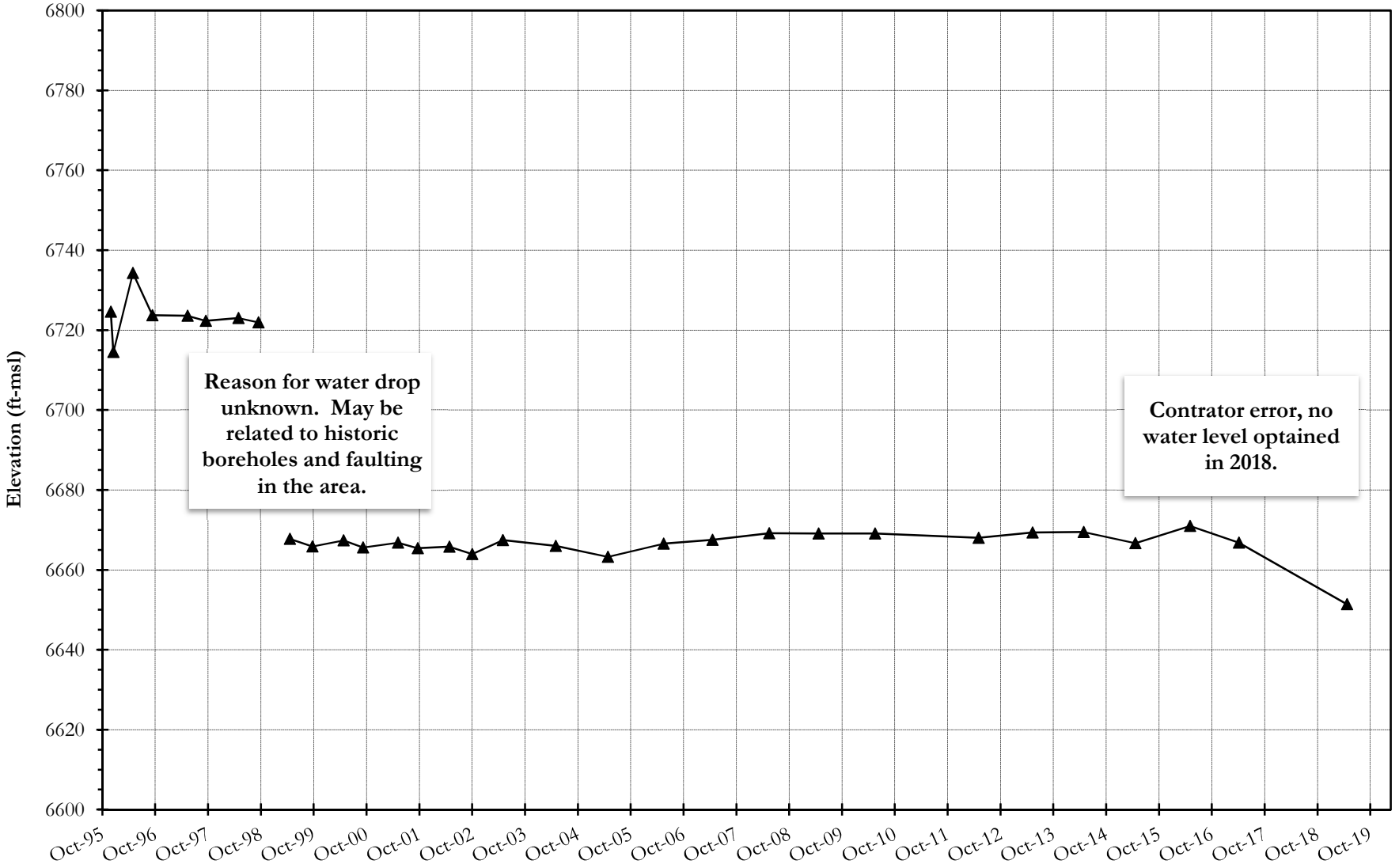

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FIGURE 26

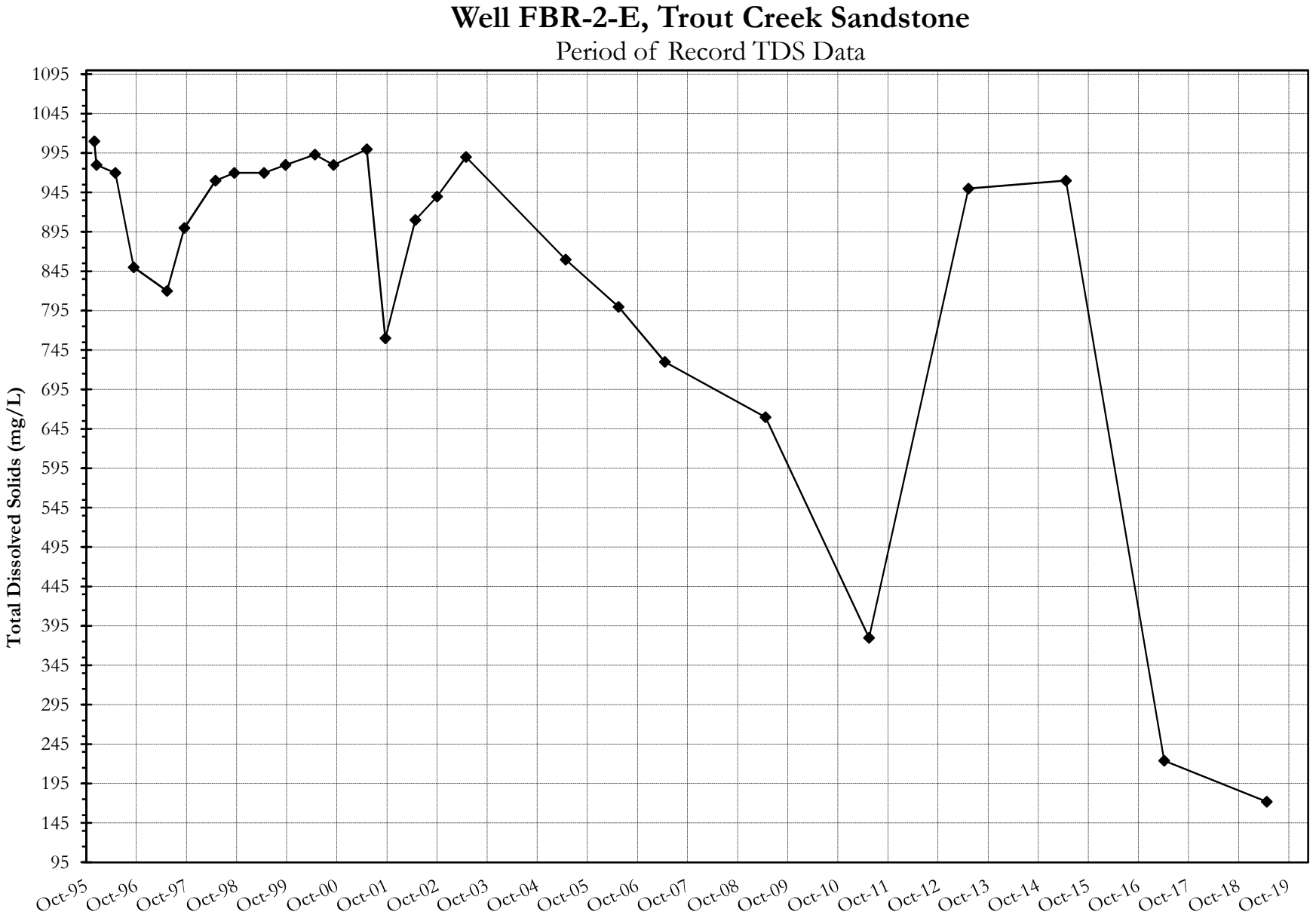

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FIGURE 27

Well 97013TC, Trout Creek Sandstone

Period of Record Water Level Data

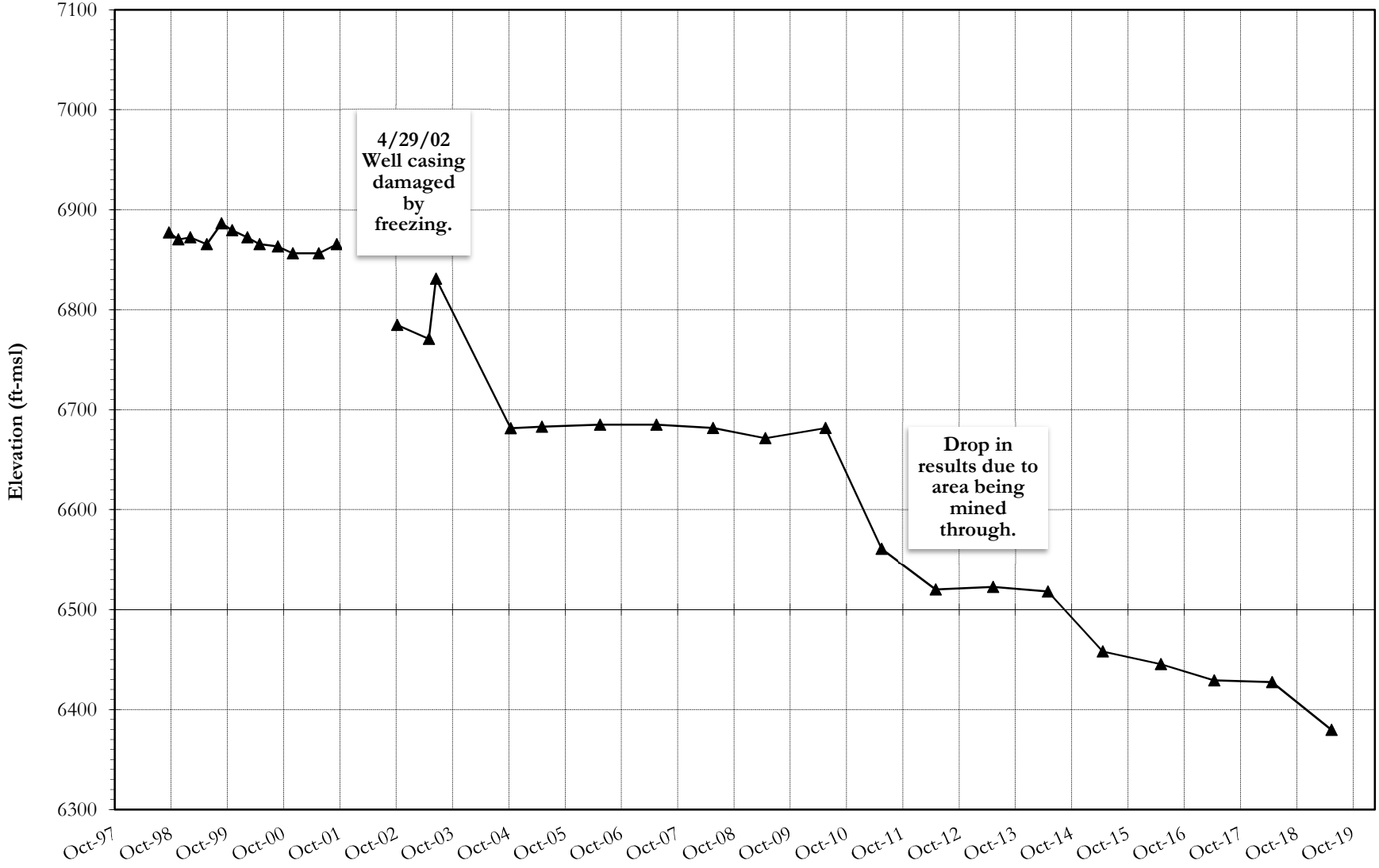

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FIGURE 28

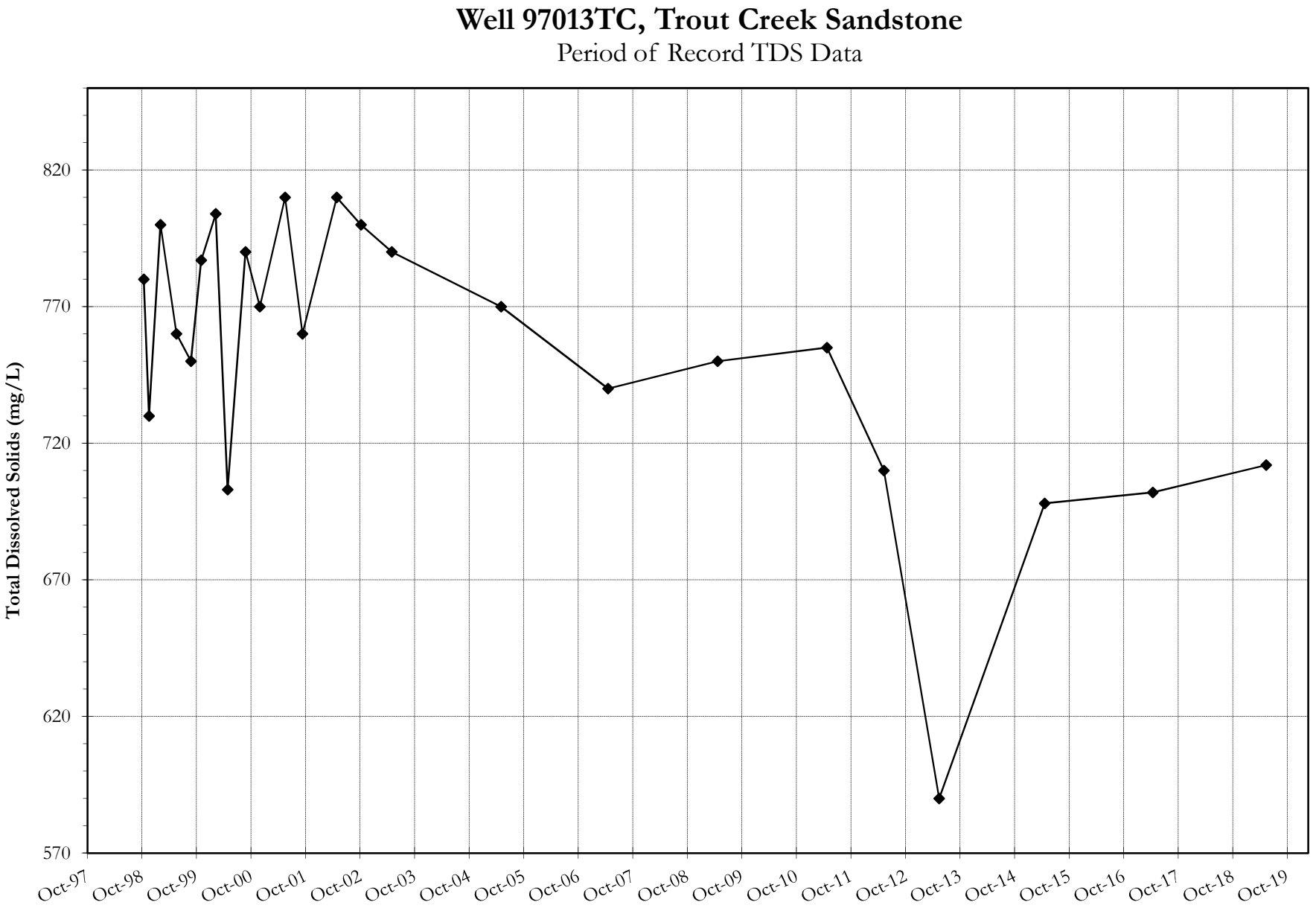

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FIGURE 29

Well 91M001 & Well 91M004, Fish Creek Sandstone

Period of Record Water Level Data

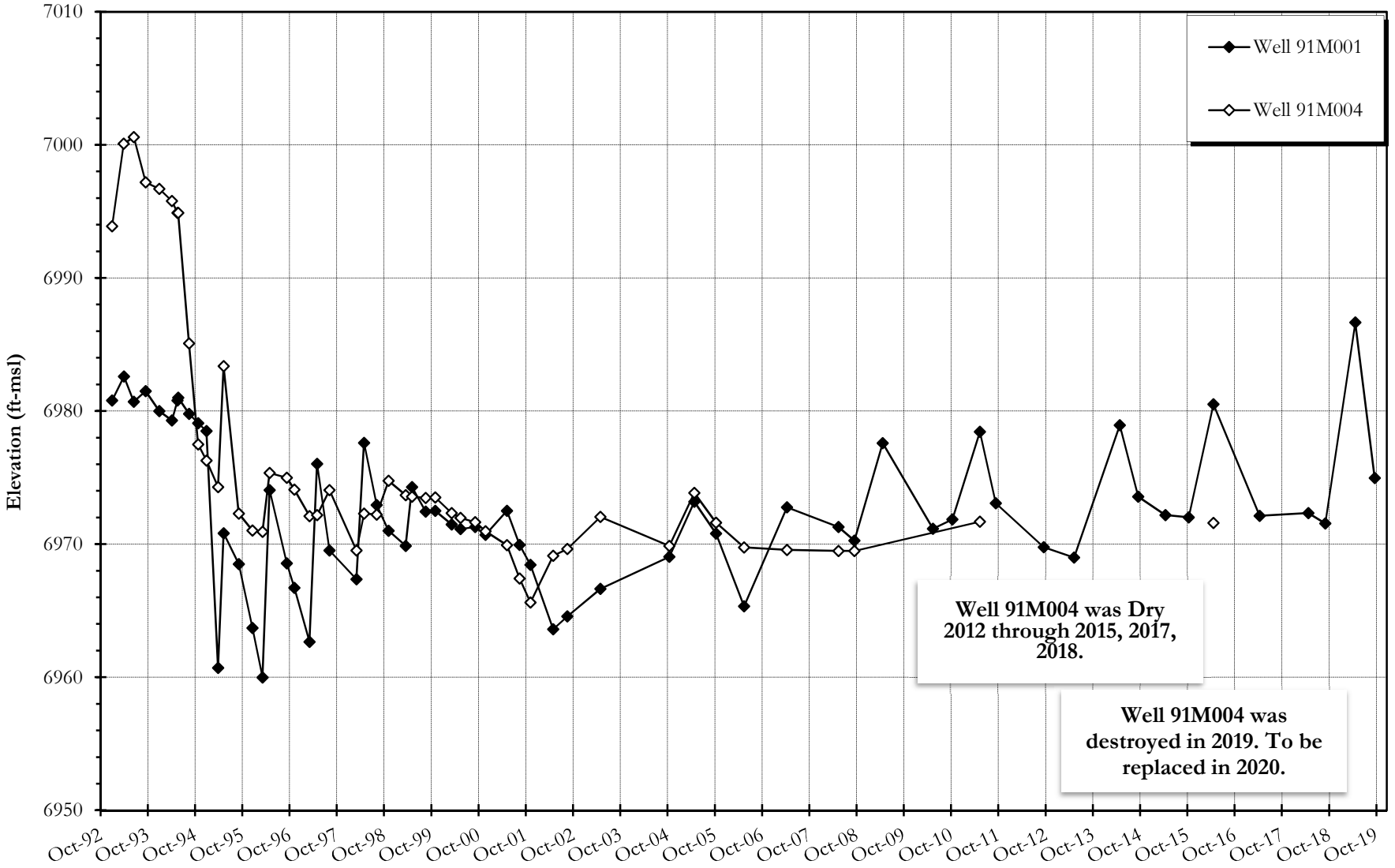

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FIGURE 30

Ashley Well, Fish Creek Sandstone

Period of Record Water Level Data

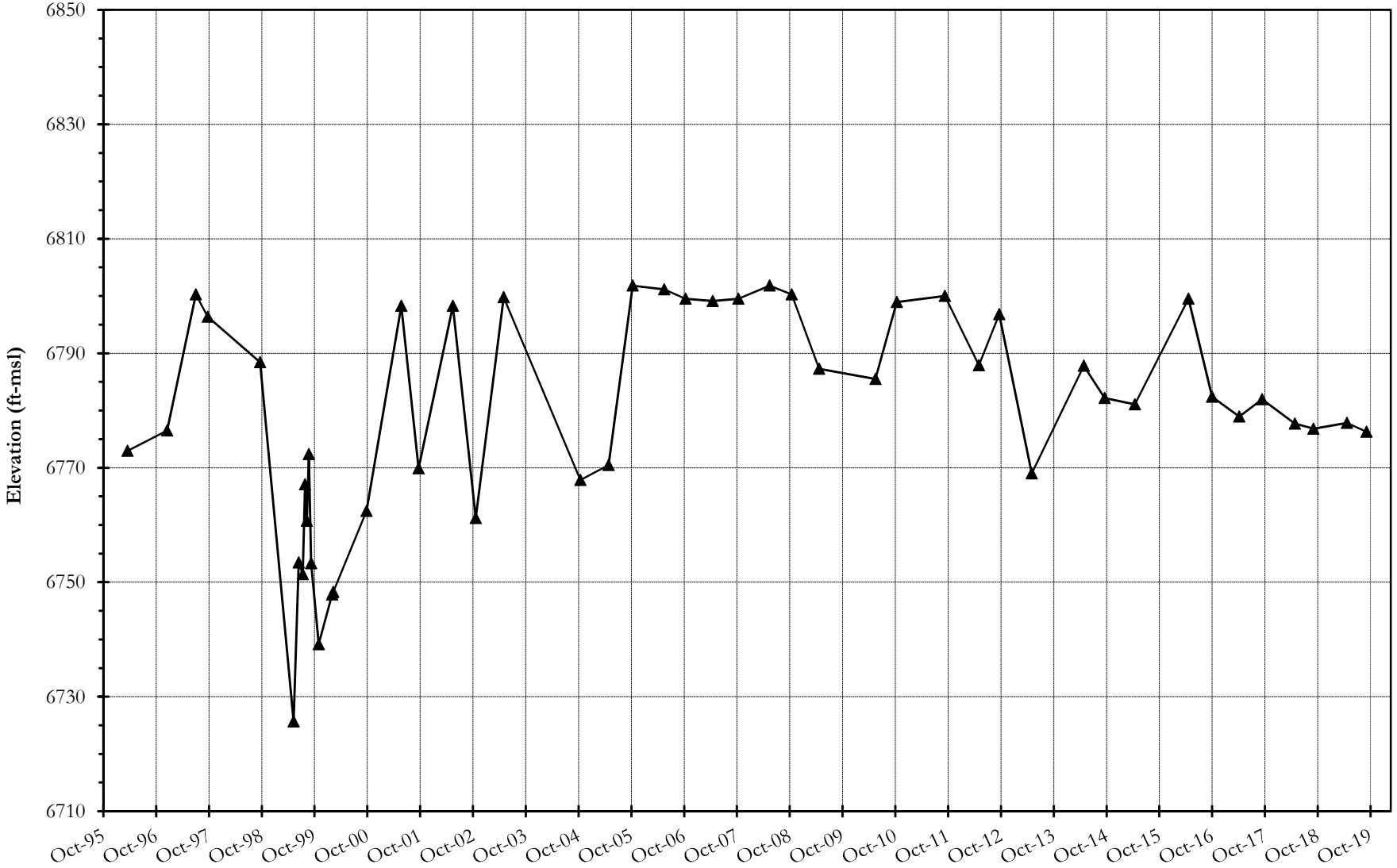

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FIGURE 31

Ashley Well, Fish Creek Sandstone

Period of Record TDS Data

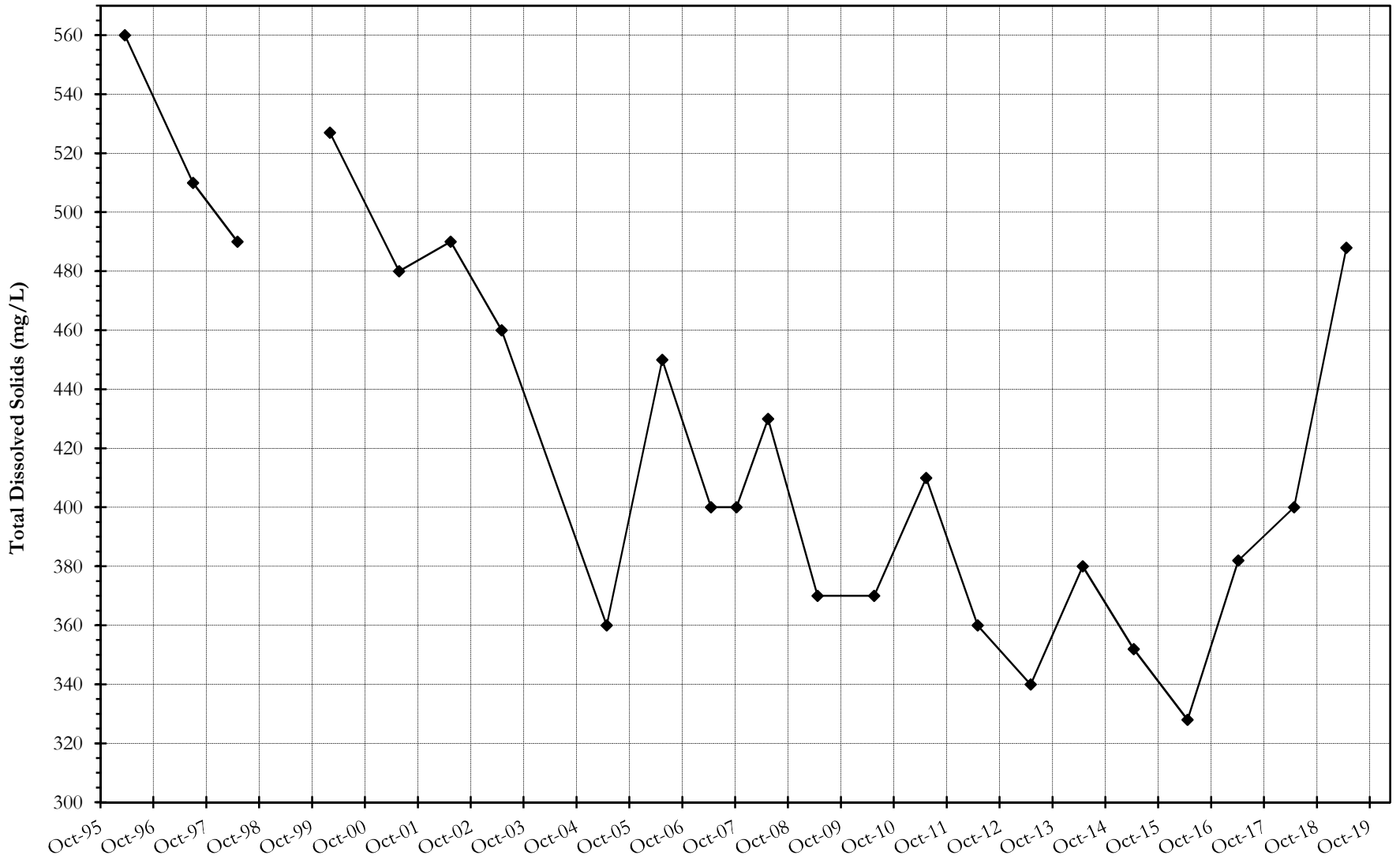

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FIGURE 32

Well 009-S-10, Foidel Creek Alluvium

Period of Record Water Level Data

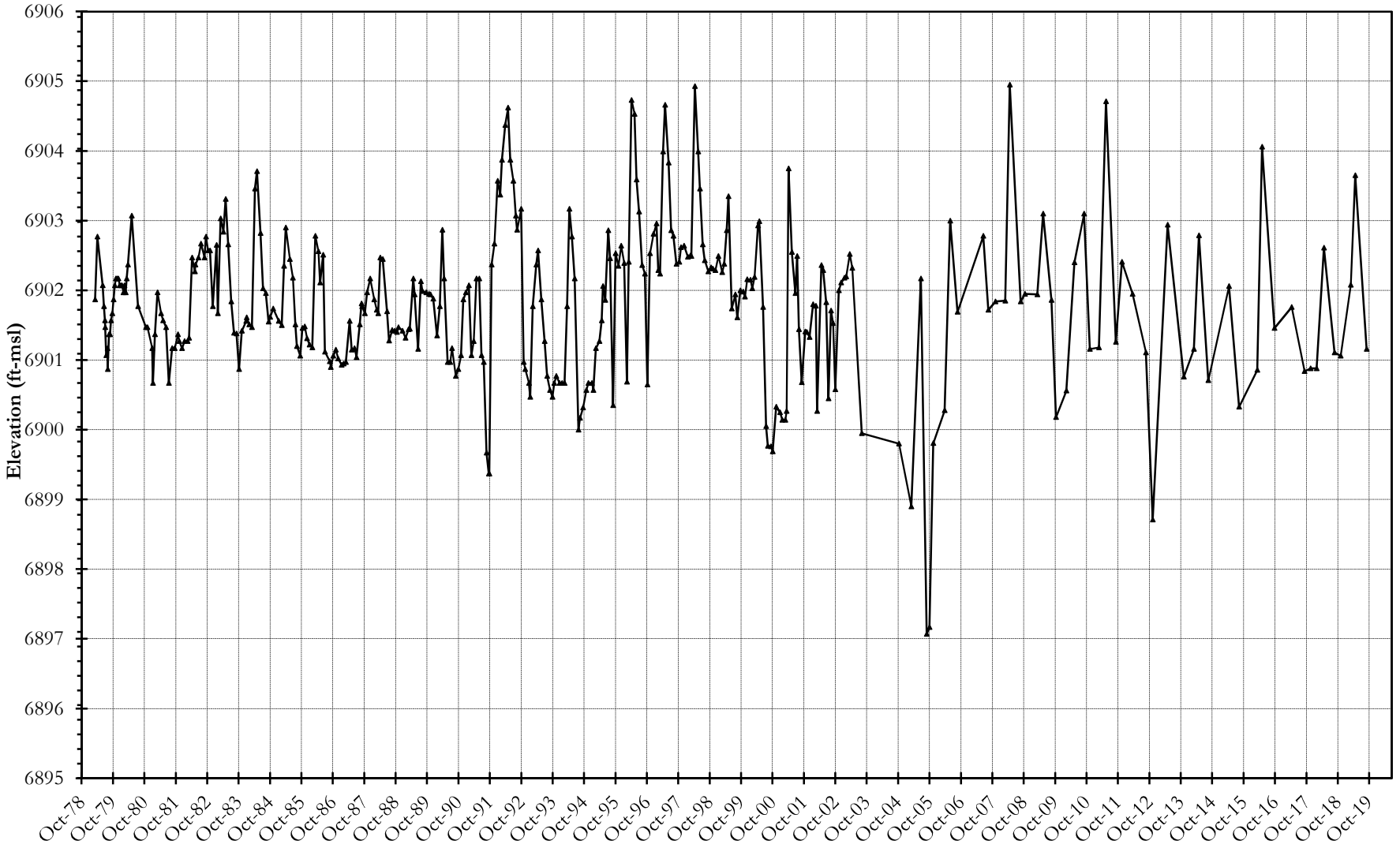

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FIGURE 33

Well 009-S-10, Foidel Creek Alluvium

Period of Record Field Conductivity Data

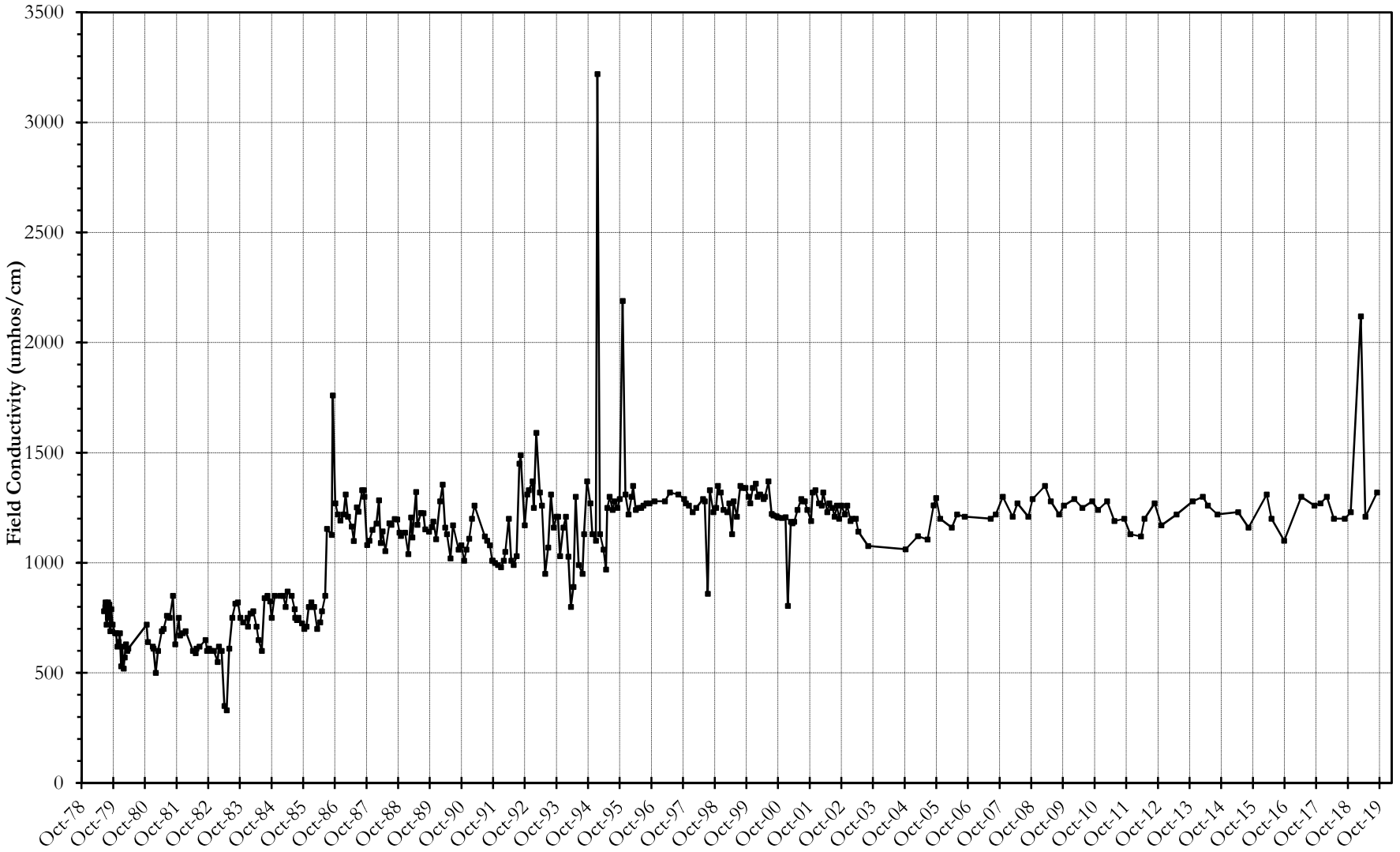

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FIGURE 34

Well 001-S-5, Foidel Creek Alluvium

Period of Record Water Level Data

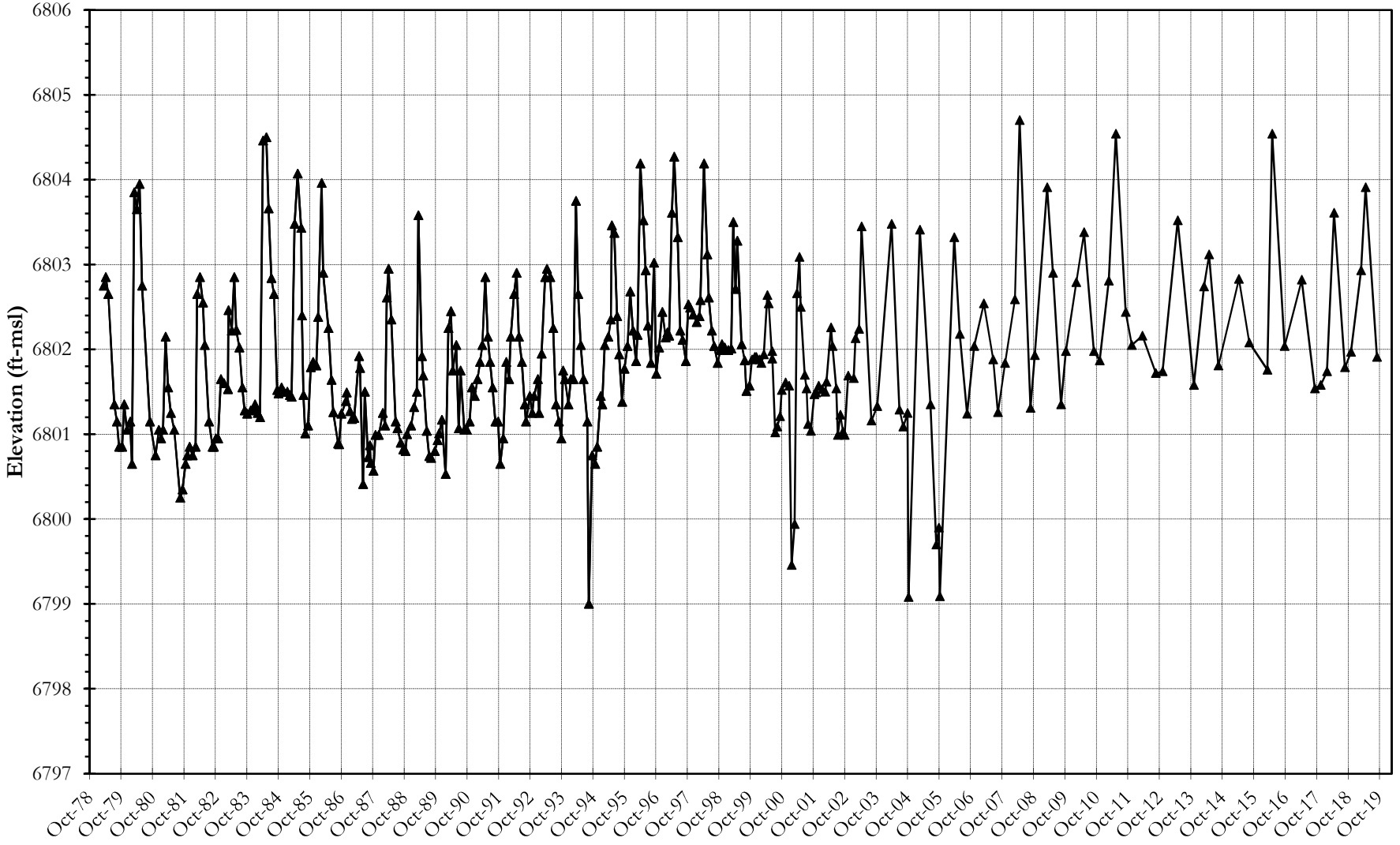

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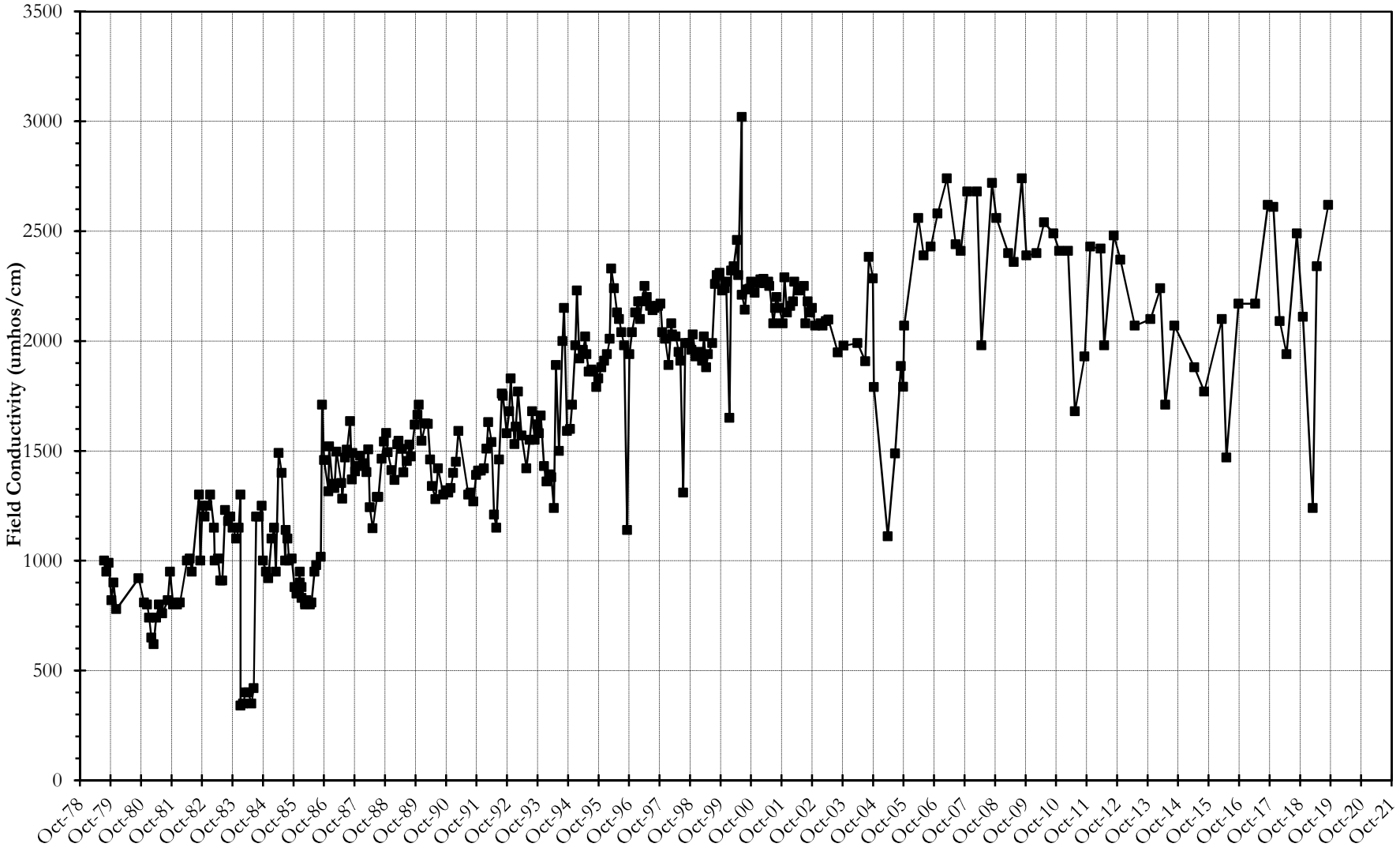
FIGURE 35

Well 001-S-5, Foidel Creek Alluvium

Period of Record Field Conductivity Data



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\001-S-5 FIG

FIGURE 36

Well 006-AY-1, Fish Creek Alluvium

Period of Record Water Level Data

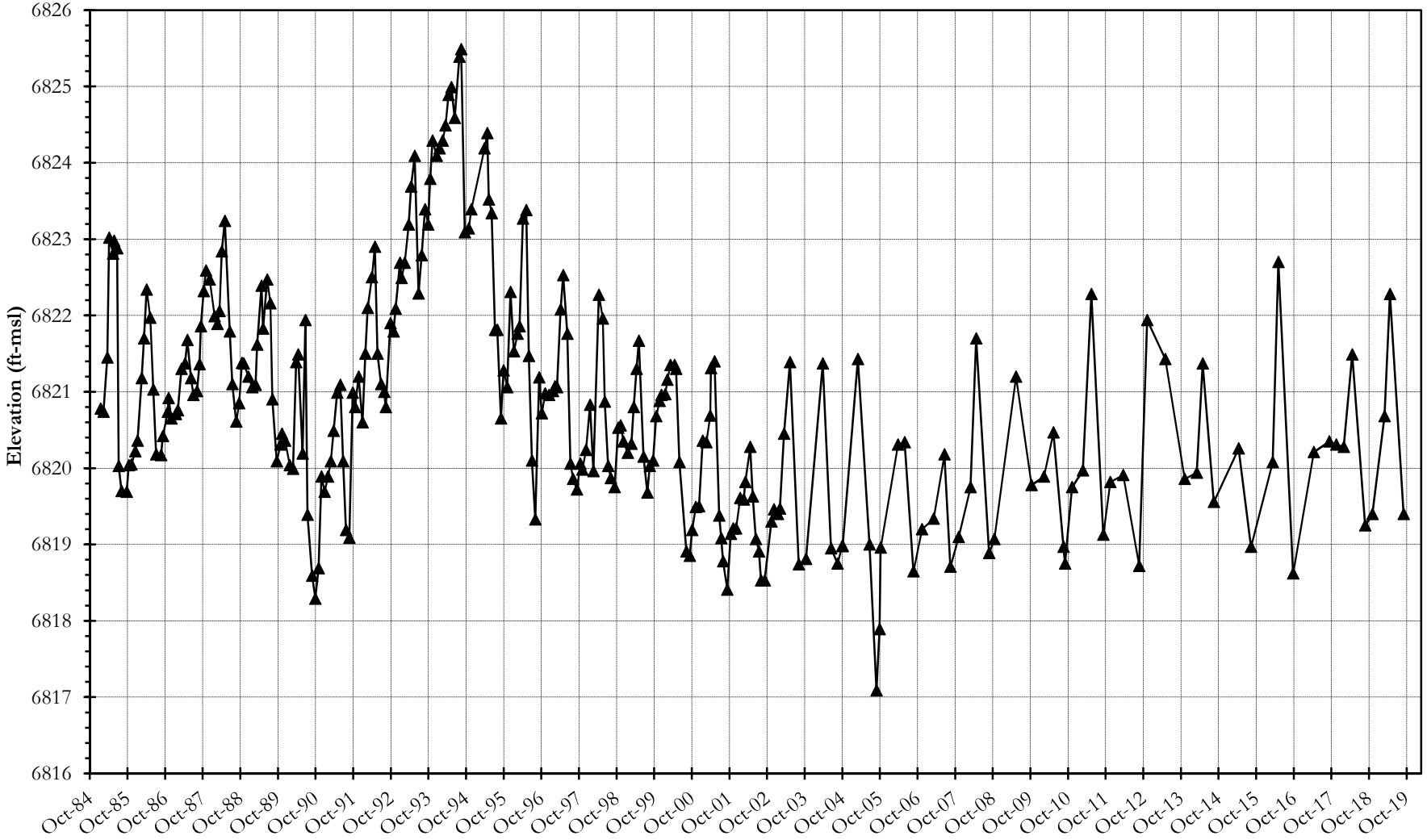


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FIGURE 37

Well 006-AY-1, Fish Creek Alluvium

Period of Record Field Conductivity Data

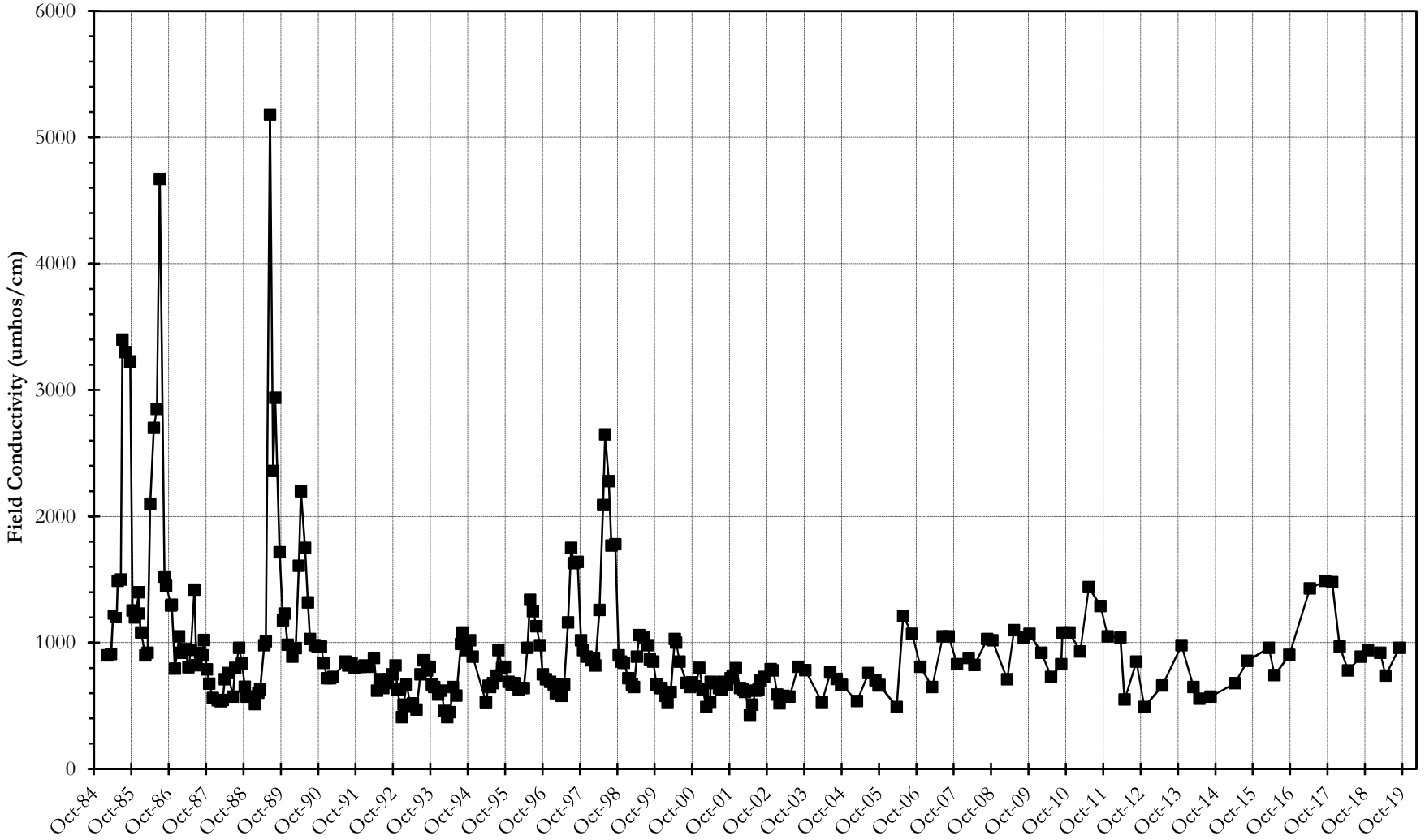

FIGURE 38

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\006-AY-1 fig

Well 006-AZ-3 Fish Creek Alluvium

Water Level Data for Water Years 1997 - 2019

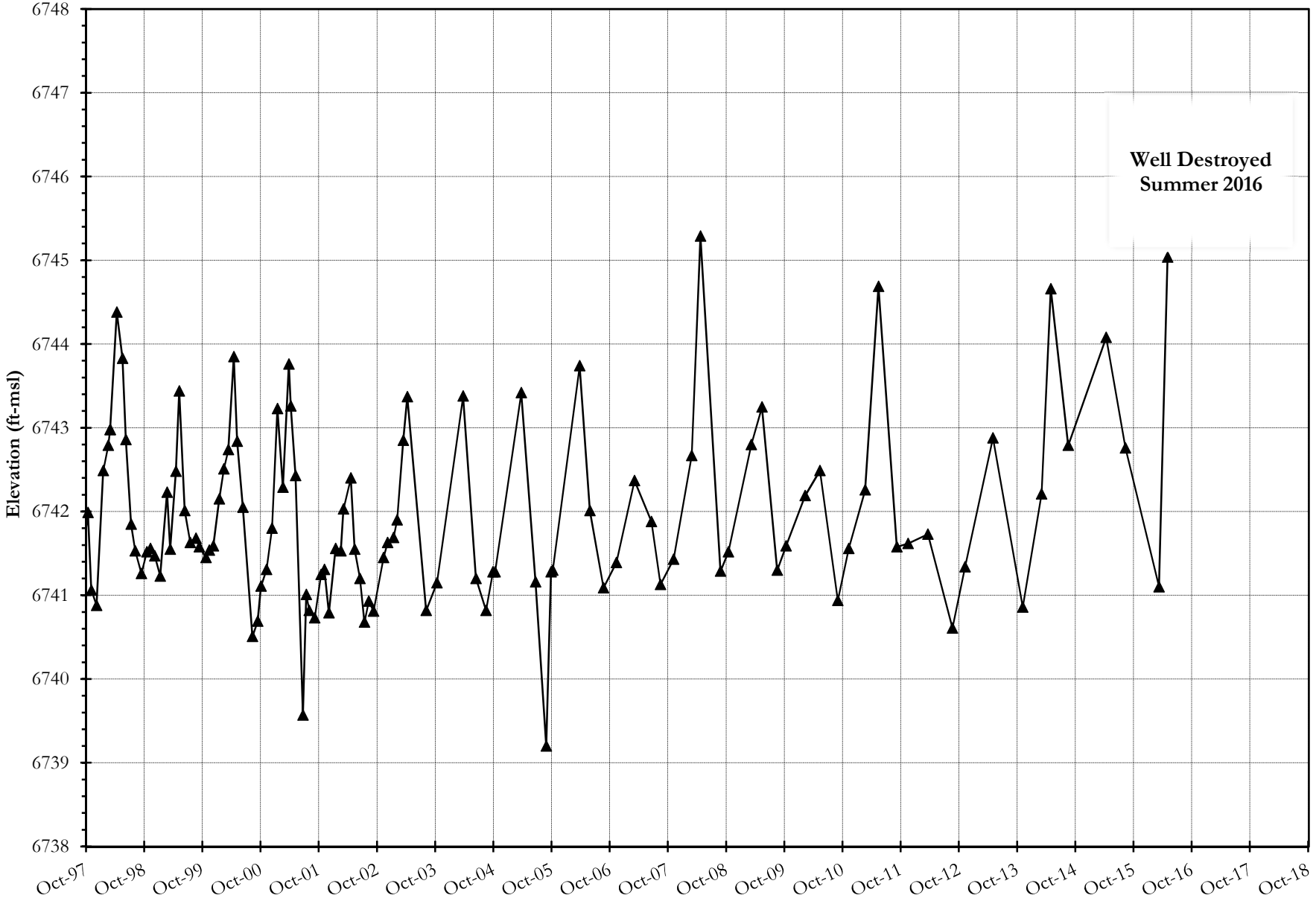

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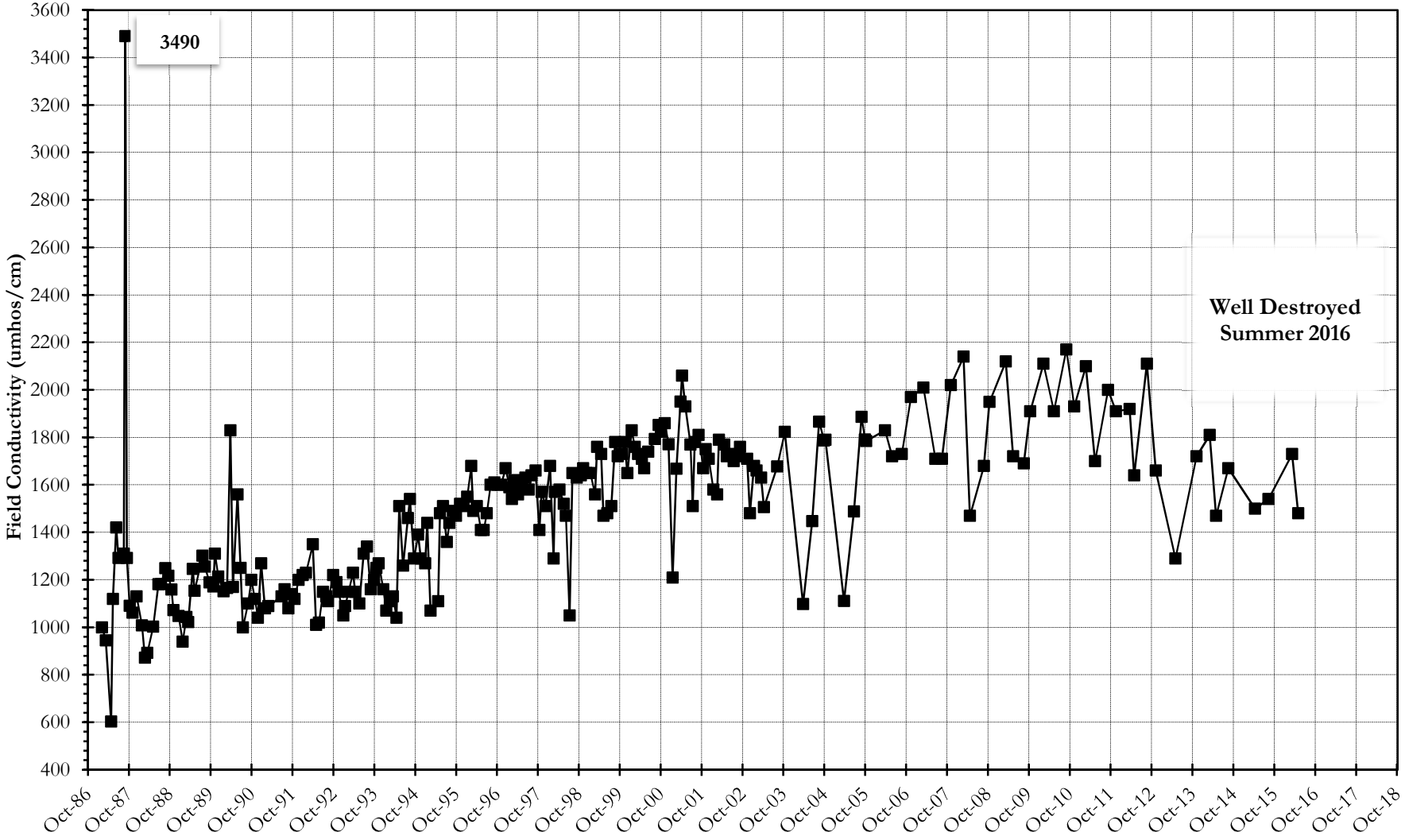
FIGURE 39

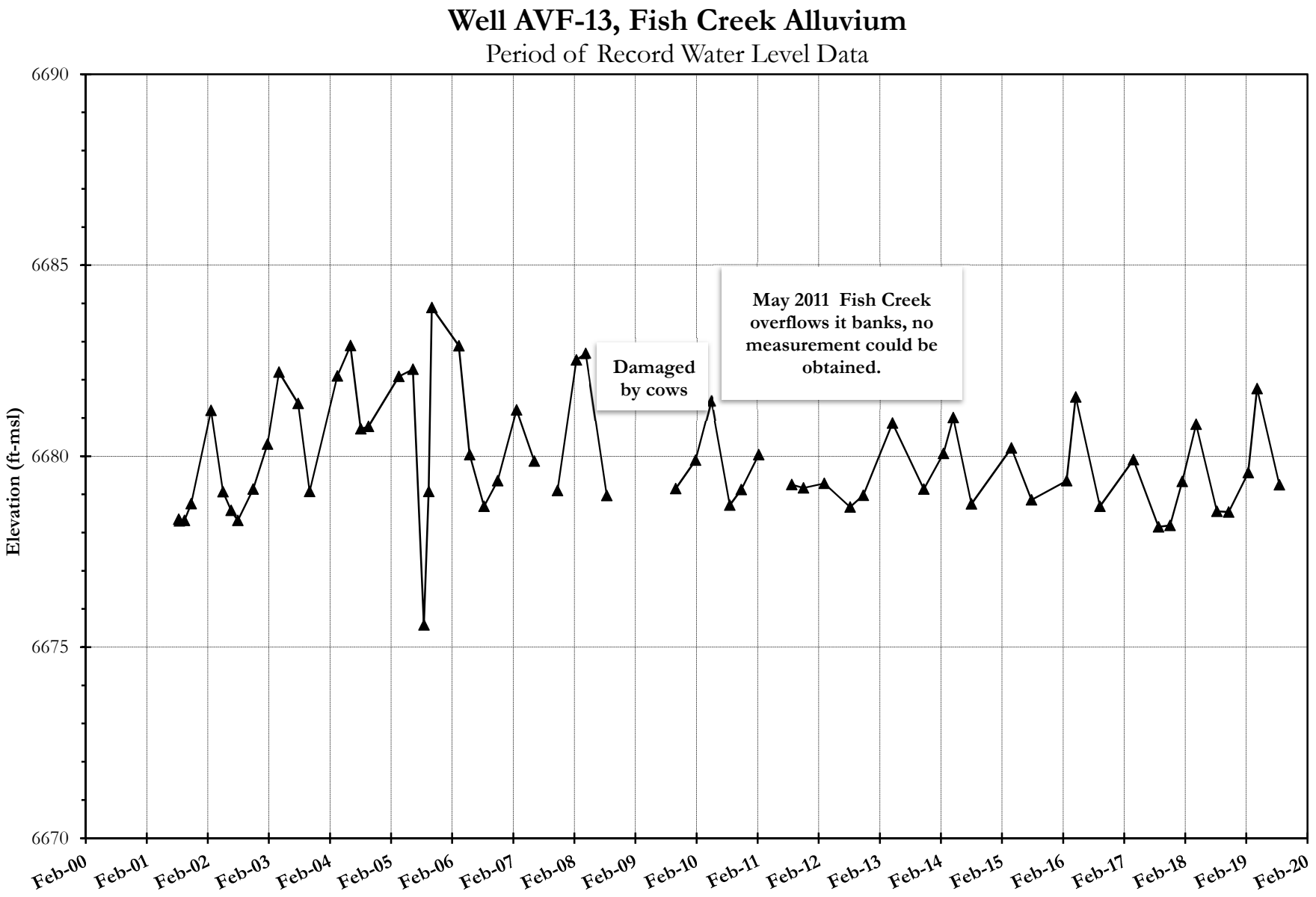
Well 006-AZ-3, Fish Creek Alluvium near Fish Creek Borehole

Period of Record Field Conductivity Data



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\006-AZ-3 fig

FIGURE 40



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\FC Alluvial Wells\AVF13 fig

FIGURE 41

Well AVF-13, Fish Creek Alluvium

Period of Record Field Conductivity Data

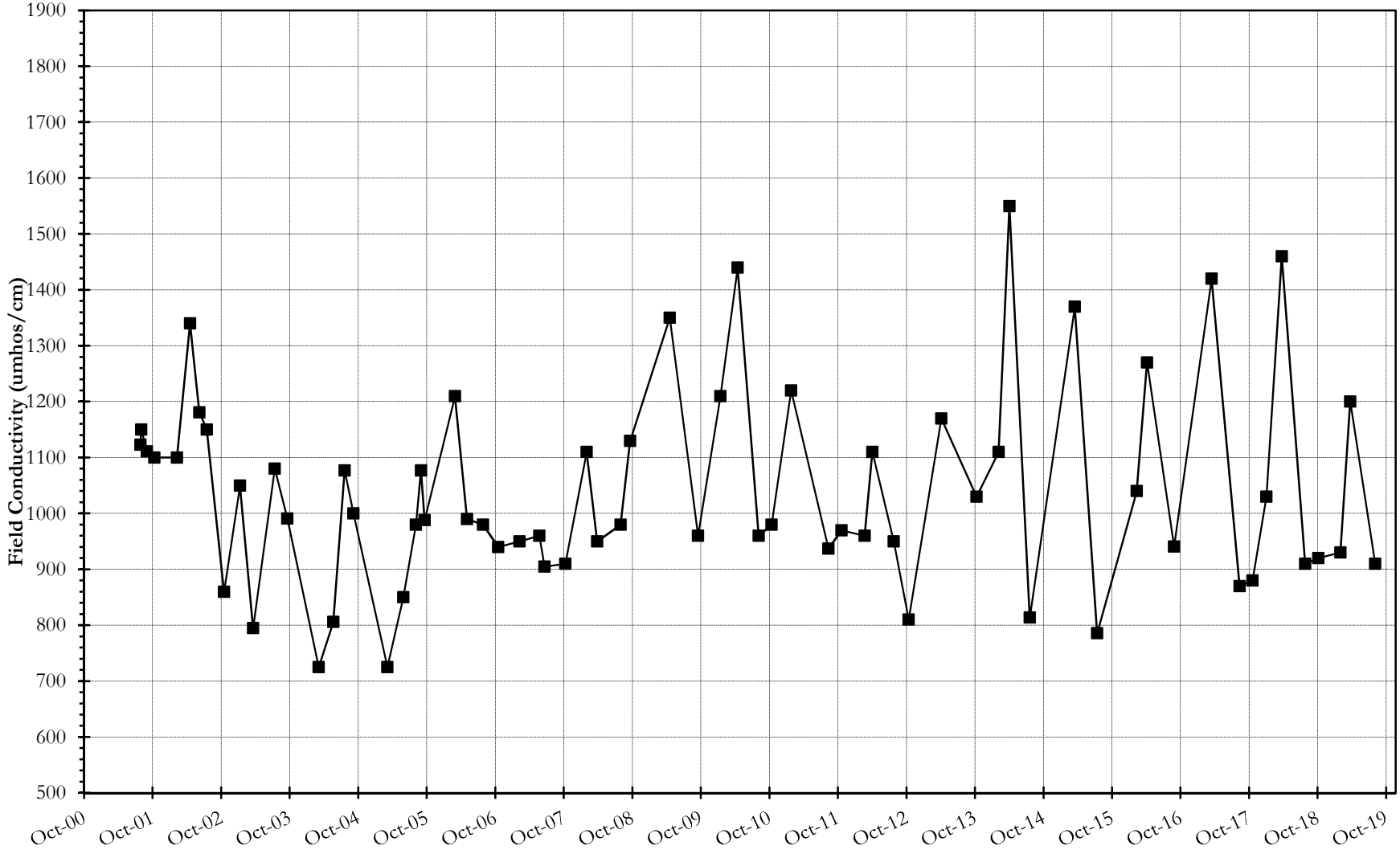


FIGURE 42

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\FC Alluvial Wells\AVF13 fig

Well AVF-14, Fish Creek Alluvium

Period of Record Water Level Data

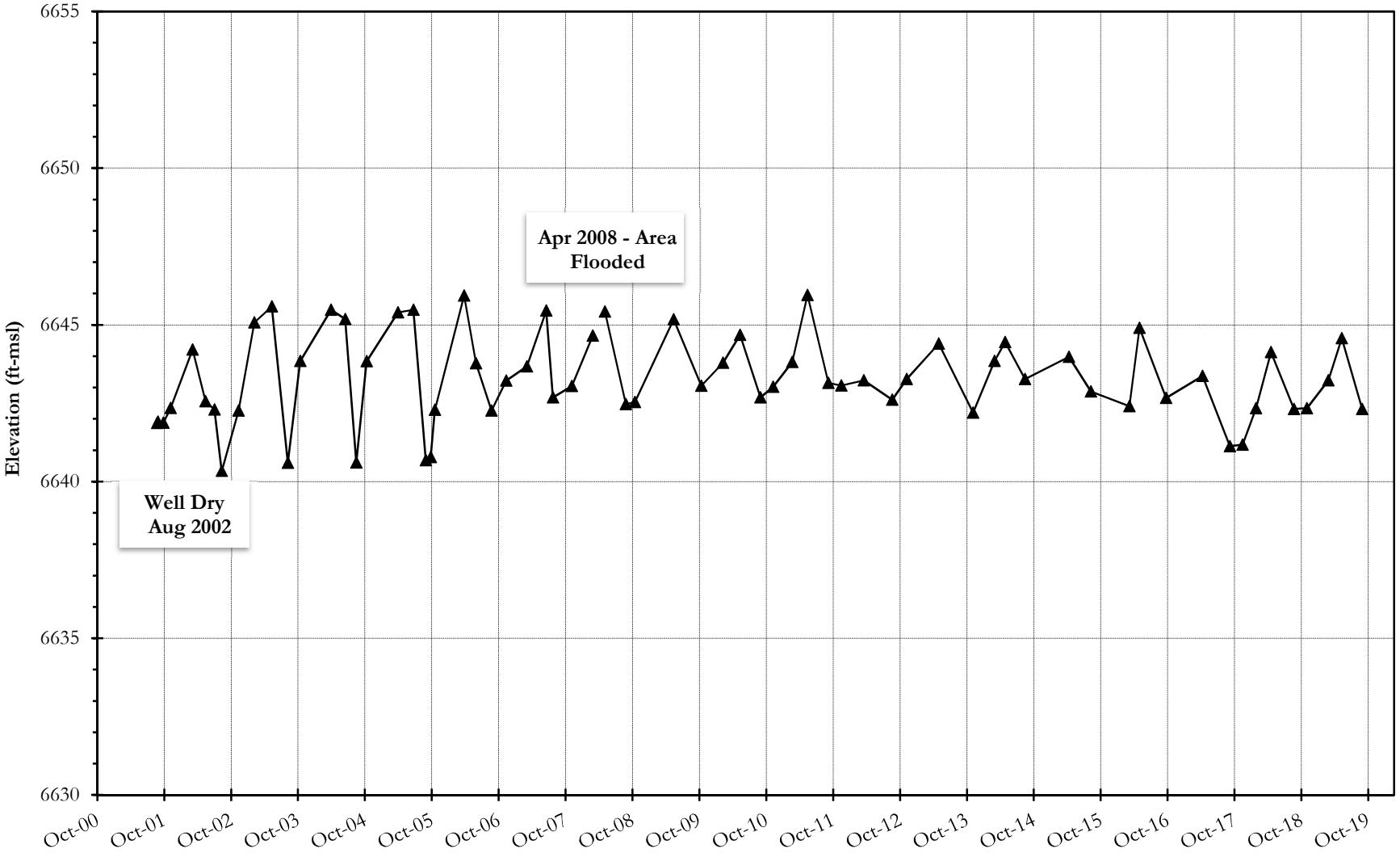


FIGURE 43

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\FC Alluvial Wells\AVF14 fig

Well AVF-14, Fish Creek Alluvium

Period of Record Field Conductivity Data

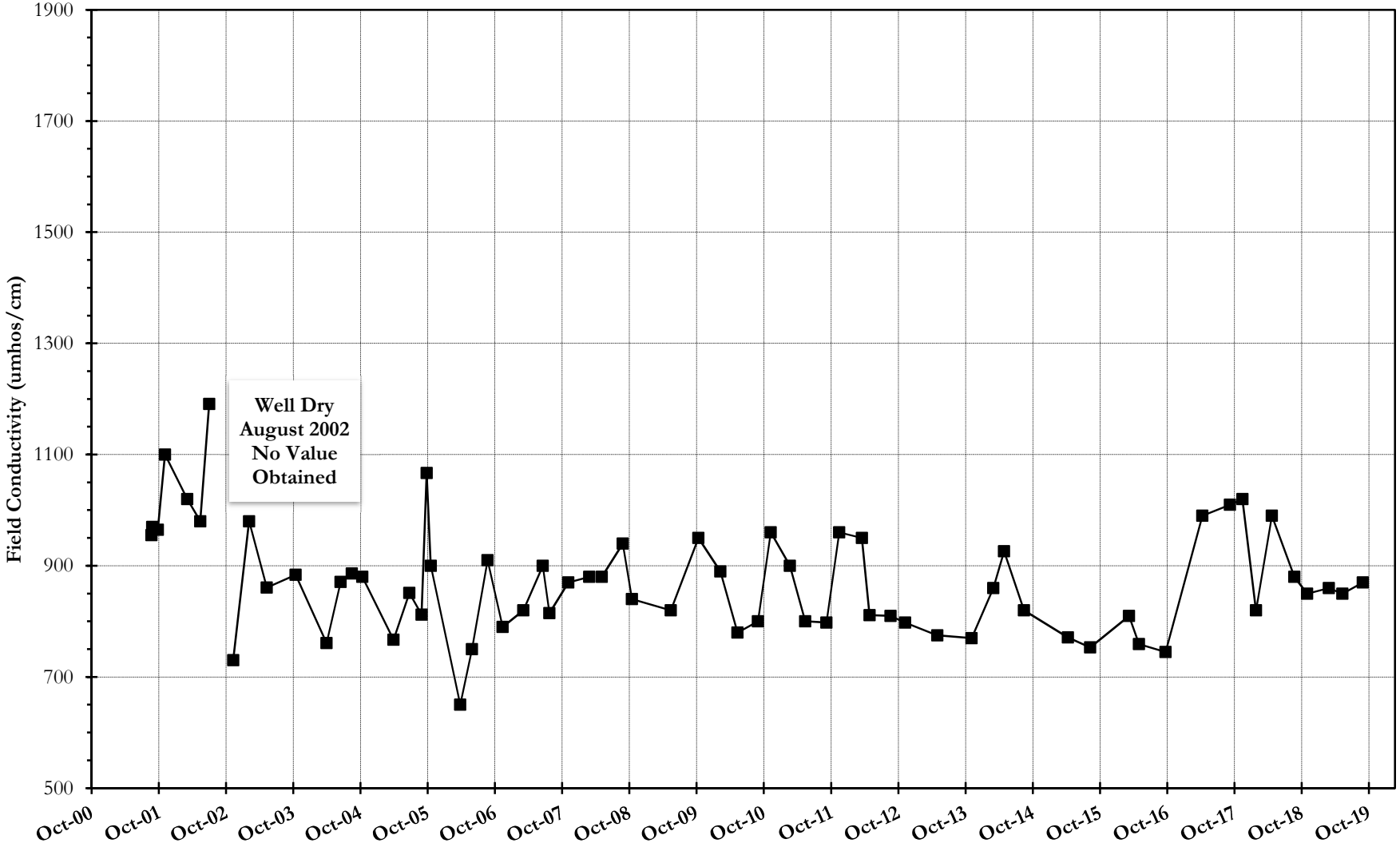


FIGURE 44

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\FC Alluvial Wells\AVF14 fig

Well AVF-15, Fish Creek Alluvium

Period of Record Water Level Data

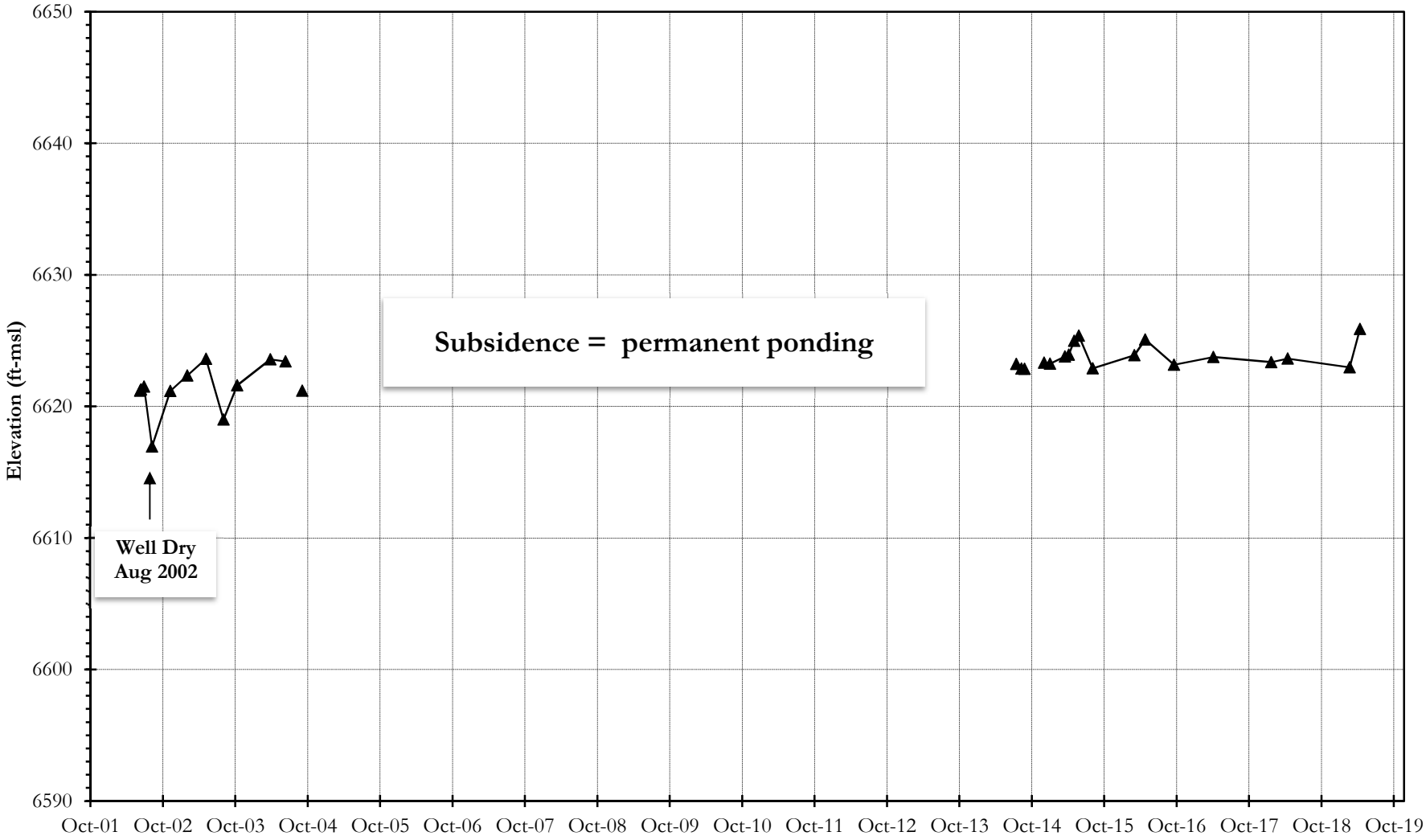


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FIGURE 45

Well AVF-15, Fish Creek Alluvium

Period of Record Field Conductivity Data

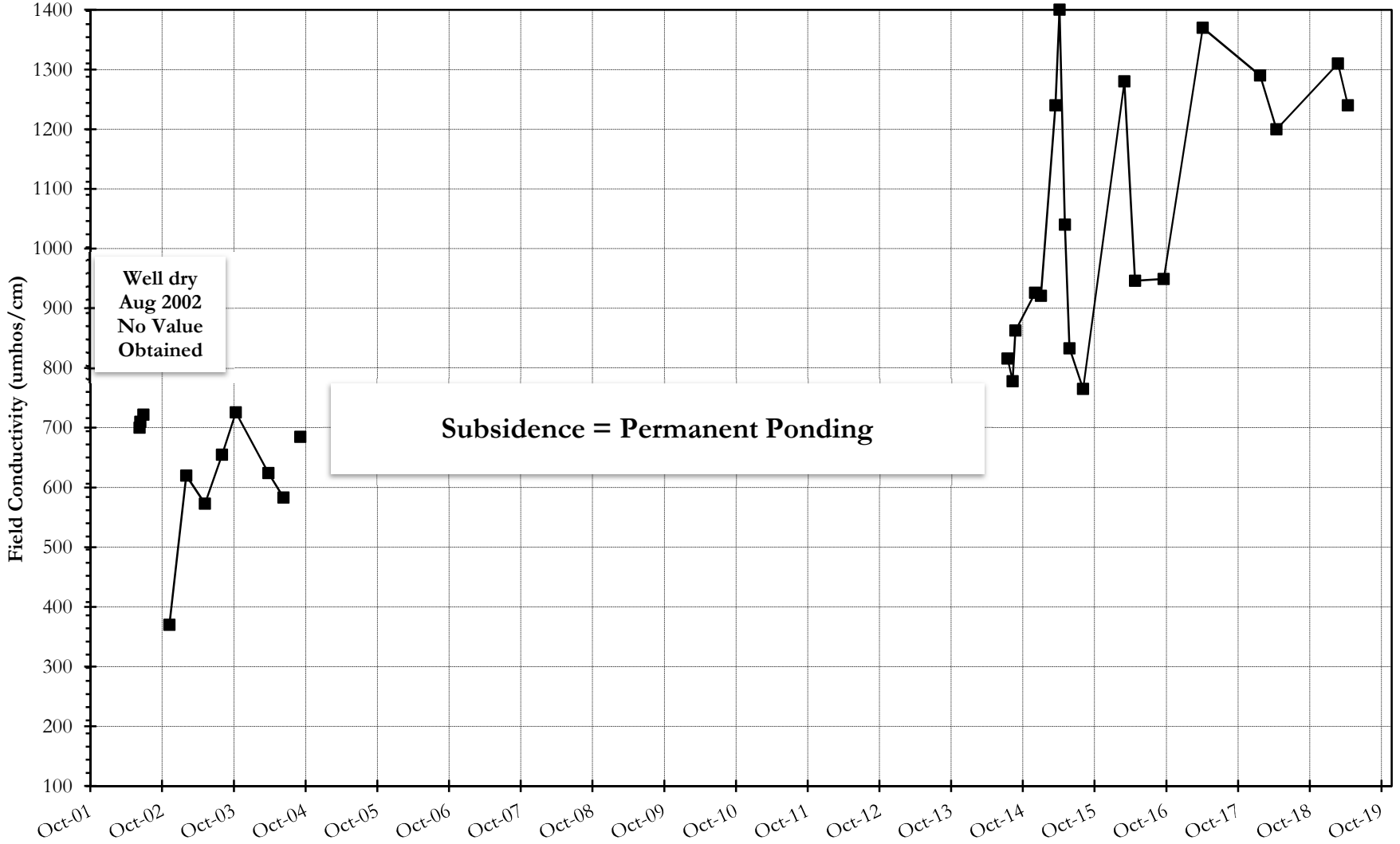
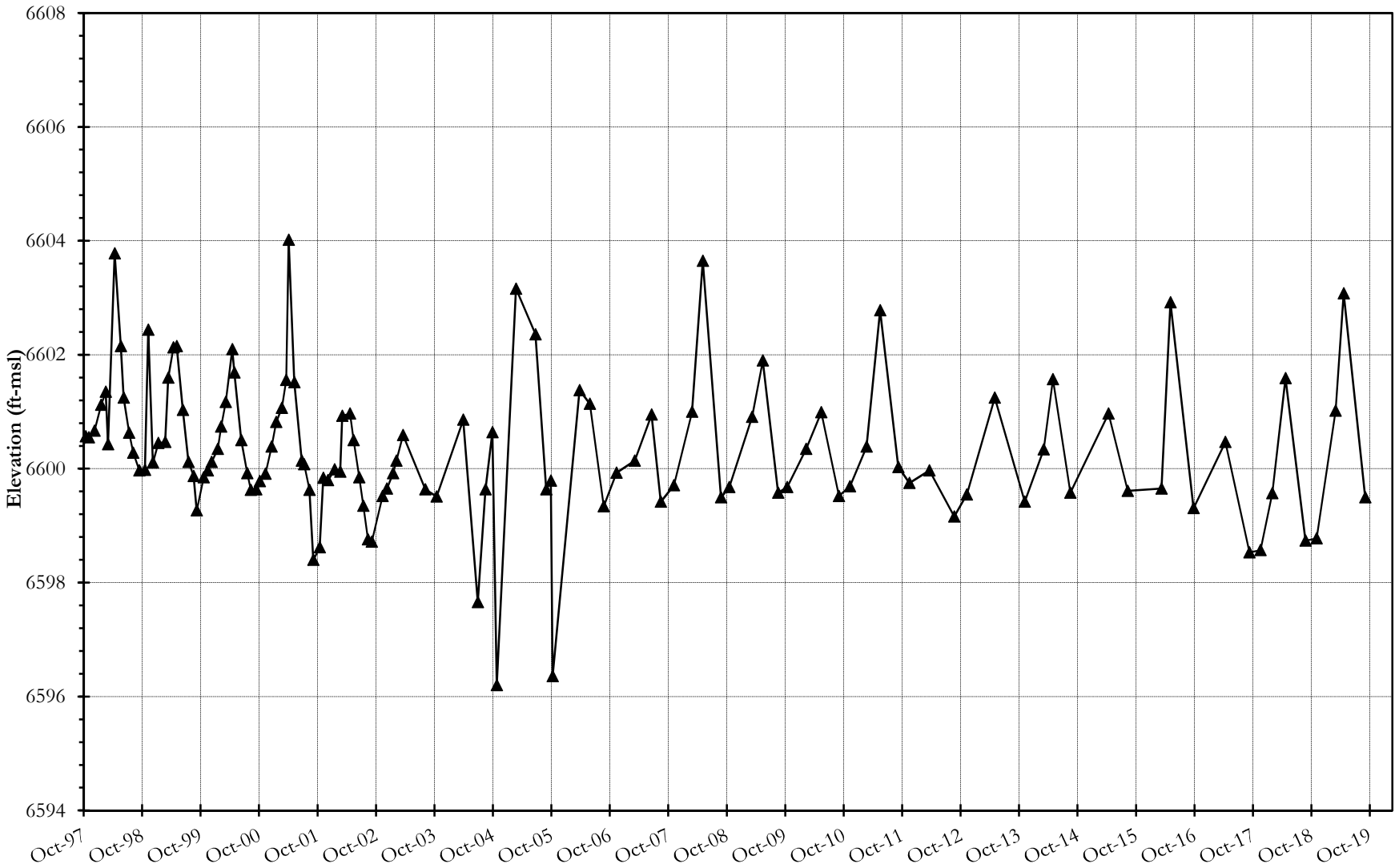


FIGURE 46

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\FC Alluvial Wells\AVF15 fig

Well 008-AU-3 Fish Creek Alluvium

Water Level Data for Water Years 1997 - 2019



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\008-AU-3 fig

FIGURE 47

Well 008-AU-3, Fish Creek Alluvium near Tipple

Period of Record Field Conductivity Data

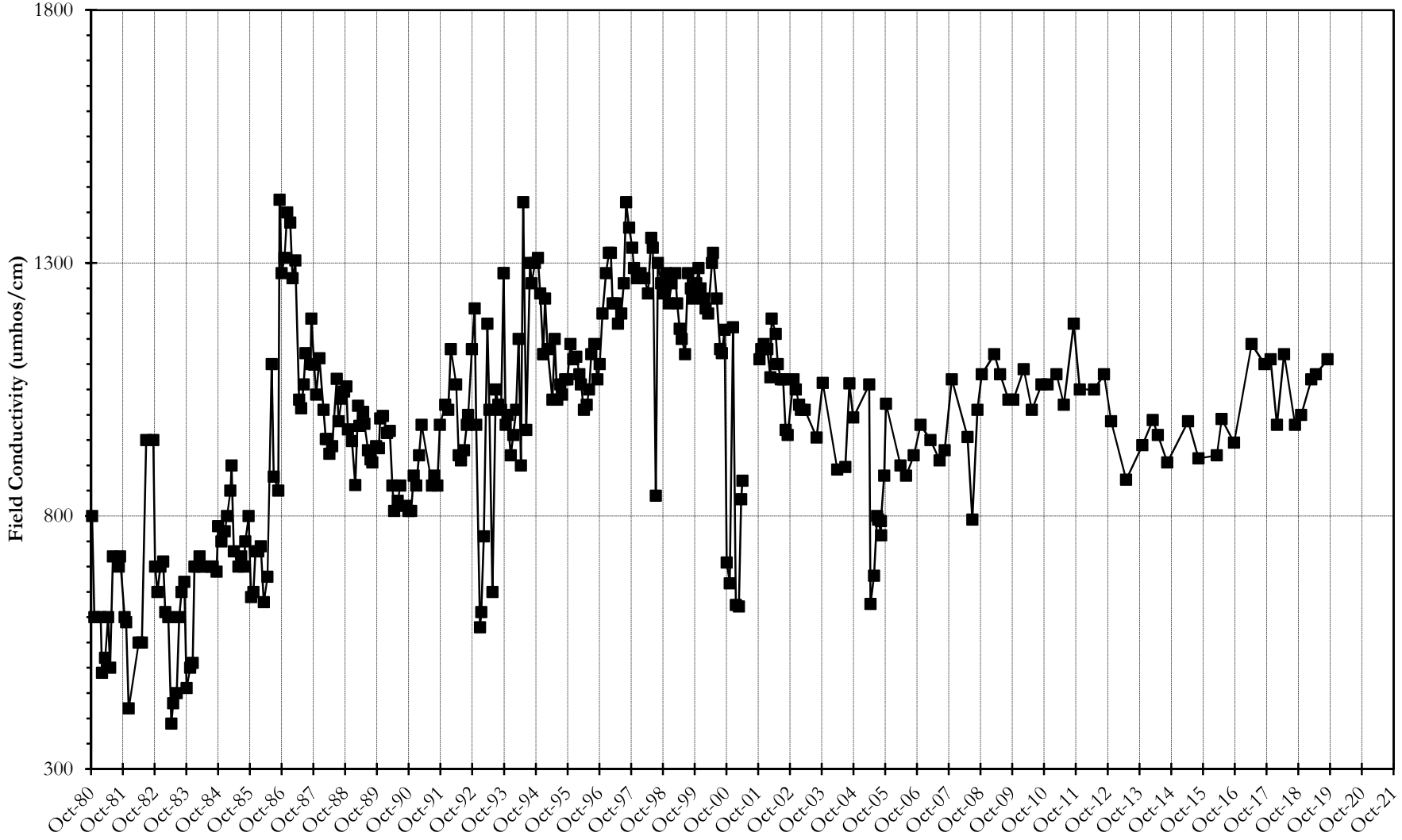
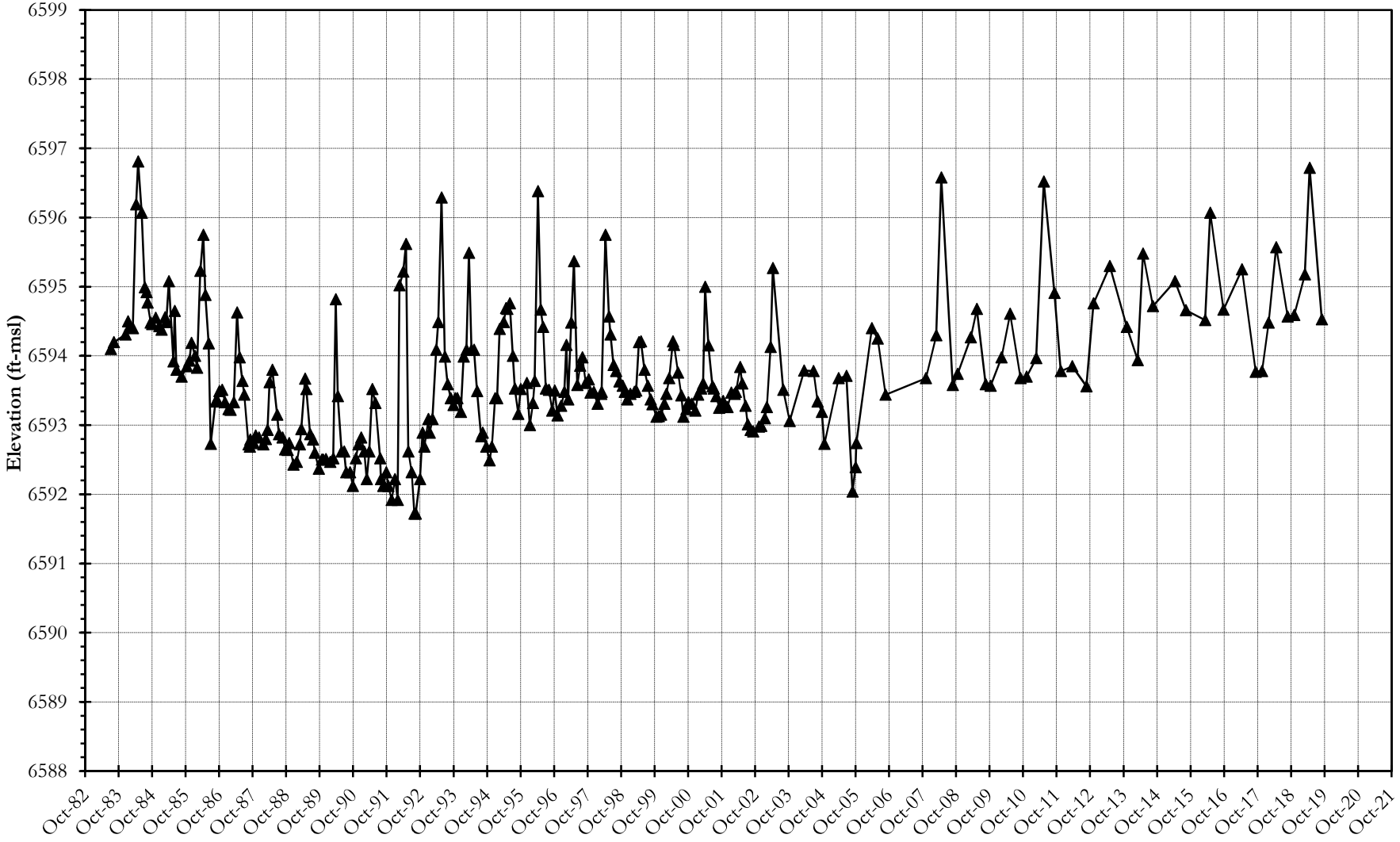


FIGURE 48

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\008-AU-3 fig

Well 008-AW-3, Fish Creek Alluvium near Tipple

Period of Record Water Level Data

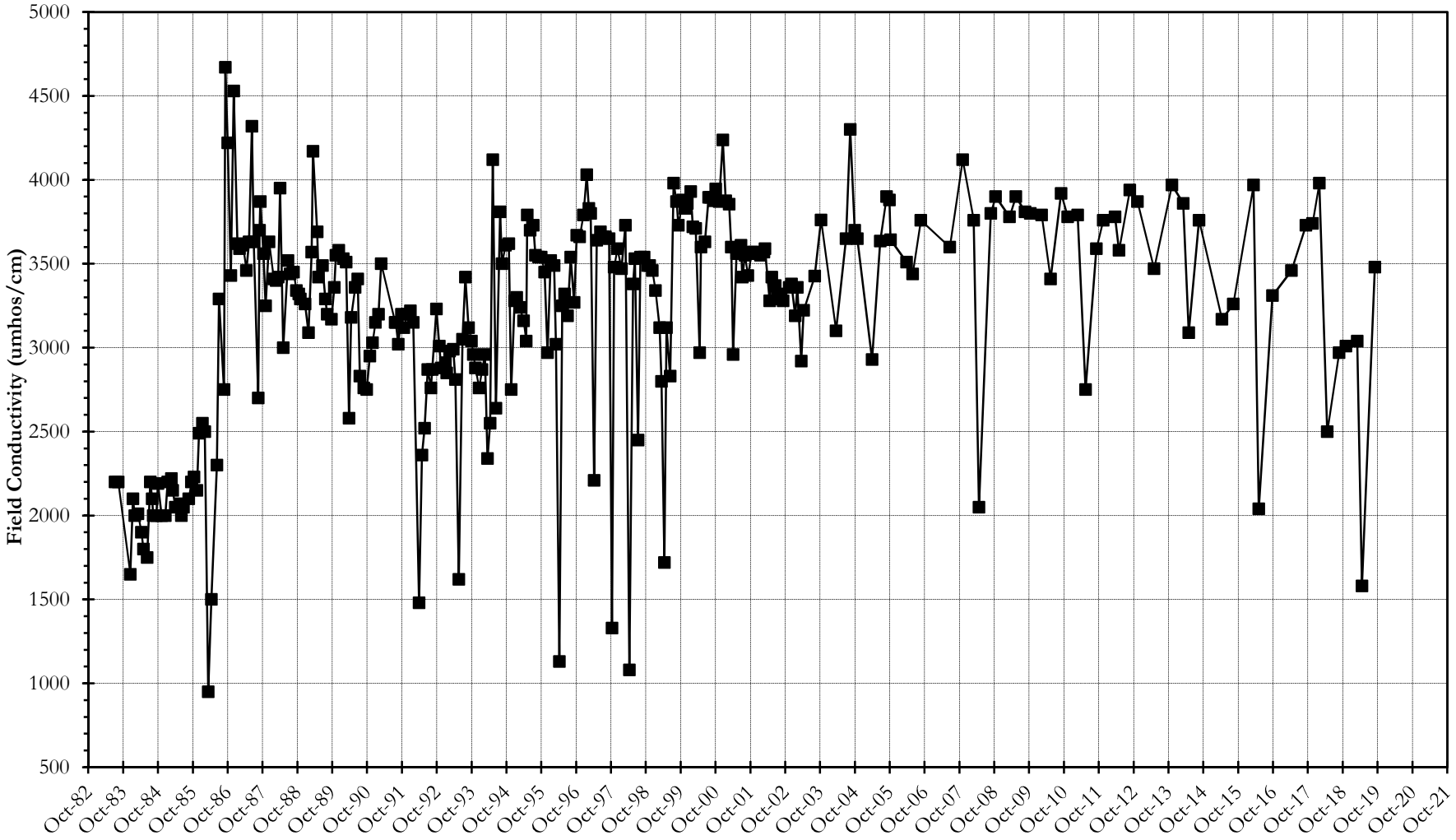


I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\008-AW-3 fig

FIGURE 49

Well 008-AW-3, Fish Creek Alluvium near Tipple

Period of Record Field Conductivity Data



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Wells\008-AW-3 fig

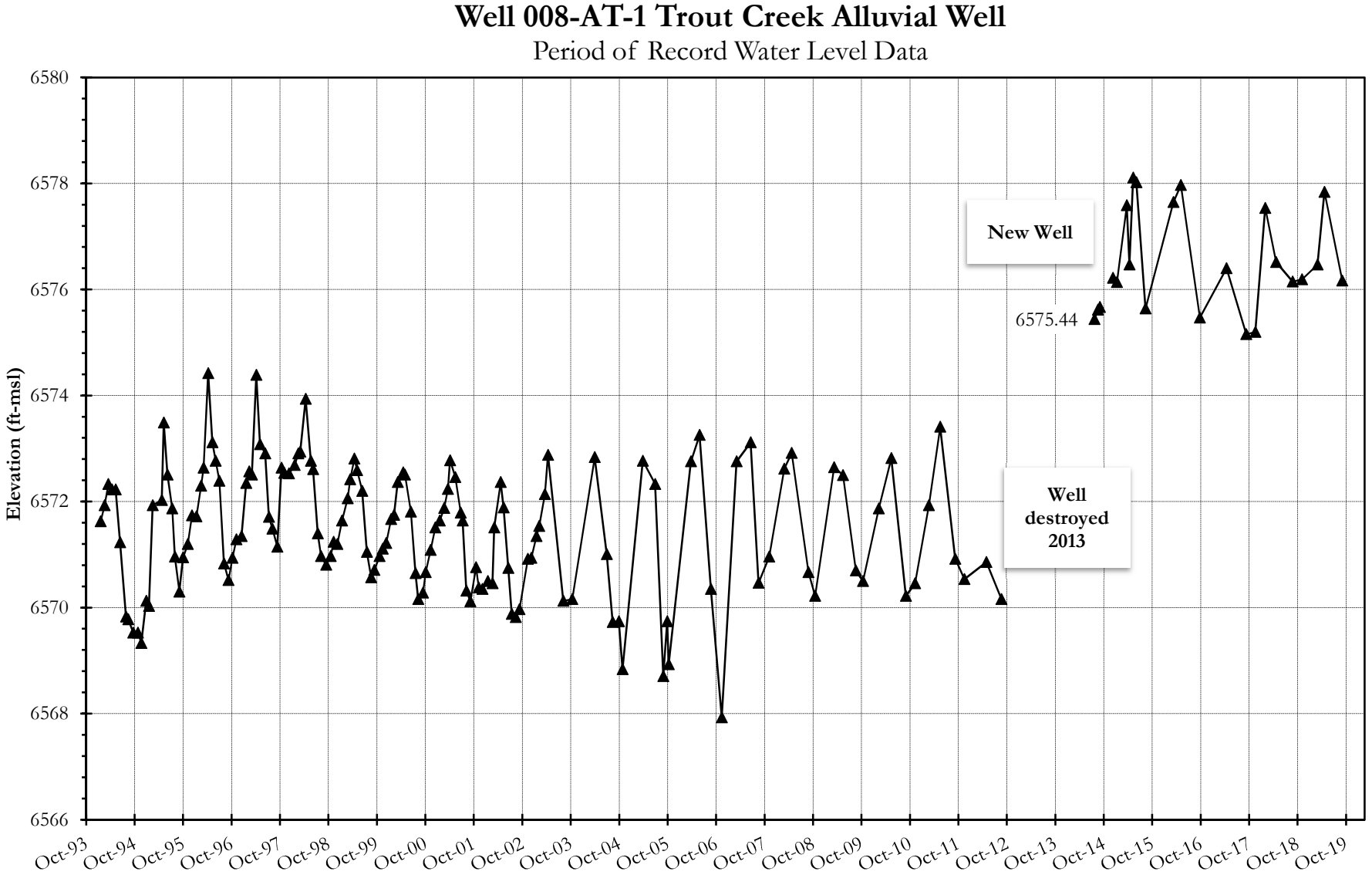


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FIGURE 51

Well 008-AT-1, Trout Creek Alluvium

Period of Record TDS Data

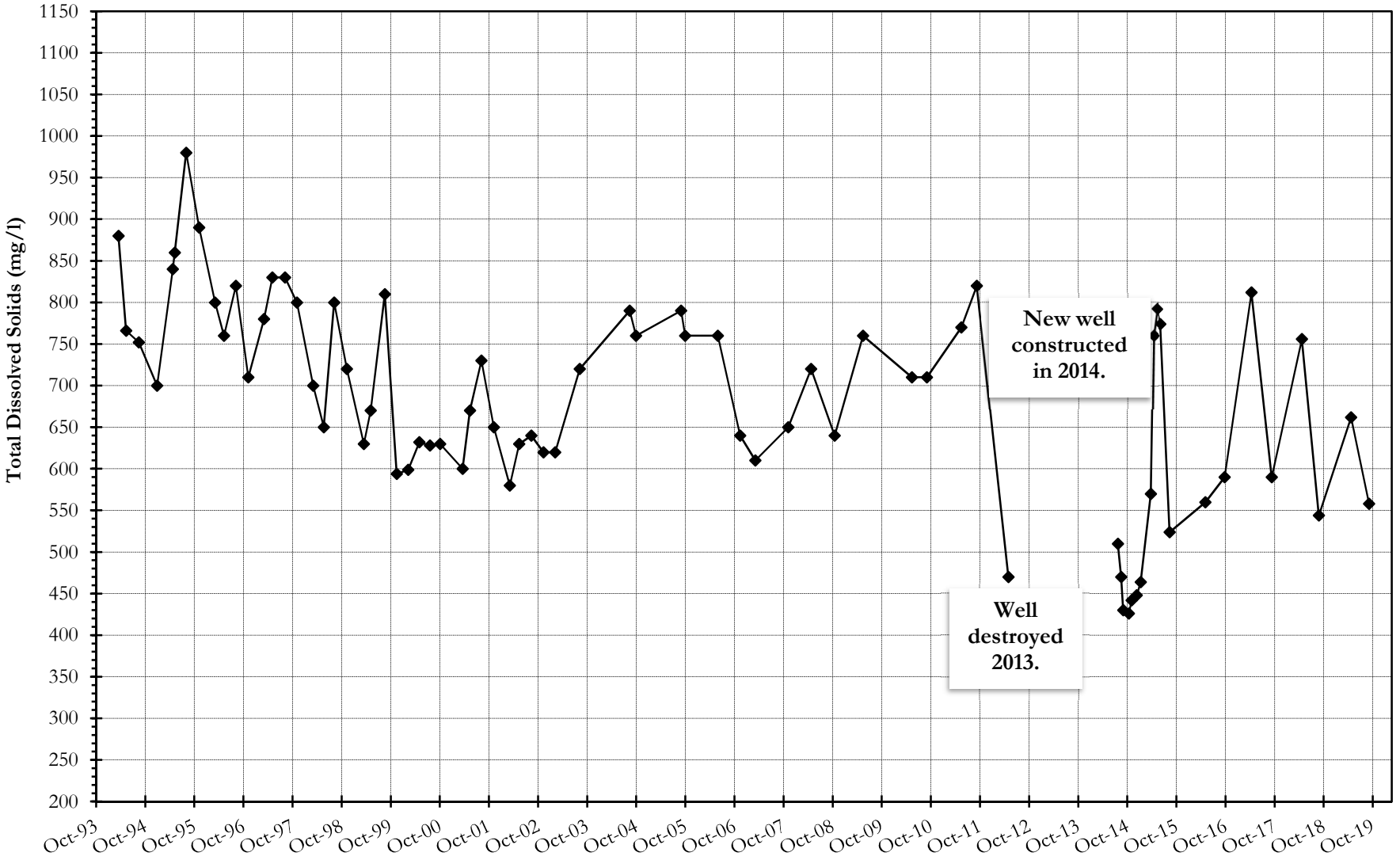

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FIGURE 52

Well Jones, Lower Trout Creek Alluvium

Period of Record Water Level Data

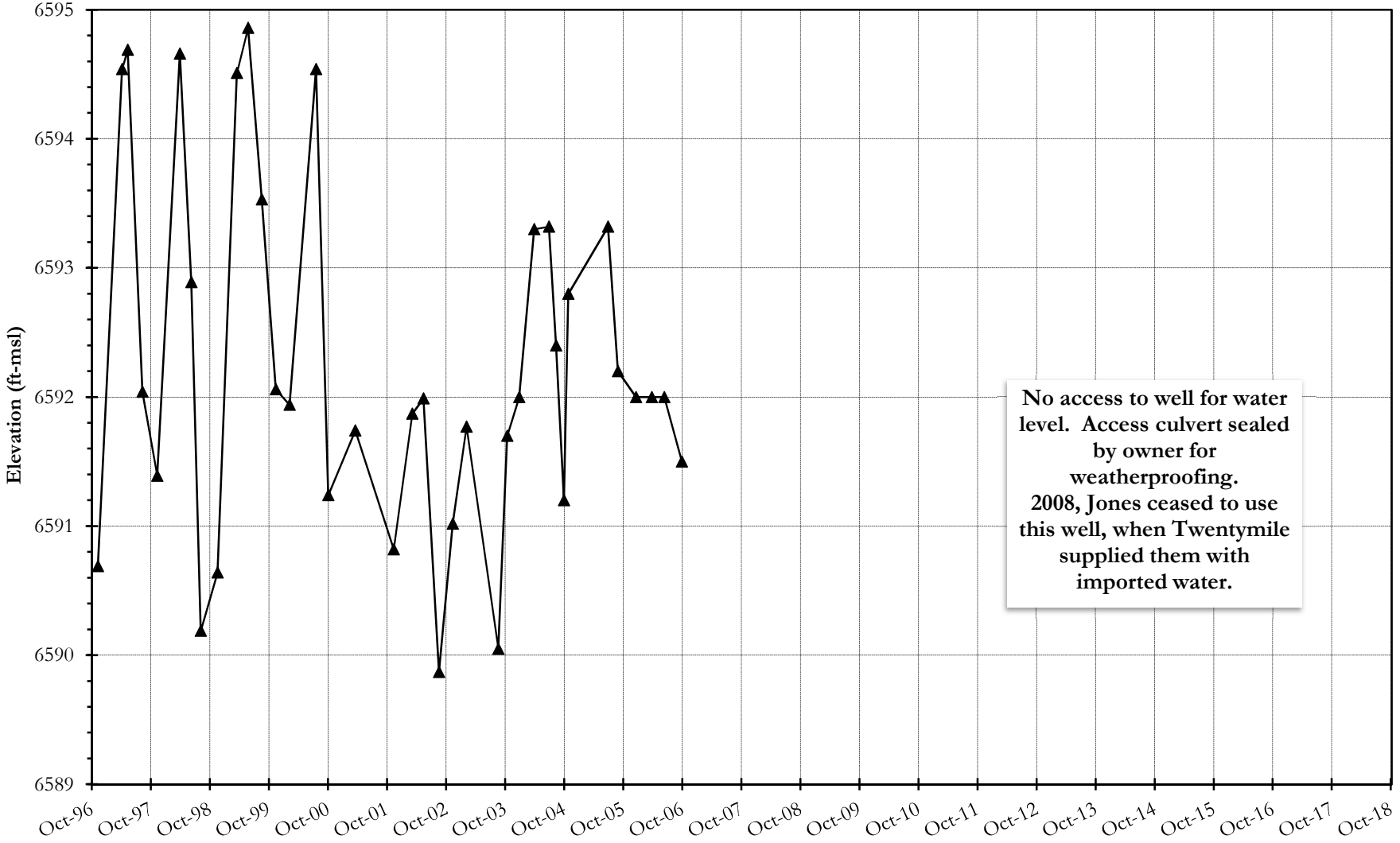

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FIGURE 53

Well Jones, Lower Trout Creek Alluvium

Period of Record TDS Data

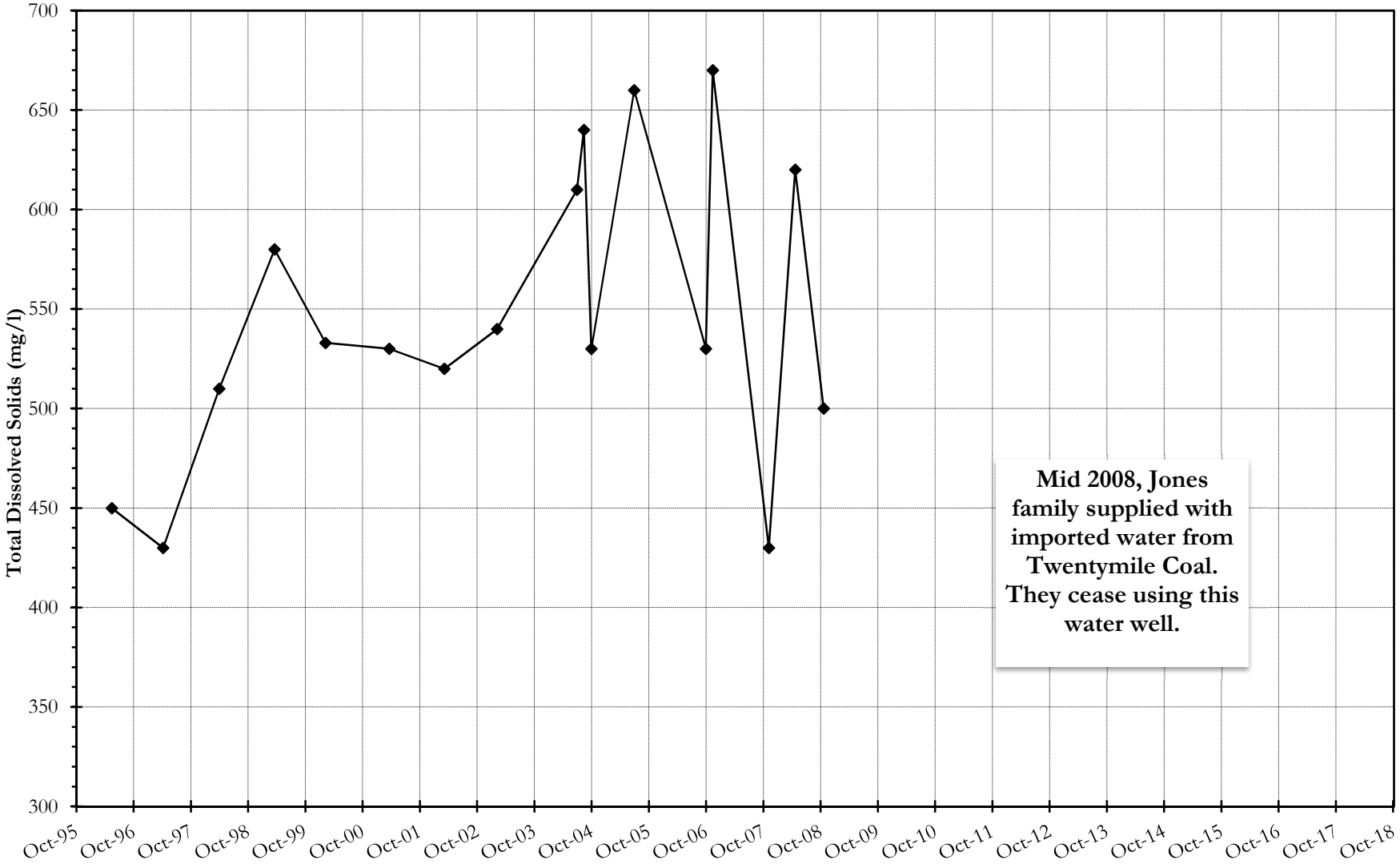

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FIGURE 54

Surface Water Site 800 (USGS 09243800), Foidel Creek at Eckman Park

2019 Water Year Flow Rate Data

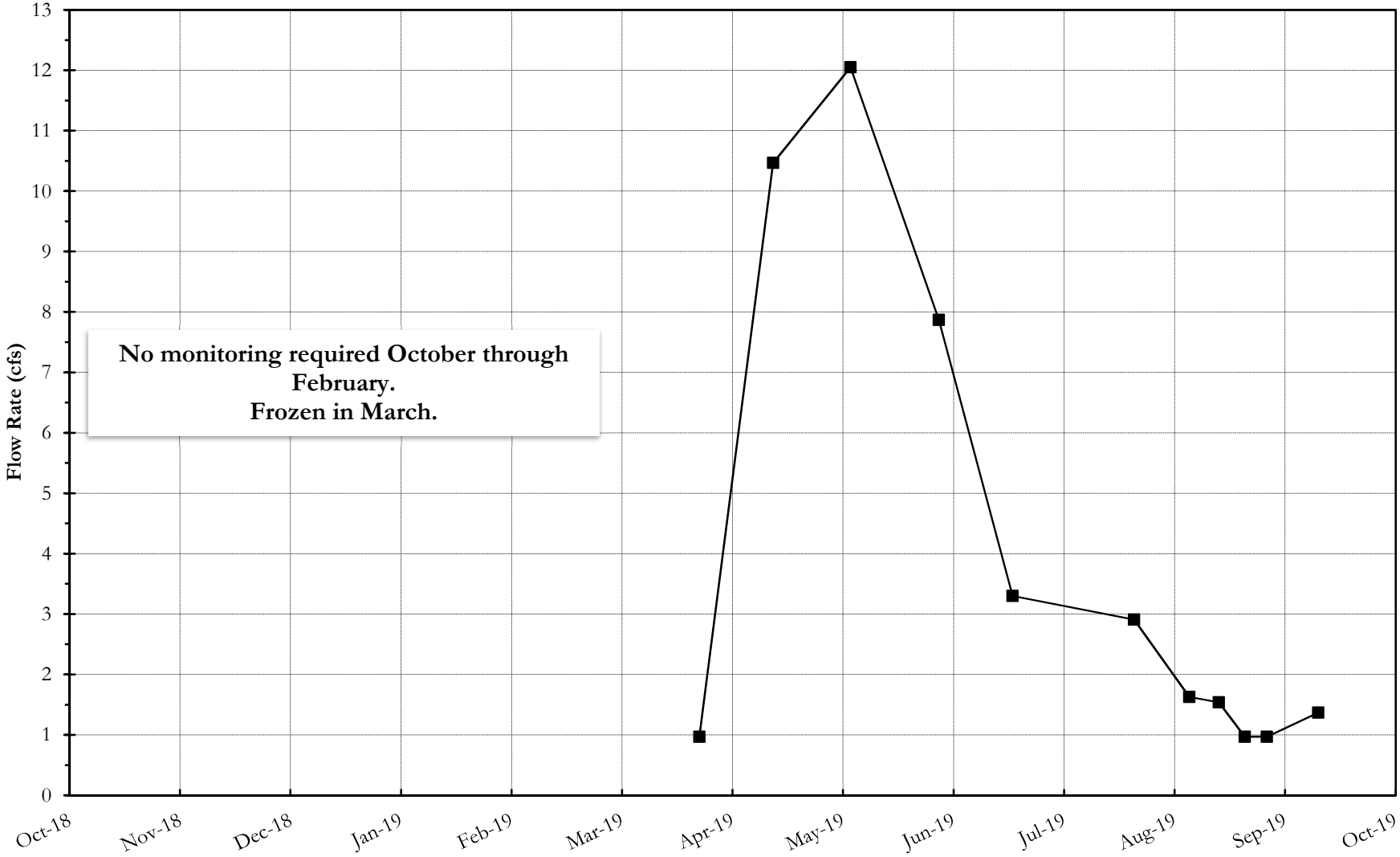

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FIGURE 55

Surface Water Site 800 (USGS 09243800), Foidel Creek at Eckman Park

2019 Water Year Field Conductivity Data

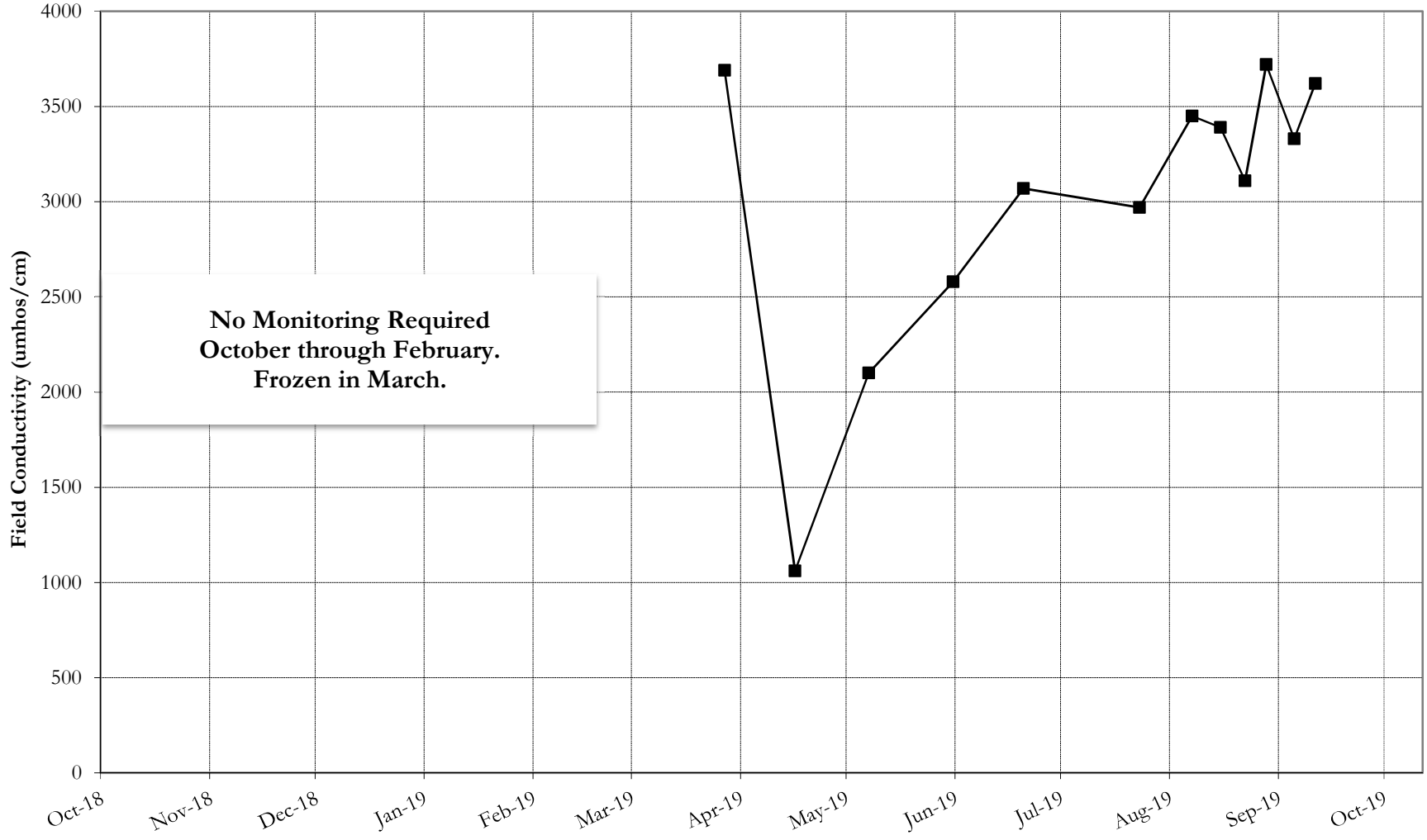

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FIGURE 56

Surface Water Site 800 (USGS 09243800), Foidel Creek - Eckman Park

Period of Record Monthly Flow Rate Data

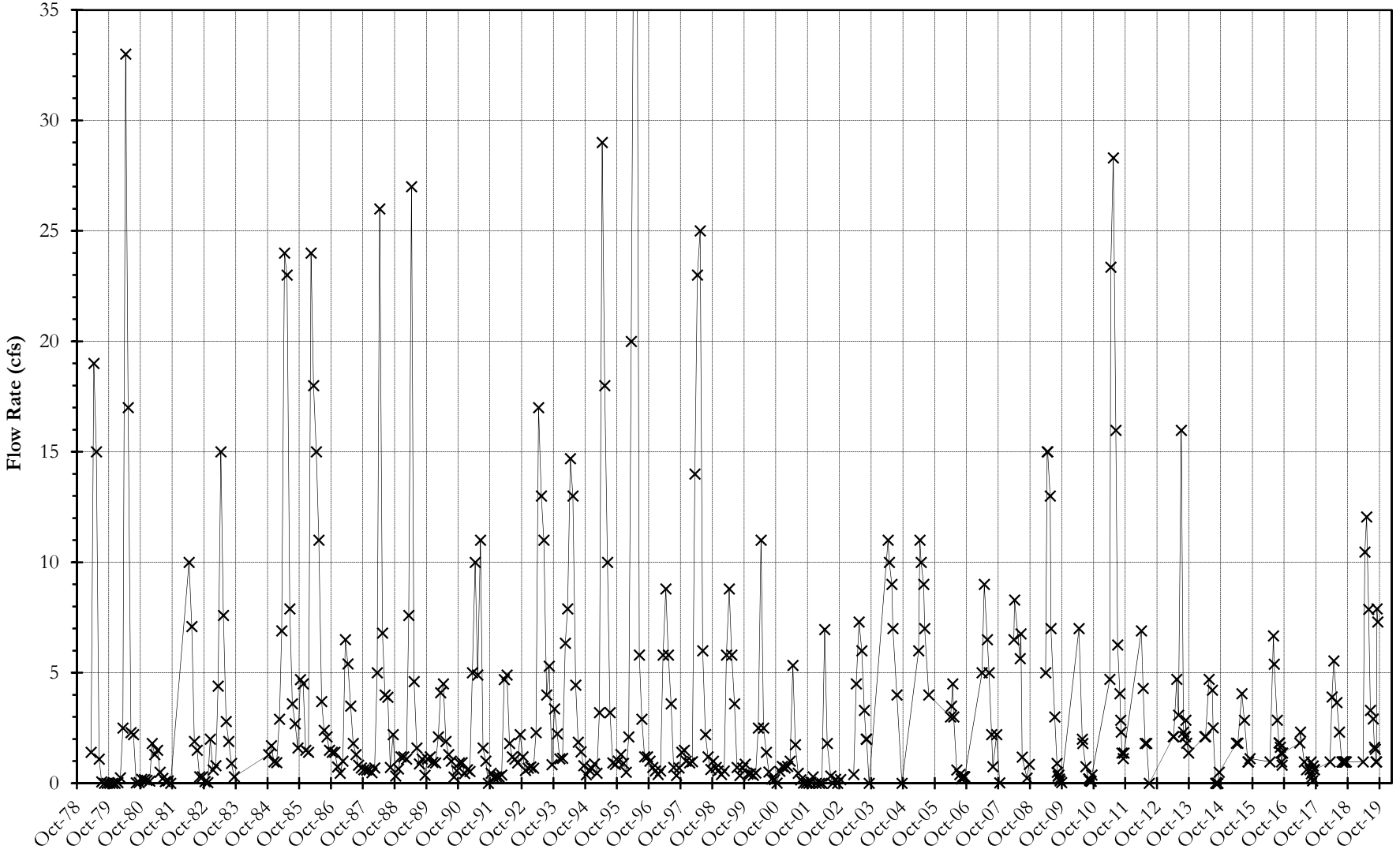

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FIGURE 57

Surface Water Site 800 (USGS 09243800), Foidel Creek - Eckman Park

Period of Record Field Conductivity Data

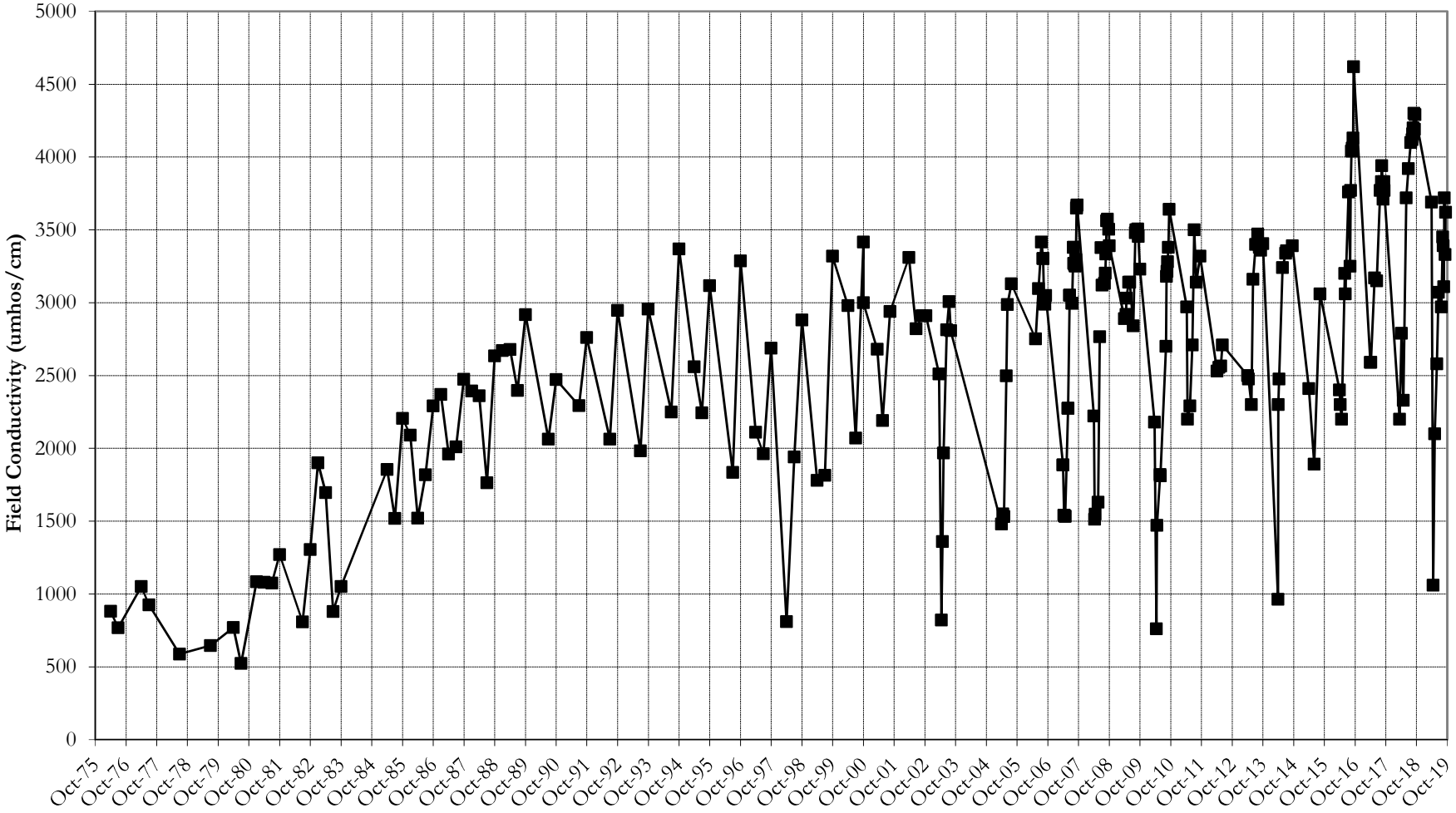

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FIGURE 58

Surface Water Site 8, Foidel Creek below Foidel Creek Mine

2019 Water Year Flow Rate Data

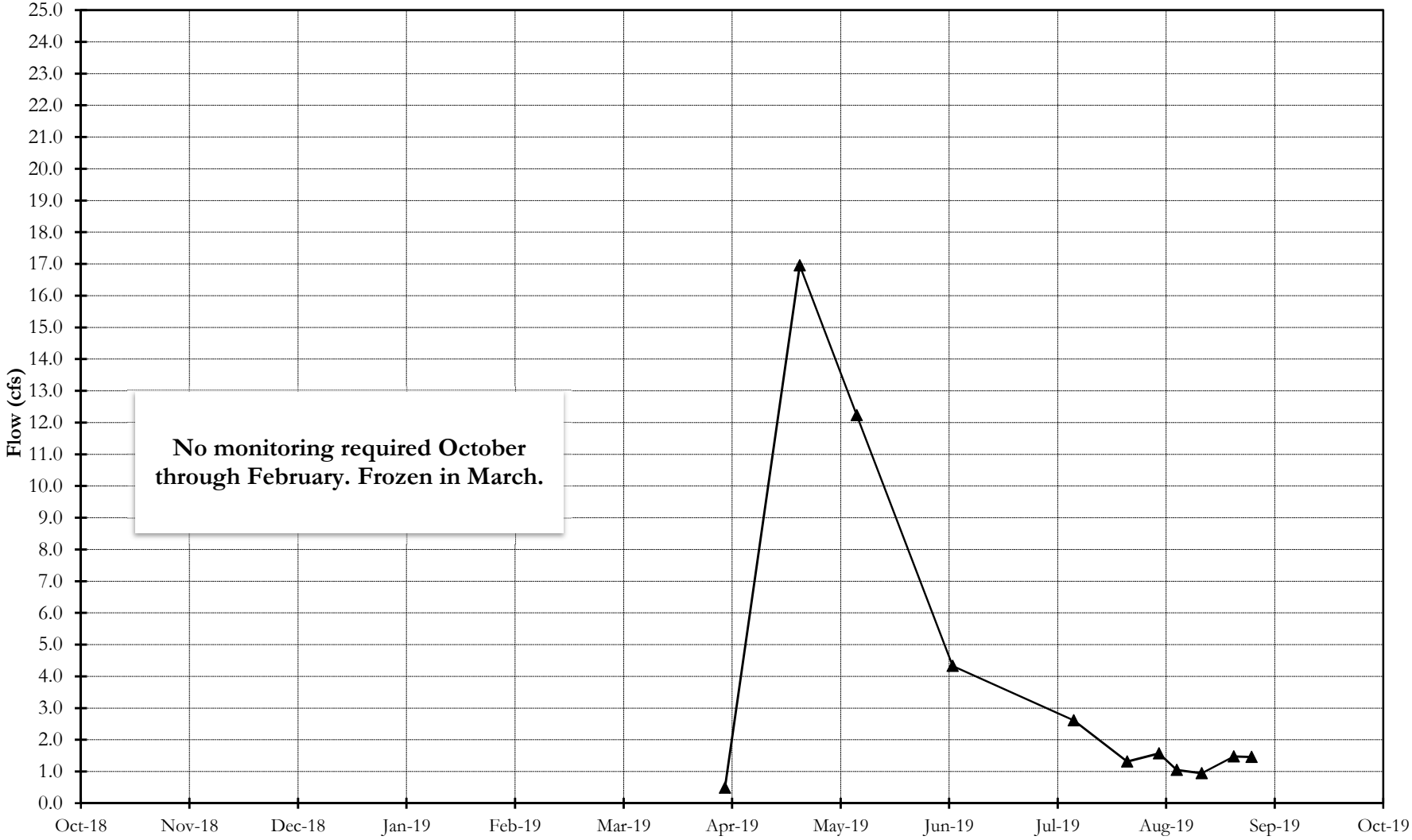

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FIGURE 59

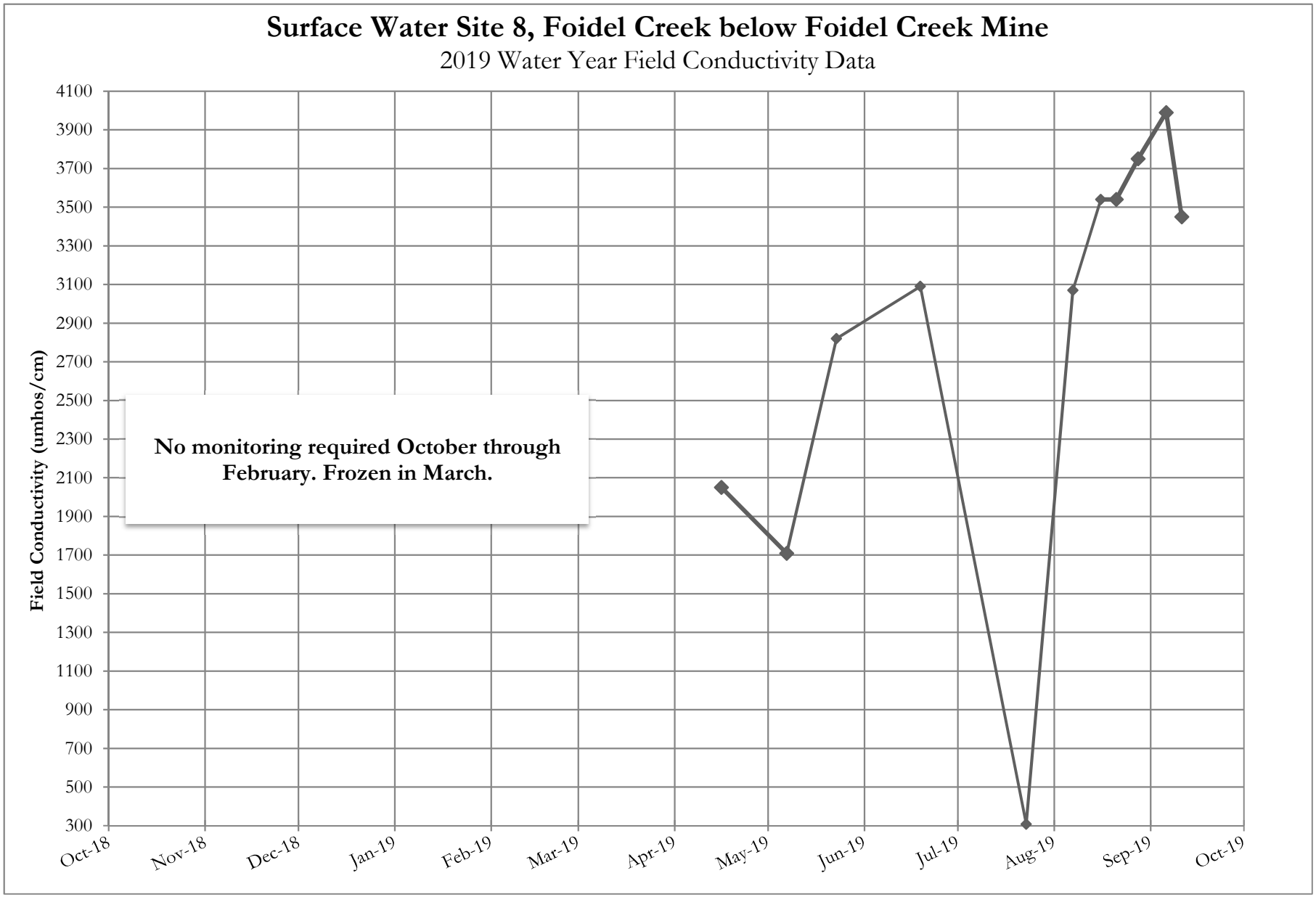

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FIGURE 60

Surface Water Site 8, Foidel Creek below Foidel Creek Mine

Mean Monthly Flow Rate Data for Water Years 1997 - 2019

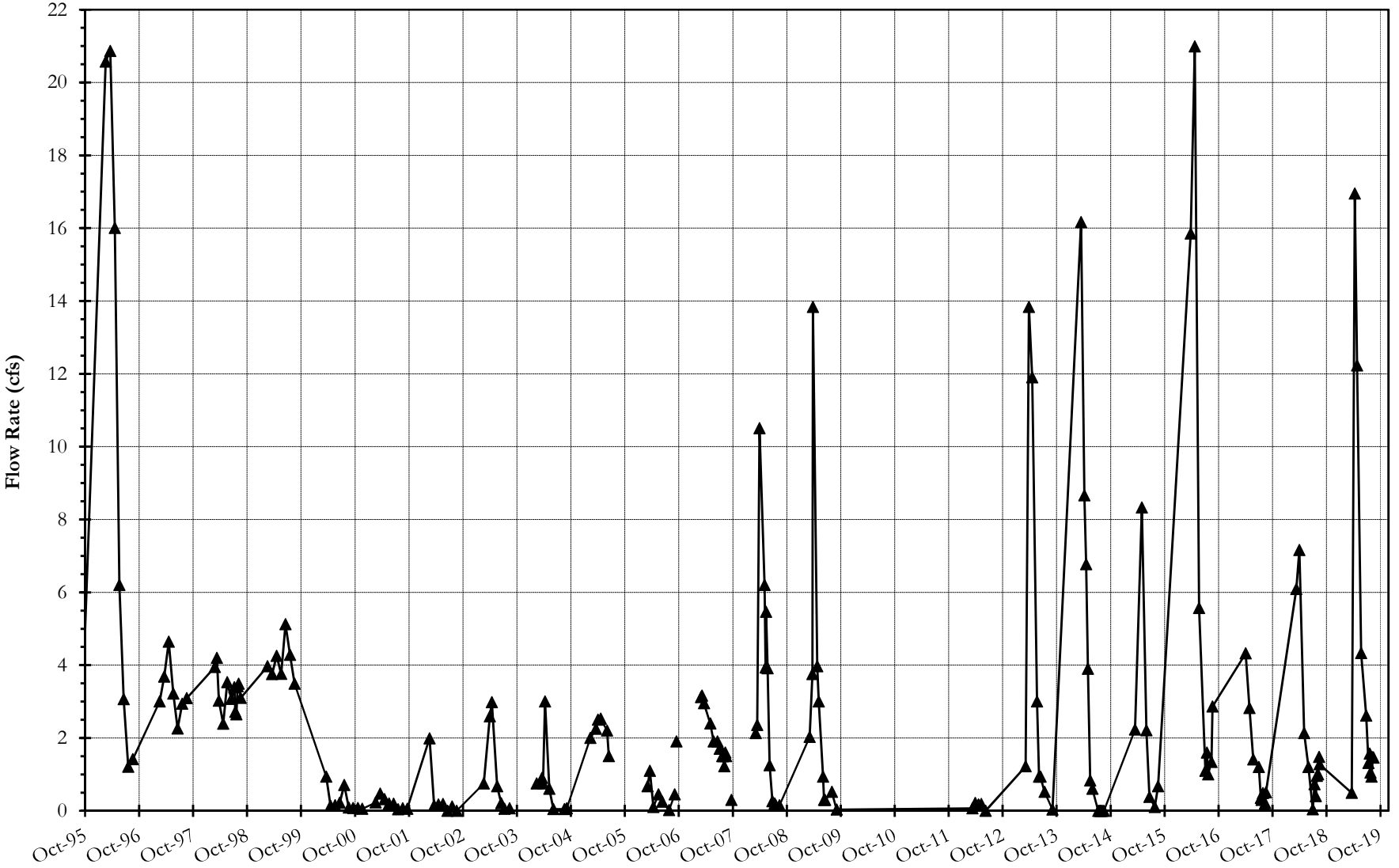

FIGURE 61

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Surface Water\8

Surface Water Site 8, Foidel Creek below Foidel Creek Mine

Period of Record Quarterly Field Conductivity Data

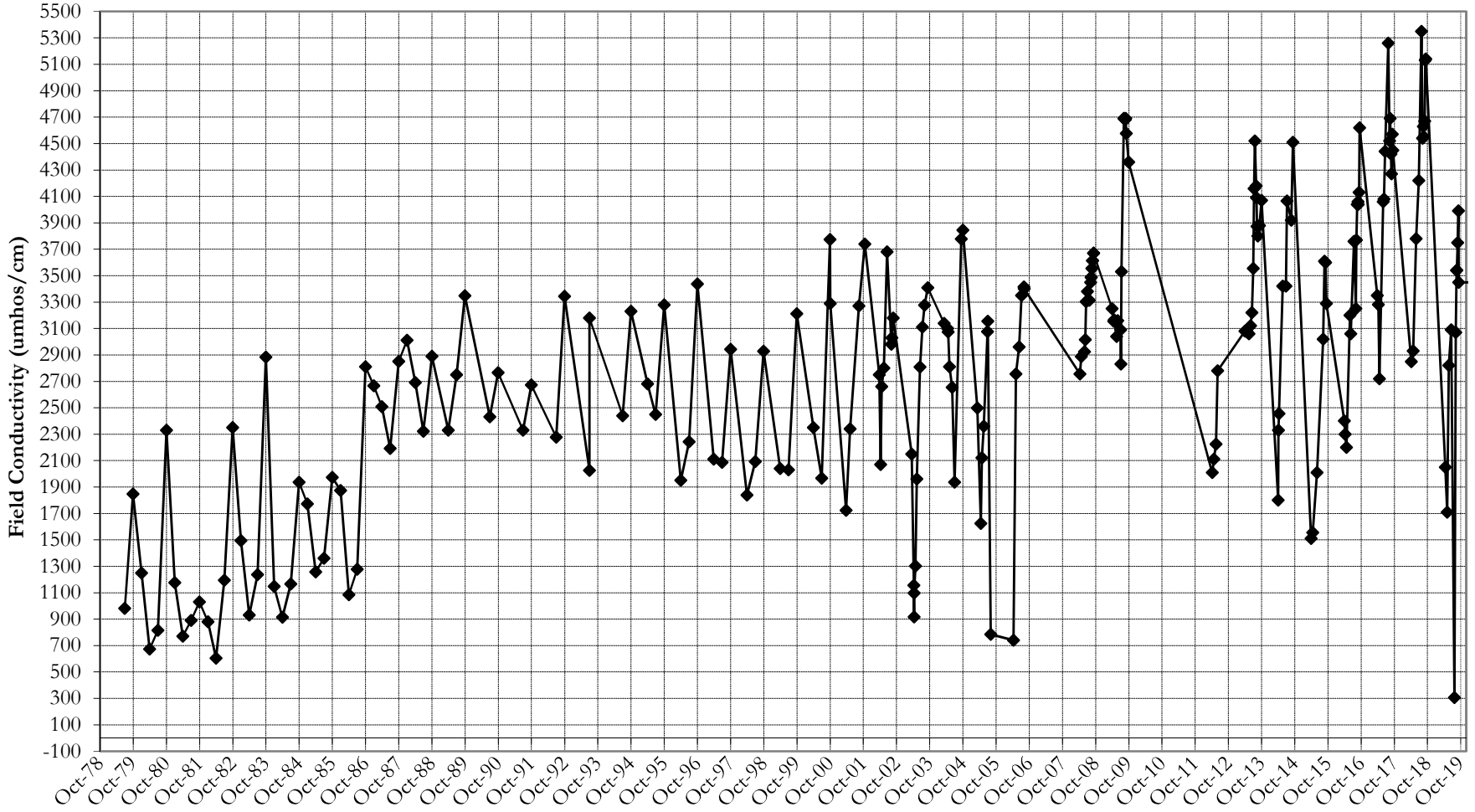

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FIGURE 62

Surface Water Site 16A, Fish Creek - Upstream of Mine 2

2019 Water Year Flow Rate Data

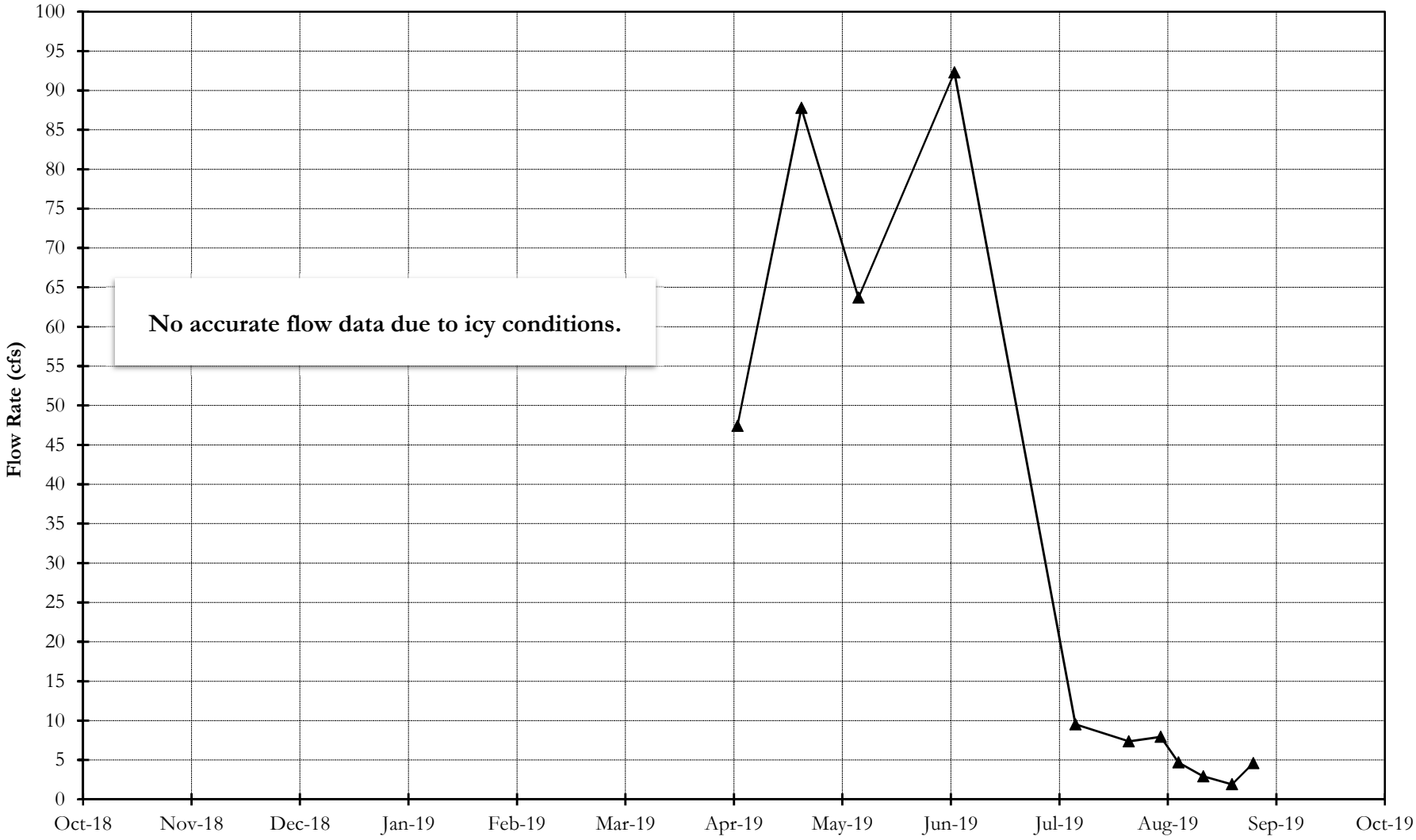

FIGURE 63

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Surface Water\16A

Surface Water Site 16A, Fish Creek Upstream of Mine 2

2019 Water Year Field Conductivity Data

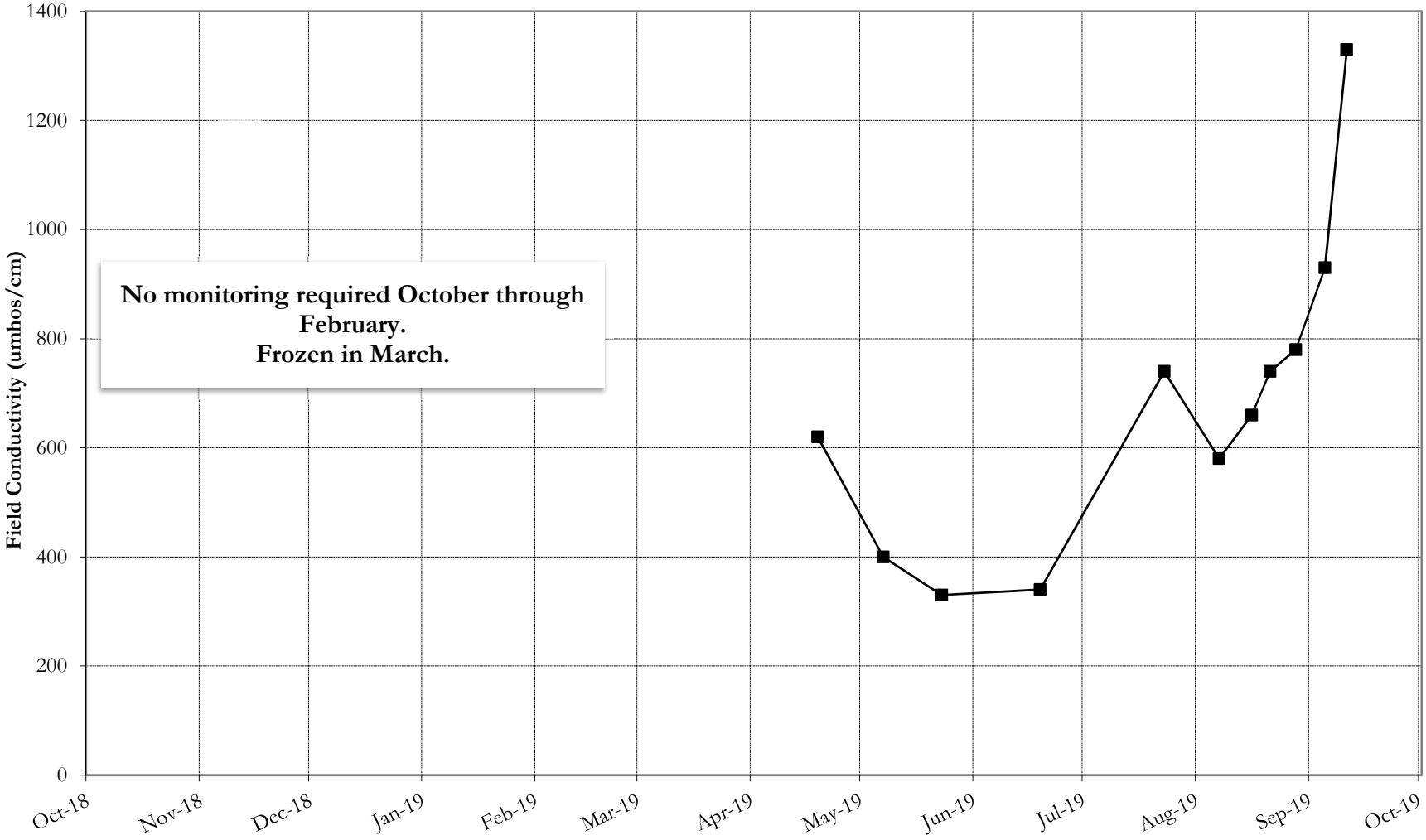

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FIGURE 64

Surface Water Site 16/16A, Fish Creek Upstream of Mine 2

Period of Record Flow Rate Readings

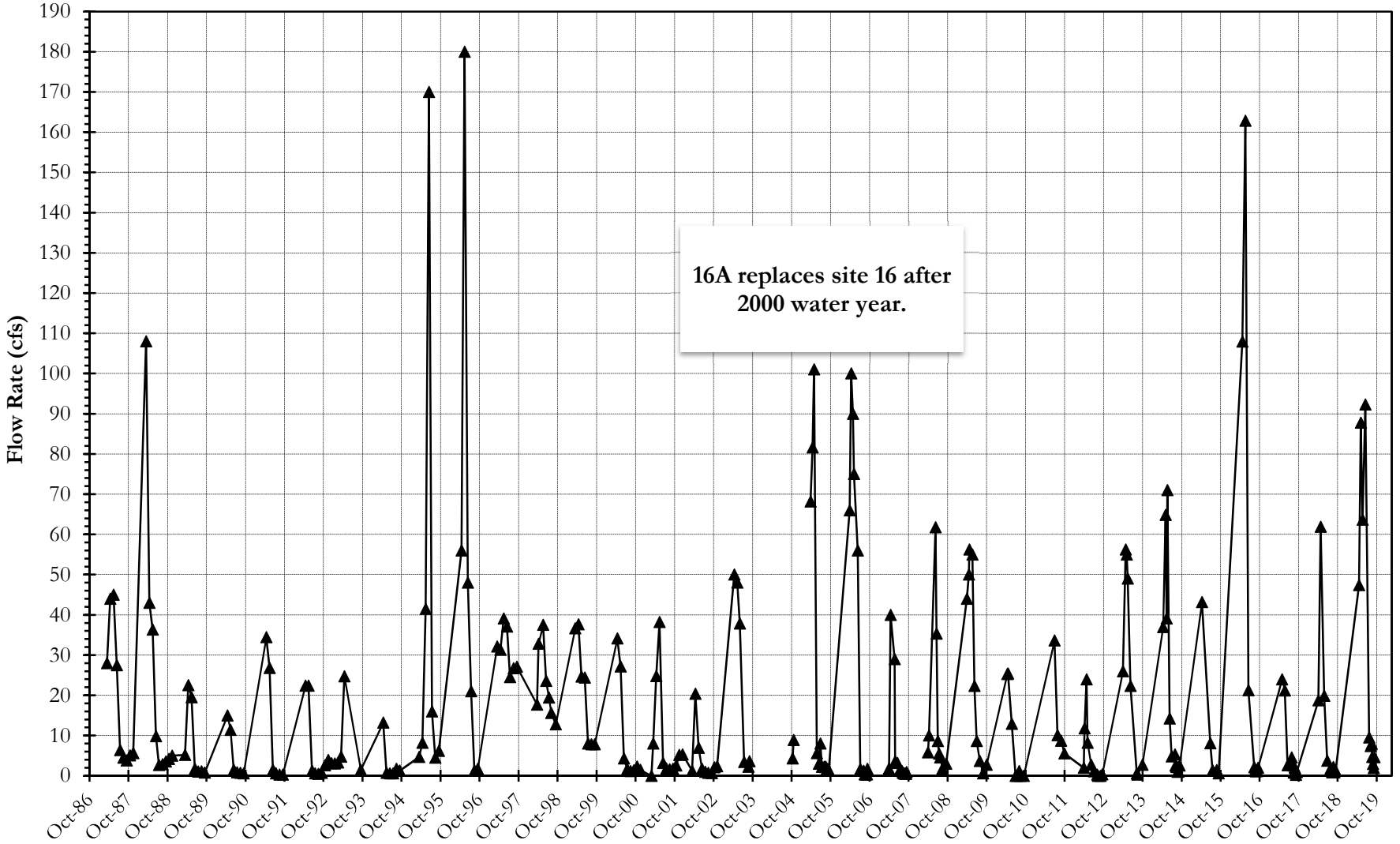

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FIGURE 65

Surface Water Site 16/16A, Fish Creek Upstream of Mine 2

Period of Record Quarterly Field Conductivity Data

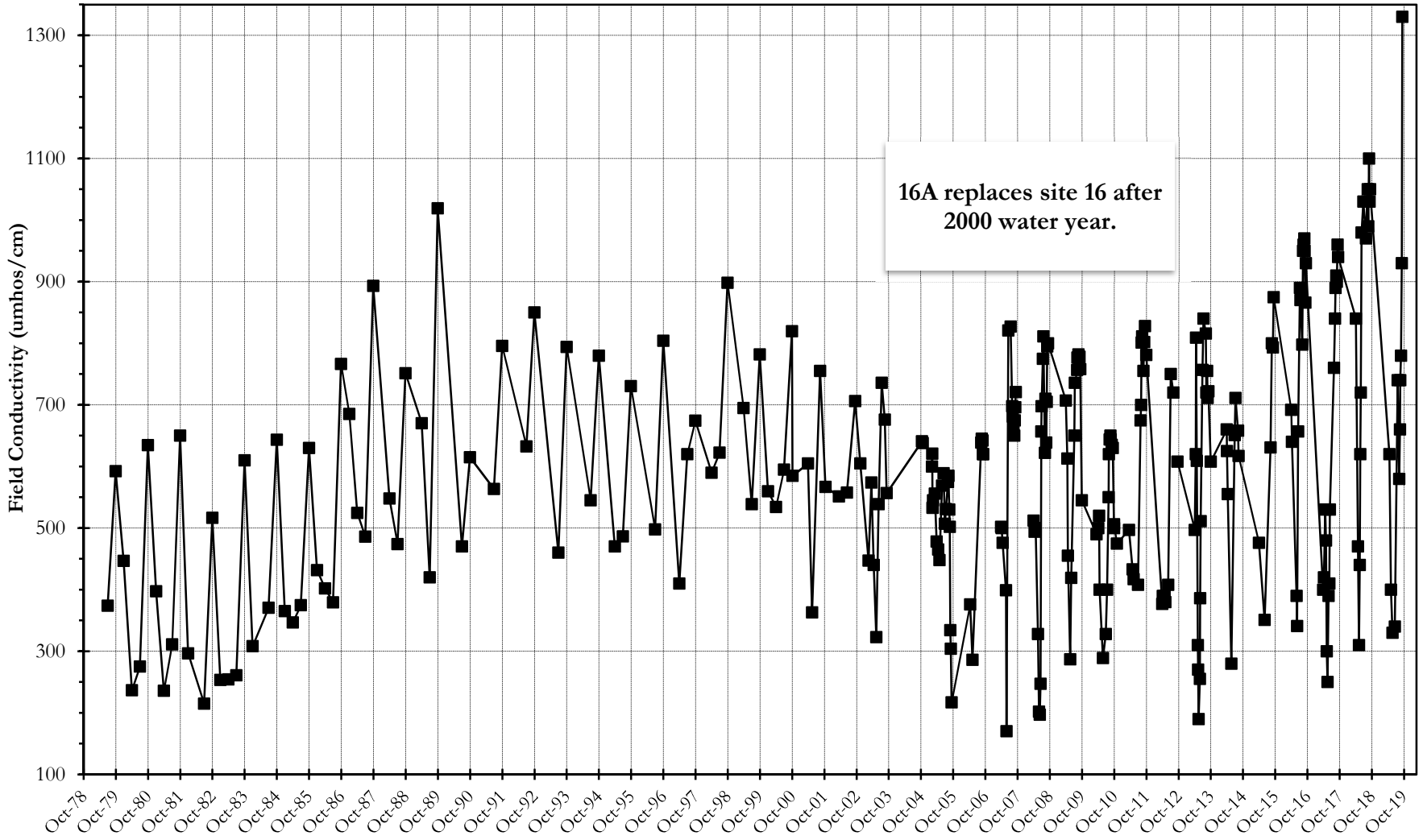

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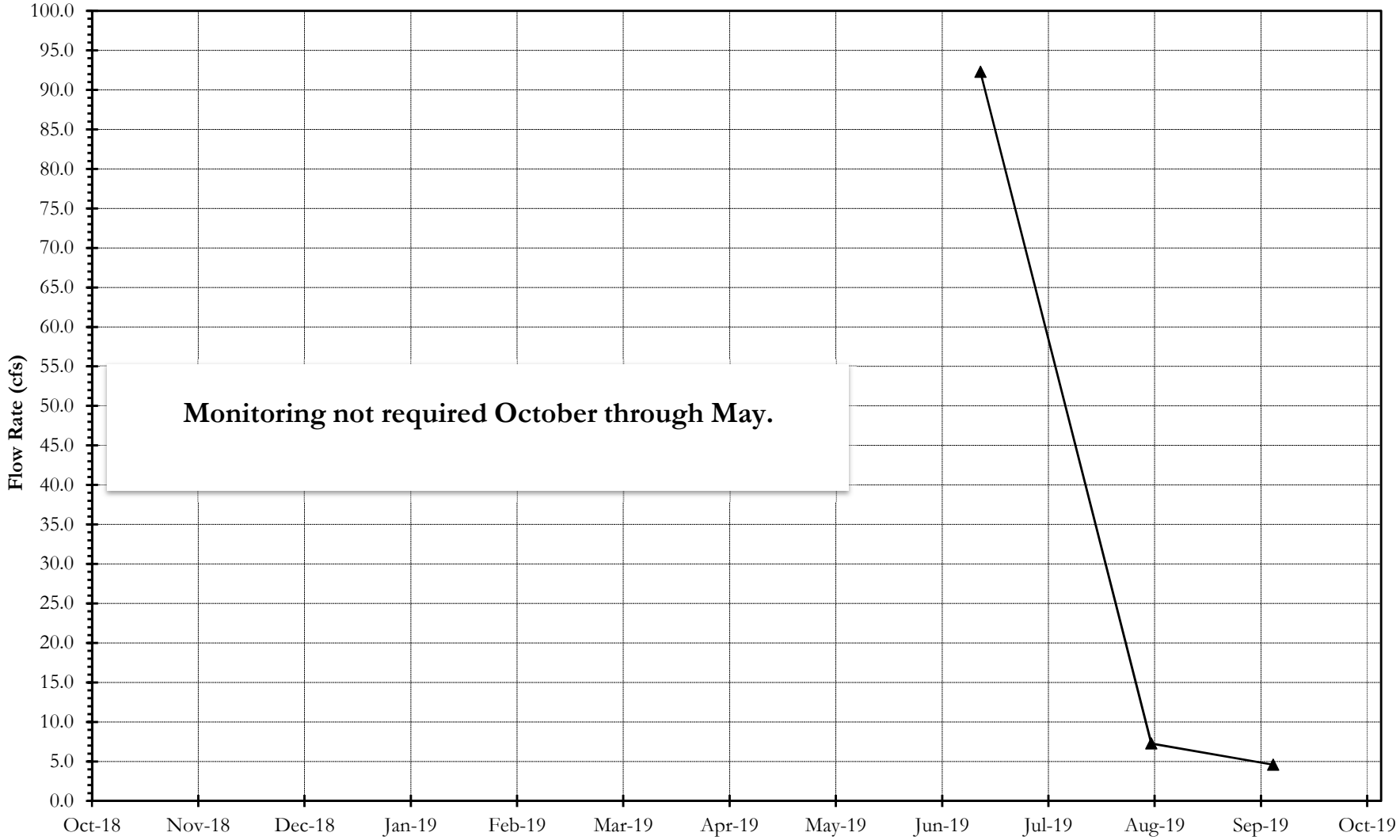
FIGURE 66

Surface Water Site 302, Fish Creek - Downstream of Mine Dewatering Site

2019 Water Year Flow Rate Data



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Surface Water\302

FIGURE 67

Surface Water Site 302, Fish Creek - Downstream of Mine Dewatering Site

2019 Water Year Field Conductivity Data

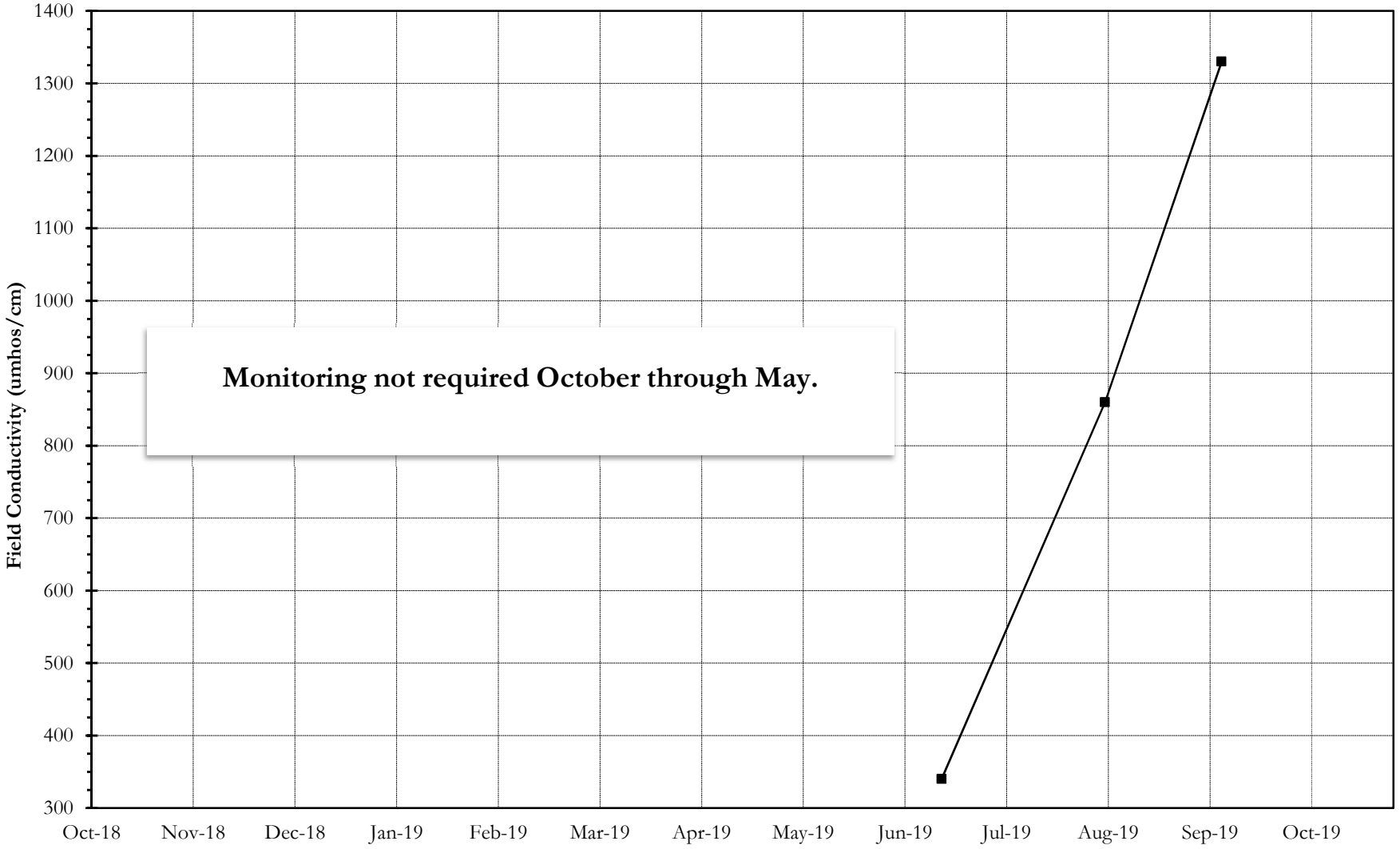


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FIGURE 68

Surface Water Site SW-13, Fish Creek - Downstream of Site 302

2019 Water Year Flow Rate Data

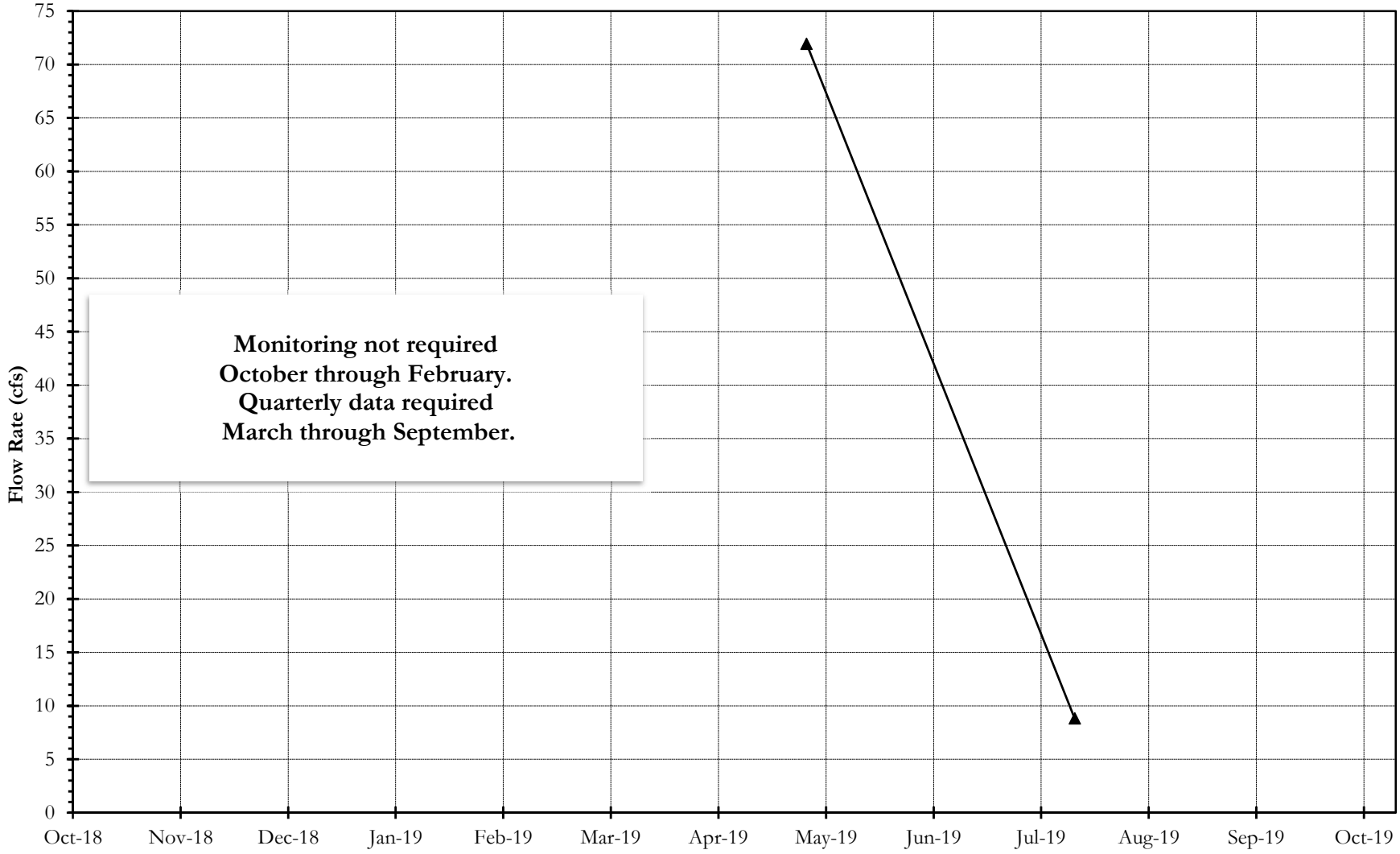
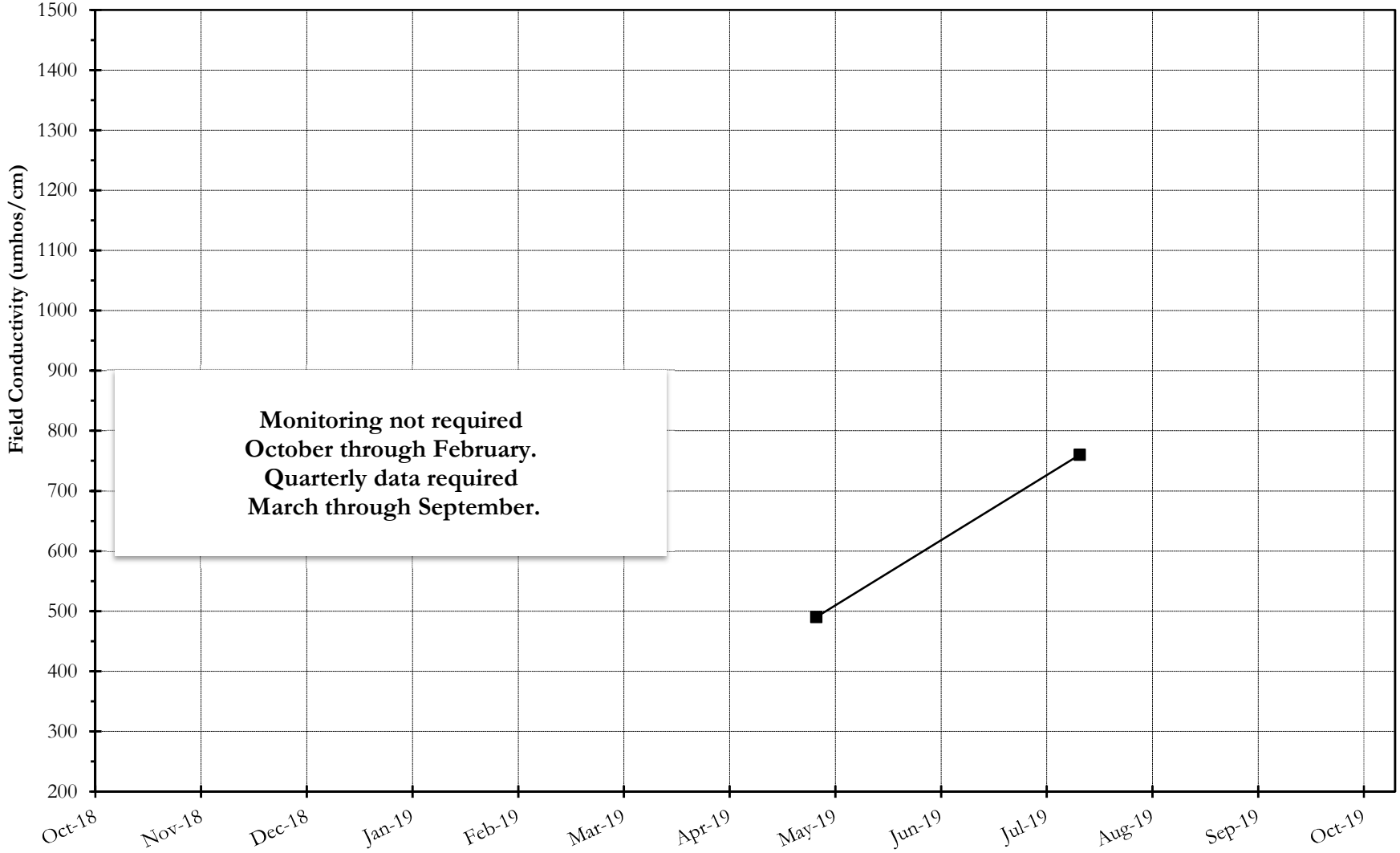


FIGURE 69

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\FC Surface Water\SW-13

Surface Water Site SW-13, Fish Creek - Downstream of Site 302

2019 Water Year Field Conductivity Data

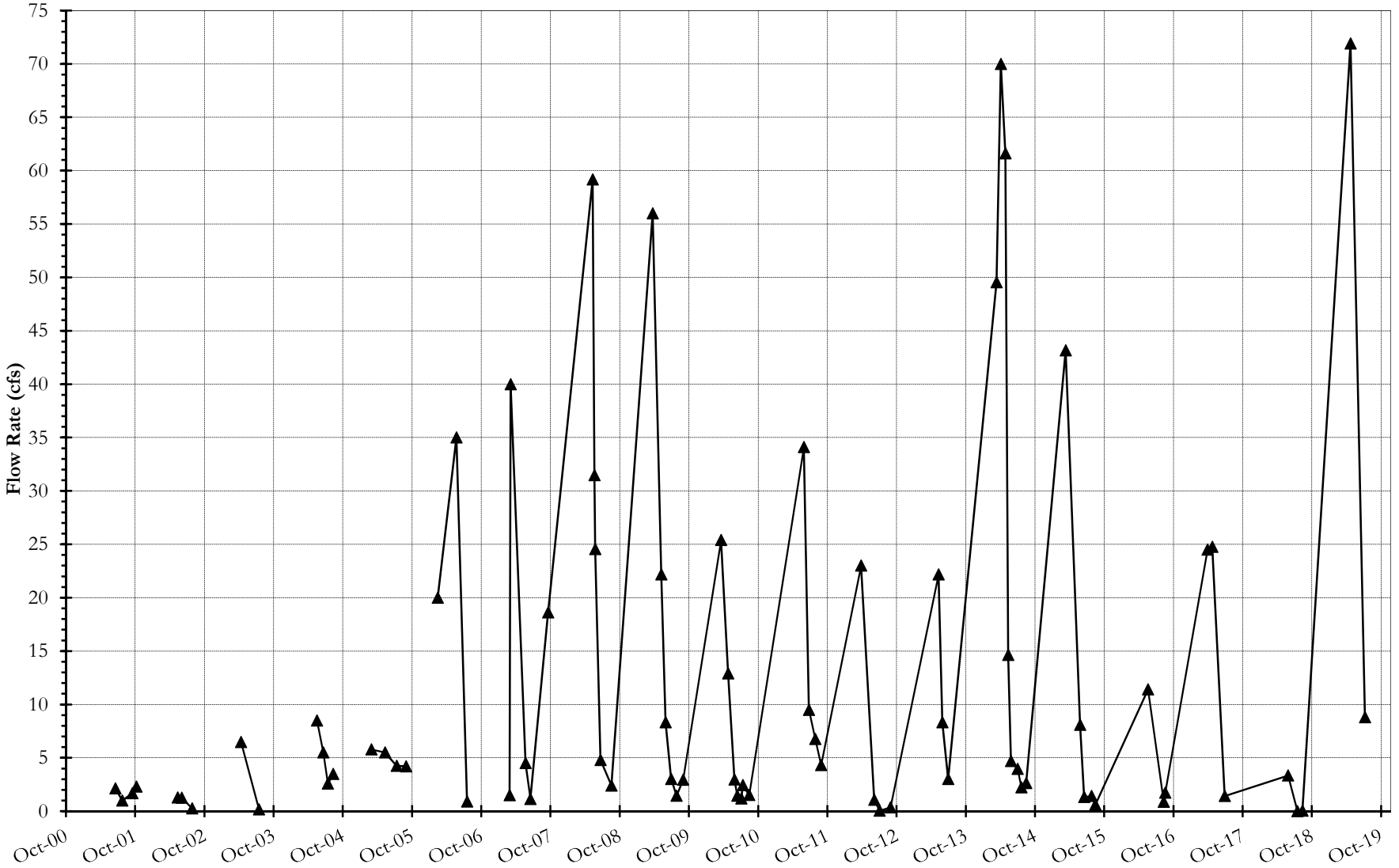


I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\FC Surface Water\SW-13

FIGURE 70

Surface Water Site SW-13, Fish Creek - Downstream of Site 302

Period of Record Flow Rate Data



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\FC Surface Water\SW-13

FIGURE 71

Surface Water Site SW-13, Fish Creek - Downstream of Site 302

Period of Record Field Conductivity Data

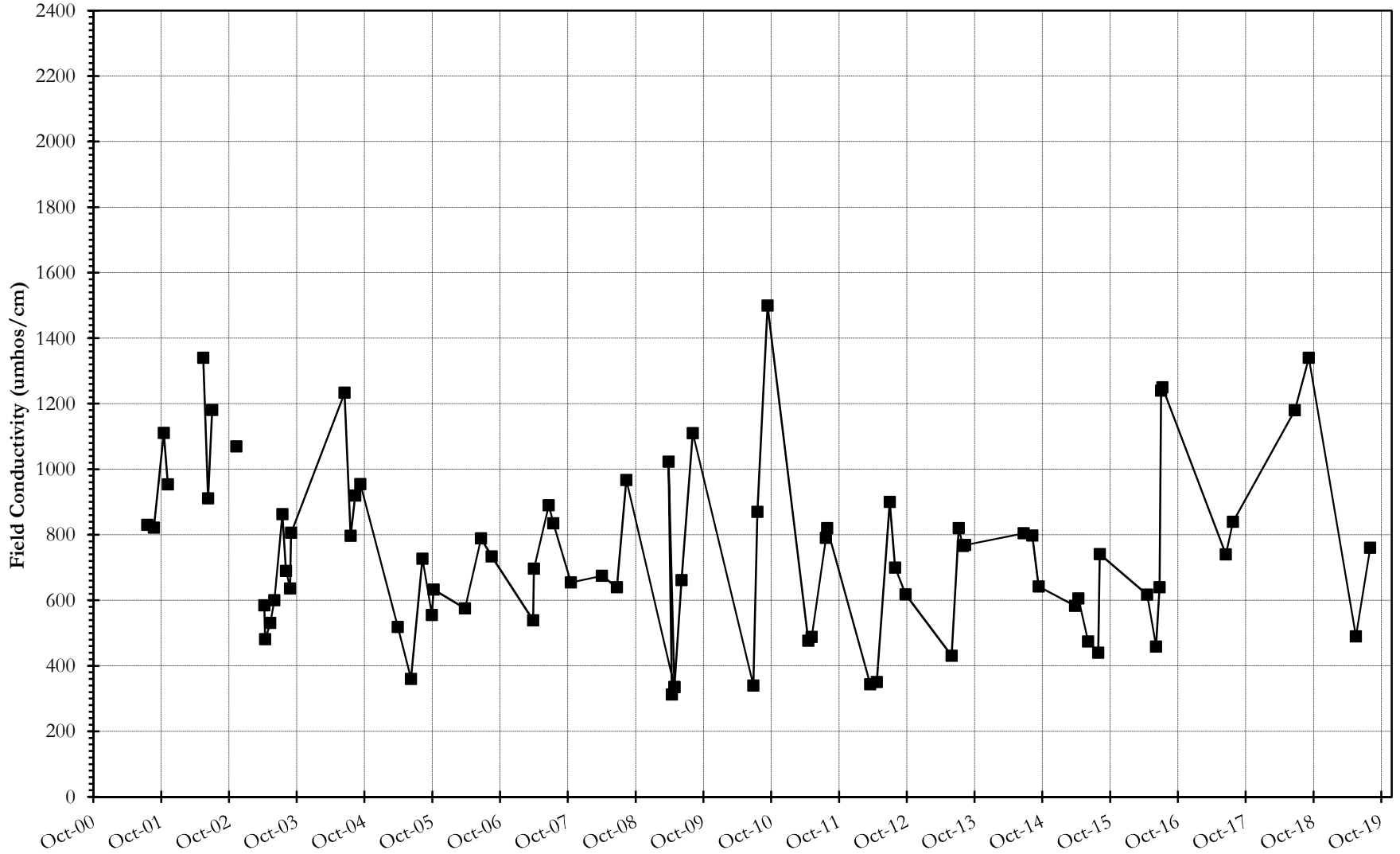


FIGURE 72

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\FC Surface Water\SW-13

Surface Water Site SW-14, Fish Creek - Downstream of Site SW-13

2019 Water Year Flow Rate Data

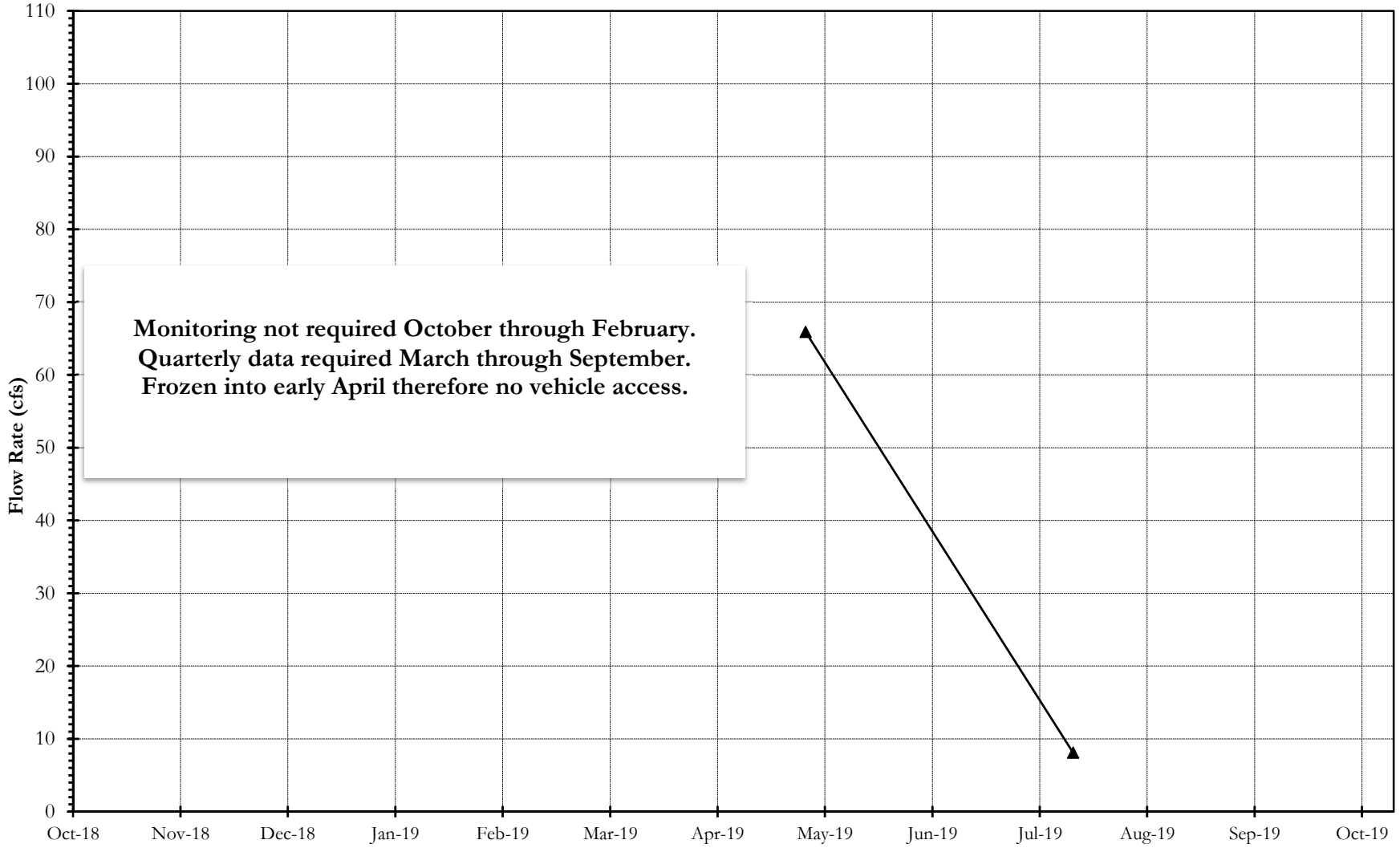
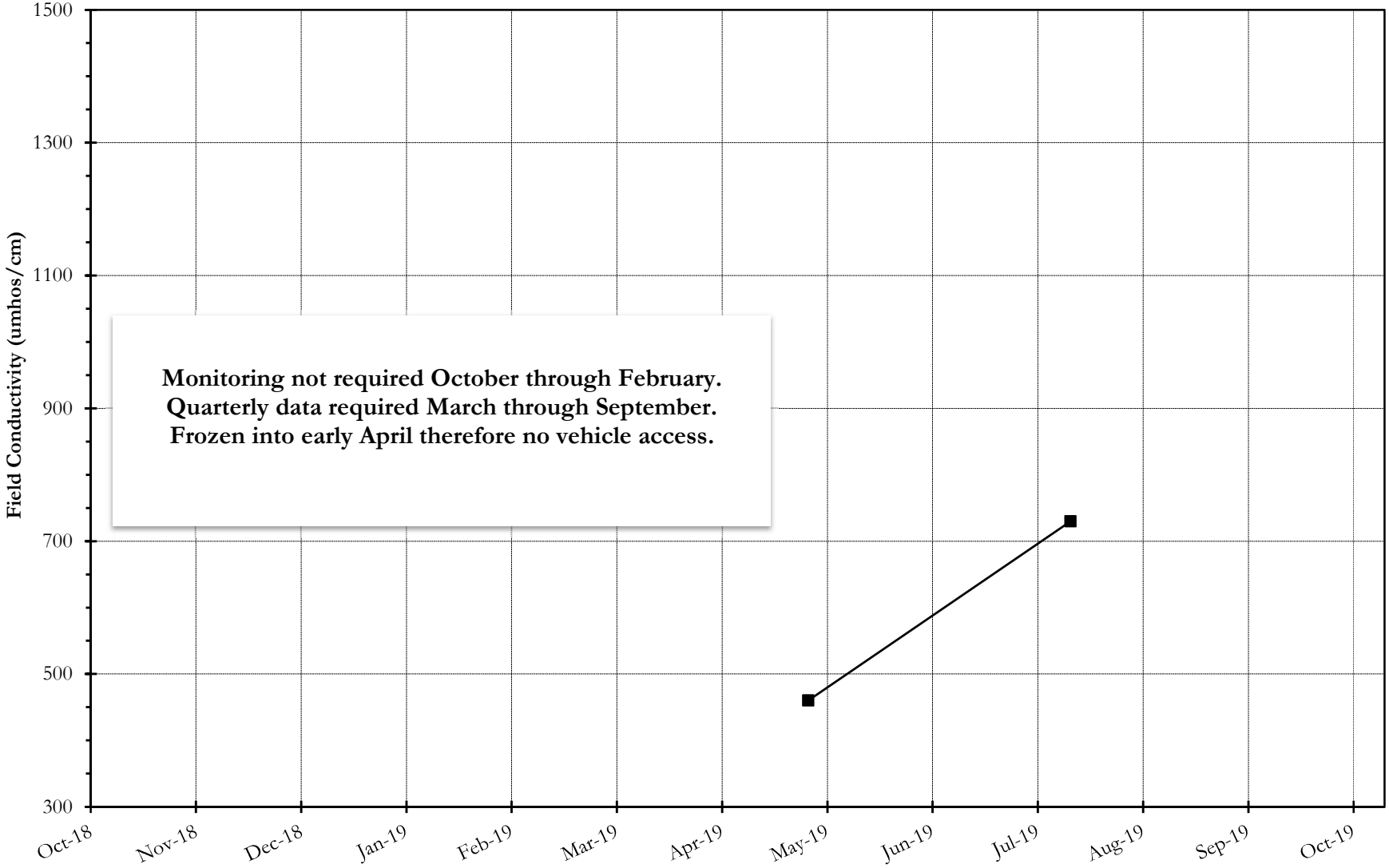


FIGURE 73

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\FC Surface Water\SW-14

Surface Water Site SW-14, Fish Creek - Downstream of Site SW-13

2019 Water Year Field Conductivity Data



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\FC Surface Water\SW-14

FIGURE 74

Surface Water Site SW-14, Fish Creek - Downstream of Site SW-13

Period of Record Flow Rate Data

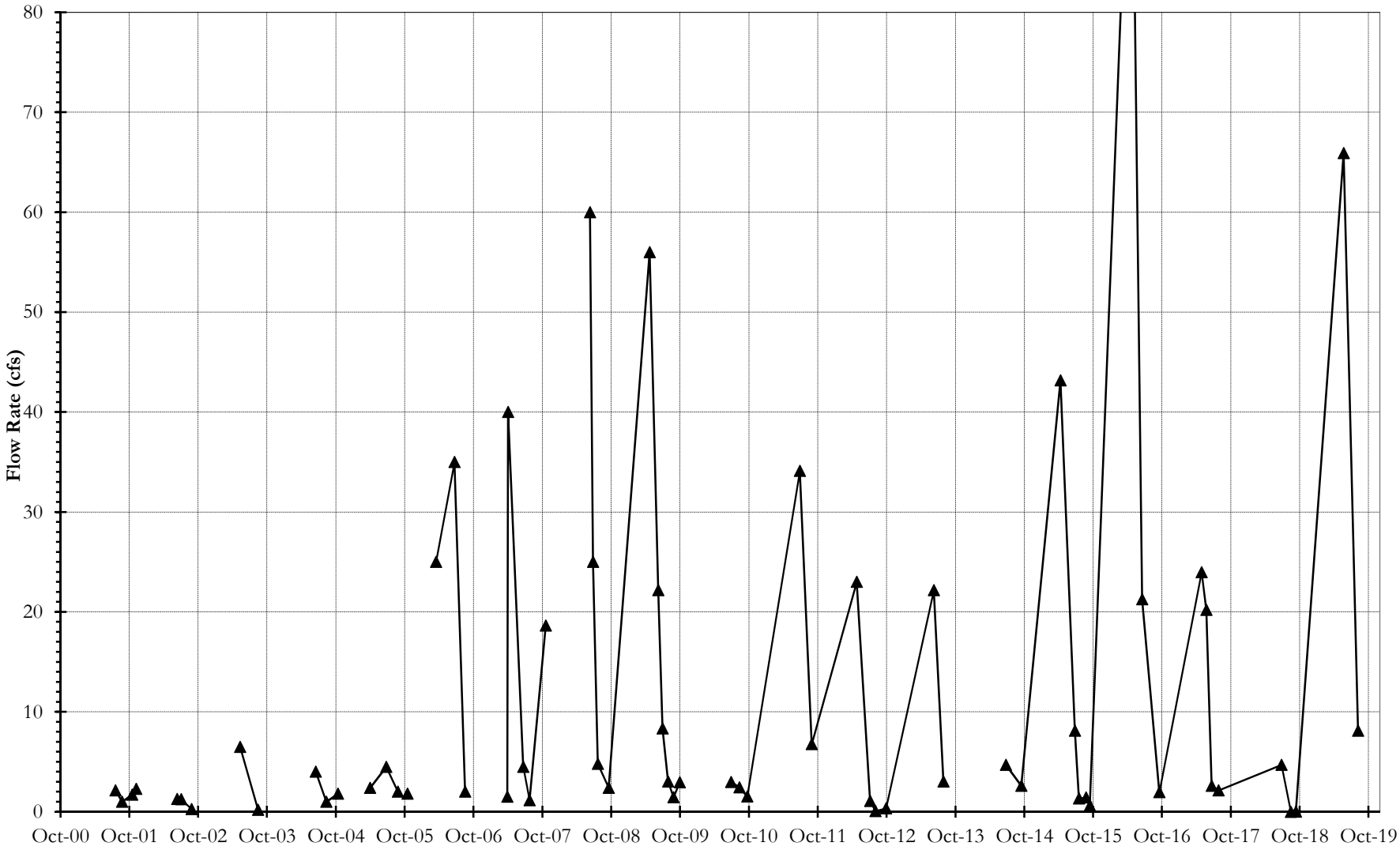


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FIGURE 75

Surface Water Site SW-14, Fish Creek - Downstream of Site SW-13

Period of Record Field Conductivity Data

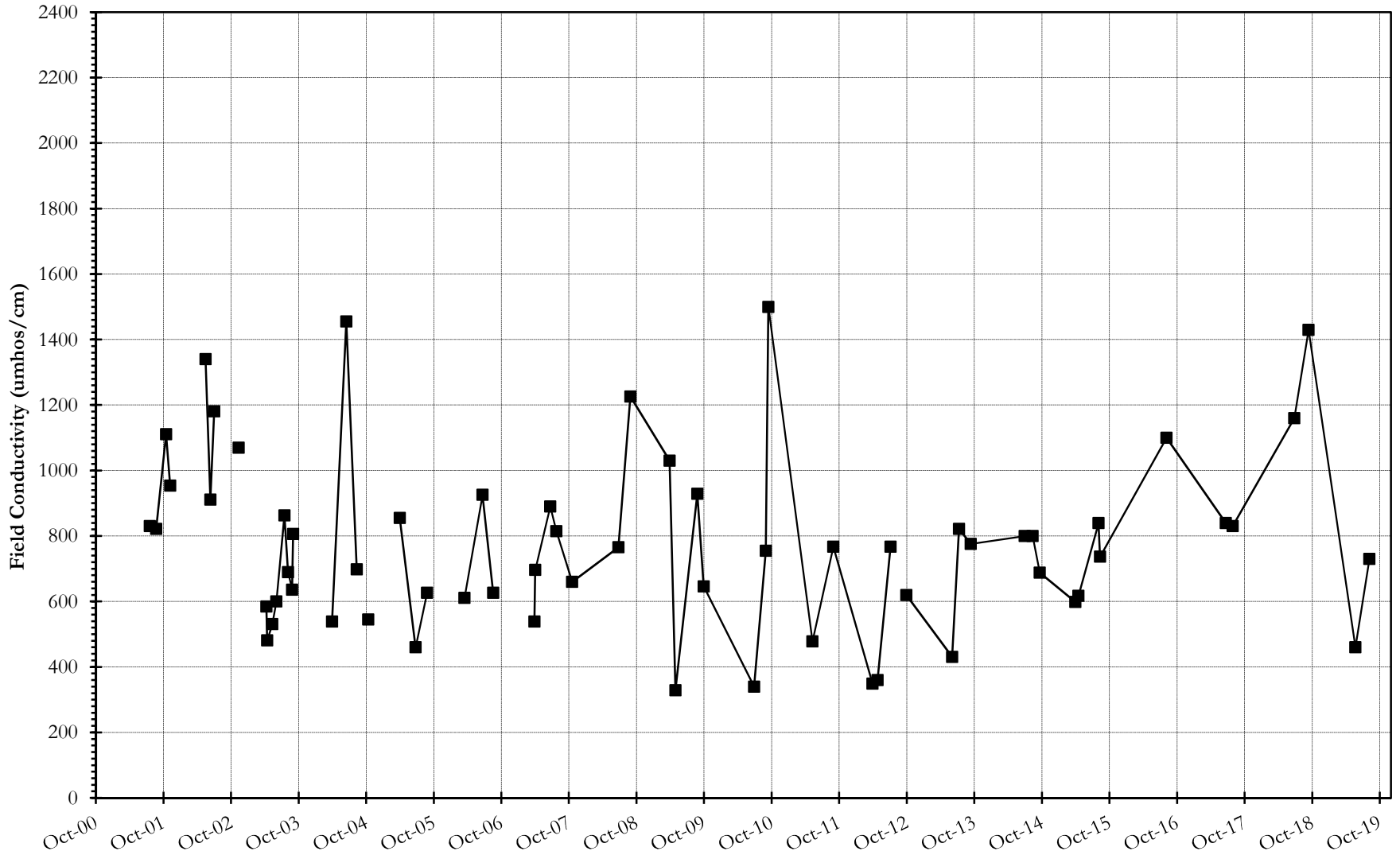

FIGURE 76

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Surface Water Site SW-15, Fish Creek - Downstream of Site SW-14

2019 Water Year Flow Rate Data

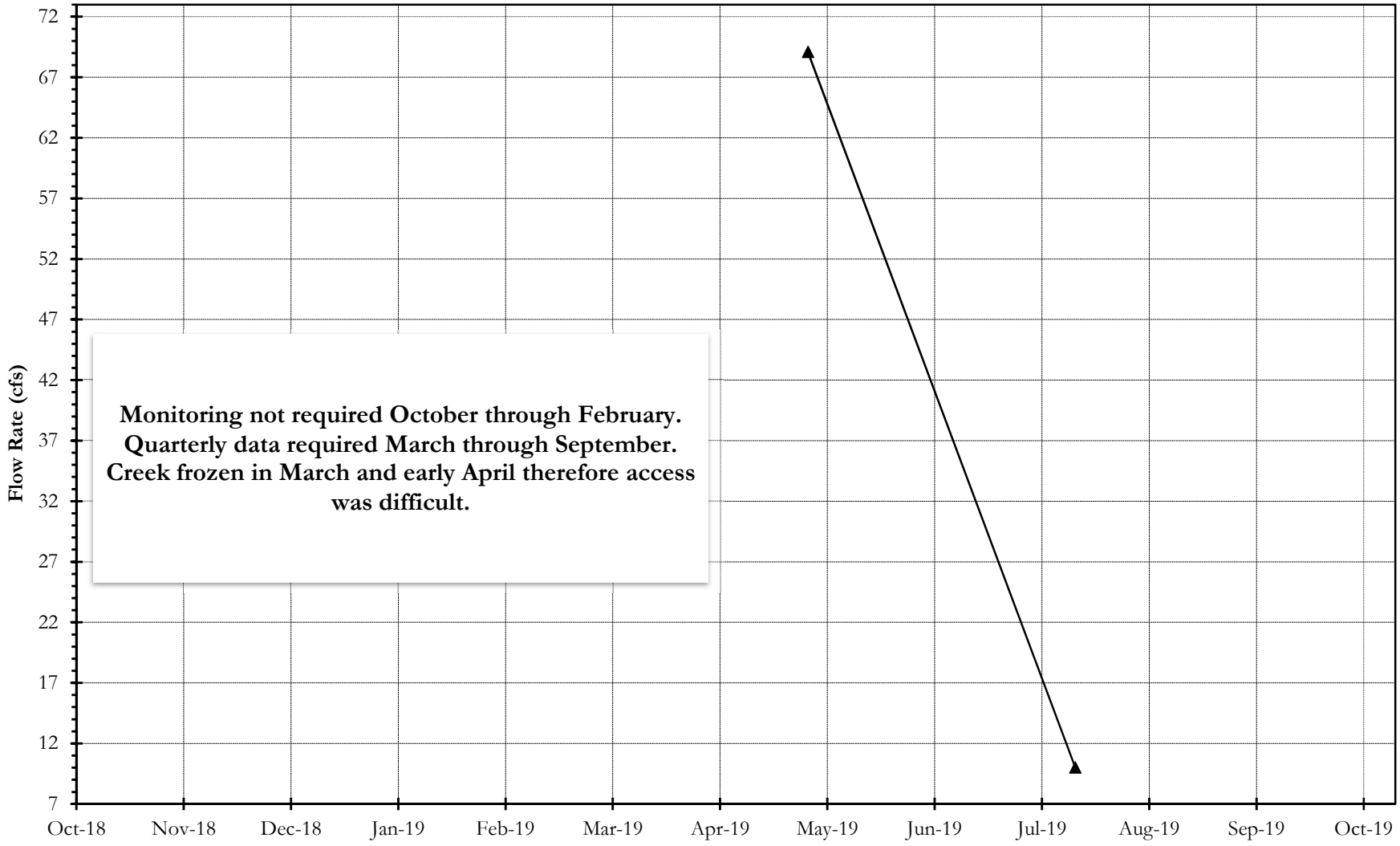

FIGURE 77

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Surface Water Site SW-15, Fish Creek - Downstream of Site SW-14

2019 Water Year Field Conductivity Data

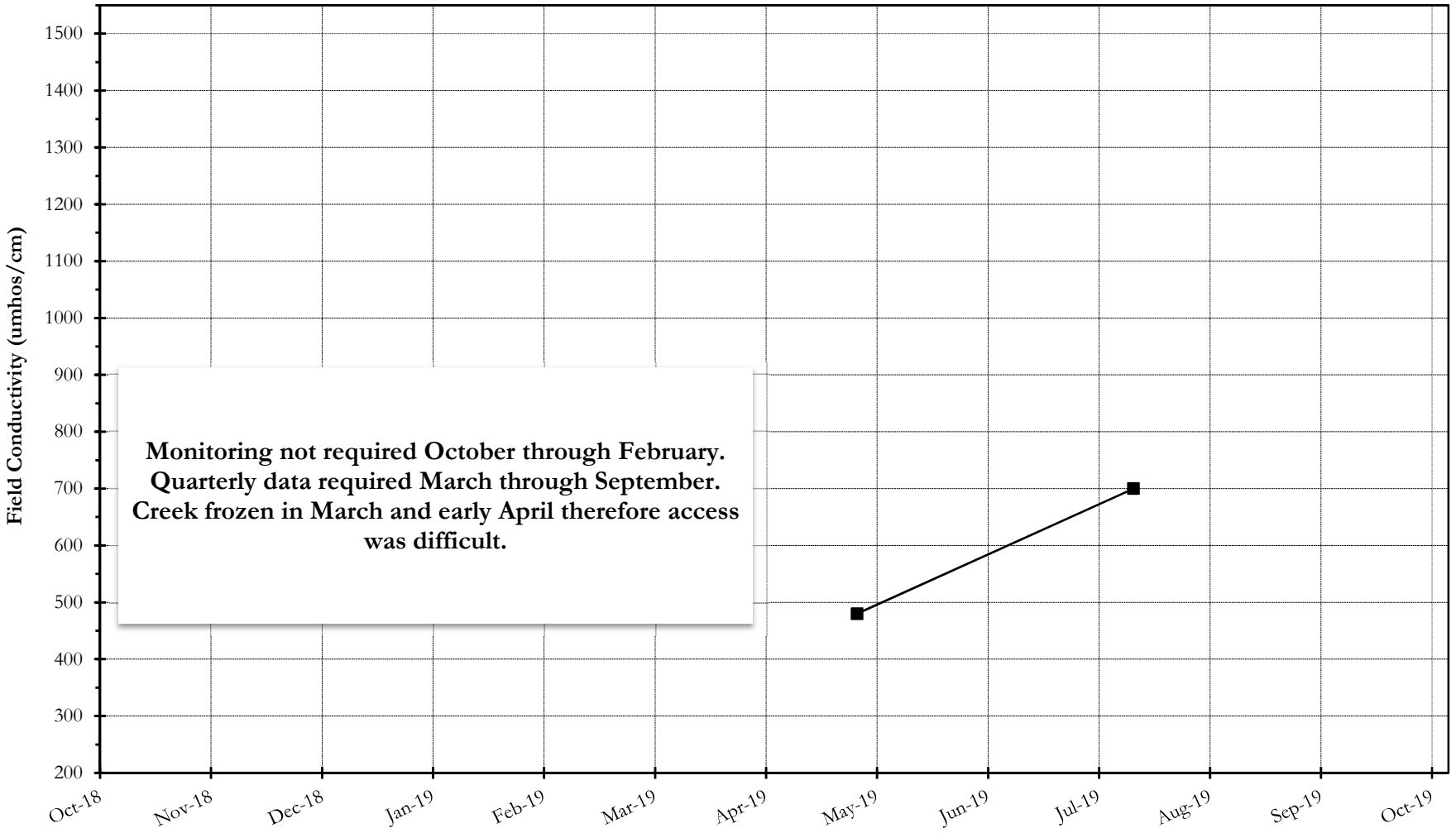

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FIGURE 78

Surface Water Site SW-15, Fish Creek - Downstream of Site SW-14

Period of Record Flow Rate Data

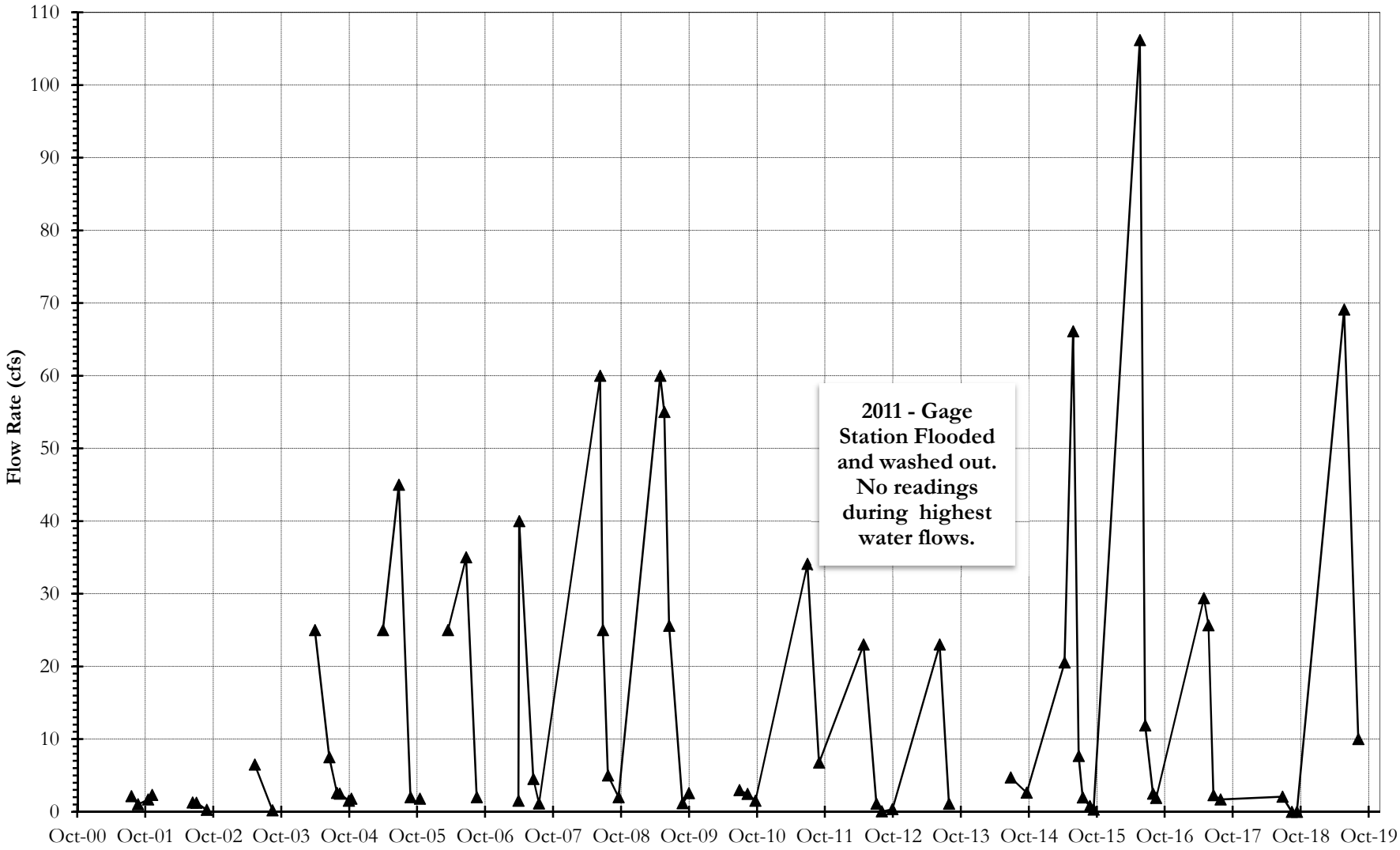

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FIGURE 79

Surface Water Site SW-15, Fish Creek - Downstream of Site SW-14

Period of Record Field Conductivity Data

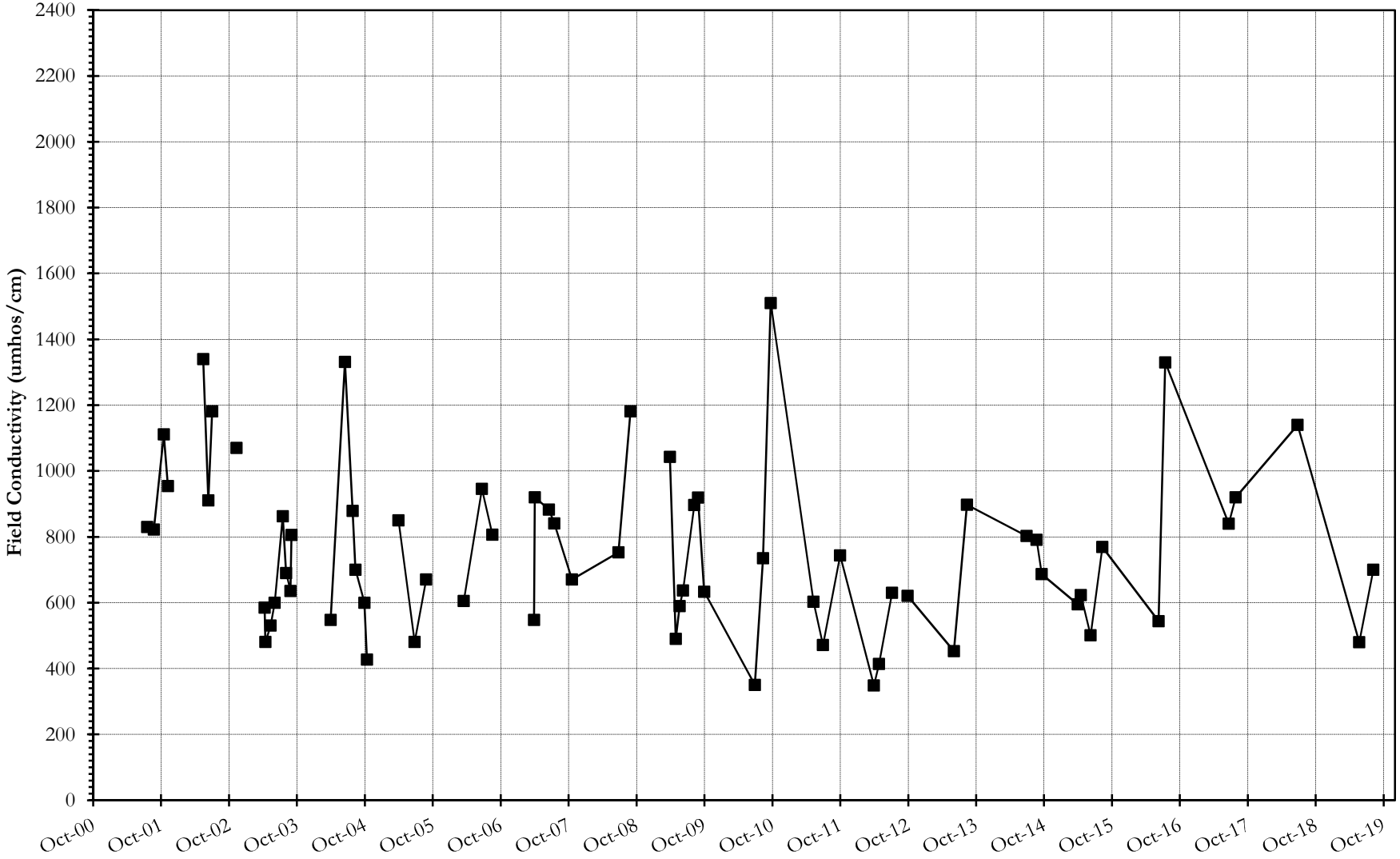

FIGURE 80

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\FC Surface Water\SW-15

Surface Water Site 305, Fish Creek - Downstream of Site SW-15

2019 Water Year Flow Rate Data

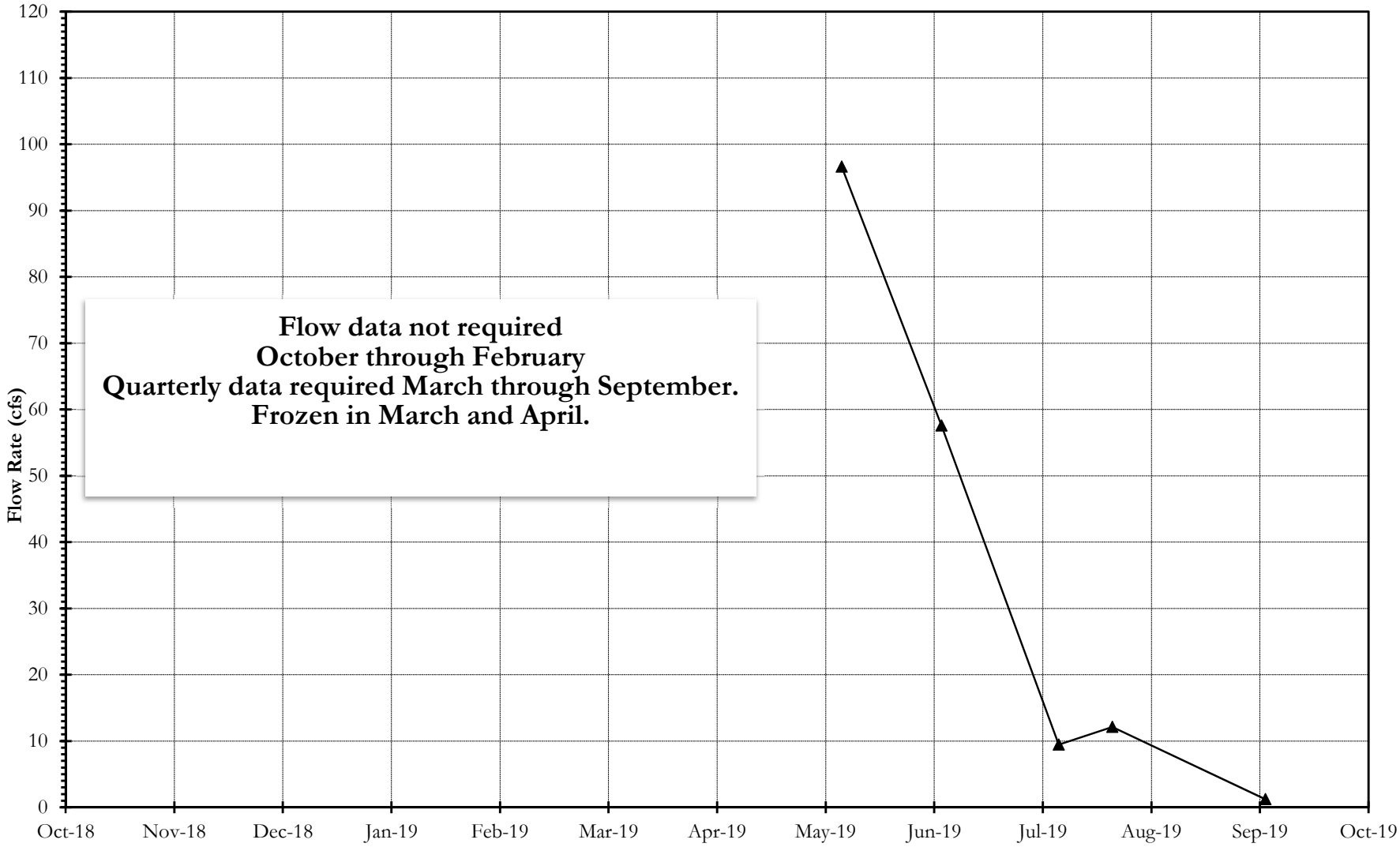

FIGURE 81

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Surface Water\305

Surface Water Site 305, Fish Creek - Downstream of Site SW-15

2019 Water Year Field Conductivity Data

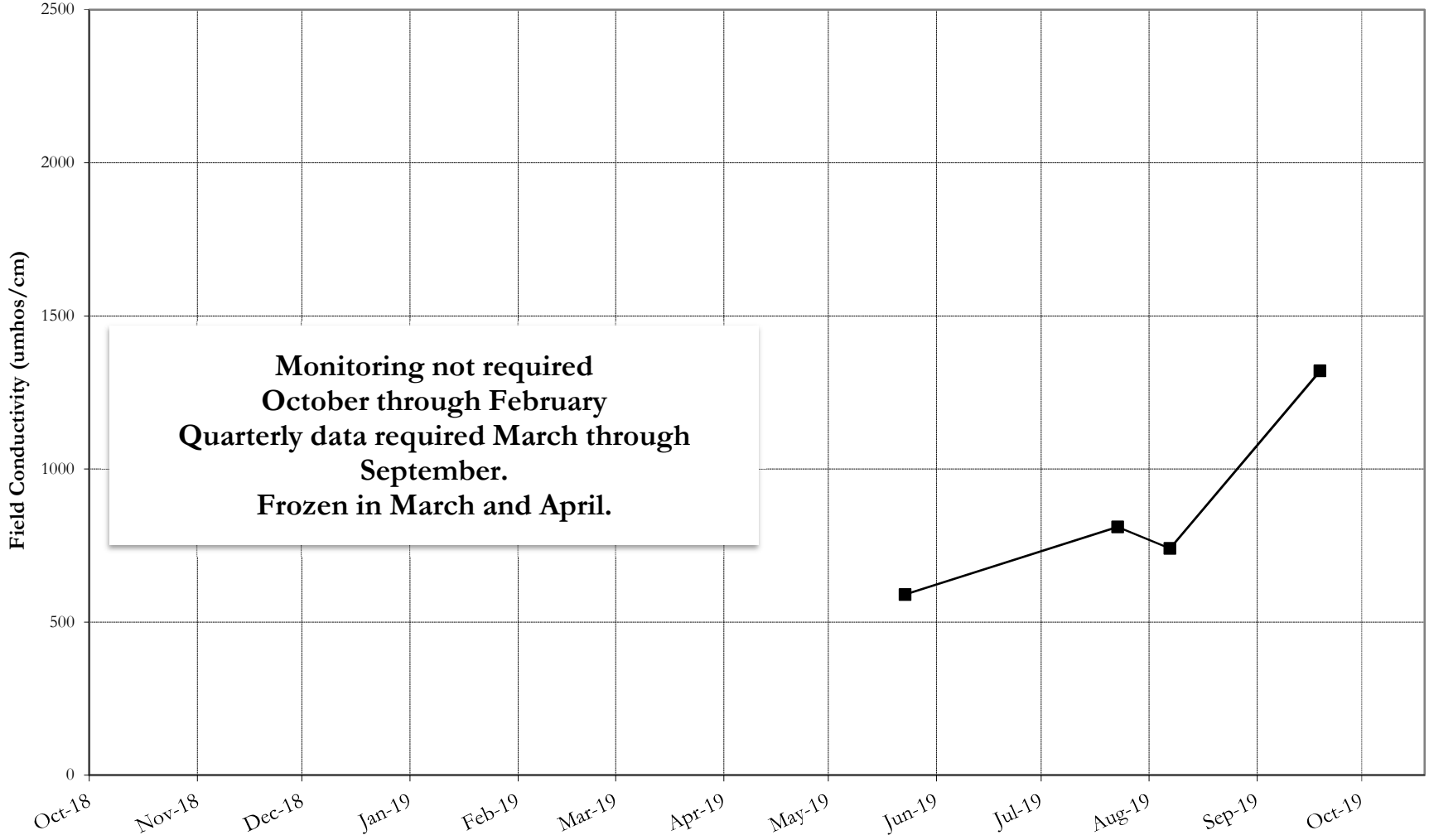

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FIGURE 82

Surface Water Site 305, Fish Creek - Downstream of Site SW-15

Period of Record Flow Rate Data

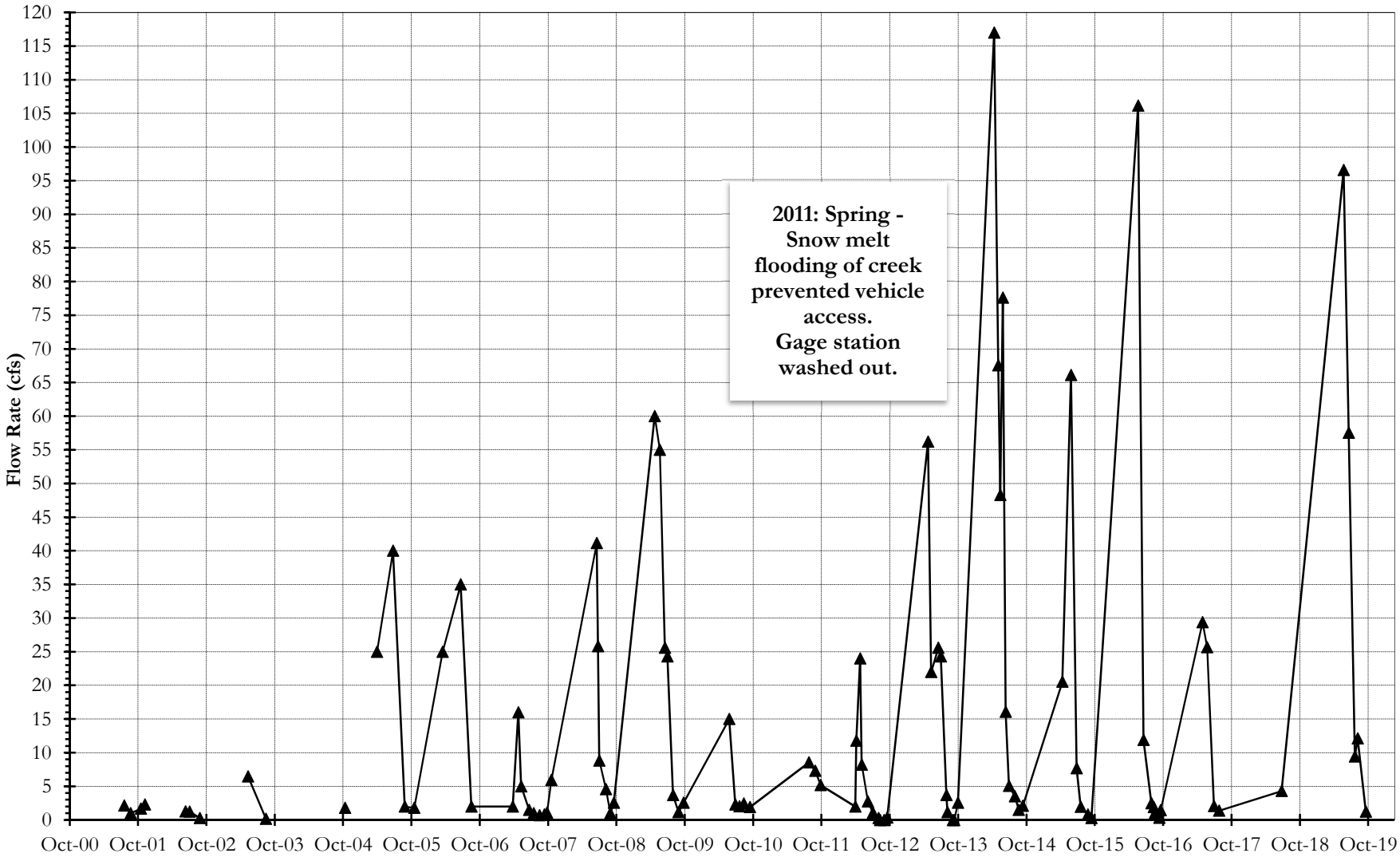

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FIGURE 83

Surface Water Site 305, Fish Creek - Downstream of Site SW-15

Period of Record Field Conductivity Data

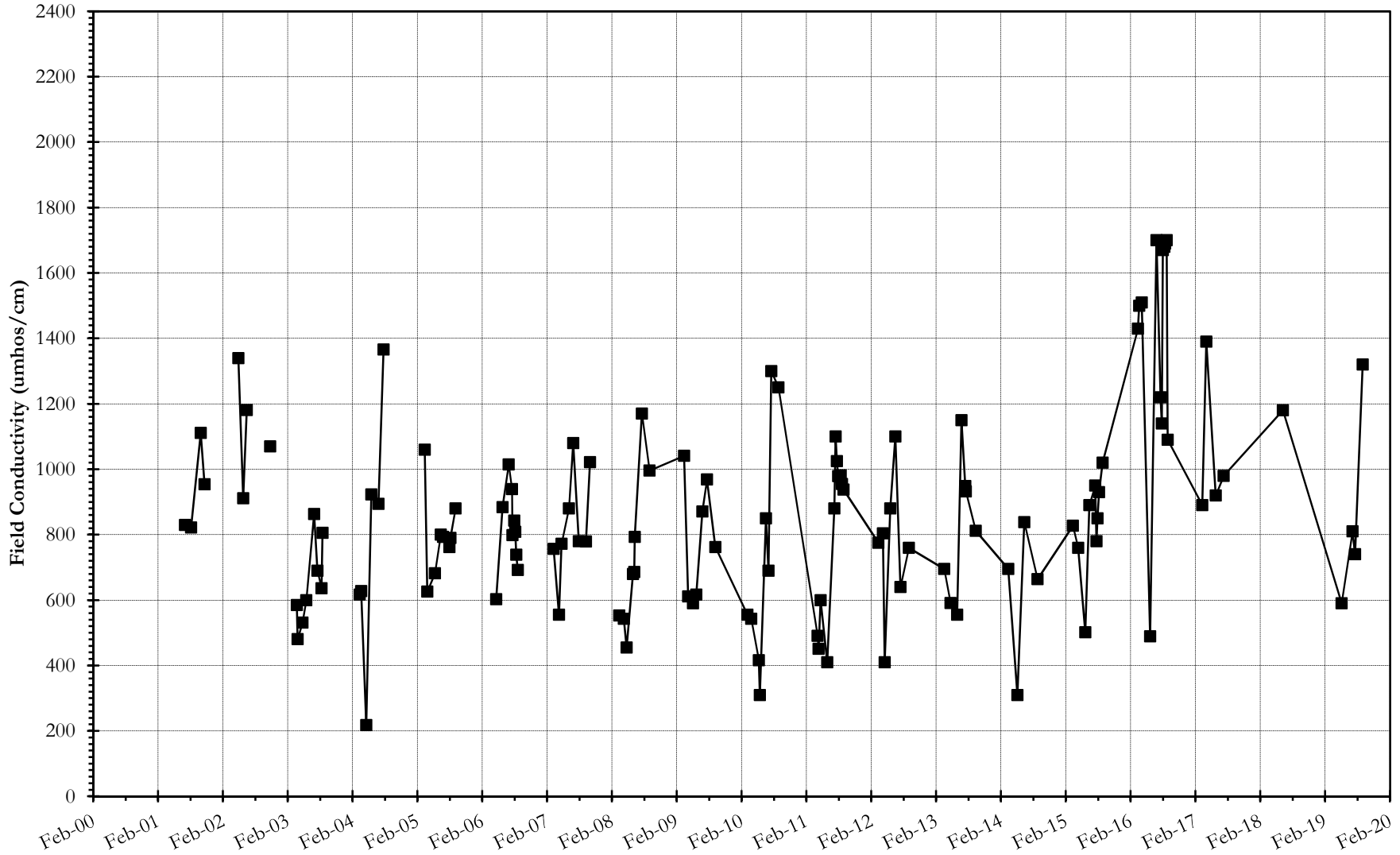
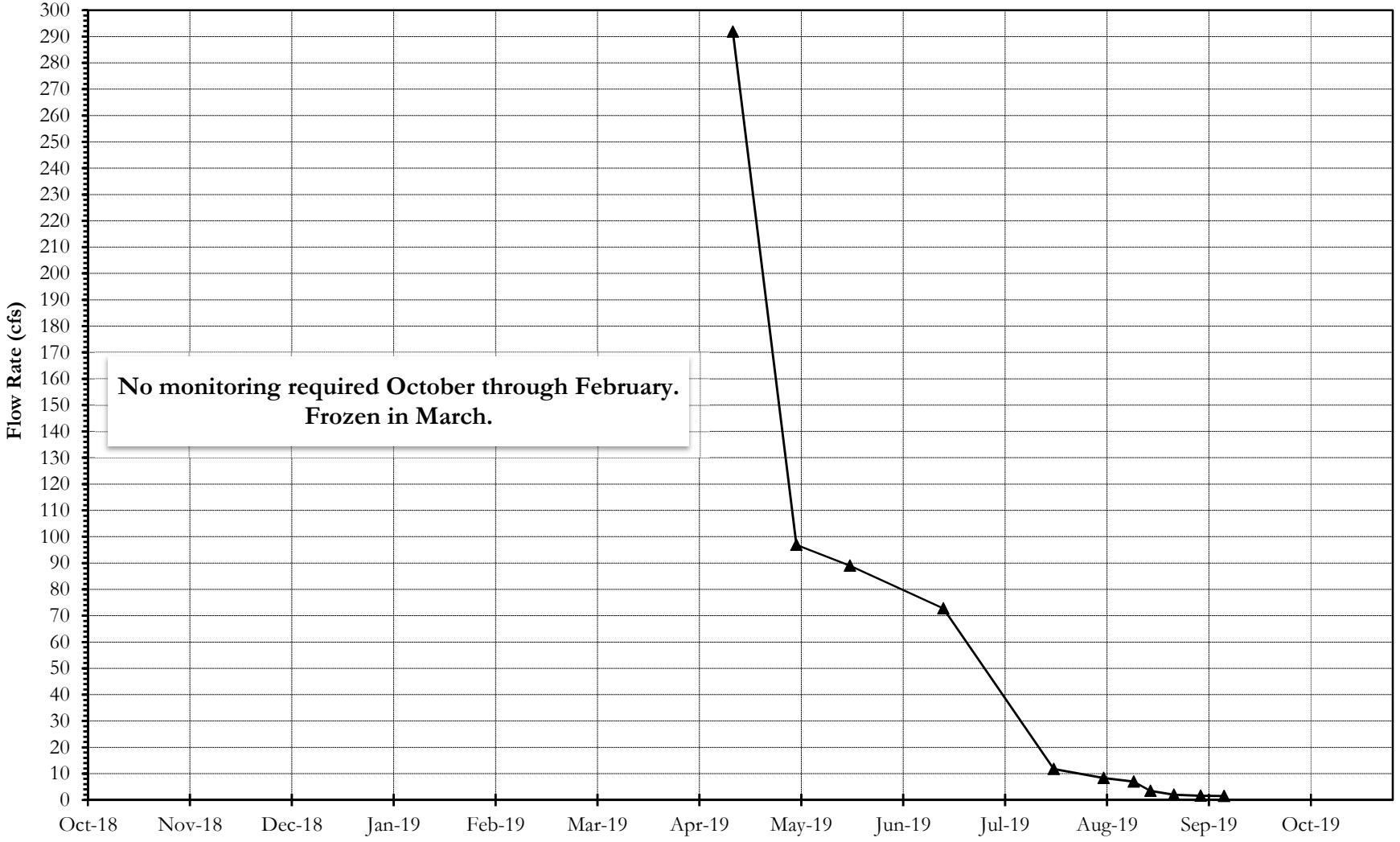


FIGURE 84

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Surface Water\305

Surface Water Site 27 A, Fish Creek near Fish Creek Tipple

2019 Water Year Flow Rate Data



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Surface Water\27A

FIGURE 85

Surface Water Site 27 A, Fish Creek near Fish Creek Tipple

2019 Water Year Field Conductivity Data

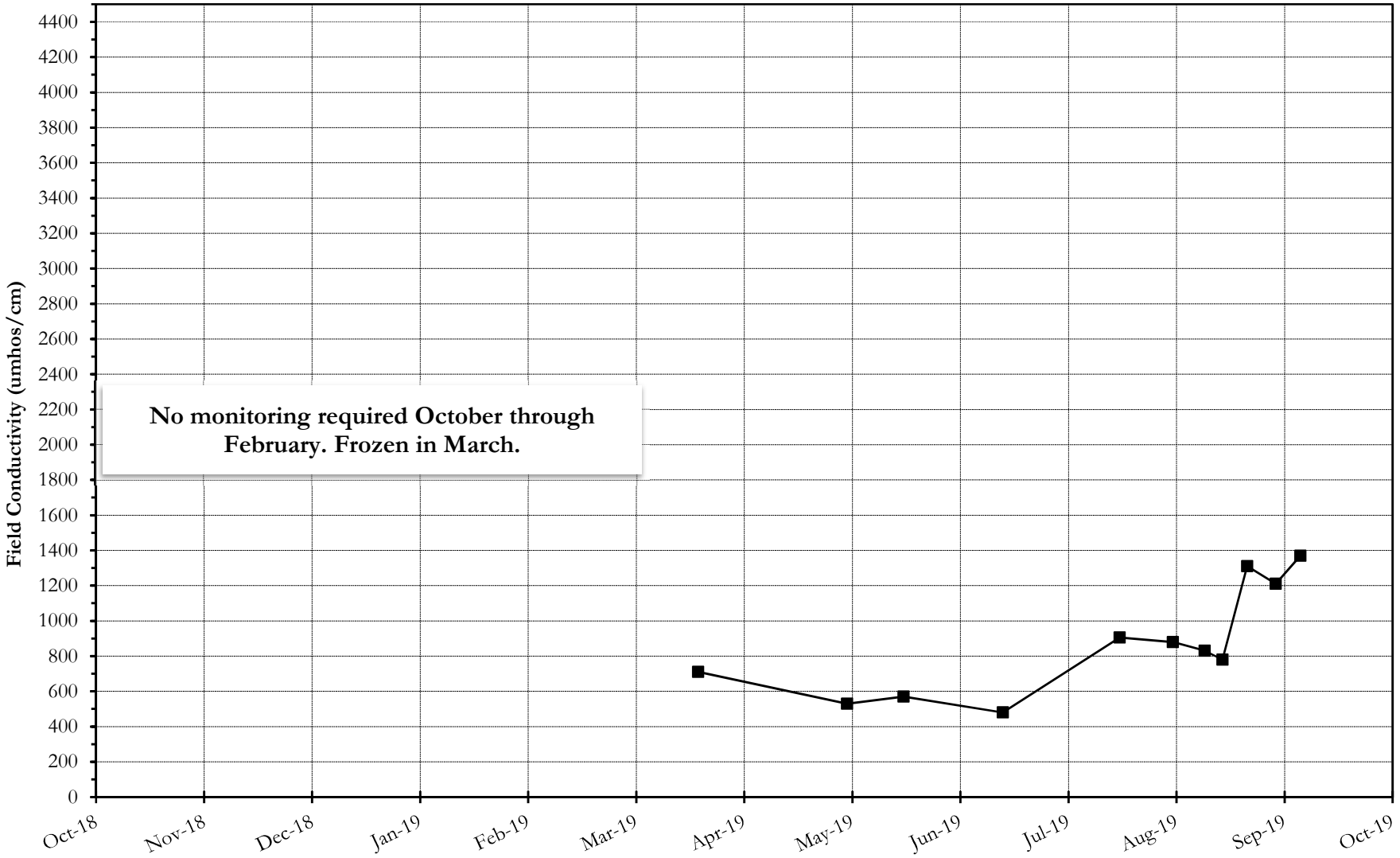


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FIGURE 86

Surface Water Site 27A, Fish Creek Near Fish Creek Tipple

Period of Record Flow Rate Data

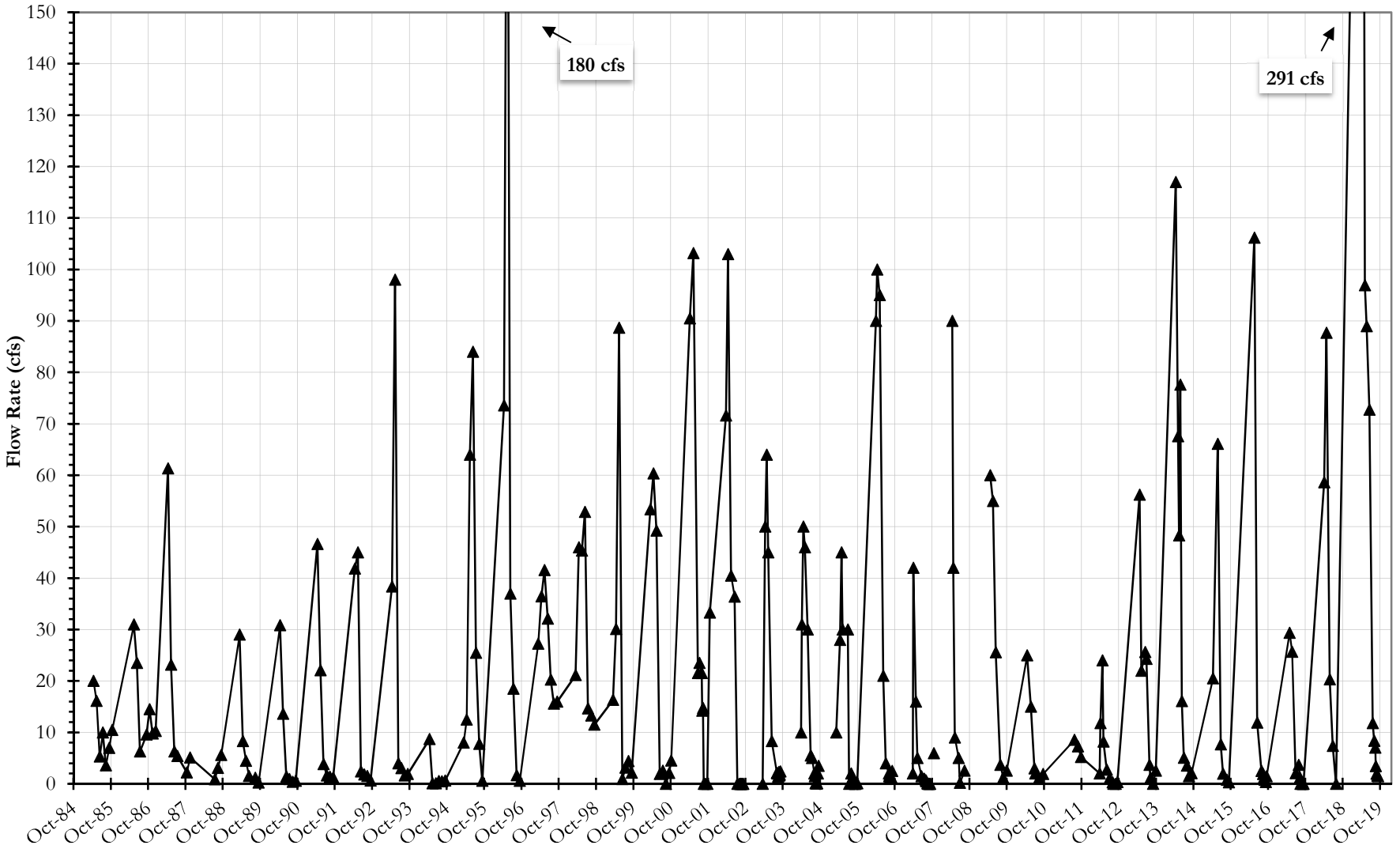

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FIGURE 87

Surface Water Site 27A, Fish Creek near Fish Creek Tipple

Period of Record Conductivity Data for Water Years 1995 - 2019

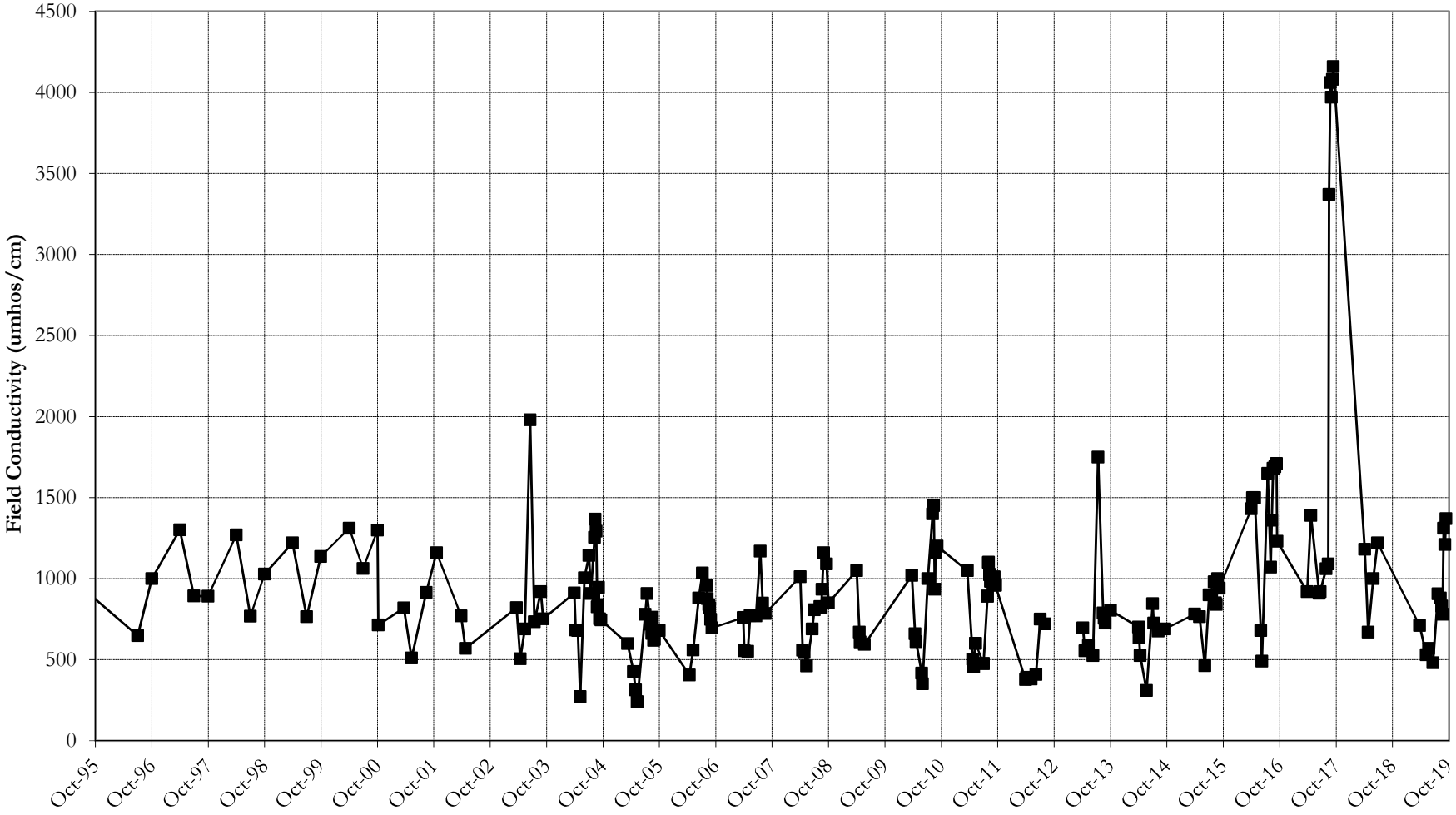

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FIGURE 88

Surface Water Site 27A, Fish Creek Near Fish Creek Tipple

Period of Record Total Recoverable Iron Data

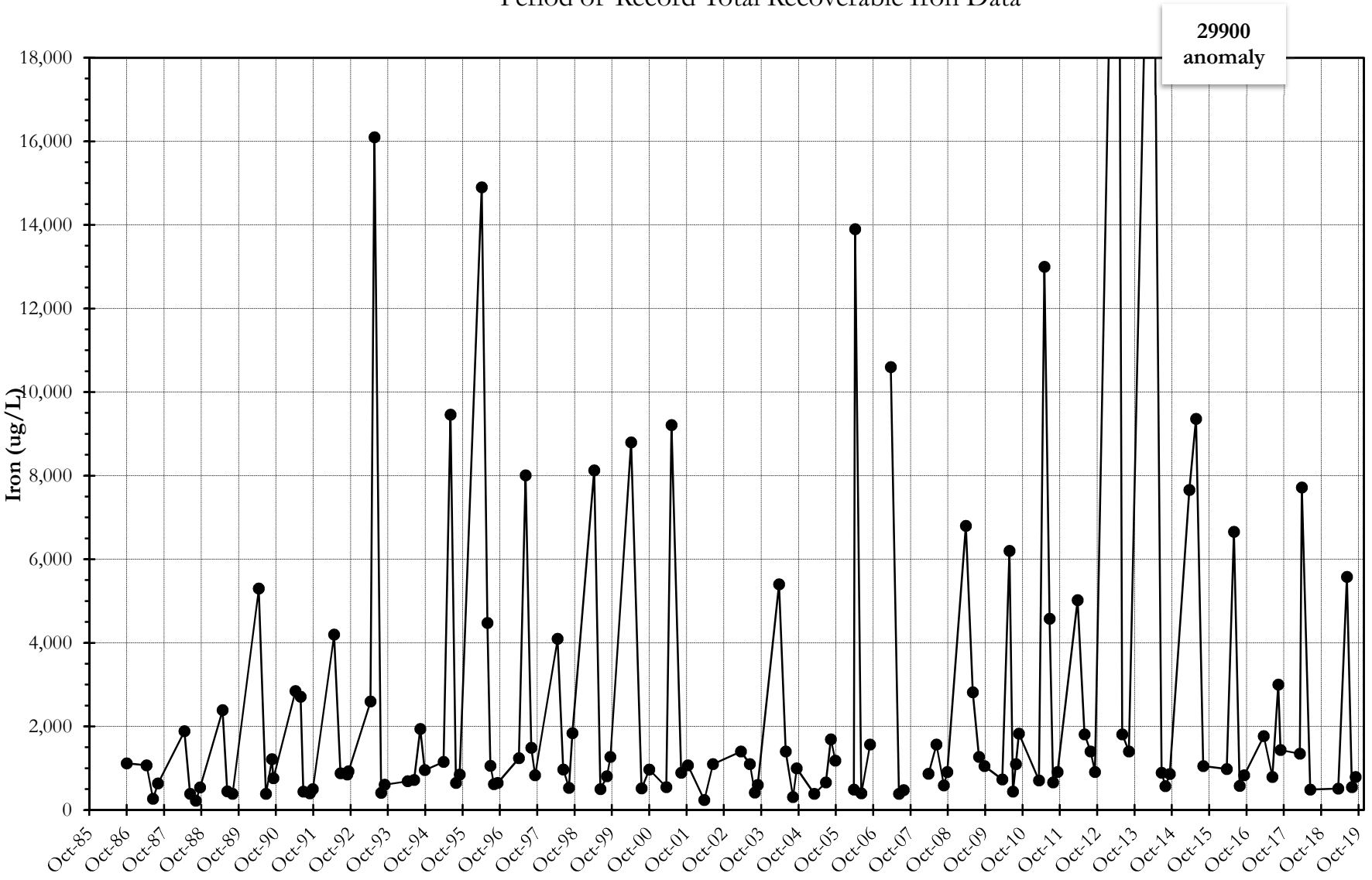

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FIGURE 89

Surface Water Site 1003, Fish Creek Downstream of Fish Creek Tipple

2019 Water Year Flow Rate Data

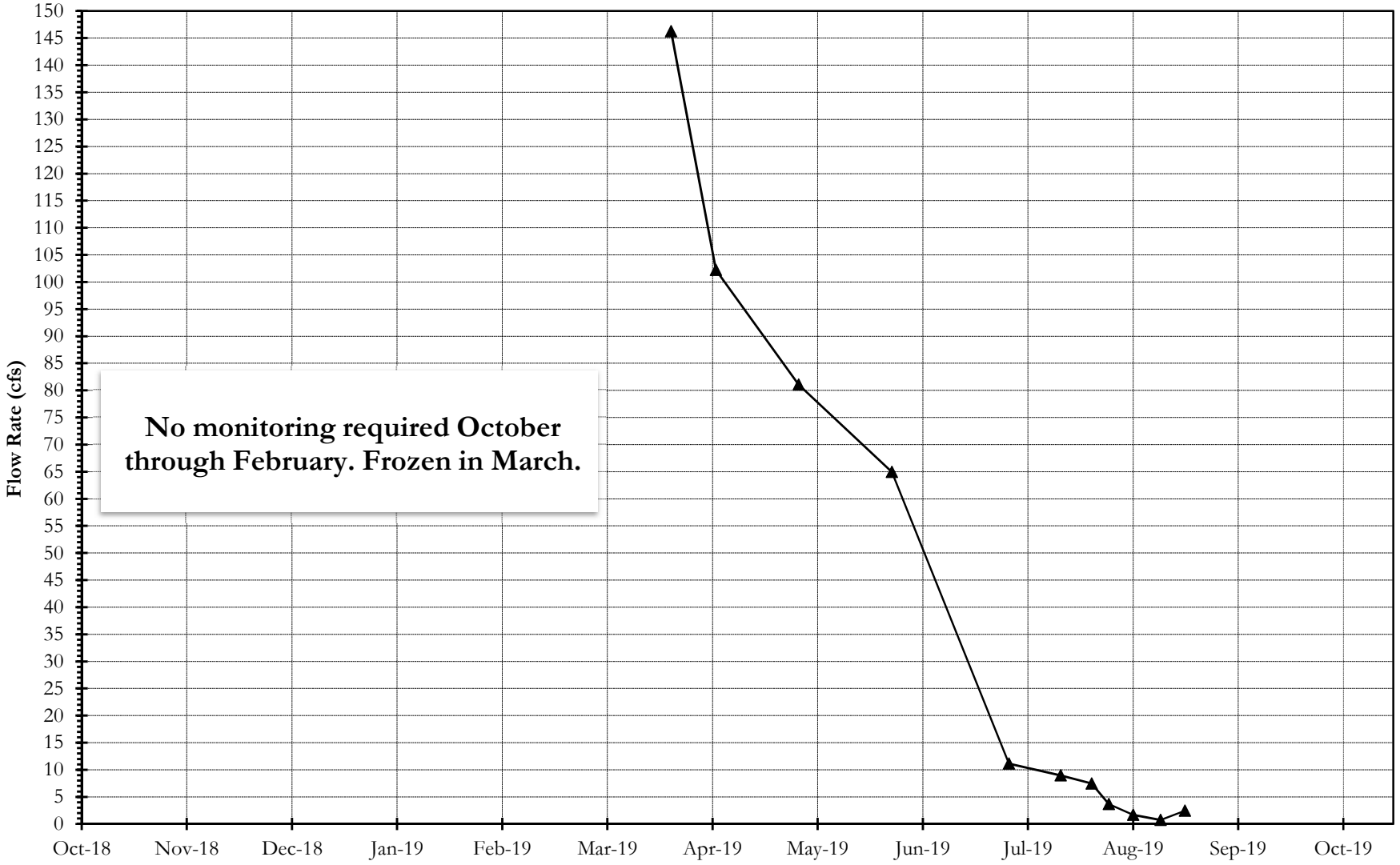

FIGURE 90

I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Surface Water\1003

Surface Water Site 1003, Fish Creek - Downstream of Fish Creek Tipple

2019 Water Year Field Conductivity Data

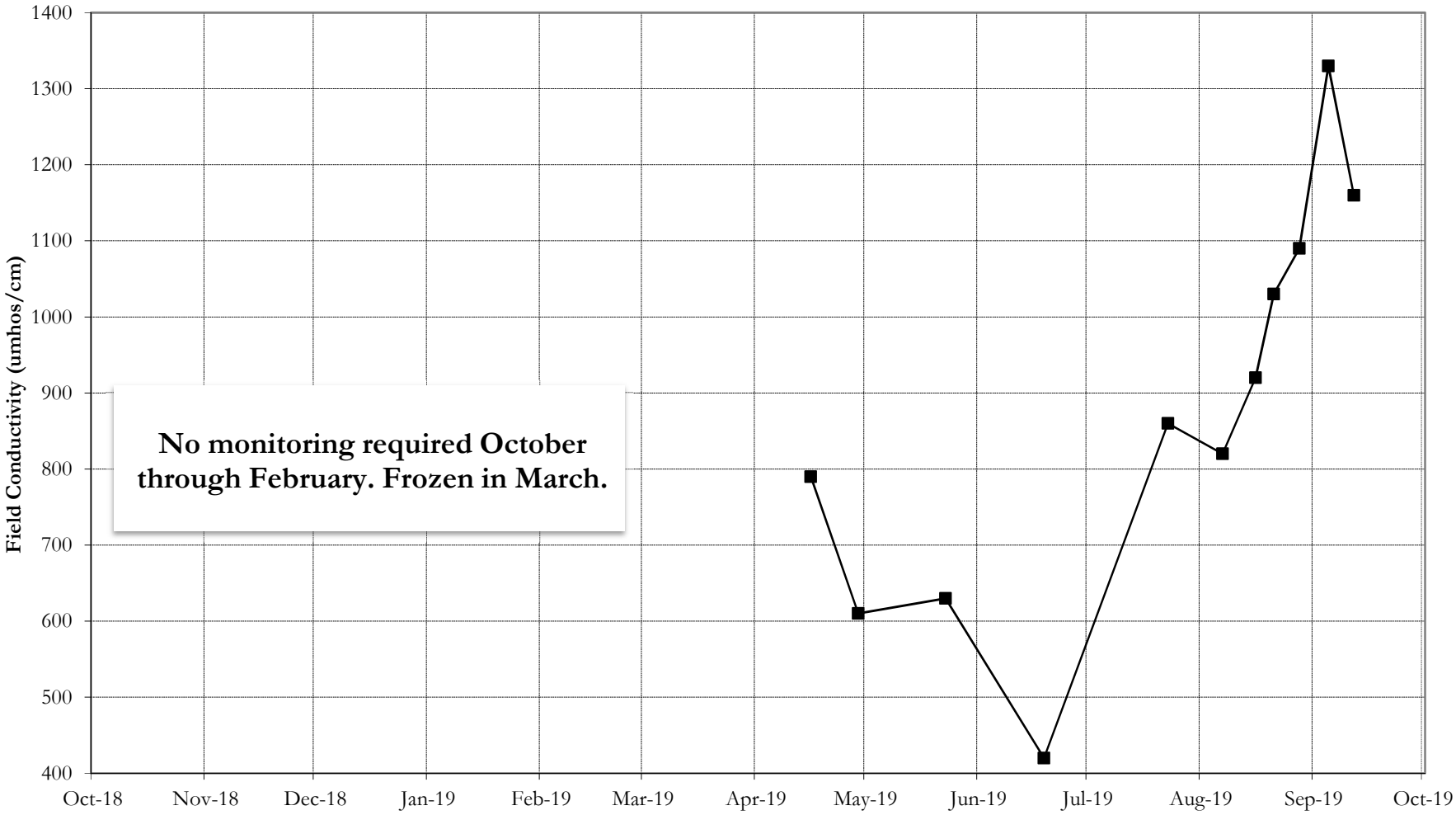

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FIGURE 91

Surface Water Site 1003, Fish Creek Downstream of Fish Creek Tipple

Period of Record Flow Rate Data

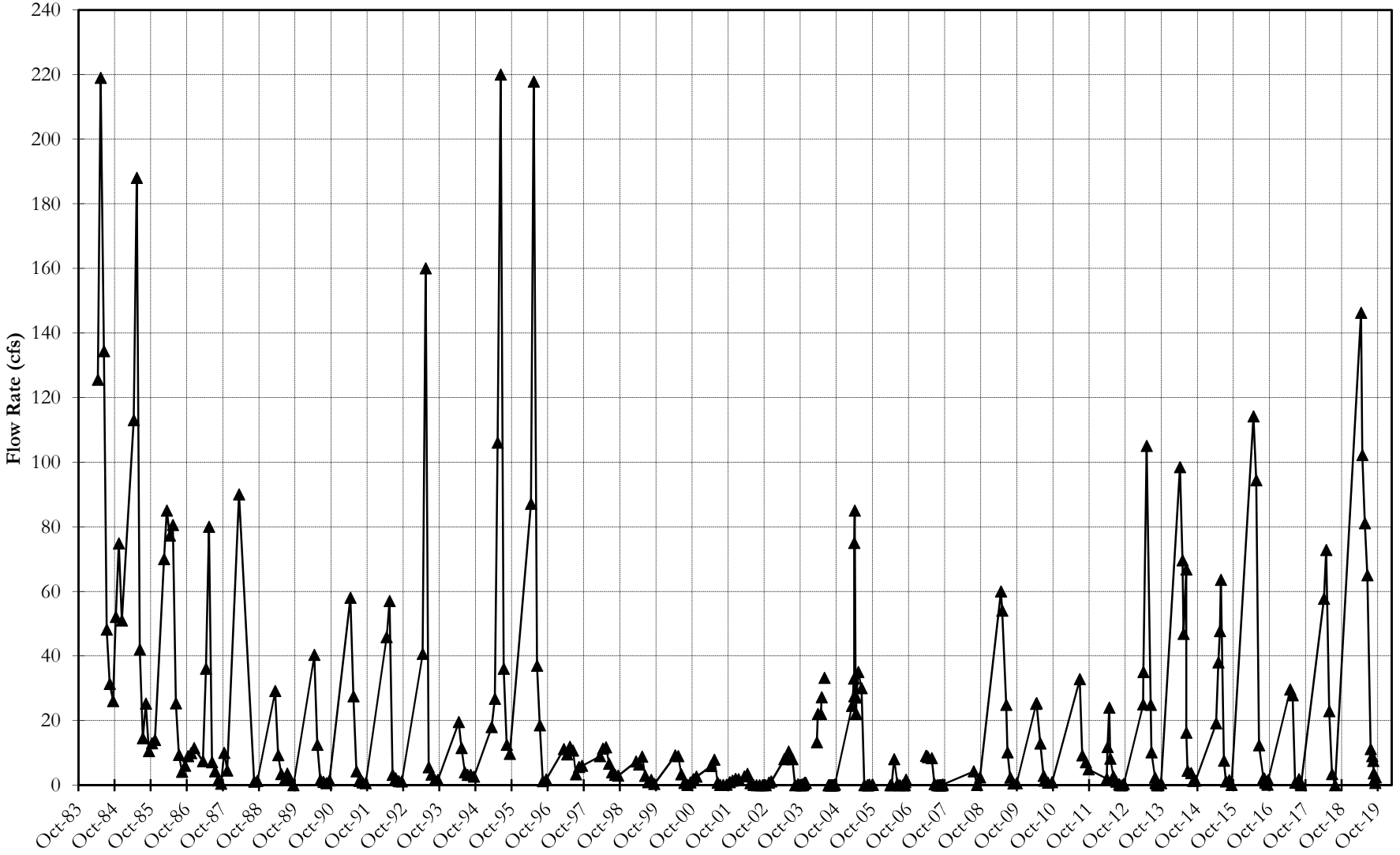

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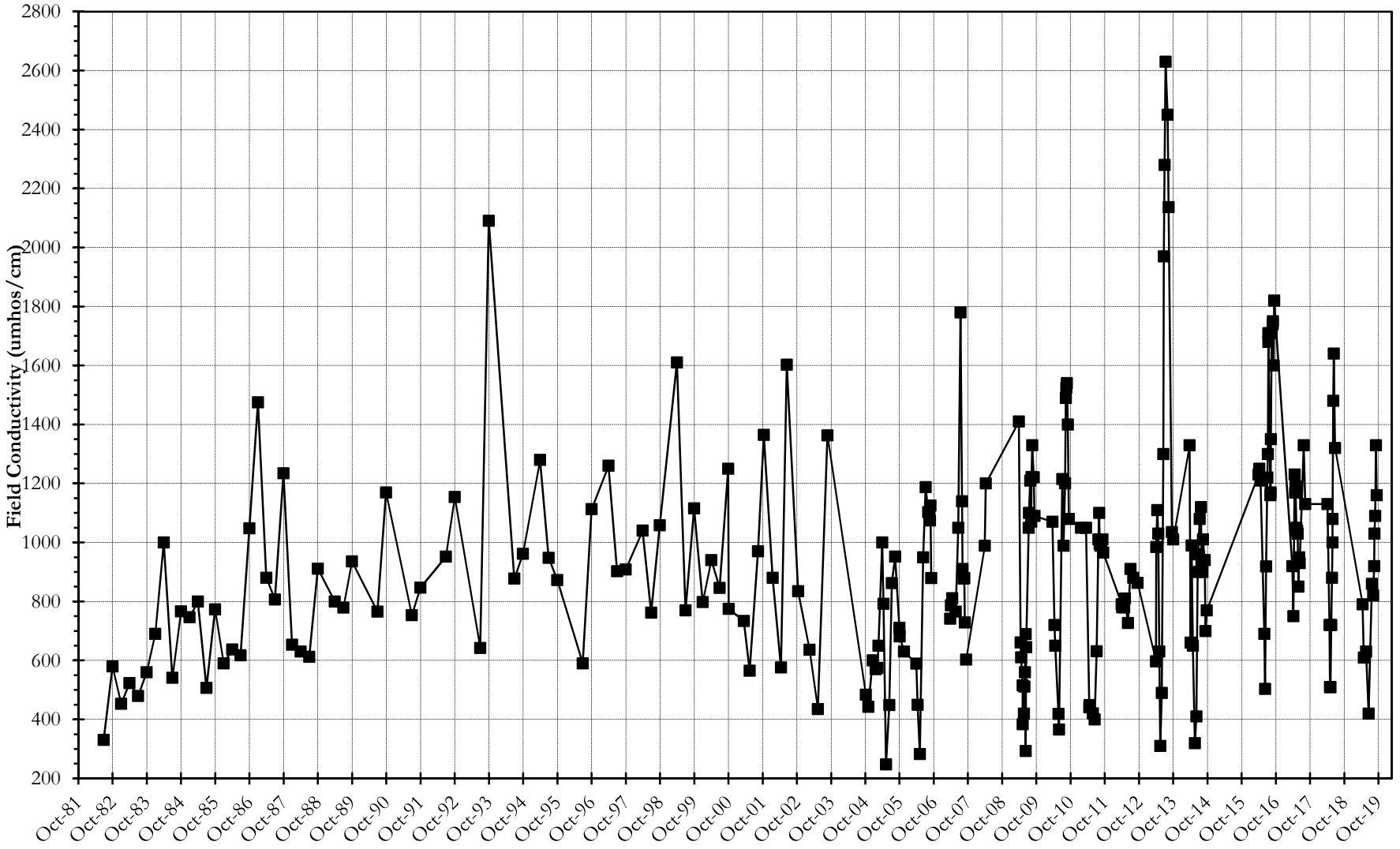
FIGURE 92

Surface Water Site 1003, Fish Creek Downstream of Fish Creek Tipple

Period of Record Field Conductivity Data

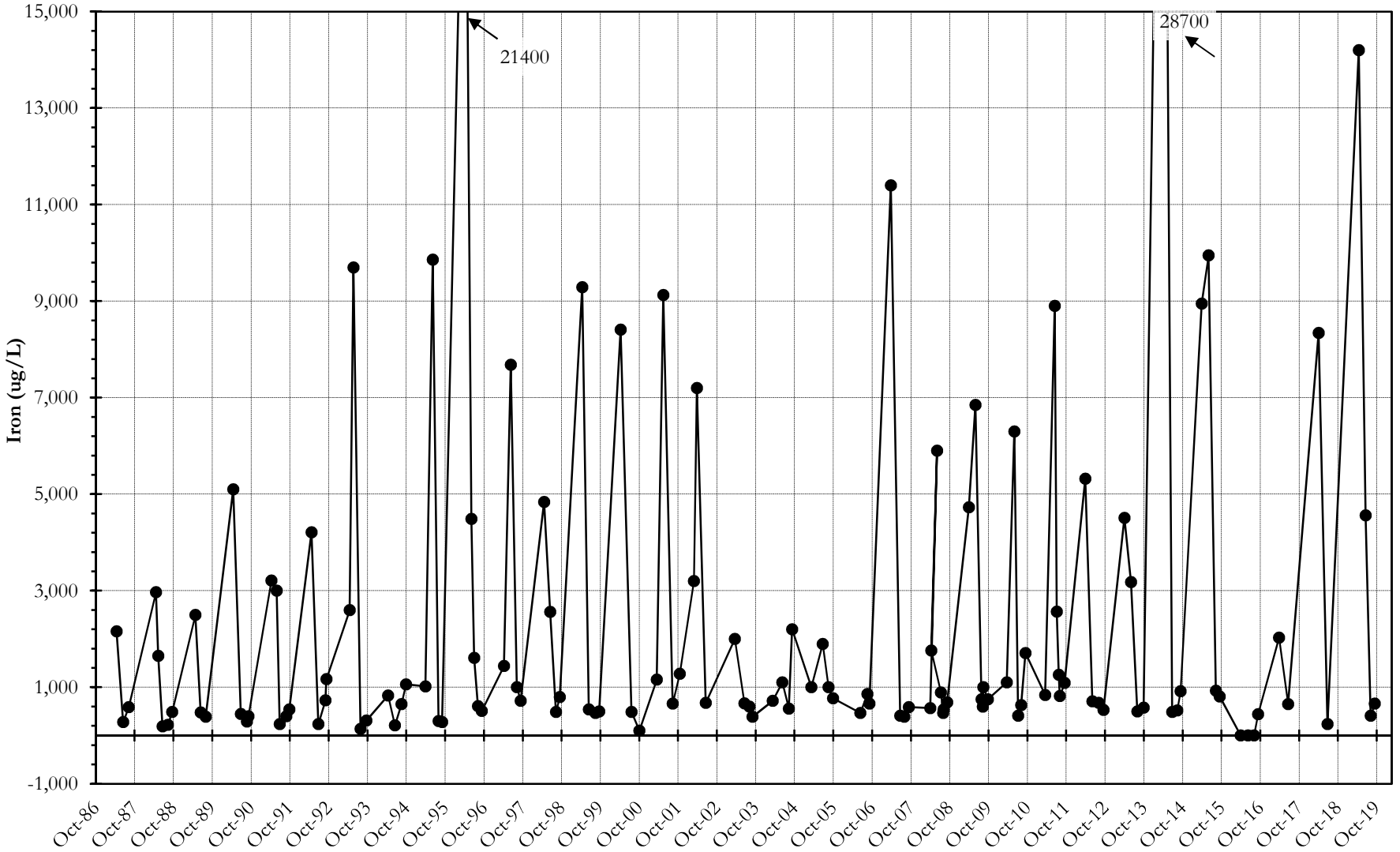


I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Surface Water\1003

FIGURE 93

Surface Water Site 1003, Fish Creek Downstream of Fish Creek Tipple

Period of Record Total Recoverable Iron Data



I:\Environmental\CDMG - CDRMS\AHR\2019\20 Mile\Figures\Surface Water\1003

FIGURE 94

Surface Water Site 301, Trout Creek above Confluence

2019 Water Year Flow Rate Data

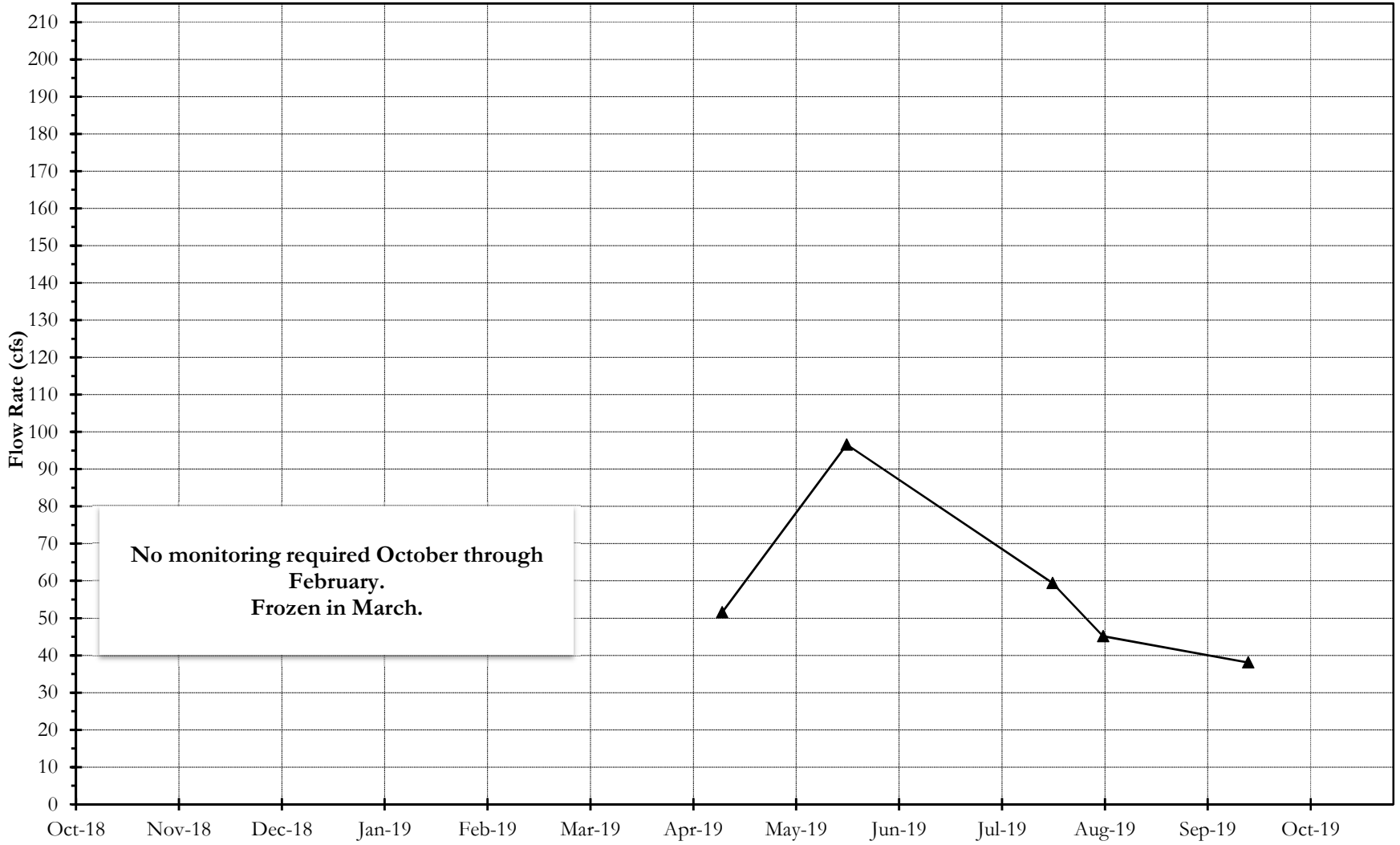


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FIGURE 95

Surface Water Site 301, Trout Creek above Confluence

2019 Water Year Field Conductivity Data

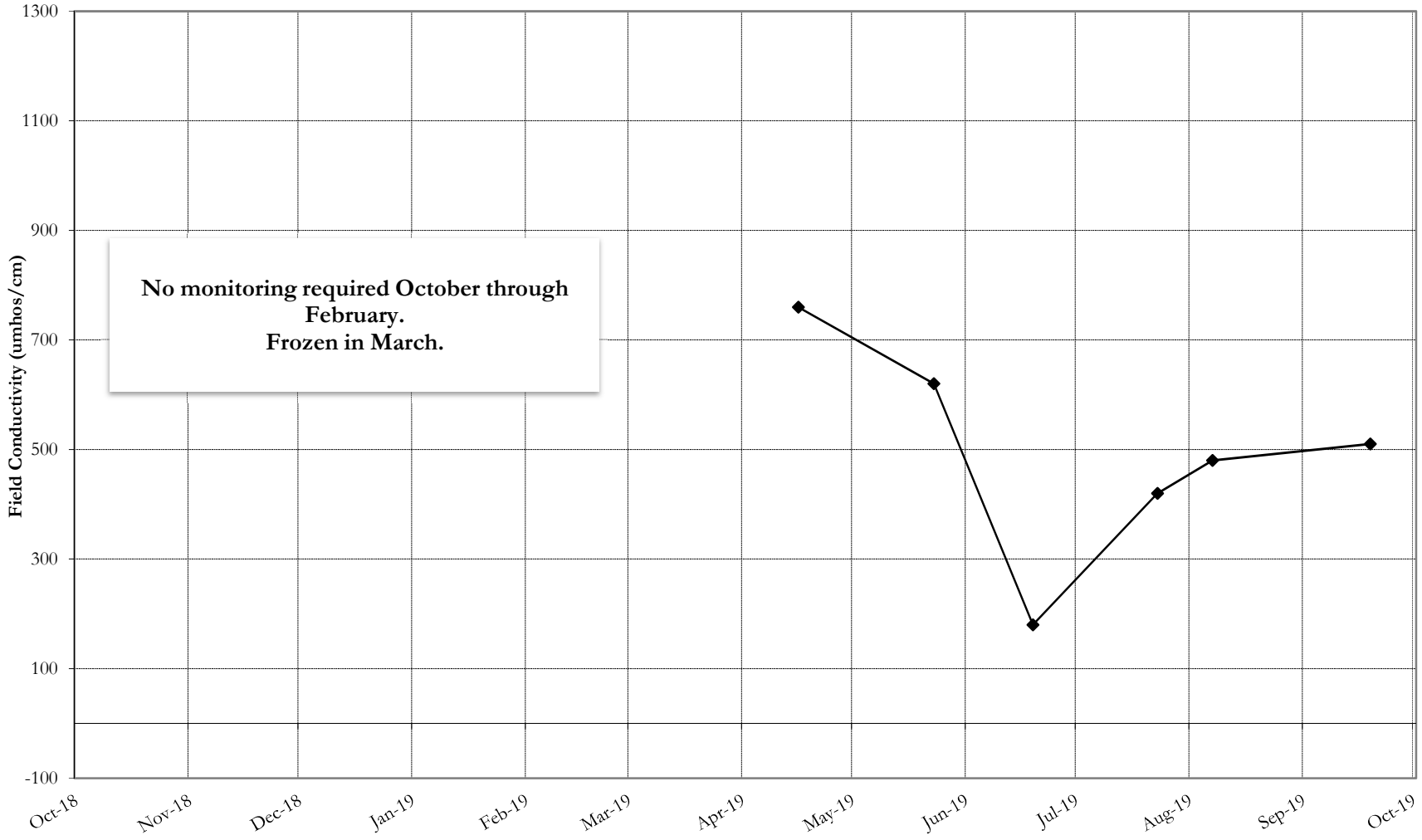

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FIGURE 96

Surface Water Site 301, Trout Creek above Confluence

Period of Record Flow Rate Data for Water Years 1995 - 2019

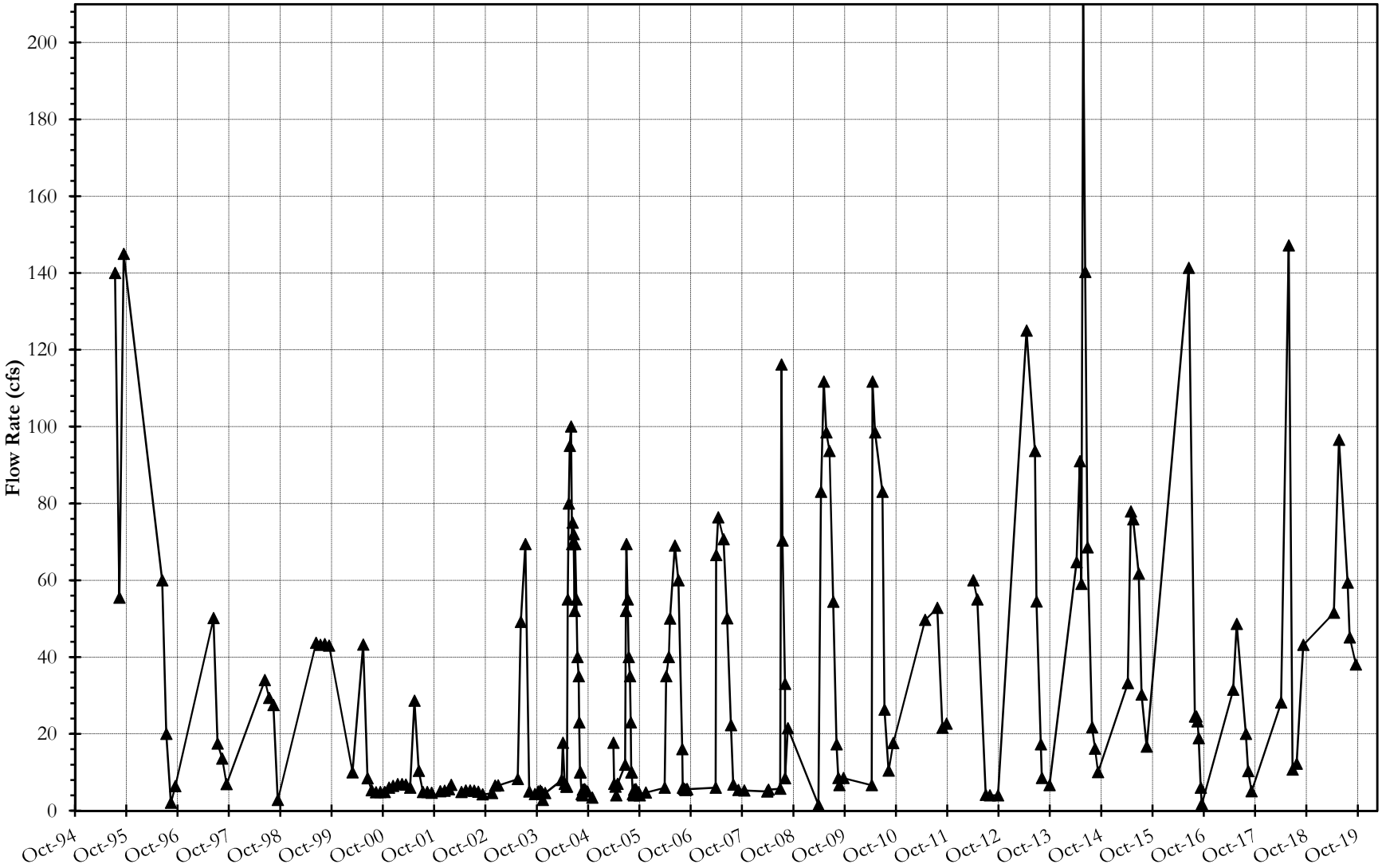

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FIGURE 97

Surface Water Site 301, Trout Creek above Confluence

Period of Record Field Conductivity Data

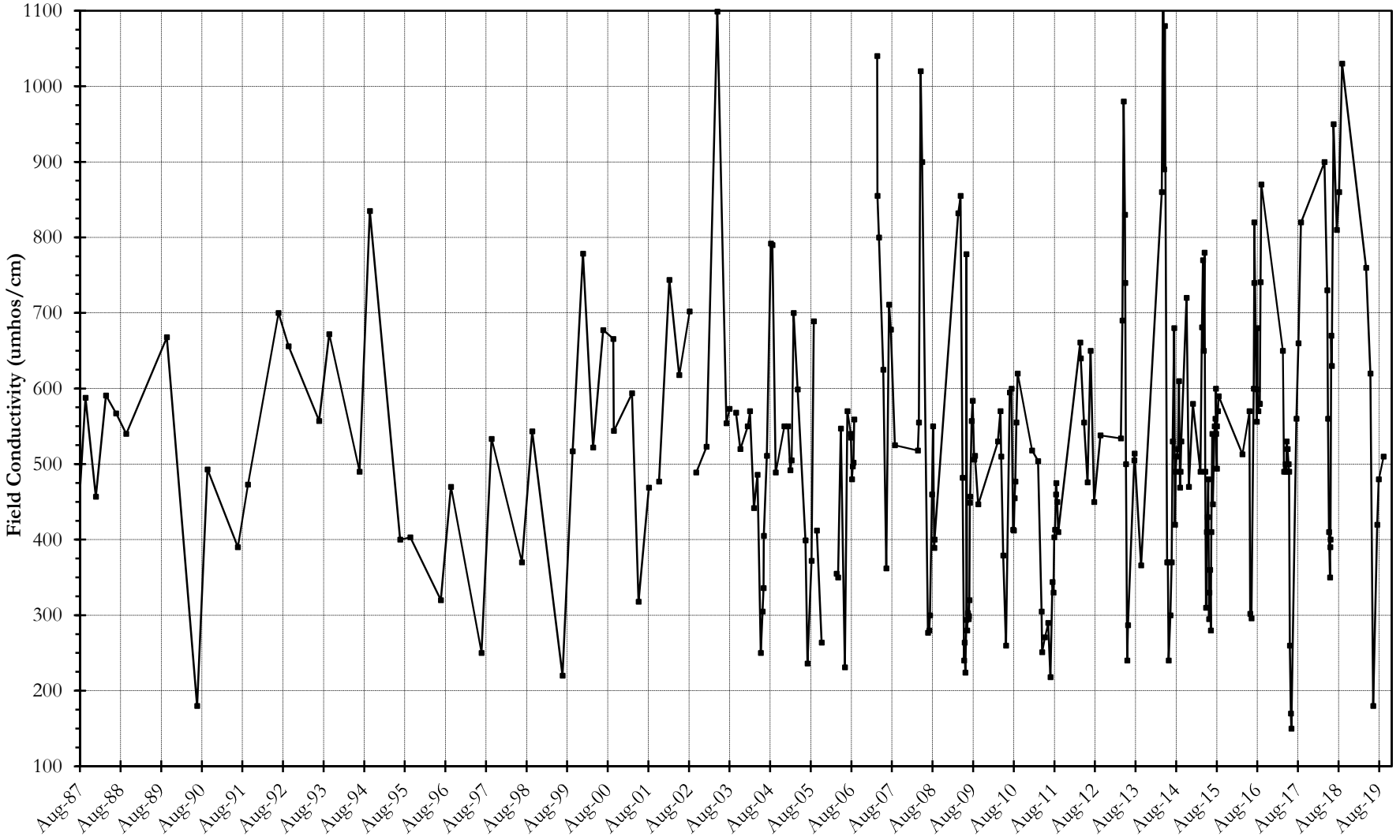

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FIGURE 98

Surface Water Site 69, Trout Creek below Confluence

2019 Water Year Flow Rate Data

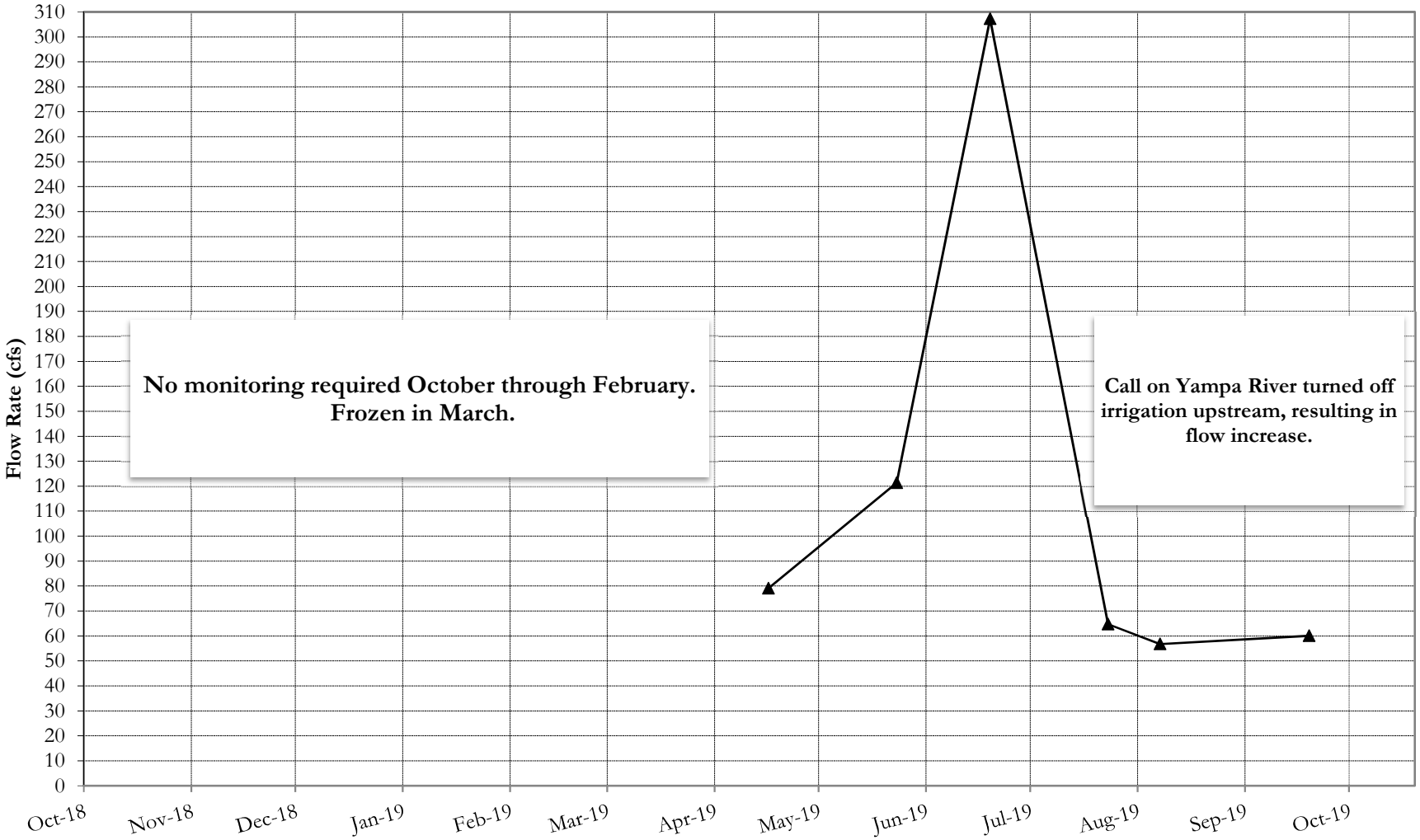

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FIGURE 99

Surface Water Site 69, Trout Creek below Confluence

2019 Water Year Field Conductivity Data

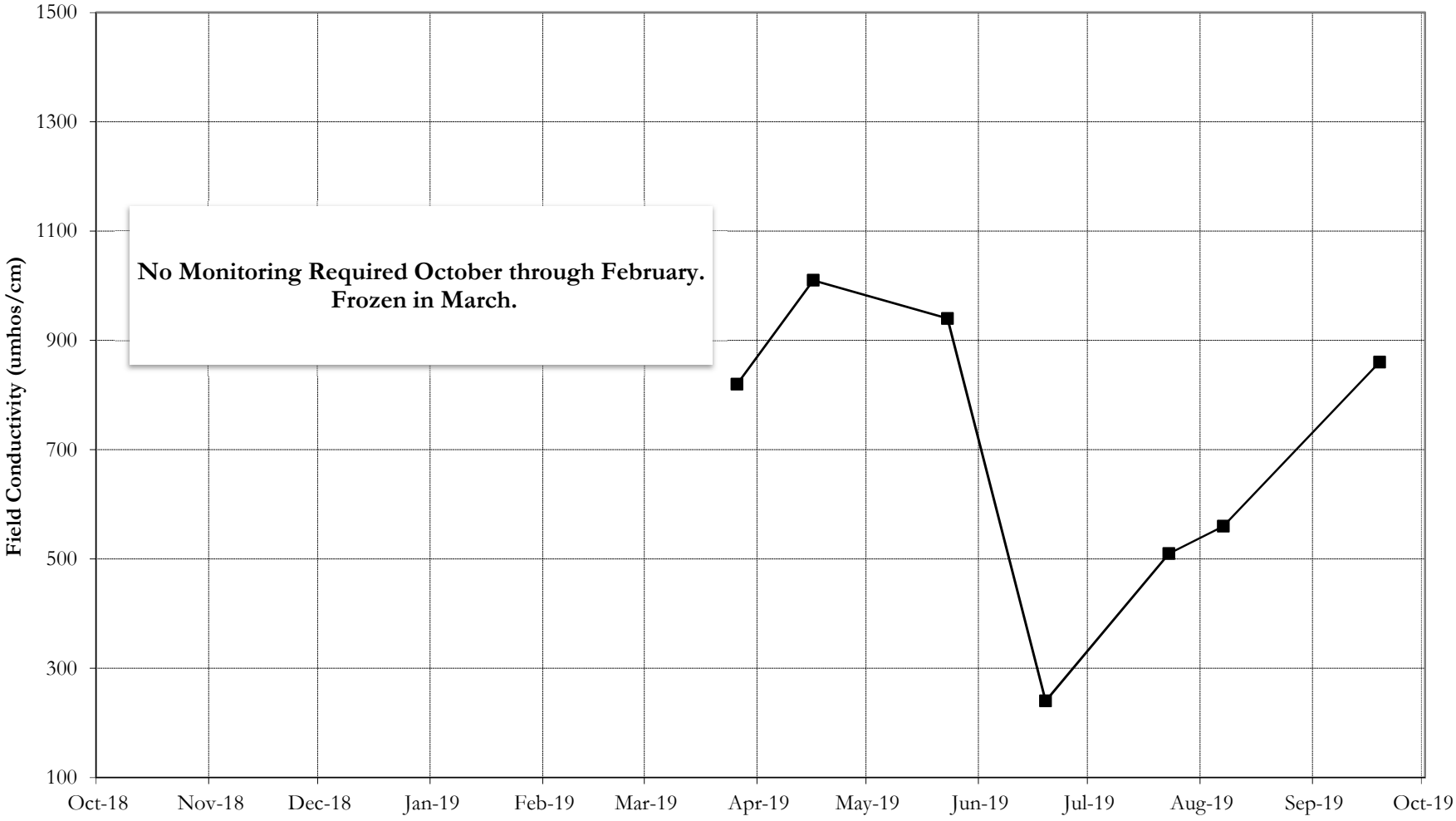

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FIGURE 100

Surface Water Site 69, Trout Creek below Confluence

Period of Record Monthly Flow Rate Data

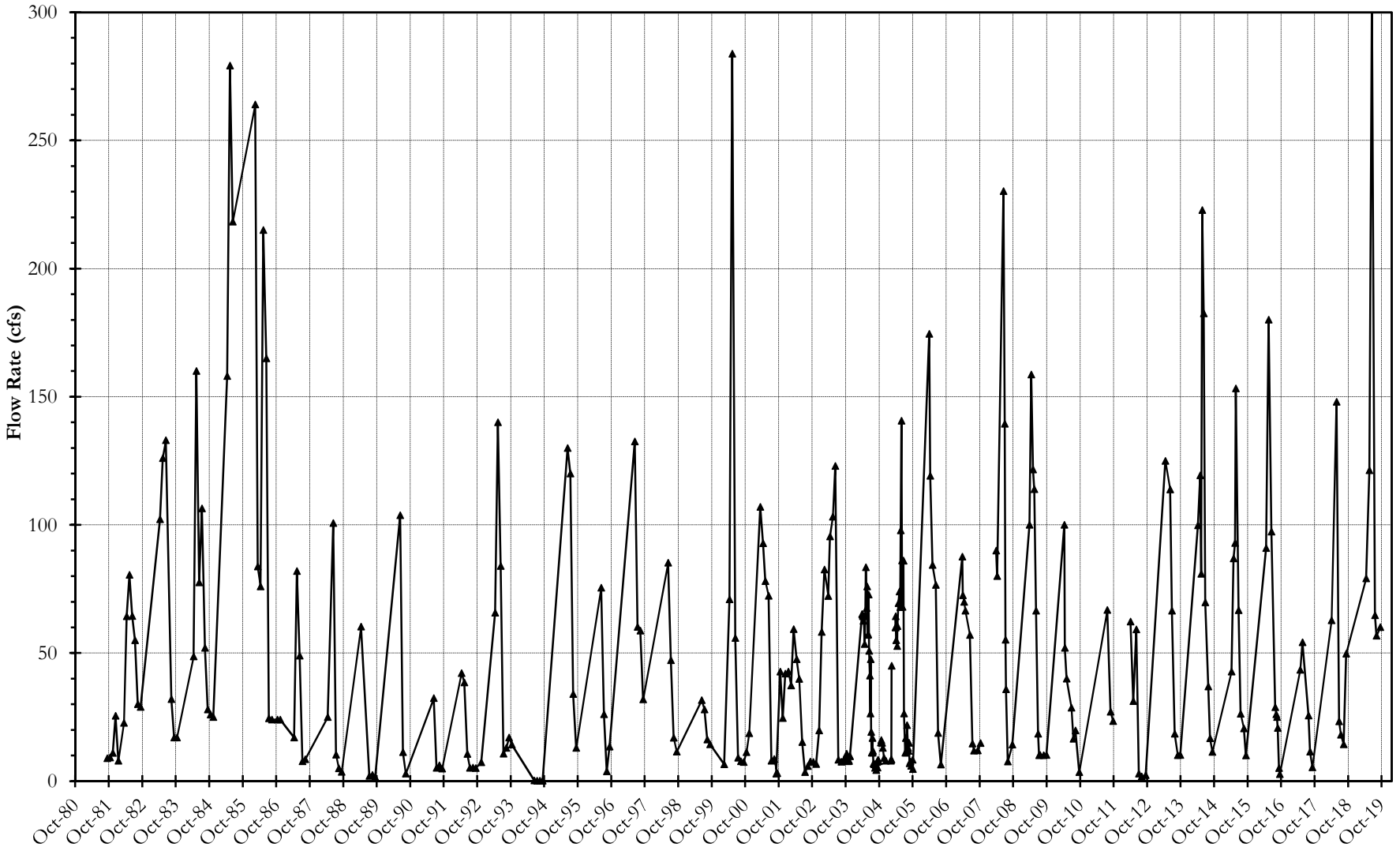

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FIGURE 101

Surface Water Site 69, Trout Creek below Confluence

Period of Record Field Conductivity Data

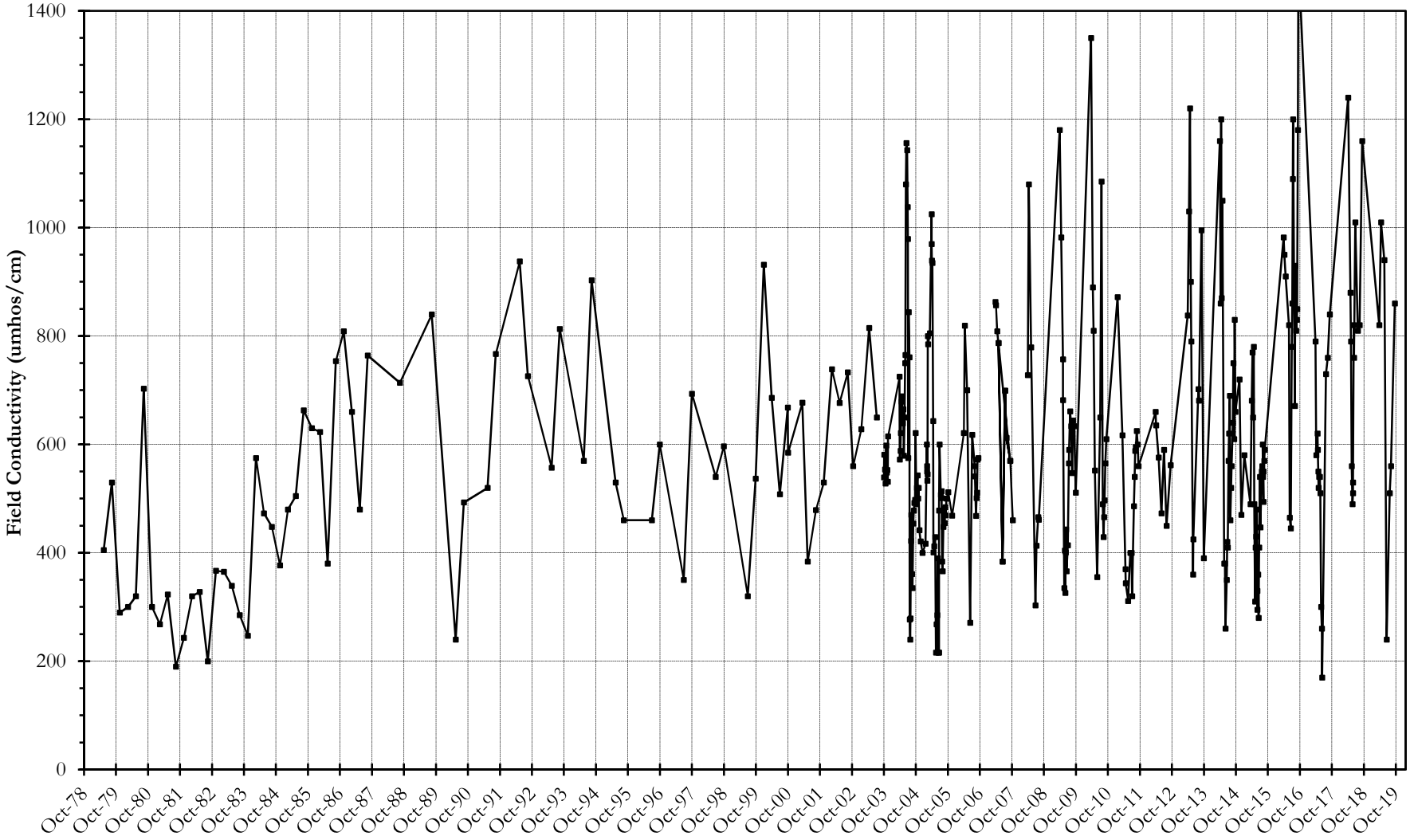

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FIGURE 102

Surface Water Site 1005, Trout Creek below Fish Creek Confluence

2019 Water Year Flow Rate Data

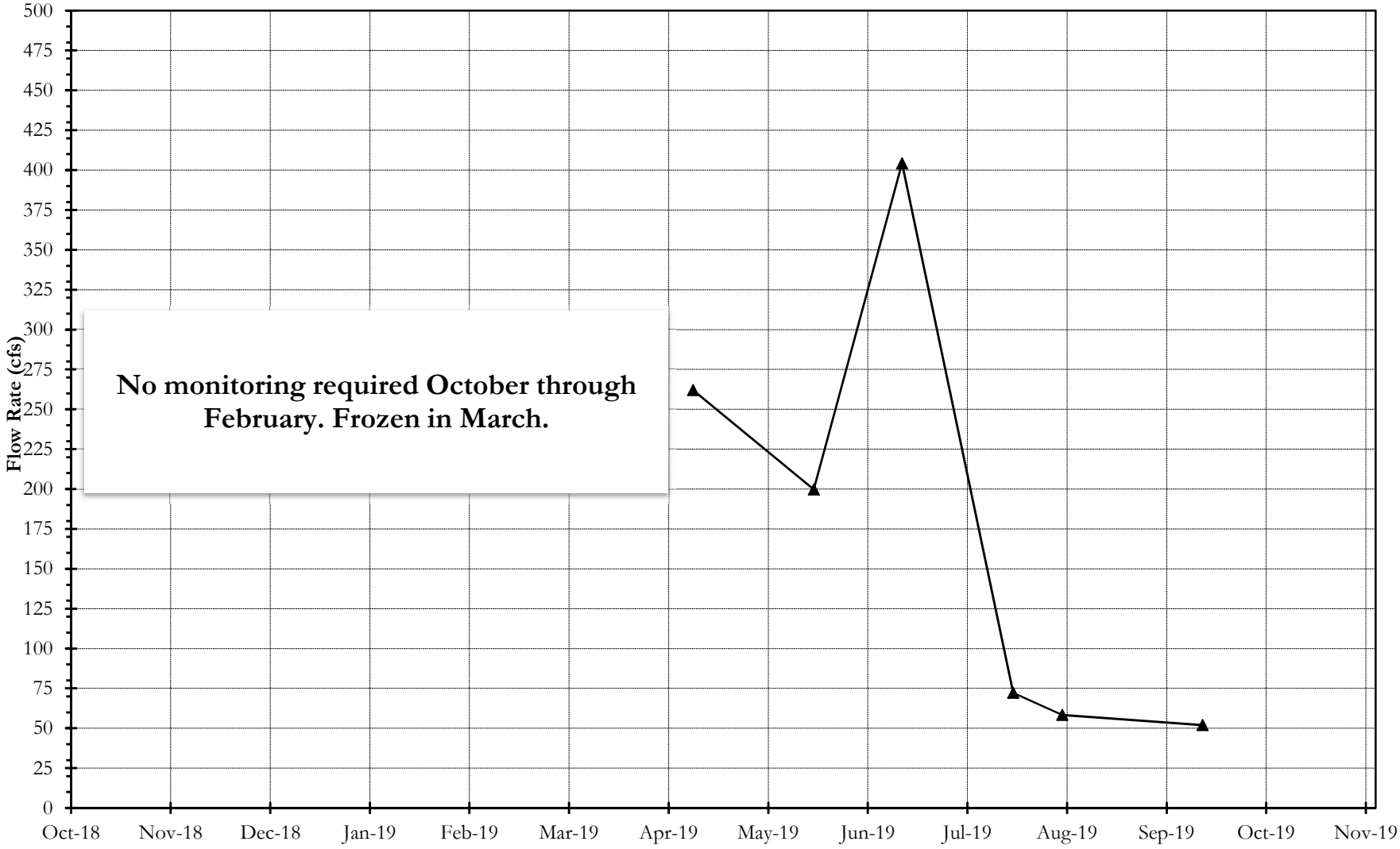

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FIGURE 103

Surface Water Site 1005, Trout Creek below Fish Creek Confluence

Period of Record TDS Data

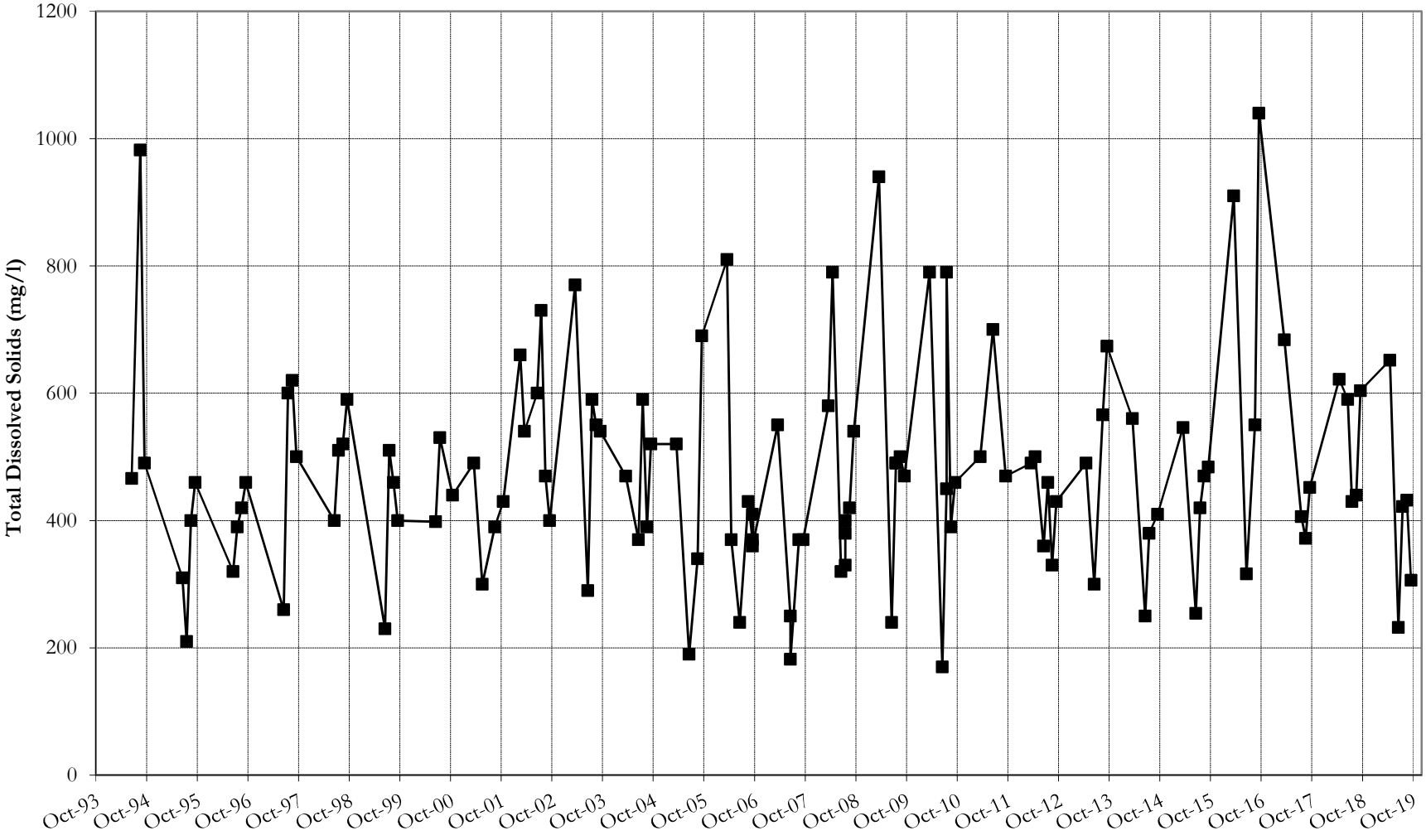

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FIGURE 104

Surface Water Site 900 (USGS 09243900), Foidel Creek

2019 Water Year Flow Rate Data

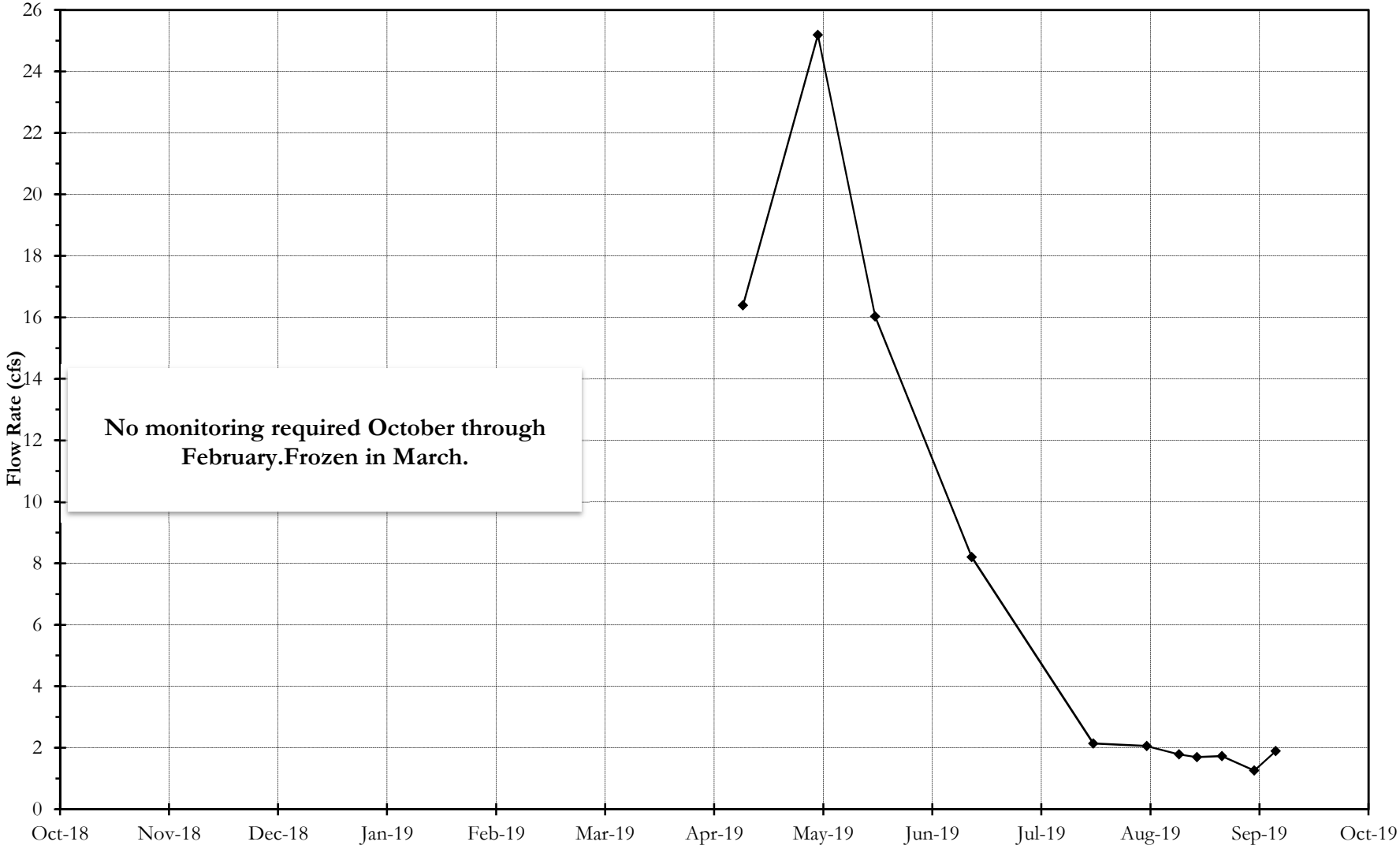

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FIGURE 105

Surface Water Site 900 (USGS 09243900), Foidel Creek

2019 Water Year TDS Data

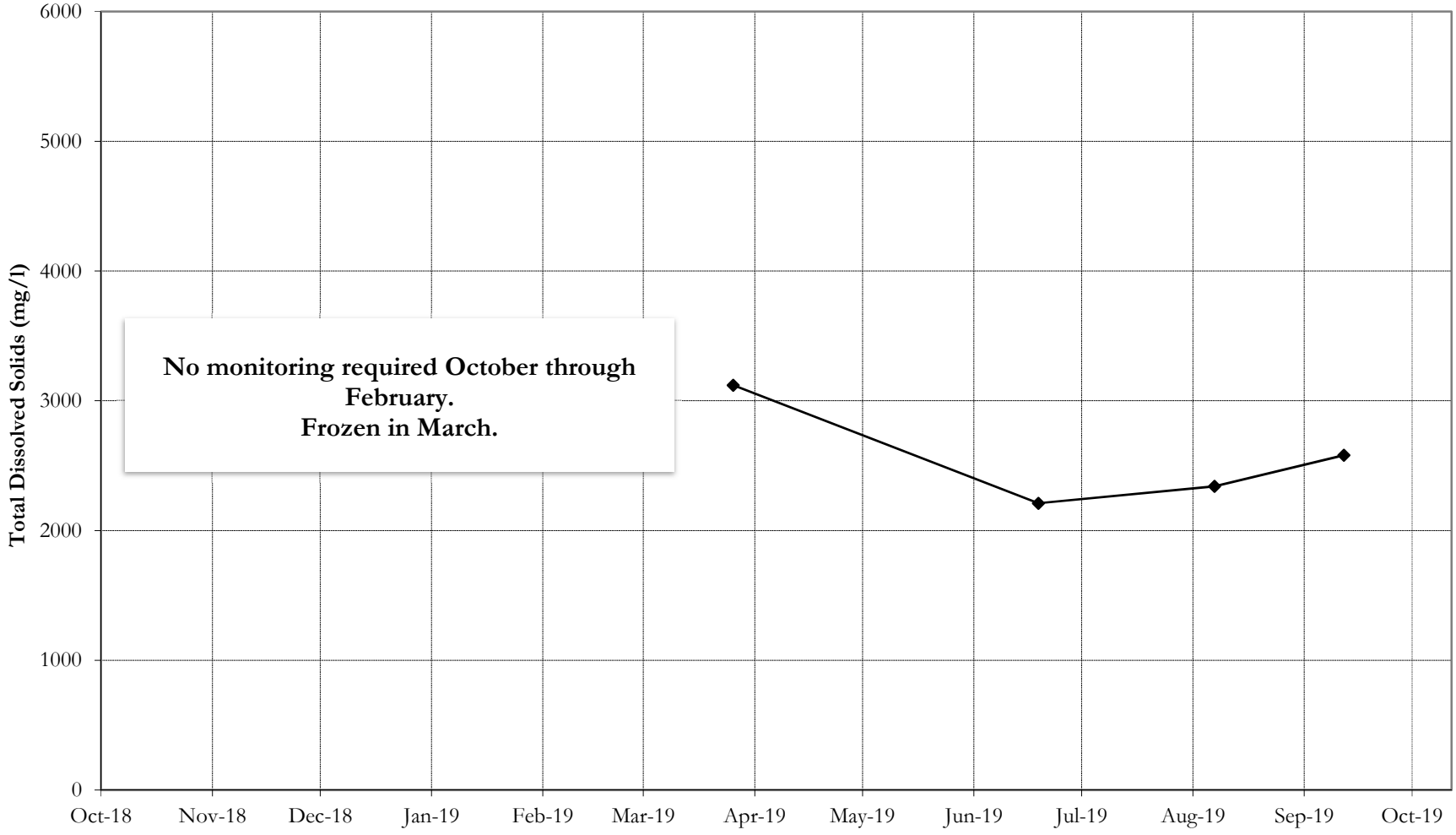

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FIGURE 106

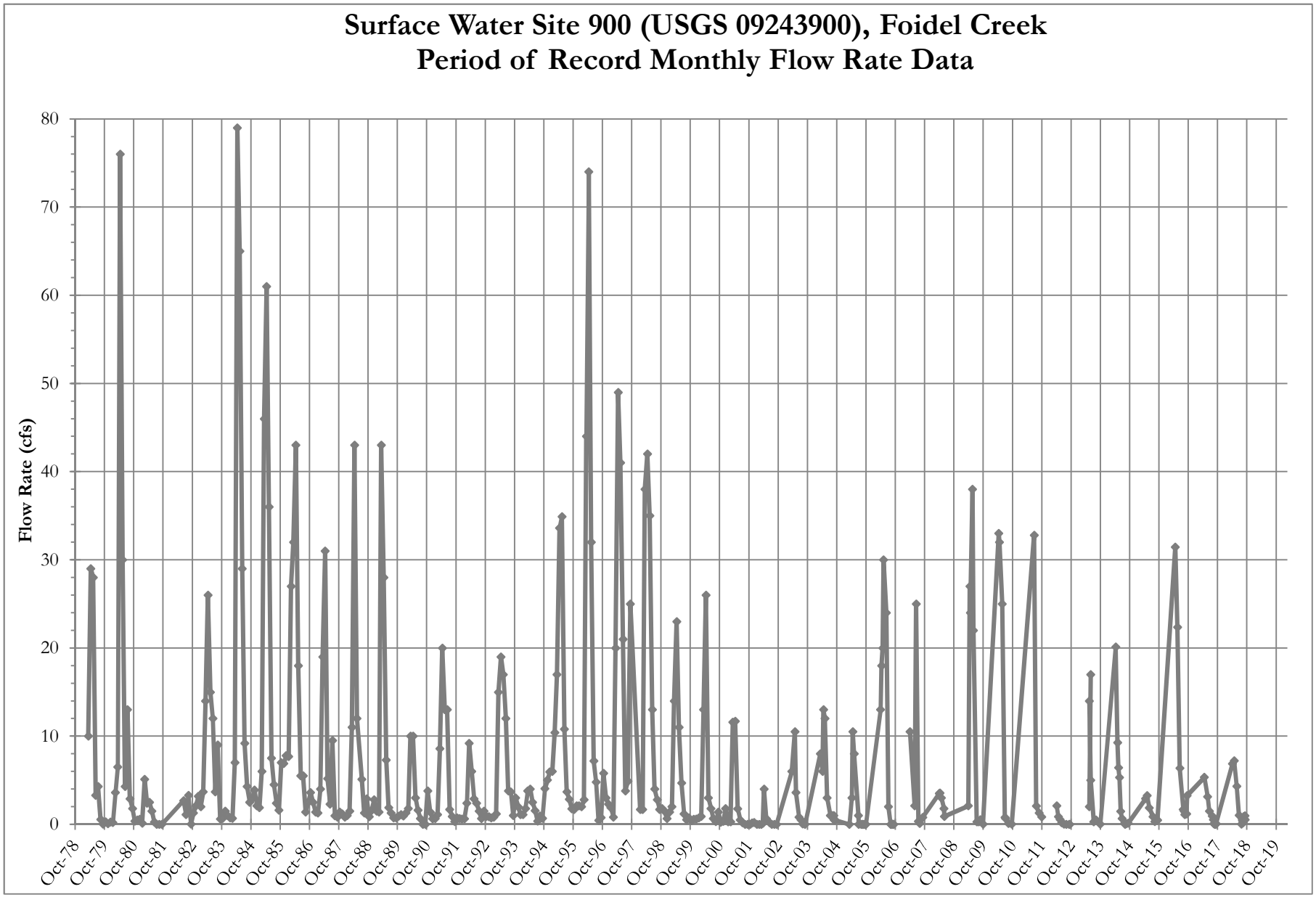

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FIGURE 107

Surface Water Site 900, (USGS 09243900), Foidel Creek

Period of Record Field Conductivity Data

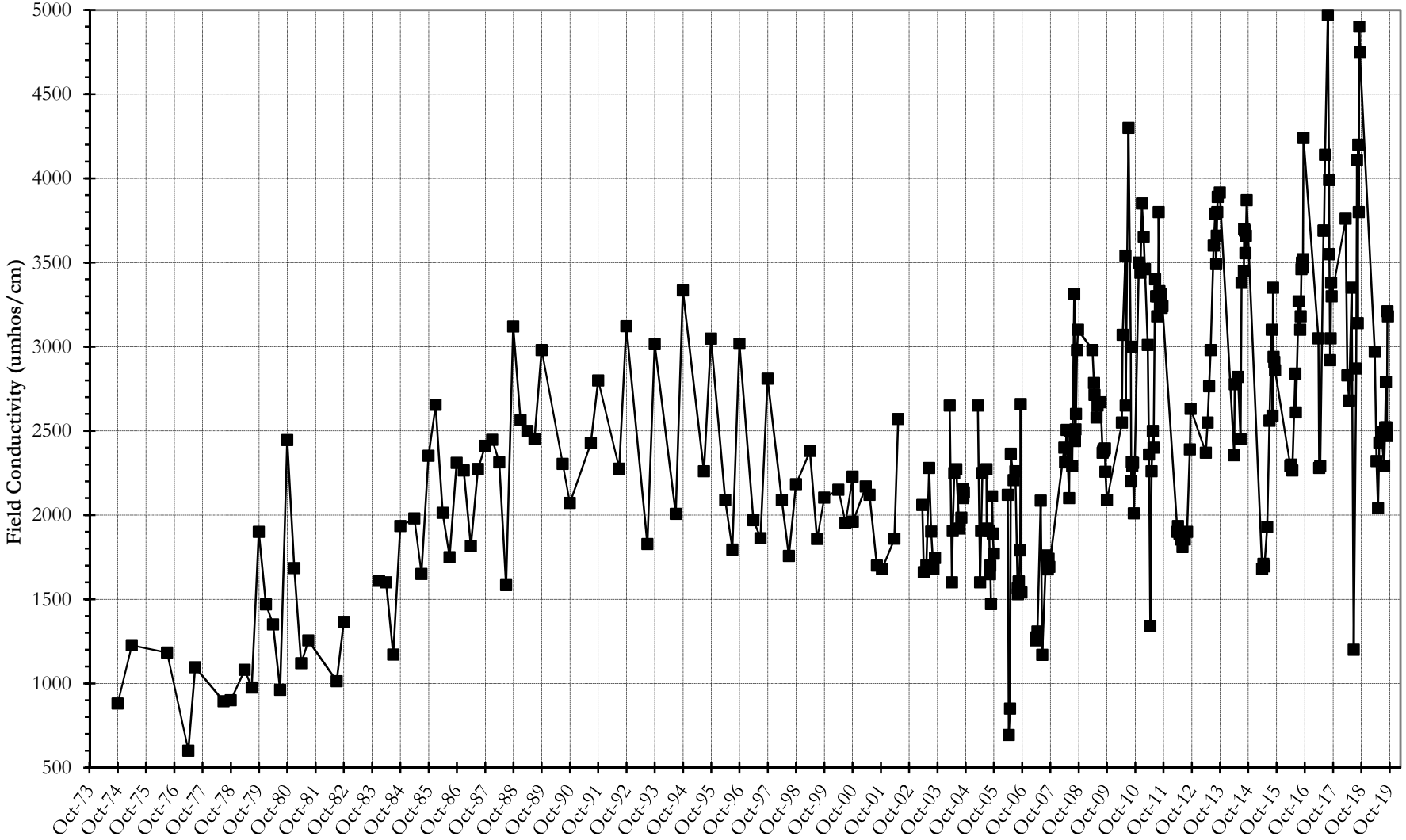

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FIGURE 108

Surface Water Site 29, Middle Creek Below Foidel Creek Confluence

2019 Water Year Flow Rate Data

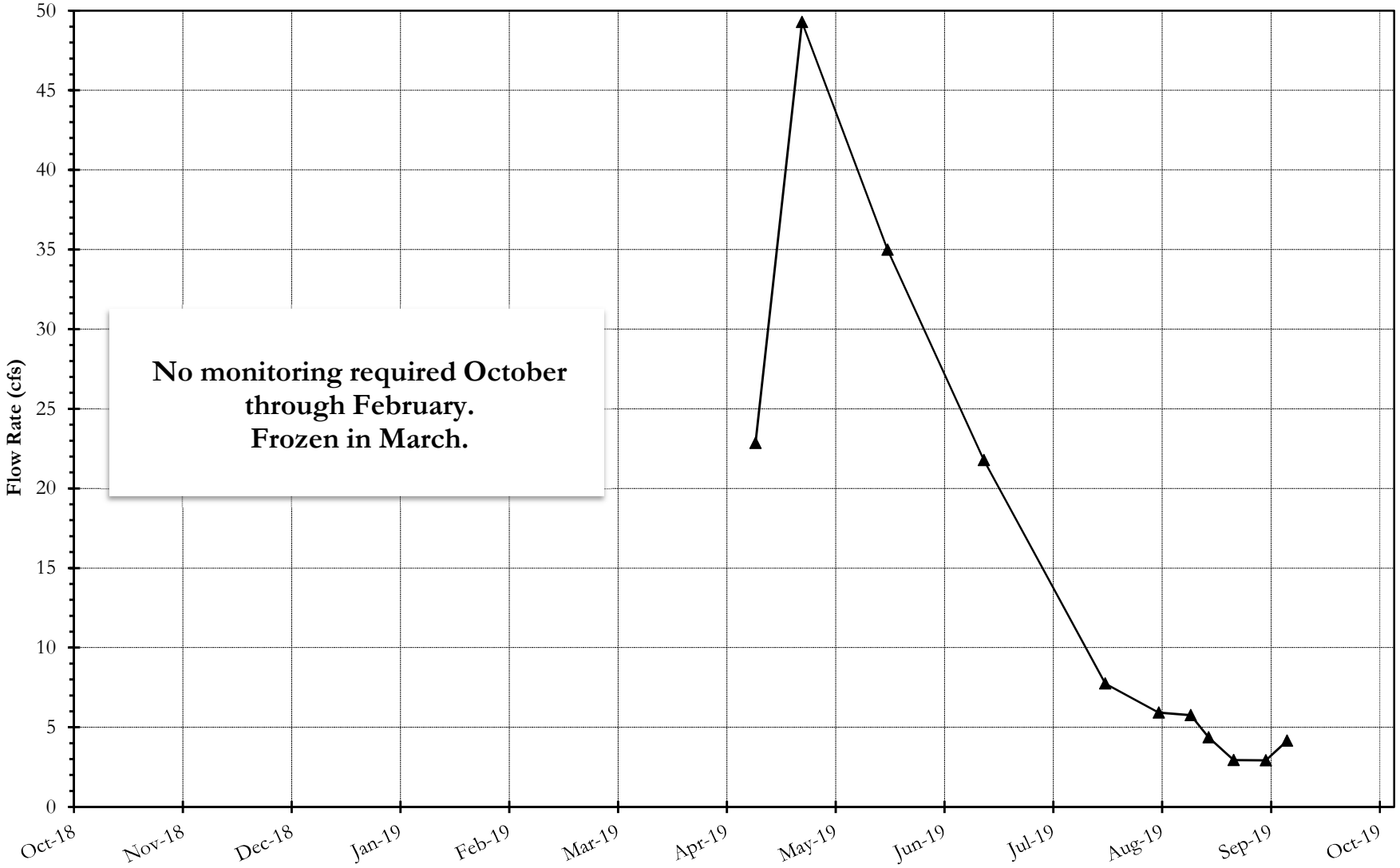

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FIGURE 109

Surface Water Site 29, Middle Creek Below Foidel Creek Confluence

2019 Water Year Field Conductivity Data

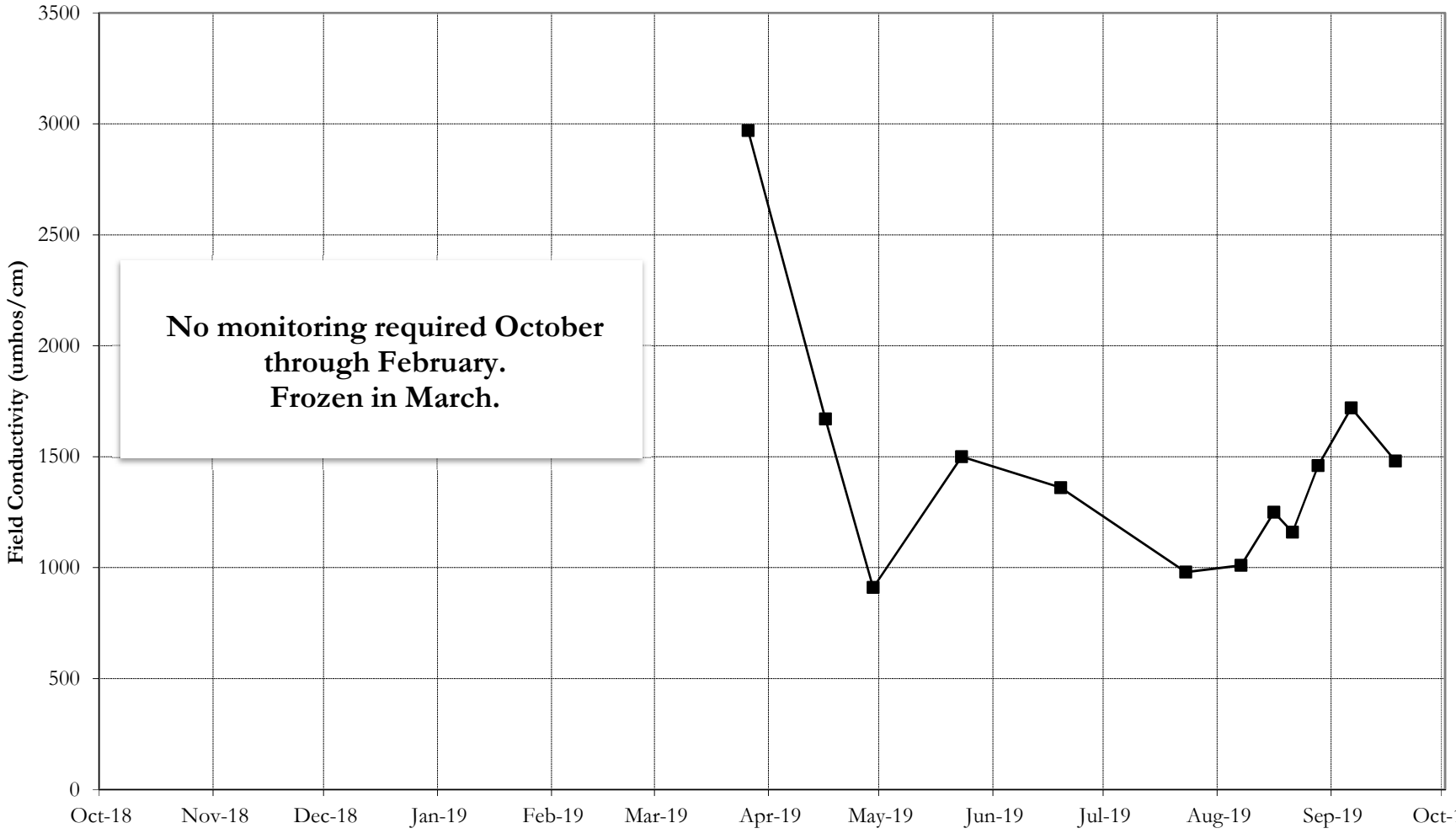

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FIGURE 110

Surface Water Site 29, Middle Creek

Monthly Flow Rate Data for Water Years 2000 - 2019

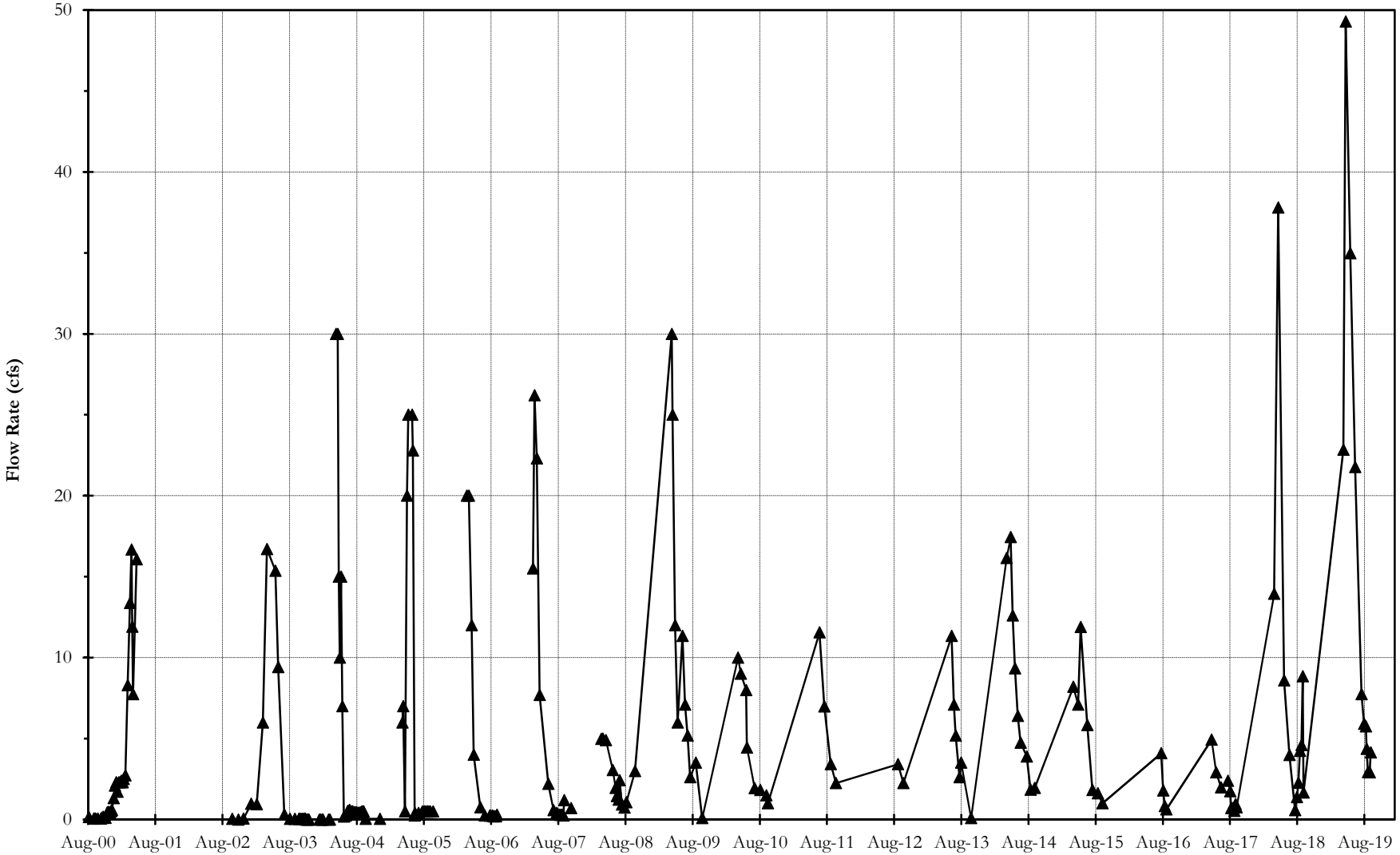

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FIGURE 111

Surface Water Site 29, Middle Creek

Period of Record

Field Conductivity Data

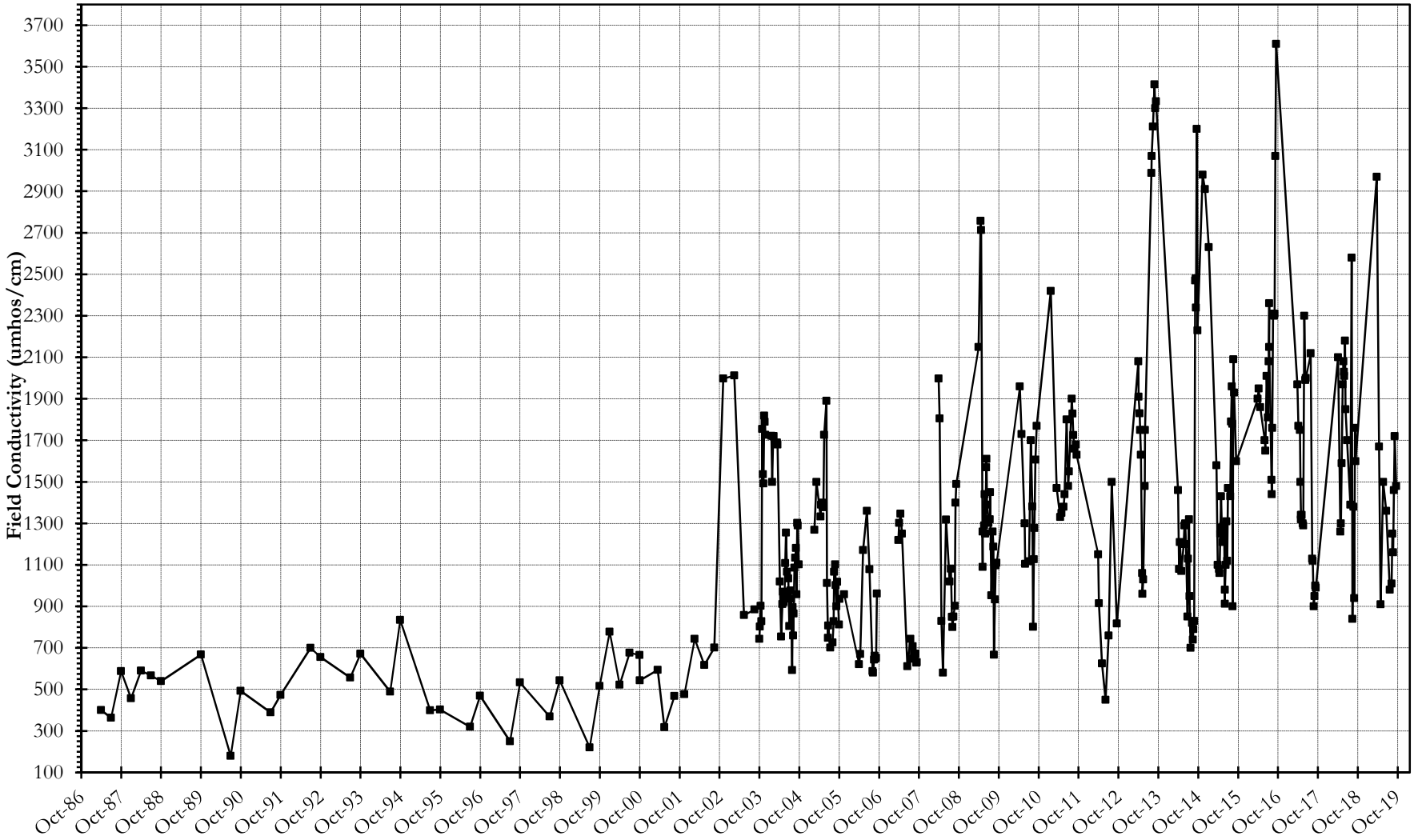

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FIGURE 112

Spring 303-1, Fish Creek Tipple Outflow

Period of Record Field Conductivity Data

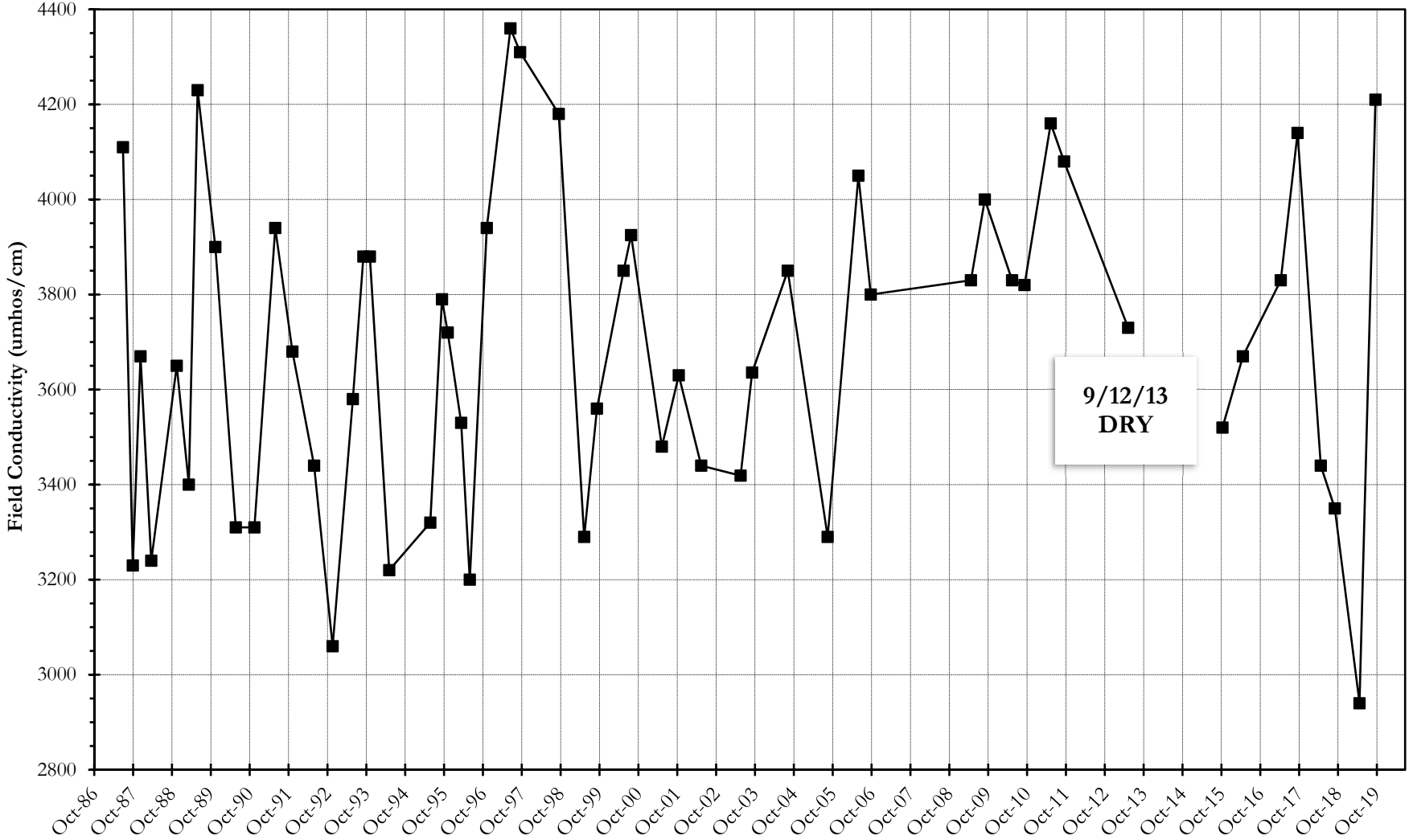

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FIGURE 113

NPDES Discharge Site 115, Fish Creek Borehole

2019 Water Year Flow Rate Data

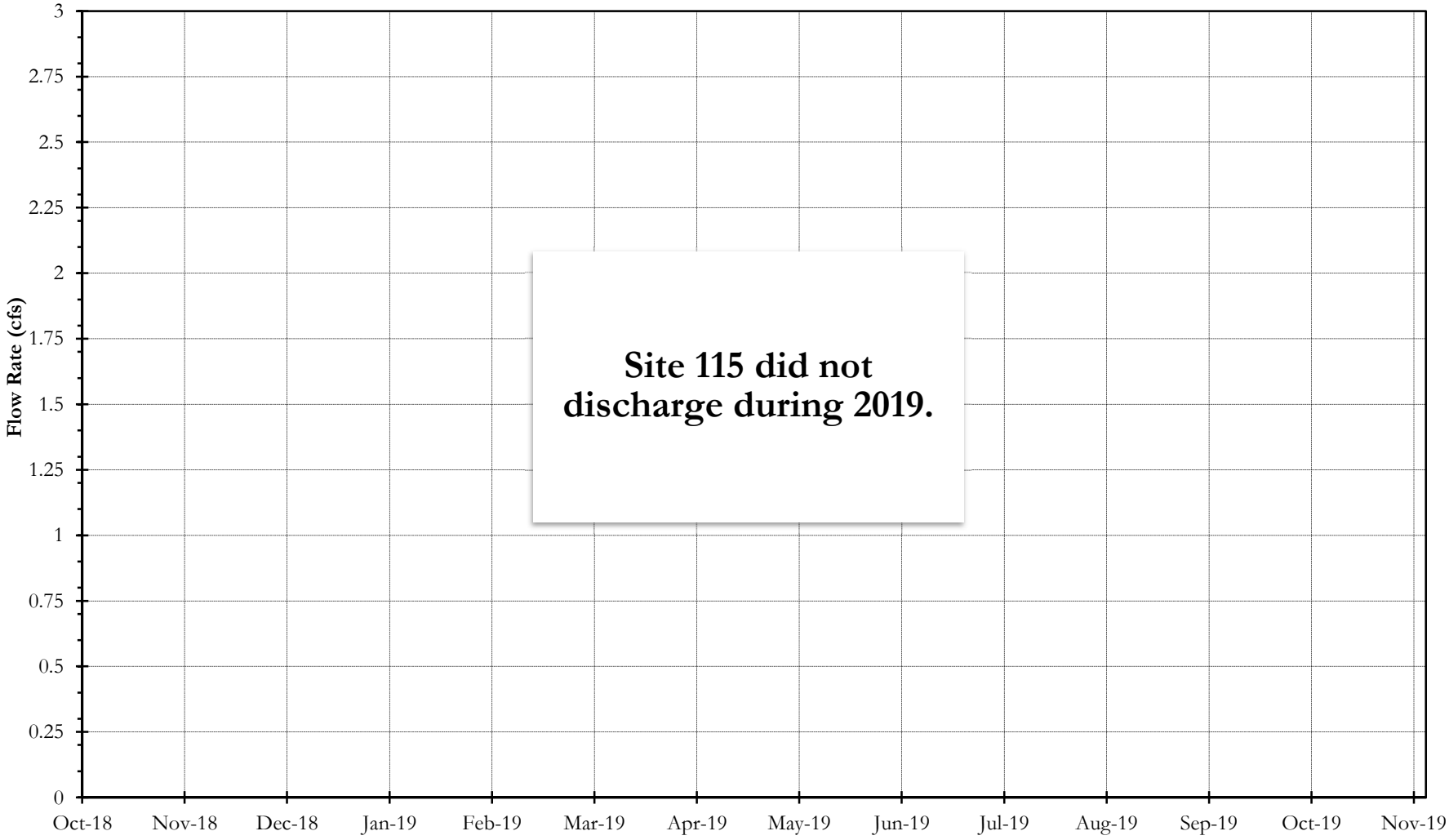

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FIGURE 114

NPDES Discharge Site 115, Fish Creek Borehole

2019 Water Year Field Conductivity Data

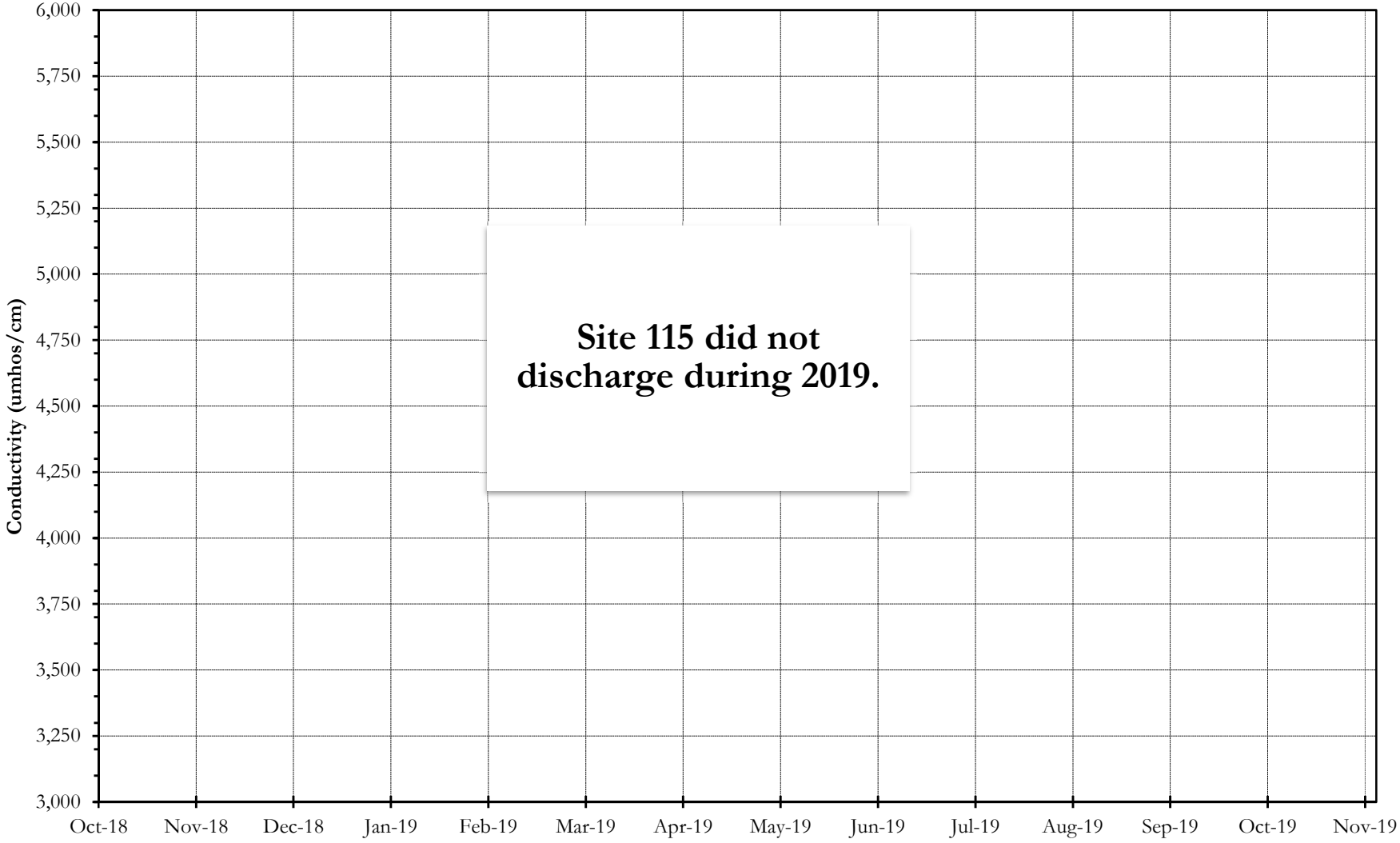

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FIGURE 115

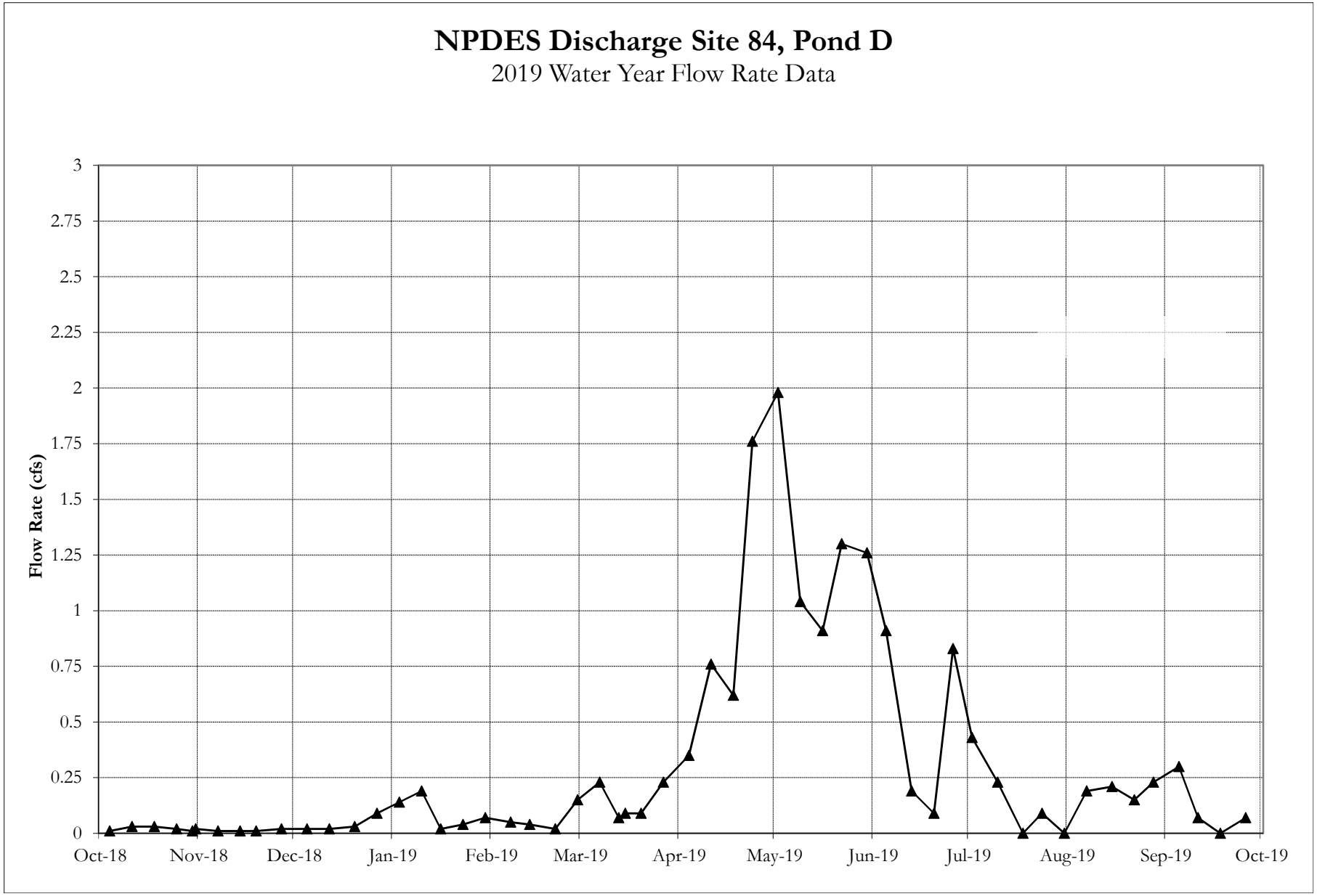

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FIGURE 116

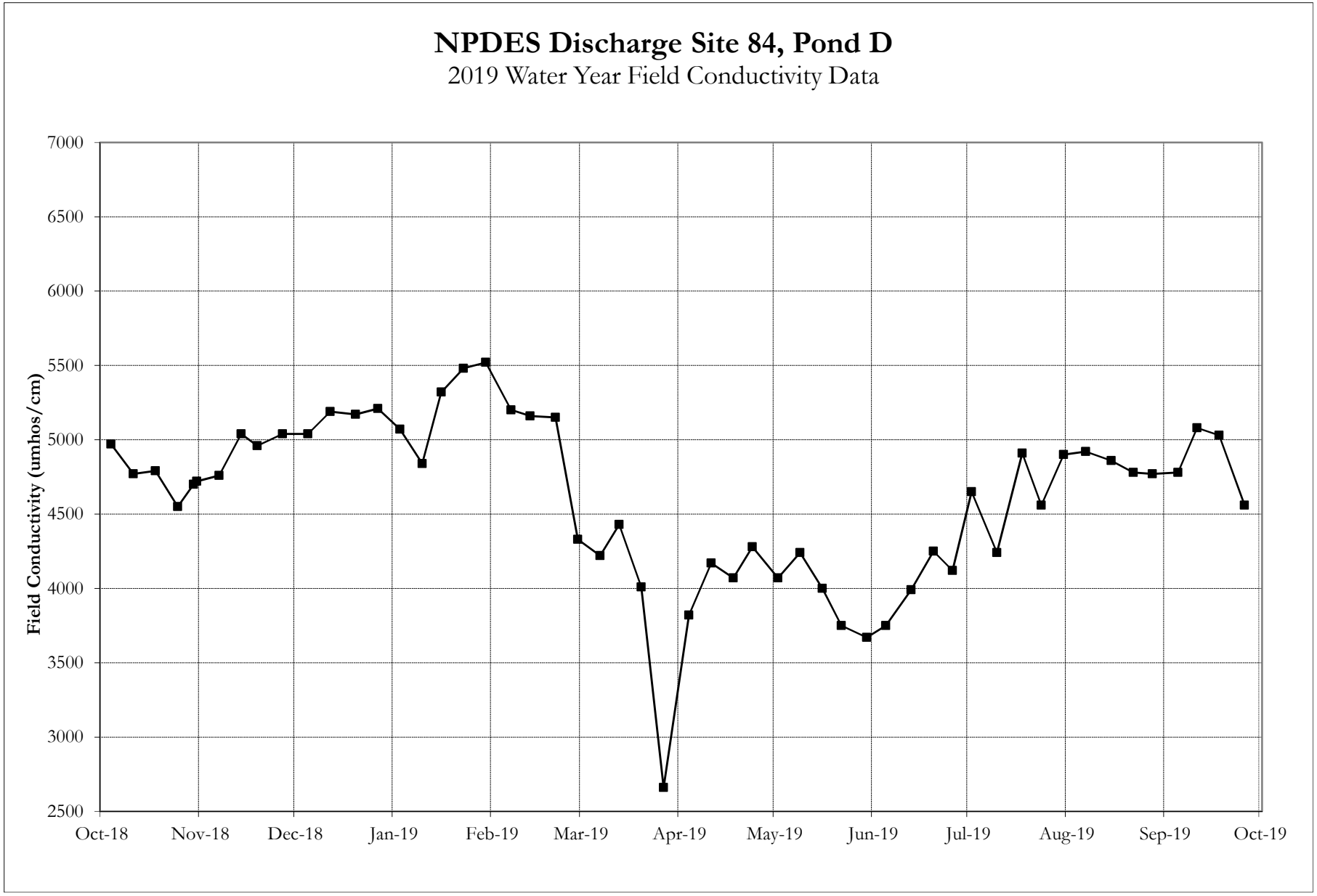

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FIGURE 117

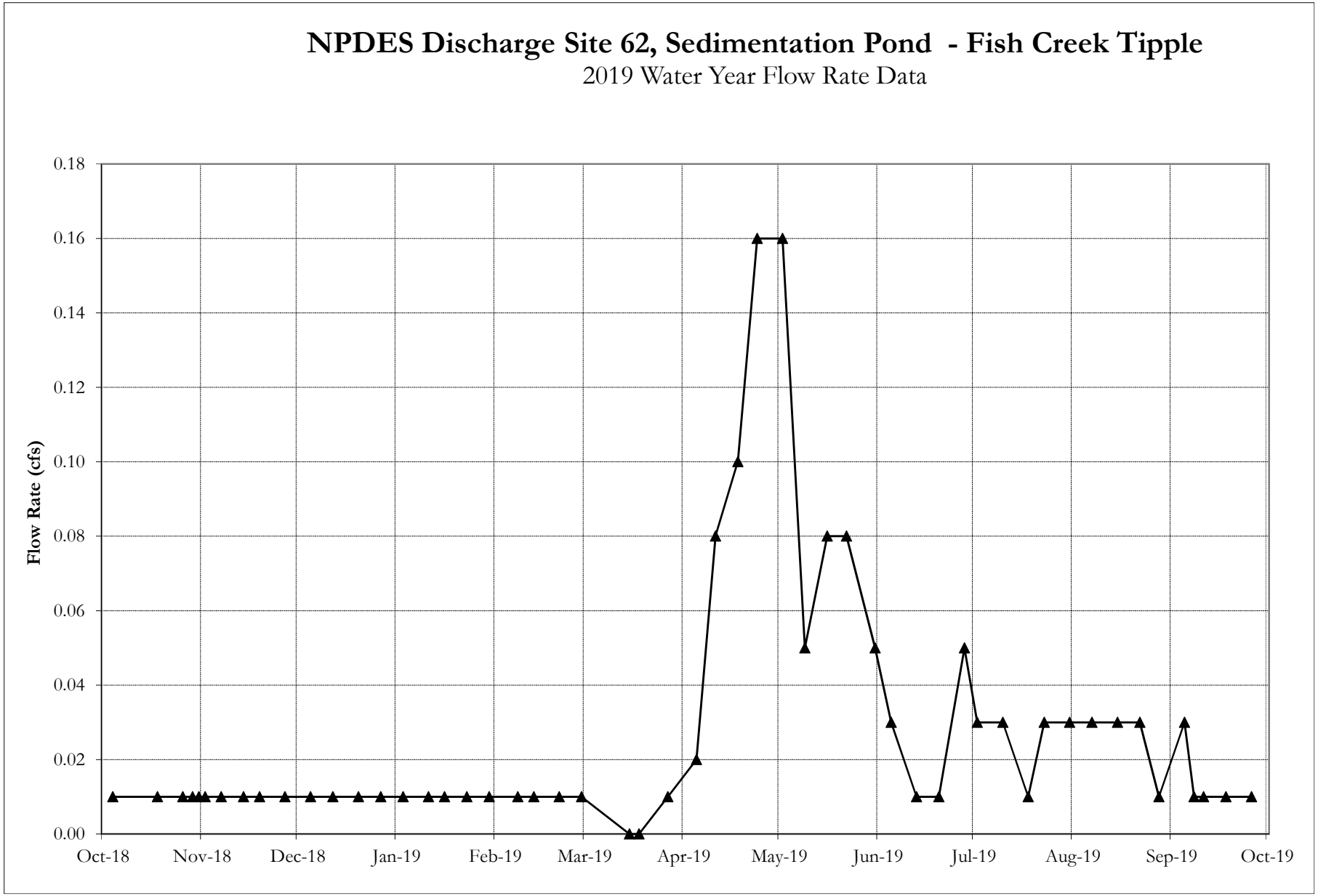

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FIGURE 118

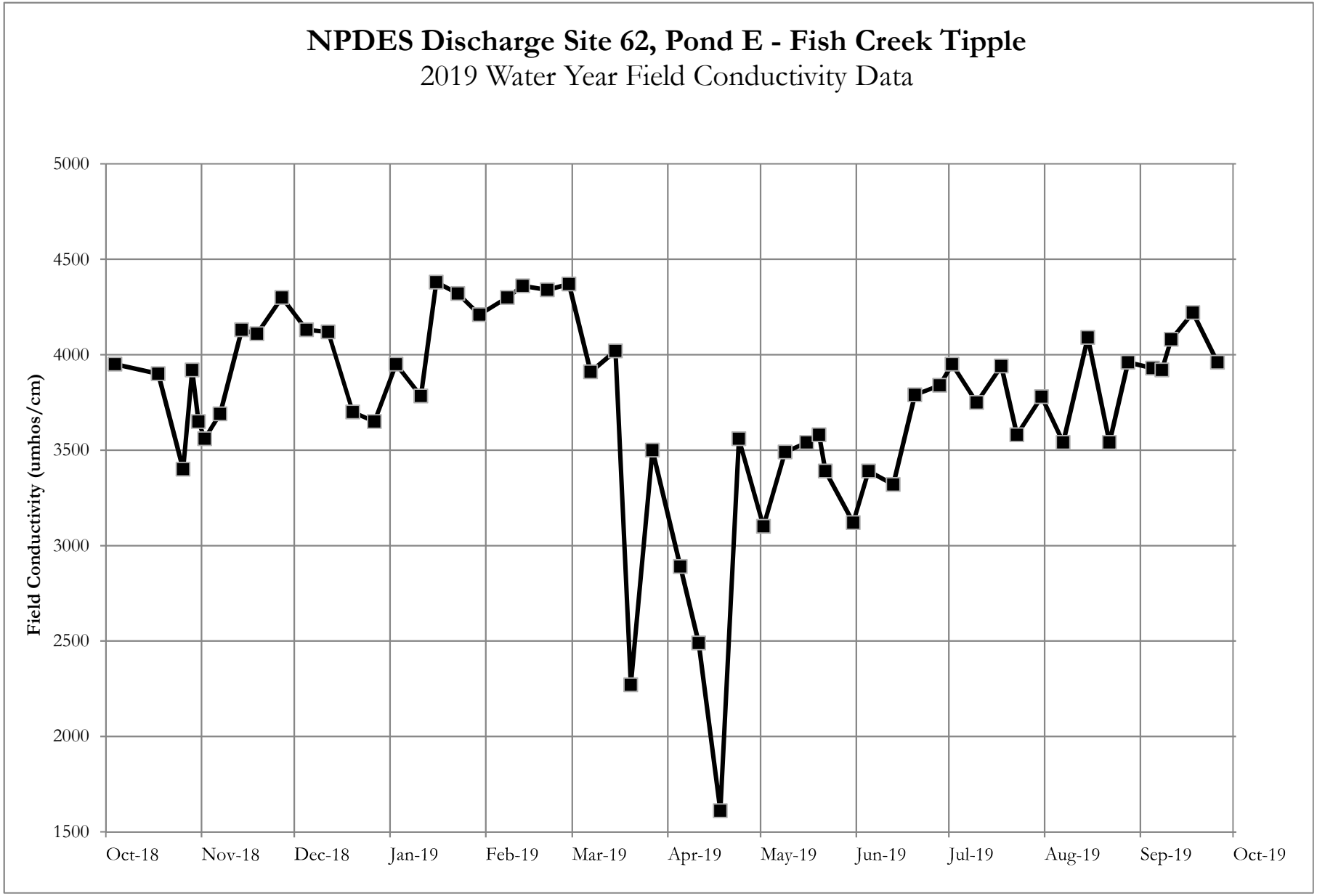

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FIGURE 119

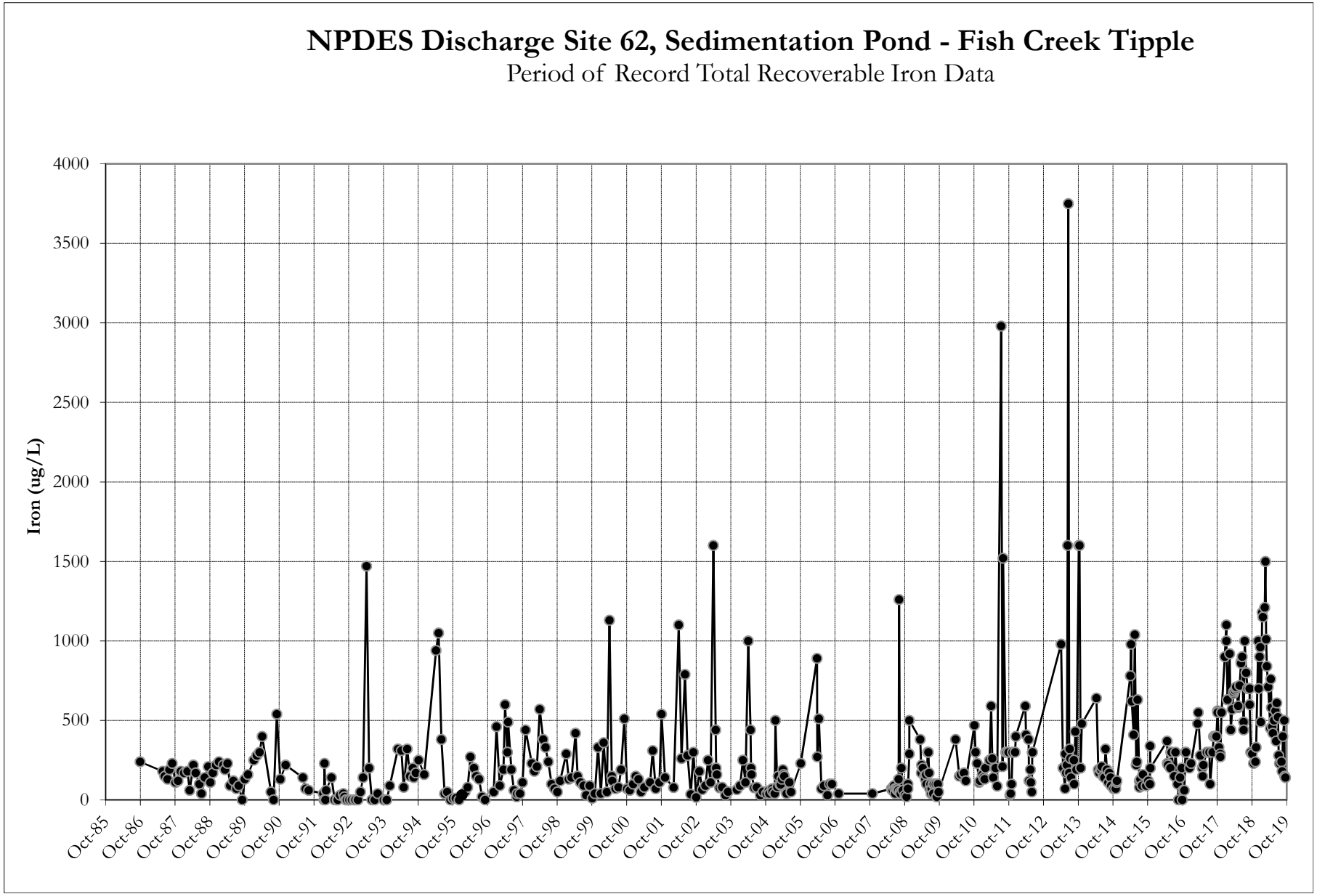

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FIGURE 120