OPERABLE UNIT 1
OPERATION & MAINTENANCE
ANNUAL REPORT 2022-2023

TAR CREEK SUPERFUND SITE
OTTAWA COUNTY, OKLAHOMA

APRIL 2023

PREPARED BY:
Ellen Isbell
For

OKLAHOMA
Environmental
Quality

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1. Introduction

Operation and Maintenance (O&M) of Operable Unit (OU) 1 at the Tar Creek Superfund Site (the Site) in Ottawa County, Oklahoma is conducted under the authority of the Oklahoma Department of Environmental Quality (DEQ). Historically, OU1 O&M activities have included annual monitoring of four Roubidoux Aquifer groundwater wells within Ottawa County. In May of 2021, Picher #5 (P5), was plugged due to previous monitoring results which exceeded Tolerance Limits and Secondary Maximum Contaminant Levels (SMCLs) (DEQ, 2021). The O&M program will continue monitoring the three remaining wells - Commerce #5 (C5), Quapaw #4 (Q4), and Picher #7 (P7). In 2022, additional wells were evaluated for inclusion in OU1 O&M to replace P5. Based on this evaluation, two Roubidoux Aquifer monitoring wells have been added to the annual sampling event - Picher #6 (P6) and Cardin #1 (CA1).

The five monitoring wells sampled were constructed to public water supply (PWS) well standards. The City of Commerce owns C5 but is not currently using C5 other than for monitoring. The Town of Quapaw owns and operates Q4 as part of the town's public water supply system. P6 is in the former town of Picher, OK and is privately owned. The owner is allowing the Quapaw Nation frequent use the well for activities associated with remediation such as dust suppression and irrigation. The Quapaw Nation own and operate both P7 and CA1. P7 is in the former town of Picher and is used as the backup well in the Quapaw Nation's public water supply system. CA1 is in the former town of Cardin, CA1 is being used as a backup well for Quapaw Nation at this time. The well locations are presented in ***Figure 1***. Well attributes are outlined in ***Appendix C***. All wells are sampled for lead (Pb), cadmium (Cd), iron (Fe), zinc (Zn), arsenic (As), and sulfates (SO_4). Fe, Zn, and SO_4 are considered indicator parameters for identifying impacts by acid mine water (AMW). Development of these indicator parameters was described in a technical memorandum during the first phase of After-Action Monitoring (AAM) (DEQ, 1993). Results from groundwater analyses for indicator parameters are compared to background levels, tolerance limits, and Maximum Contaminant Levels (MCLs) or SMCLs. This comparison helps to determine whether water from the Roubidoux Aquifer wells is being impacted by AMW contamination originating from the Boone Aquifer. The three indicator parameters were chosen primarily because comparisons between AMW impacted groundwater and non-impacted groundwater showed the greatest numerical difference for these constituents.

Also included in annual OU1 O&M activities, is the visual inspection of the Lytle Creek diversion dike in the Douthat area (O-3). O-3 is located within the southwest quarter of Section 29, Township 29 North, Range 23 East. Visual inspection of the Lytle Creek diversion dike is used to assess the integrity and functionality of the dike and diversion channel. This O-3 diversion dike was conceived as part of a plan to reduce surface water recharge into mines, thus reducing the volume of acid mine water (AMW) that can eventually upwell back to the surface and into water bodies such as Tar Creek.

2. Methods

Groundwater sampling was conducted by DEQ personnel under a DEQ approved Quality Assurance Project Plan (QAPP) (DEQ, October 2022) and followed Standard Operating Procedures (SOPs) with strict chain-of-custody protocols. Wells Q4, C5, P6, P7, and CA1 were sampled on November 22, 2022.

Groundwater was the only matrix sampled. Samples were collected at the wellhead (without chlorination) under reduced flow conditions via a spigot. Date, time, weather conditions, and sampling team personnel were recorded in the field logbook. Prior to sample collection, water stability parameters are normally measured—pH, temperature, specific conductivity (SC), dissolved oxygen (DO), and oxidation-reduction potential (ORP) using a YSI Multiparameter Meter and recorded in the field logbook. The YSI probe did not seem to be working in the field, pH values were derived from laboratory analysis. Any observed, unusual characteristics (e.g., relating to the presence of gas bubbles, odor, coloration, or clarity) of the water samples were also noted. Field notes and recorded logbook data are shown in ***Appendix D***.

During sampling, all total metals and SO_4 samples were collected directly from the well spigot into pre-labeled sample containers. Samples analyzed for dissolved metals were filtered in the lab. It was not necessary to preserve samples collected for metals analyses with acid in the field because all samples were scheduled to reach the Oklahoma State Environmental Laboratory Services (SELS) within the time frames determined for each analysis. Sample containers were stored and delivered to SELS on ice to meet the requirements of EPA Method 375.4. Samples were analyzed by SELS using EPA Method 200.7 for dissolved & total Fe and Zn, EPA Method 200.8 for dissolved & total Pb, As and Cd, and EPA Method 375.4 for SO_4. New power cords were ordered for DEQ's perista tic machines.

The O-3 Inspection Form (***Appendix B***) was used to assess and document the integrity of the dike, channel, and mineshaft seal on-site (***Figure 2***).

3. Quality Assurance/Quality Control

Duplicate samples were used to evaluate the precision of the laboratory performance and sampling method. Duplicate samples were collected for all analytes at well Q4 on November 22, 2022. The duplicate samples were pre-labeled with unique IDs that did not reveal which well samples were duplicated. The specific well associated with each duplicate sample was recorded in the field logbook. As defined in the QAPP, for each analyte, the relative percent difference (RPD) between the two reported results of the sample and its duplicate were calculated and compared to the required laboratory precision of +/- 30% difference. For the November 22, 2022, sampling event, RPDs for all analytes from all samples did not exceed +/- 30% difference, so no QA/QC contingencies were triggered.

Clean sample containers and analytical grade deionized (DI) water were supplied by SELS prior to the sampling event. Dedicated sampling equipment (filter and hose) were prepared for each well to avoid cross contamination between wells. Dedicated filters and hoses were used by the lab. A field blank for total metals was collected at well C5 at 9:00AM.

4. Results and Discussion

The EPA has established primary maximum contaminant levels (MCLs) for both Pb and Cd. **Results of the November 2022 sampling event showed no detections of Pb or Cd in any of the five wells.**

The indicator parameters (Fe, SO_4, and Zn) have SMCLs, Tolerance Limits, and Background Levels assigned to help interpret the results of the analytical data reported by SELS. These laboratory results are shown in ***Table 1*** for all three indicator parameters. CA1, C5, P6 and P7 results contained exceedances for at least one Tolerance Limit. Additionally, C5, P6, and P7 exceeded at least one SMCL. No wells exceeded Tolerance Limits or SMCLs for Zn. Q4 and its duplicate sample displayed no exceedances of indicator parameters. The graphs in ***Figures 3 A&B*** ***Figures A&B*** show the recent and historical exceedances of indicator parameters at wells P6 & P7. Previous exceedances have not been detected at CA1 and C5 and will require confirmation with six-month analysis.

The relative percent difference between the primary samples and their duplicates was less than 10% for all analytes. For purposes of calculating RPD, data reported as being between zero and the reporting limit was assigned a numerical value equal to the reporting limit, itself (e.g., "<20 ppb" was interpreted to be exactly 20 ppb). This was done to minimize the chance of estimated values needlessly triggering QA/ QC contingencies. Field blank results were below detection limits for all analytes.

Table 1: *Concentrations of Indicator Parameters in OU1 O&M Wells (November 2022)*

LIMITS	**Fe (ug/L)**	**SO_4 (mg/L)**	**Zn (ug/L)**	
Background Level	61.5	25	8.8	
Tolerance Limit	207	82	43	
SMCL	300	250	5,000	
WELL	**Total/Dissolved**	**Total**	**Total/Dissolved**	**AMW Evaluation**
CA1	150/<20.0	**157***	6.2/<5.0	*Possibly impacted*
C5	**6820***/<20.0	18.4	12.3/<5.0	*Possibly impacted*
P6	**1140***/<20.0	**580***	11.5/<5.0	***Probably impacted***
P7	**400***/<20.0	**167***	<5.0/<5.0	*Possibly impacted*
Q4	23.6/<20.0	18.3	<5.0/<5.0	Not impacted
Duplicate (Q4)	21.7/<20.0	18.2	<5.0/<5.0	Not impacted

***Bold** text indicates an exceedance of the corresponding Tolerance Limit. **Underlined** text indicates an exceedance of the corresponding SMCL.

The following evaluation criteria are used in evaluating the groundwater data obtained from the monitoring activities:

- A well producing water with concentrations less than the Tolerance Limit for all three indicator parameters indicates the Roubidoux Aquifer is not impacted by AMW locally near the well site.
- A well producing water with concentrations more than the Background Levels for *two* (2) of the three indicator parameters **and** above the **Tolerance Limits** for *one* (1) of the indicator parameters indicates the Roubidoux Aquifer is *possibly impacted* by AMW locally near the well site.
- A well producing water with concentrations more than the Background Levels for all *three (3)* indicator parameters **and** above the **Tolerance Limits** for *two* (2) of the indicator parameters indicates the Roubidoux Aquifer is ***probably impacted*** by AMW locally near the well site.
- A well producing water with concentrations more than the **Tolerance Limits** for *all three (3)* indicator parameters indicates the Roubidoux Aquifer ***is impacted*** by acid mine water locally near the well site.

Table 2. *Evaluation Summary*

Categories exceeding Background Level	Categories exceeding Tolerance Limits	AMW Evaluation
N/A	0	Not Impacted
2	1	*Possibly Impacted*
3	2	**Probably Impacted**
3	3	**Is Impacted**

The above evaluation criteria do not directly address whether contaminants with primary MCLs, such as Pb and Cd, are present in each well's groundwater, but rather use indicator parameters to determine if the Roubidoux Aquifer is likely being contaminated by Boone Aquifer groundwater.

5. Conclusions

Roubidoux Groundwater

Based on the evaluation criteria for indicator parameters presented in the previous section, the Q4 well is considered not impacted (confirmed by a duplicate sample). The CA1, C5, and P7 wells exceed Background Levels for *two (2)* indicator parameters (Total Fe and SO_4) and exceed at least *one (1)* Tolerance Limit (Total Fe and SO_4); they are considered *possibly impacted*. The P6 well exceeds Background Levels for all *three (3)* indicator parameters and exceeds *two (2)* Tolerance Limits (Total Fe and SO_4); it is considered ***probably impacted***.

Due to the designation of the Q4 well as not impacted, no further action is necessary at this well until the next annual O&M sampling event.

CA1 has tested above the Tolerance Limit for SO_4. This is a change from the last sampling in which there were no exceedances of Tolerance Limits. Confirmation will be needed to determine if this is an aberration or a consistent trend. The exceedance warrants additional sampling based on the general response action plan (***Figure 8***).

C5 tested above the Tolerance Limit **and** SMCL for Fe. This is also a change from the last sampling in which there were no exceedances of Tolerance Limits. Confirmation will be needed to determine if this is an aberration or a consistent trend.

SO_4 concentrations at P7 have historically exceeded the Tolerance Limit, as shown in ***Figure 7A***. The P7 well also exceeded the Tolerance Limit **and** SMCL for Fe (***Figure 7B***). This has suggested a concerning trend at P7.

The P6 well is privately owned and had not been tested from 2014 to 2021. Since testing has resumed, P6 has consistently exceeded the Tolerance Limits **and** SMCLs for both SO_4 and Fe, as well as the Background Level for Zn.

Although Pb and Cd concentrations were below detection limits, the wells considered possibly or probably impacted will require additional monitoring. Moving forward, the CA1 and C5 wells will be tested every 6 months instead of every 12 months (until confirmation or elimination of a trend can be determined). The P6 and P7 wells will resume testing every 6 months to keep track of any trends and ensure no Pb or Cd are present.

Diversion Dike

The diversion dike is in good condition and there is no evidence of erosion, settlement, or sloughing. All brush along the dike has been removed and maintained by the owner of the property. In November of 2022, the creek water could be described as low. The streambeds are visible and there is no evidence of recent beaver activity. Any remaining materials from the previous beaver dams appear to be abandoned. Average streamflow for the nearby Spring River on this date was recorded by the United States Geological Society (USGS) as 300 cubic feet per second (cfs). This is "below normal" for Spring River's mean flow of 900 cfs. Although the water level and streamflow are below normal, there does not appear to be anything that might impede the flow once the water rises. Flow from the watershed to the north of the dike is being conveyed through the constructed channel that diverts Lytle Creek into an upper reach of Tar Creek.

Overall, O-3 is functioning as designed, though the benefit of this surface water diversion has only been partially effective. The original intent of O-3 was to divert surface water away from open mine shafts, and diking projects in Kansas were expected to change the Douthat O-3 area from a location of groundwater upwelling to a location of groundwater inflow, which could generate undesired AMW. Unfortunately, the area remains a point of discharge of AMW into Tar Creek, but the promotion of drainage in the area provided by O-3 is assumed to help reduce immediate rises in mine water levels.

6. Recommendations

DEQ recommends continued *annual* monitoring of all chemicals of concern, Pb, Cd, Fe, Zn, and SO_4 at well Q4. The CA1, C5, P6, and P7 wells are recommended for semi-annual testing for all chemicals of concern.

In addition to groundwater sampling, the Douthat O-3 inspection should continue annually. If the property owner stops maintaining the area and trees begin to grow on the dike or if vegetation growth becomes excessive and hinders O-3 inspections, DEQ should take steps to have it mowed and maintained.

Continued monitoring of beaver dams at the diversion dike is recommended. Road maintenance and other wildlife intrusion should continue to be monitored.

7.0 Abbreviations

AAM	After Action Monitoring
AMW	Acid Mine Water
BGL	Below Ground Level
C5	Commerce 5 Well
CA1	Cardin 1 Well
COC	Chemicals of Concern
DEQ	Oklahoma Department of Environmental Quality
DI	Deionized
DO	Dissolved Oxygen
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
GWMP	Groundwater Monitoring Plan
MCL	Maximum Contaminant Level
O&M	Operation and Maintenance
O-3	Douthat Diversion Dike Site
ORP	Oxidation-Reduction Potential
OU	Operable Unit
OWRB	Oklahoma Water Resources Board
P5	Picher 5 Well
P6	Picher 6 Well
P7	Picher 7 Well
PWS	Public Water Supply
Q4	Quapaw 4 Well
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RPD	Relative Percent Difference
ROD	Record of Decision
SC	Specific Conductance
SELS	State Environmental Laboratory Services
SMCL	Secondary Maximum Contaminant Level
SOP	Standard Operating Procedure
TCSS	Tar Creek Superfund Site
USGS	United States Geological Survey
Pb	Lead
Cd	Cadmium
Fe	Iron
SO_4	Sulfate
Zn	Zinc

8. References

1) U. S. Environmental Protection Agency (EPA). *Record of Decision, Remedial Alternative Selection.* June 6, 1984.
2) Oklahoma Department of Environmental Quality (DEQ). *Technical Memo: "Sampling Results of Public Water Supply Wells, August 1992 through January 1993, Tar Creek Superfund Site", OK*. December 1993.
3) Oklahoma Department of Environmental Quality (DEQ). *After Action Monitoring of the Roubidoux Aquifer at the Tar Creek Superfund Site, Ottawa County, OK*. 2014.
4) Oklahoma Department of Environmental Quality (DEQ). *Sixth Five-Year Review for Tar Creek Superfund Site*. July 2020.
5) Oklahoma Department of Environmental Quality (DEQ). *Operable Unit 1 Operation & Maintenance Annual Reports for Tar Creek Superfund Site*. 2017-2021.
6) Oklahoma Department of Environmental Quality (DEQ). *Operation & Maintenance Plan, Tar Creek Superfund Site, OU1*. February 28, 2018.
7) Oklahoma Department of Environmental Quality (DEQ). *Roubidoux Aquifer Groundwater Monitoring Plan, Tar Creek Superfund Site, OU1*. February 28, 2018.
8) Oklahoma Department of Environmental Quality (DEQ). *Quality Assurance Project Plan for Tar Creek Operable Unit 1 Operation & Maintenance*. October 2022.
9) Oklahoma Department of Environmental Quality (DEQ). *Roubidoux Well Plugging Project at the Tar Creek Superfund Site, Ottawa County, Oklahoma*. July 2021

APPENDIX A:

FIGURES

Figure 1: The wells monitored for OU1 O&M

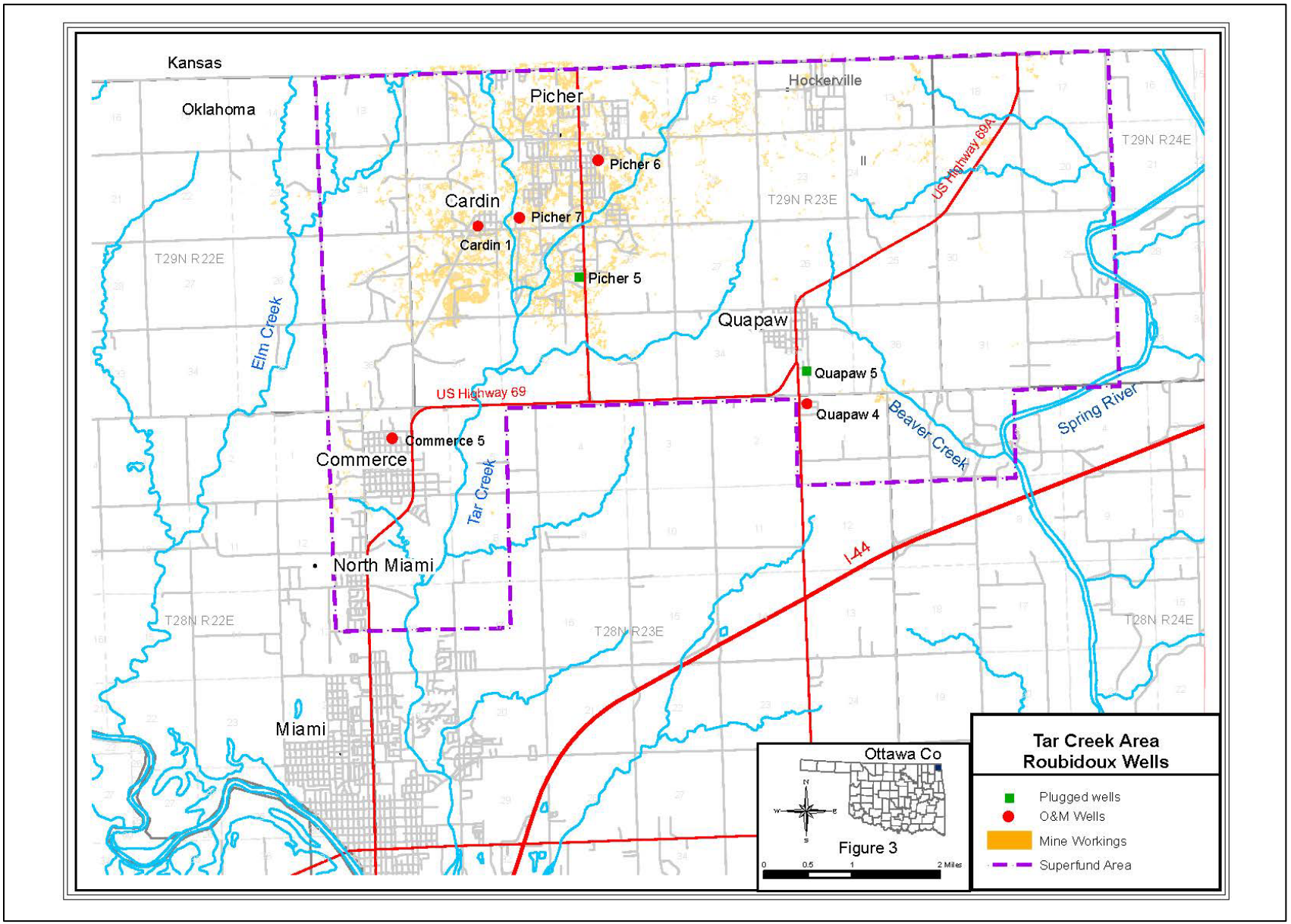
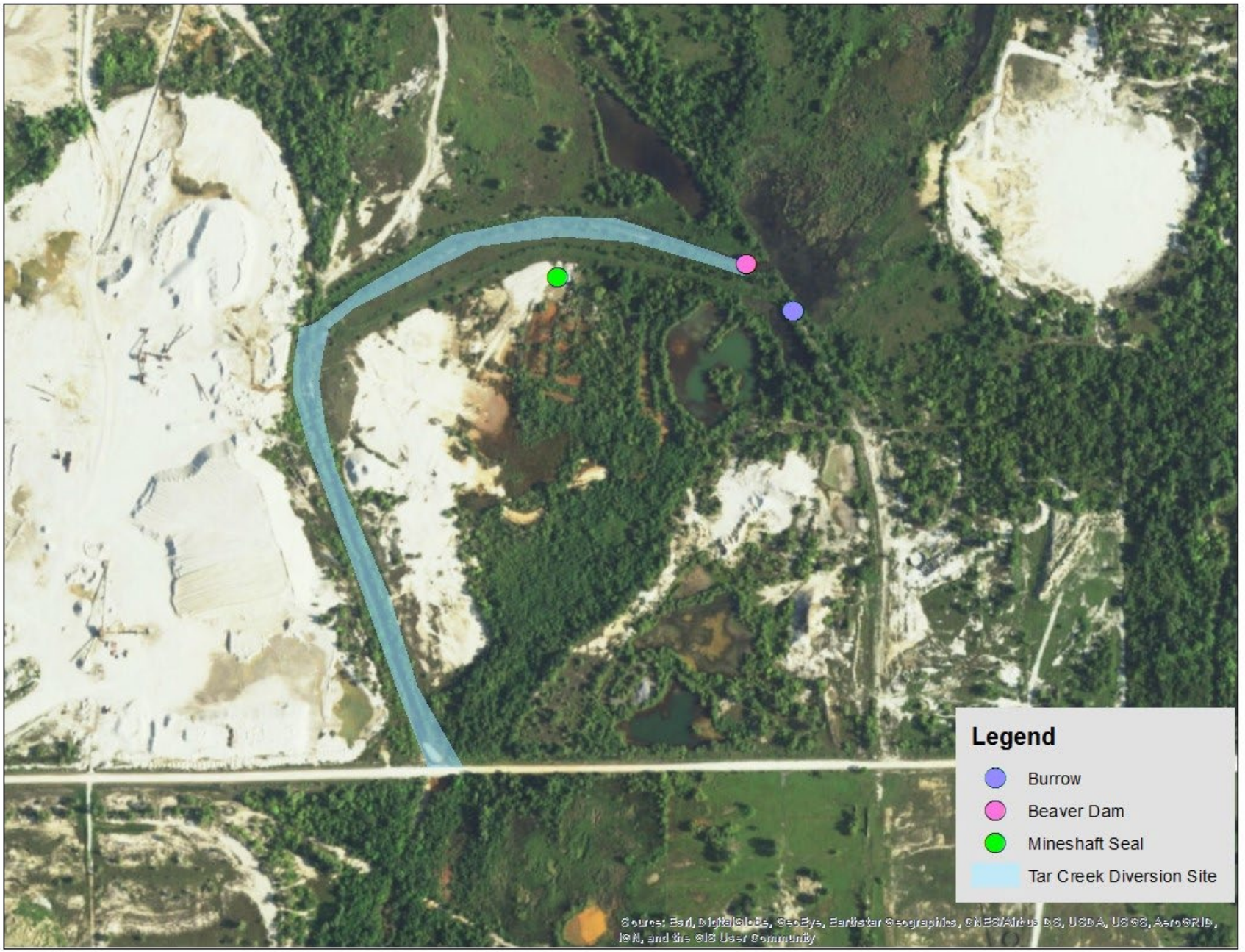
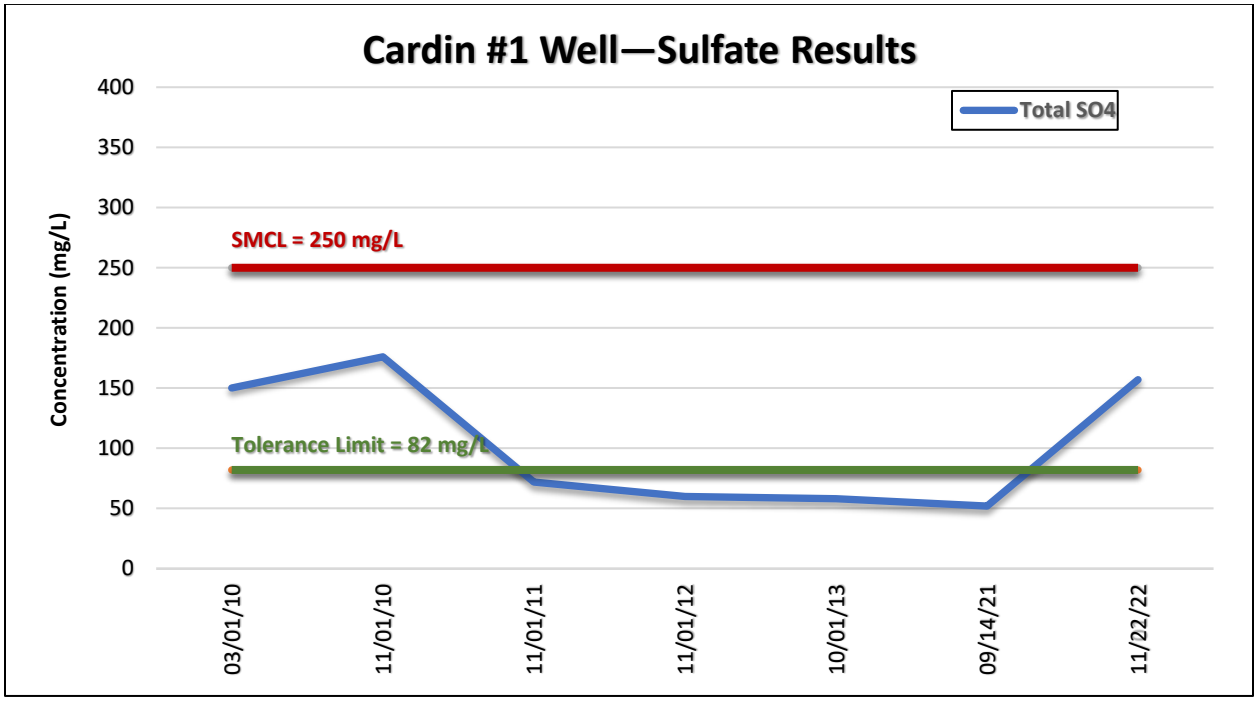
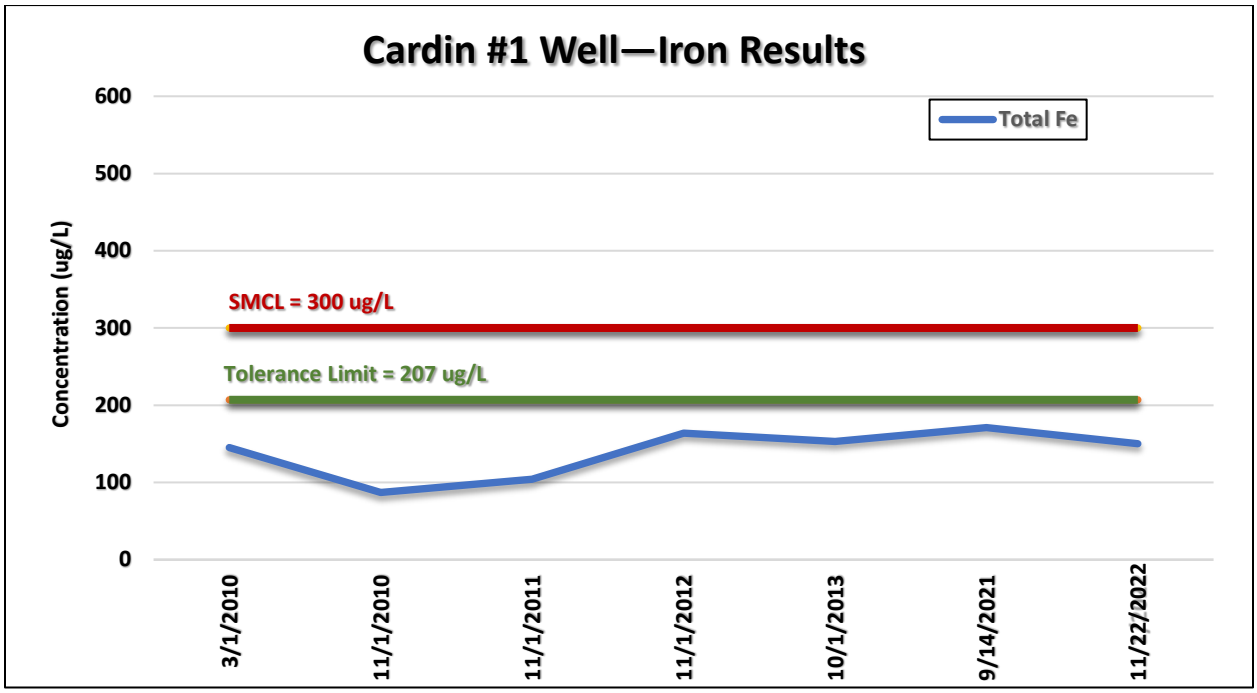


Figure 2: The Douthat Diversion Site (O-3) as observed during O&M inspection

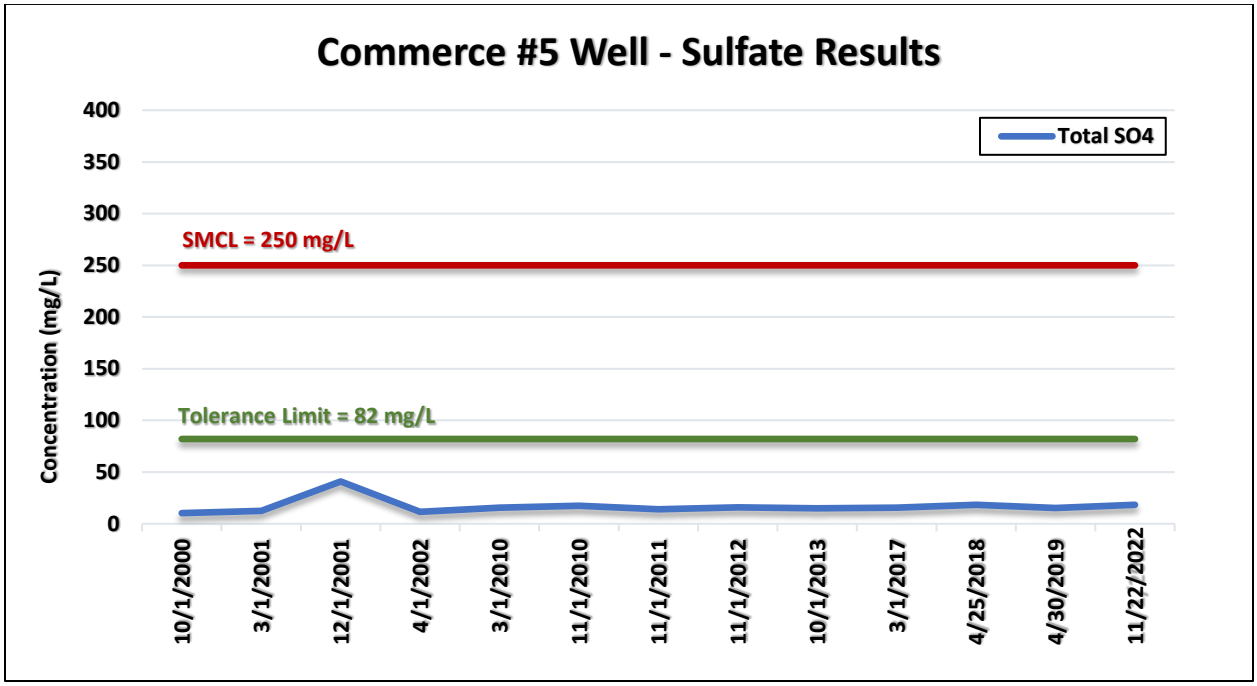


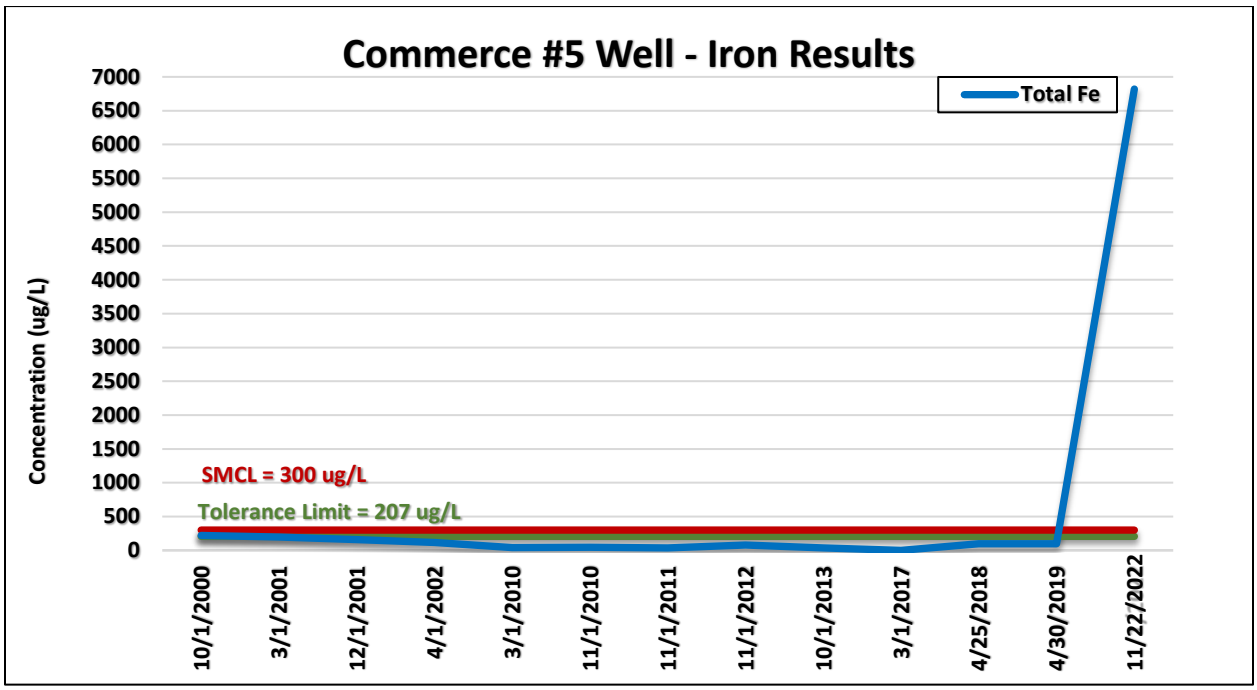
Figures 3A and 3B: Sulfate and Iron concentrations at Cardin #1 well compared to tolerance limits and SMCLs



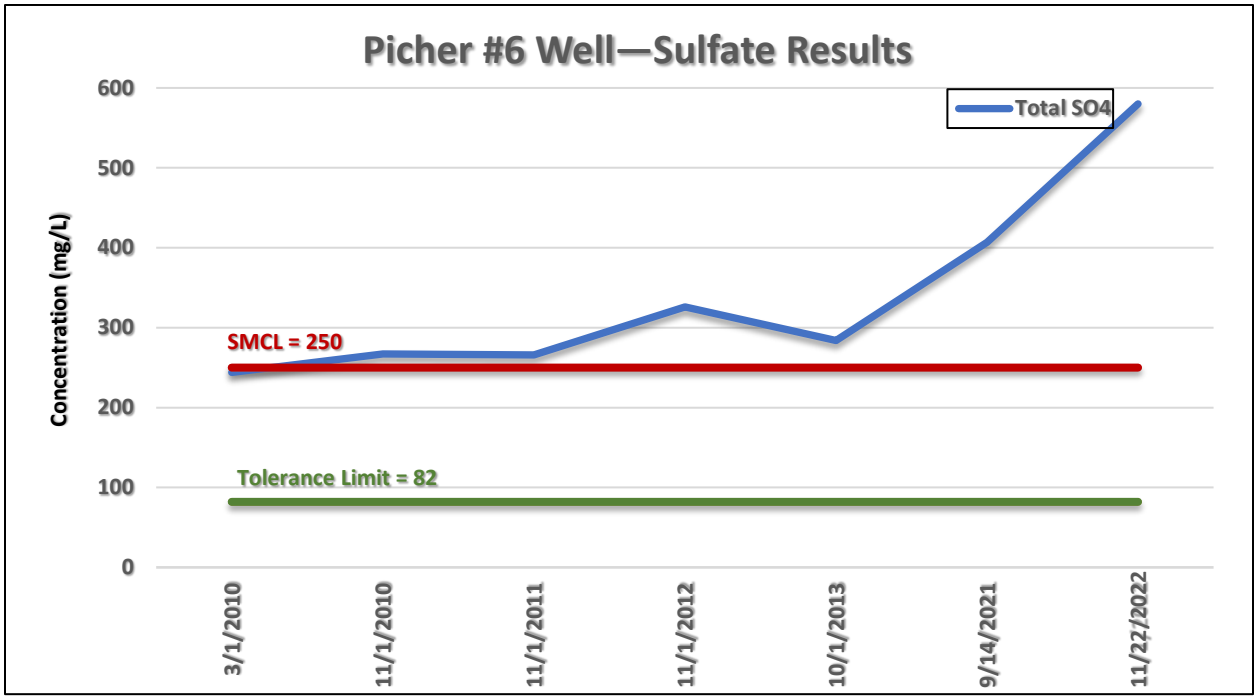


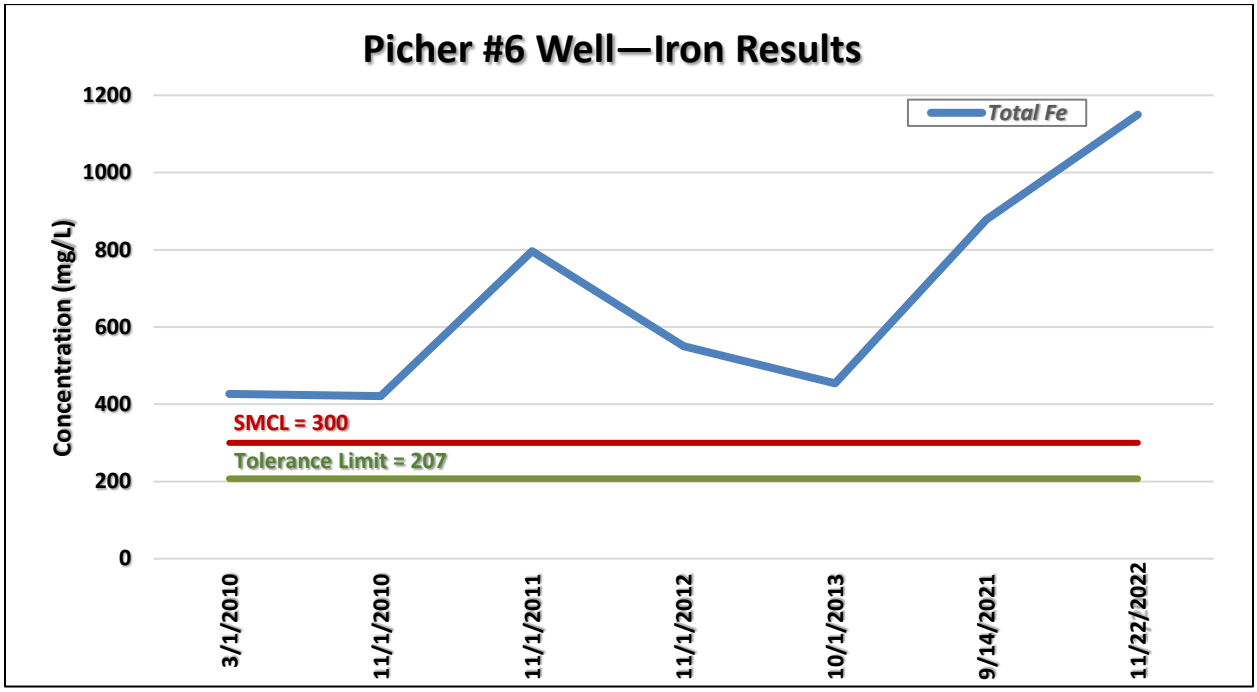
Figures 4A and 4B: Sulfate and Iron concentrations at Commerce #5 well compared to tolerance limits and SMCLs



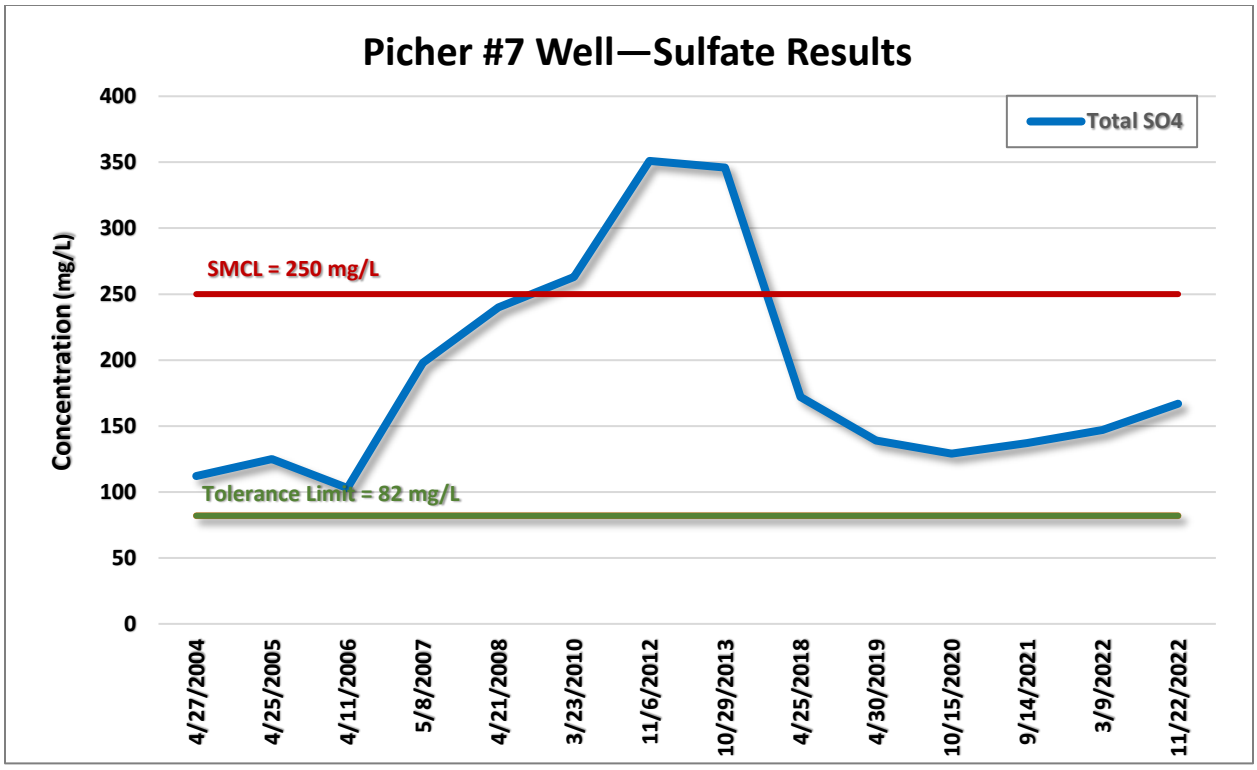


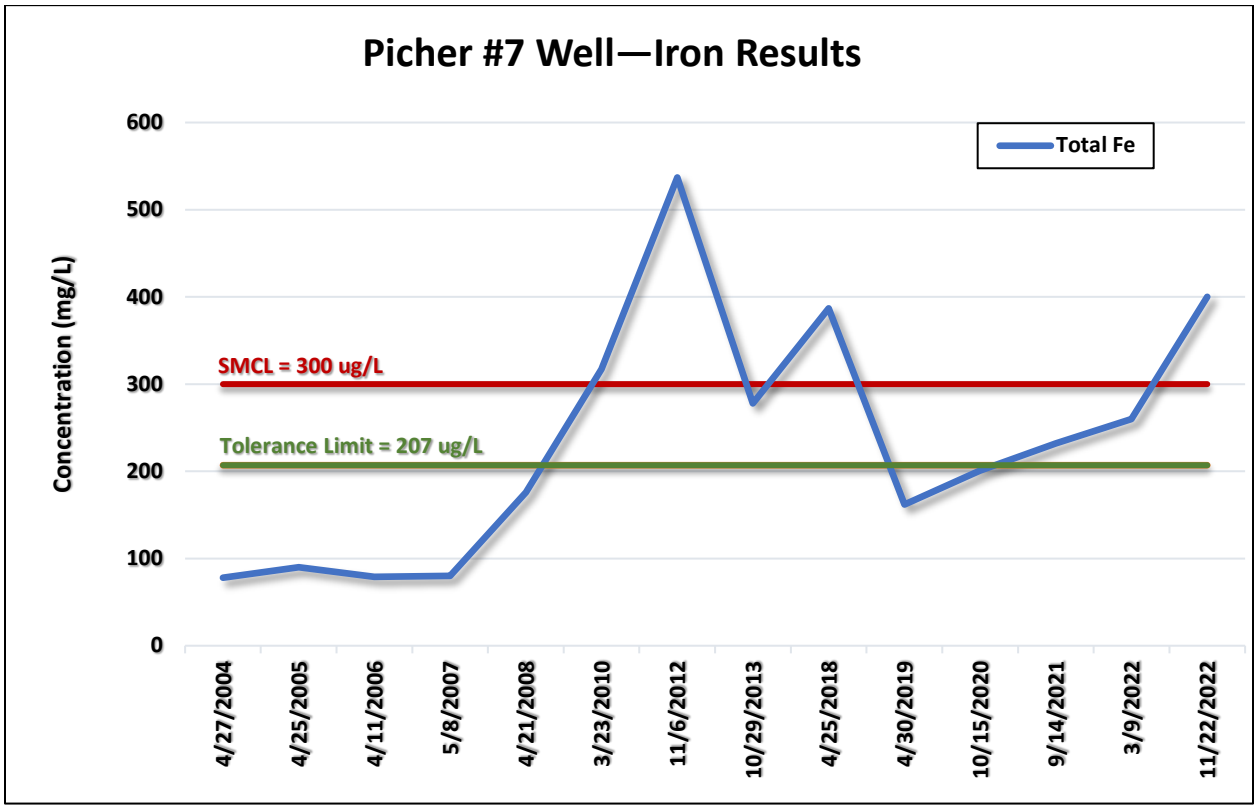
Figures 5A and 5B: Sulfate and Iron concentrations at Picher #6 well compared to tolerance limits and SMCLs



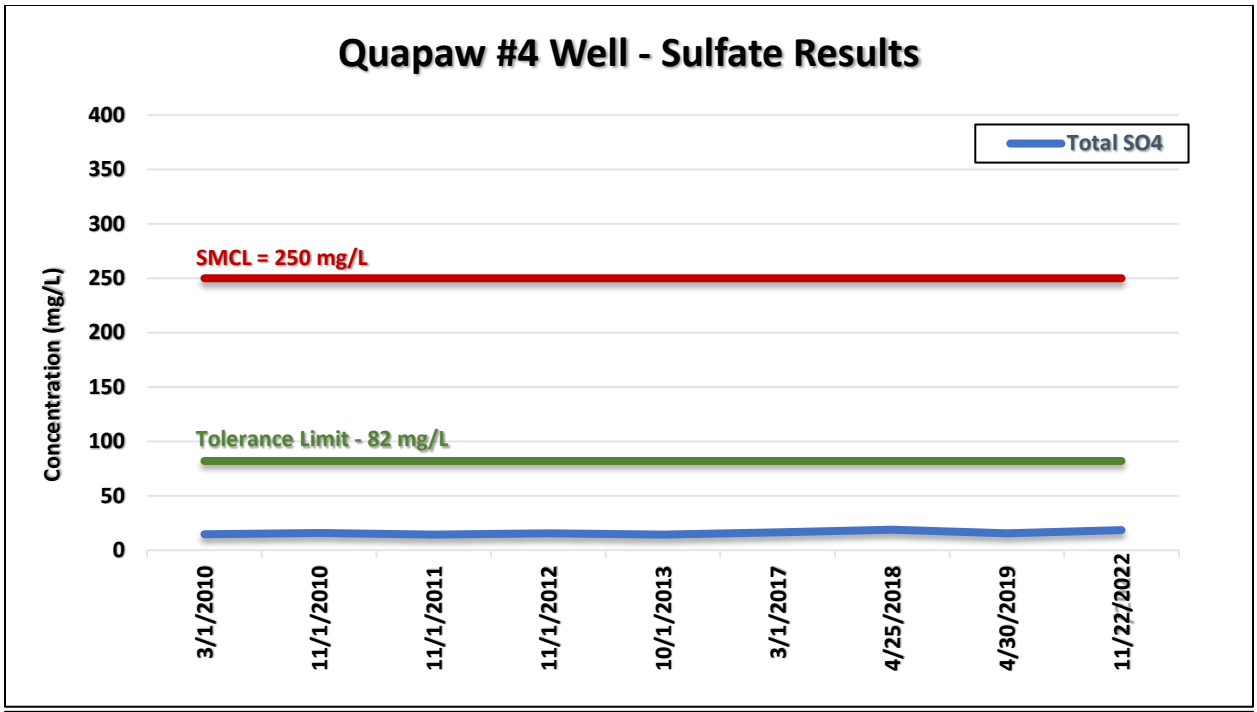


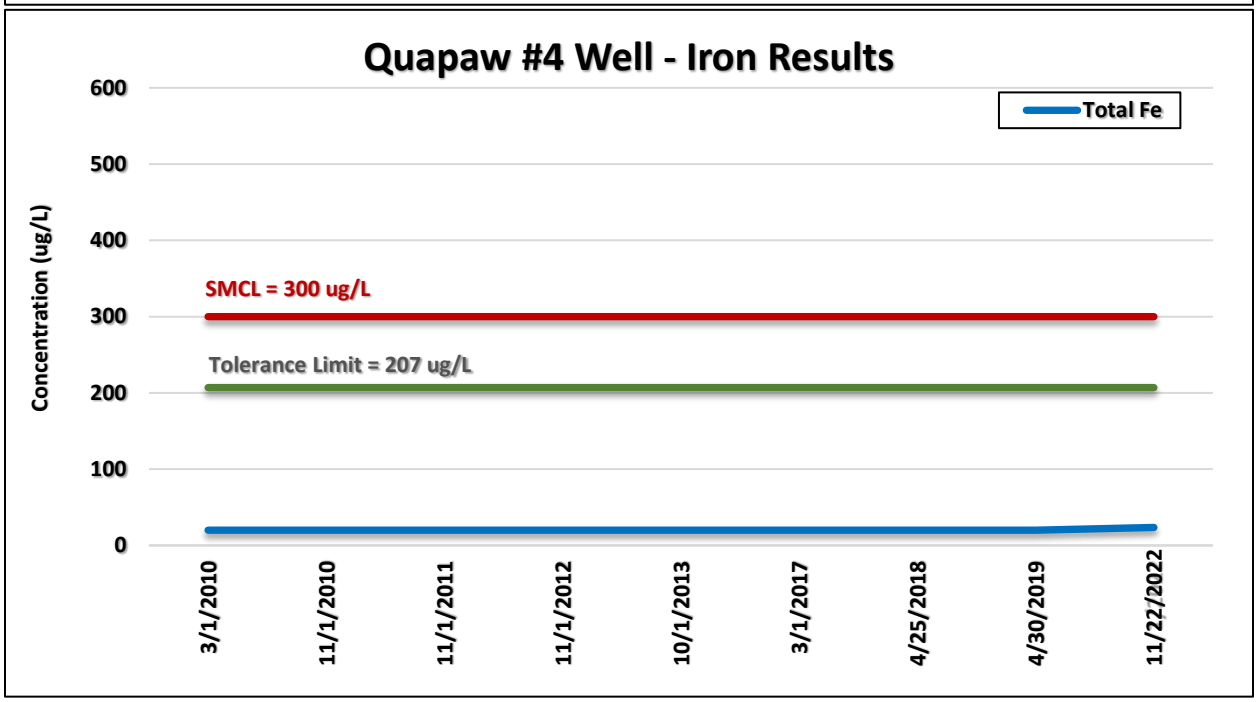
Figures 6A and 6B: Sulfate and Iron concentrations at Picher #7 well compared to tolerance limits and SMCLs





Figures 7A and 7B: Sulfate and Iron concentrations at Quapaw #4 well compared to tolerance limits and SMCLs





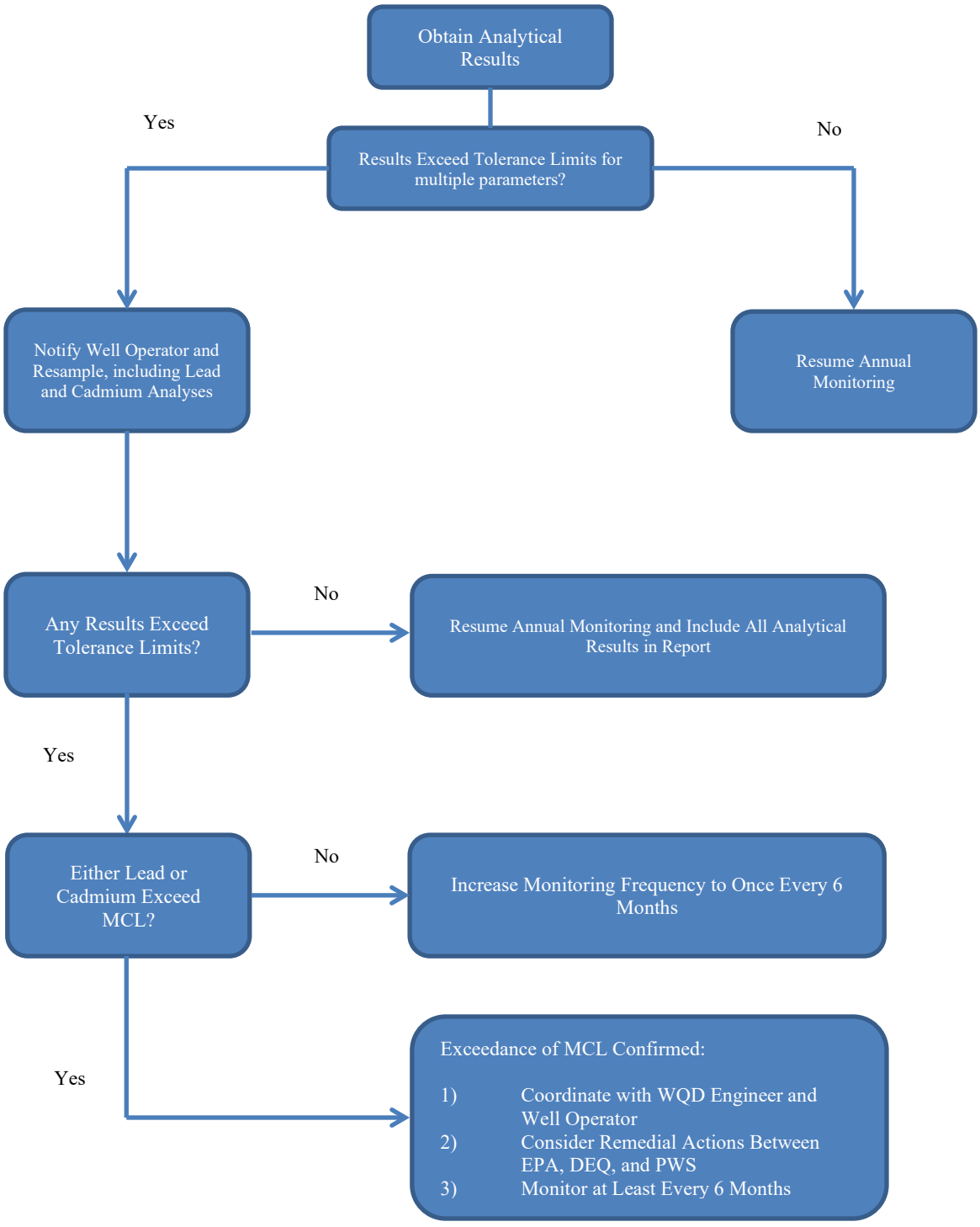


Figure 8. General response action plan

APPENDIX B:

Douthat Area Diversion Site (O-3) Inspection Form

I. SITE INFORMATION

Site name: OU1 Douthat Diversion Site	**Date of inspection:** 03/17/2021
Location and Region: Tar Creek, Ottawa County	**Weather/temperature:** Sunny, 62°F
Attachments: ■ Site map available within this report – Figure 2	

II. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   ■ O&M manual ■ Readily available ■ Up to date ☐ N/A

   Remarks: QAPP 07/24/2020, Updated 09/13/2021. All related O&M documents were available on-site.

2. **Site-Specific Health and Safety Plan** ■ Readily available ■ Up to date ☐ N/A
   ■ Contingency plan/emergency response plan ■ Readily available ■ Up to date ☐ N/A
   Remarks

3. **O&M and OSHA Training Records** ■ Readily available ■ Up to date ☐ N/A
   Remarks: All training is up to date for Ellen Isbell.

III. O&M COSTS

1. **O&M Maintenance Organization**
☐ Contractor for State ■ Other: Oklahoma Dept of Environmental Quality (DEQ)

Organization:_____

2. **O&M Cost Records**
■ Readily available ■ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate_____ ☐ Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: Not Applicable

IV. DIKE

1. **Road** ■ Location shown on site map ■ Road adequate
Remarks: The road was somewhat difficult to locate in areas. We should keep consider future maintenance if the road continues to degrade.

1. **Settlement** ☐ Location shown on site map ■ Settlement not evident
Areal extent_____ Depth_____
Remarks: _____

2. **Erosion** ☐ Location shown on site map ■ Erosion not evident
Areal extent_____ Depth_____
Remarks: No significant erosion, but some riparian areas on the east/northeast side of the dike have been affected by wildlife which could lead to erosion. Something to keep track for future inspections.

3. **Holes** ☐ Location shown on site map ☐ Holes not evident
Areal extent: _____ Depth:

Remarks:

4. **Bare Areas** ☐ Location shown on site map ■ N/A

Areal extent_____ Type_____
Remarks_____

6. **Excessive Vegetative Growth** Type_Grasses_____
☐ No evidence of excessive growth
■ Vegetation does not impede flow
☐ Location shown on site map Areal extent_____

Remarks: _____

7. **Slope Instability** ☐ Slides ☐ Location shown on site map ■ No evidence of slope instability
Areal extent_____
Remarks_____

V. CHANNEL

1. **Obstructions** Type: Beaver dams

☐ No obstructions

■ Location shown on site map (Figure 2.)

Areal extent_____

Size_____

Remarks: The previous inspection noted several beaver dams. Heavy rains appear to have altered and broken up the beaver dams. Any remaining materials see to have been abandoned by the animals. Should future action be required on beaver dams, USDA Wildlife Services relocates the animals, but there are services that can be explored to bridge the dam allowing water flow if relocation is not a good option. Photos included.

2. **Erosion** ☐ Location shown on site map ■ Erosion not evident

Areal extent_____ Depth_____

Remarks_____

VI. MINESHAFT SEAL

1. **Settlement** ☐ Location shown on site map ■ Settlement not evident

Areal extent_____ Depth_____

Remarks_____

VII. Overall Observations

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

O-3 remedy was designed to reduce acid mine water produced via recharge of underground mines. Because O-3 area remains a point of discharge rather than inflow for groundwater, the benefit of the diversion dike is limited to high-flow precipitation events.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. Discuss their relationship to the current and long-term protectiveness of the remedy.

Should the area south of the dike become a point of groundwater inflow, the current O&M procedures should ensure the integrity of the dike. The dike should be mowed if trees begin to grow on the dike or if vegetation growth becomes excessive and hinders inspections.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

N/A

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

N/A

Inspection/Sample Team Roster

Ellen Isbell	DEQ	Environmental Programs Specialist
Katrina Pollard	DEQ	Environmental Programs Specialist

APPENDIX C:

Well Locations and Attributes

Groundwater Well Locations and Attributes

	Quapaw #4 (Q4)	Commerce #5 (C5)	Picher #7 (P7)	Picher #6 (P6)	Cardin #1 (CA1)
Location	NW NW NW S1-T28N-R23E (N 36°56'33.4'' W 94°47' 11.2'')	NW SE NW S6-T28N-R23E (N 36° 56' 19.4'' W 94° 52' 17.9'')	SW SE SW S20 T29N-R23E (N 36°58' 28.37" W 94°50' 38.26")	SE SE NW S21 T29N-R23E (N 36° 59' 00.7" W 94° 49' 21.1")	SW SE SE S19 T29N-R23E (N 36 58' 23.3" W 94 51' 07.2")
Type	Public Supply	Monitoring Well	Public Supply	Privately owned	Monitoring Well
Elevation	845'	810'	814'	822'	817'
Total Depth	1,350'	1,100'	1,102'	1,100'	1,150'
Casing Depth	620'	8" at 850'	8" at 850'	850'	500'
Pump Depth	608'	795'	800'	777'	615'

APPENDIX D

Field Logbook

C.5 11/22/22 9:00AM
SUNNY 42°

No one is here to meet us.
Well house is not maintained and appears to have a leak.

Cannot find power source to flush well.

Peristaltic is not working even though I tested it last week. I'll see if Jaime can filter samples in the lab. yes

VSI is not working. Both of them have old probes. I will have Jaime add ptf to analysis. yes

Kenny met us.
Kimaber

Rite in the Rain

ODEQ-1756336-01
metals/hardness
time: 9:51 am

ODEQ-1756336-03
dissolved metals
* to be filtered
in lab, peristaltic not functioning
time: 9:52 am

ODEQ-1756336-02
sulfates
time: 9:53 am

left site @ 10 am

Flow meter disabled.

PLe 11/22 10:05AM

Owner: Johnnie Sparman

ODEQ 1756337-01
metals/hardness
time: 10:18
* grabbed from truck loading spigot

ODEQ 1756337-02
sulfates
time: 10:18
* grabbed from truck loading spigot

ODEQ 1756337-03
dissolved metals
time: 10:16
* grabbed from truck loading spigot

* needs to be filtered in lab

Rita in the Rain

P6 cont. 11/22

Spigot and flow meter removed.

Gave sample to Johnnie. (extra)

1756337-01→03

Q4 11/22 11AM

Well is offline. Waiting to see if we can grab samples. 11:15

800GPM

1756339-01→03 Q4 11:39

1756340-01→03 Dup 11:42

Rite in the Rain

P7 11/22 1PM

Flushing... met Rich Walden

Flintrock to open gate

1756338-01→03 1:35

ptt + filtering TBD in lab.

flow meter isn't working.

C1 C8? 11/22 ~~2PM~~ 1:45ish

Flushing Rich Walden

1756335-01→03 1:52+

ptt + filtering TBD in lab.

flow meter isn't working.

APPENDIX E

Lab Results