

Region 6 - Enforcement & Compliance Assurance Division

INSPECTION REPORT

Inspection Date(s):	04/13/2023	
Media Program:	Water	
Regulatory Program(s)	Clean Water Act – National Pollution Discharge Elimination System (NPDES) – Brine Program	
Company Name:	Williford Petroleum, LLC	
Facility Name:	A. E. Denny B	
Facility Physical Location:	34.168000, -97.369000	
(city, state, zip code)	Lone Grove, Oklahoma 73443	
Mailing address:	3143 E 87 th Street	
(city, state, zip code)	Tulsa, Oklahoma 74137	
County/Parish:	Carter County	
Facility Phone Number	(981) 671 – 0404	
Facility Contact:	Mark Powell	Representative
	mpowell@wilpetro.com	
FRS Number:	n/a	
EPA Identification Number:	OKU002159	
Media Identifier Number:	n/a	
NAICS:	211111	
SIC:	1311	
Personnel participating in inspection:		
Jeanne Eckhart	U.S. EPA Region 6 – ECDWE	Lead Inspector
Tamara Griffin	U.S. EPA Region 6 – ECDWE	Inspector
Brad Ice	Oklahoma Corporation Commission	Manager of Field Operations
Shawn Coslett	Oklahoma Corporation Commission	Manager of Pollution Abatement
Jeff Perkins	Oklahoma Corporation Commission	District III Manager
Everett Plummer	Oklahoma Corporation Commission	Field Supervisor
Ambra Matheson	Oklahoma Corporation Commission	Environmental Coordinator
Robert Reynolds	Oklahoma Corporation Commission	Oil and Gas Specialist
Clayton Christian	Oklahoma Corporation Commission	Field Inspector
Josh Lakey	Oklahoma Corporation Commission	Field Inspector
EPA Lead Inspector Signature/Date		
	Jeanne Eckhart	Date
Acting Supervisor Signature/Date		
	Damon McElroy	Date

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

EPA Region 6 Inspectors, Jeanne Eckhart and Tamara Griffin, arrived at the Williford Petroleum, LLC A.E. Denny B Lease area (EPA ID No. OKU002159) at 9:00 AM on 04/13/2023 for a Clean Water Act (CWA) inspection under the National Pollution Discharge Elimination System (NPDES). This was an inspection in response to a referral from the Oklahoma Corporation Commission (OCC) received by EPA Region 6. We met with Oklahoma Corporation Commission representatives on site for the entire inspection. There were no company representatives on site during the beginning of the inspection. The inspection was conducted by the authority of the Clean Water Act (CWA) and Safe Drinking Water Act (SDWA) to determine compliance with federal regulations.

FACILITY DESCRIPTION

EPA conducted an initial CWA inspection near the multiple production and injection wells due to historical and potential ongoing sources of contamination referred to EPA. The identified historical and potentially ongoing contamination migrated downgradient in two tributaries that flowed into Walnut Creek. The surface and soil around the area including a main area of concern (GPS: 34.165328, -97.360706) indicated potentially ongoing brine contamination as well as evident historical contamination. EPA staff conducted a creek survey of two tributaries and Walnut Creek and observed multiple wells across the A.E. Denny Lease, area during the inspection in response to state regulatory concerns. Not all wells in the area of concern were observed or assessed during this EPA inspection.

Geology in this area was not assessed as a part of this inspection report. EPA was provided some well records and other information associated with different potential well issues in this area of concern and preliminary site assessments. EPA will continue to assess this information external to this inspection report.

Section II - OBSERVATIONS

There were multiple wells in this area of concern that I observed, including two wells associated with the well owner Williford Petroleum, LLC. OCC representatives on site did express concerns associated with several wells on site, including integrity and other potential well construction issues for the production and injection wells during the inspection. **Appendix A**, Photo Nos. 1 – 4 are photographs of the two injection wells observed during the inspection.

EPA inspectors observed other wells and operations in the area of concern but did not assess all the wells owned or operated by Williford Petroleum, LLC during the inspection in the area of concern, see Table 1 in **Appendix B** for the 149 identified wells within 0.5 mile of the 3-acre area of concern (GPS: 34.165328, -97.360706). These 149 wells are oil and gas associated, including production wells, underground injection control wells, plugged wells, or wells with an unknown status.

Table 2 in **Appendix B** shows the currently nine (9) identified water wells in or near the area of concern. Other potential sources of drinking water were not assessed during this inspection. This information was sourced from the Oklahoma Water Resources Board (OWRB) records.

Appendix C shows the latest Mesonet data from nearby Mesonet stations in Oklahoma, including Newport, Ardmore, and Ringling. This data was downloaded from the Mesonet Oklahoma public website for this report to indicate rainfall within the last 10 days of the inspection had not occurred. (Data Source: https://mesonet.org/index.php/site/about/monthly_summaries)

I assessed the surface water quality in the area with a properly calibrated YSI Pro 30 Conductivity Meter. The assessment can be seen in the **Appendix A** Photo Log, Photo Nos. 5 – 17. GPS location information for each observation is recorded with each photo in the photo log. I assessed two tributaries and Walnut Creek in this area. Specifically, for the A.E. Denny B Lease, there was only some surface contamination at site observed, the elevated TDS reading (Photo No. 7) did not flow off site during the inspection.

With the conductivity meter, I took Total Dissolved Solids (TDS) readings throughout the creek surveys. At the confluence of a downstream (from the A.E. Denny B Lease) tributary and Walnut Creek a TDS reading of 11,431 mg/L (Photo No. 11) was taken in Walnut Creek. Ordinary high water mark, flow, debris, bed features, bank features, riparian vegetation, and black discoloration in Walnut Creek were observed here during the inspection. See **Appendix A**, Photo Nos. 8 – 14.

I also assessed Walnut Creek upstream from the Bayou Unit along Walnut Creek and Hwy 70. This was assessed as a “background” reading during the inspection and observations are seen in **Appendix A**, Photo Nos. 15 – 17. Bed, bank, and riparian vegetation were observed in this location of the creek. A TDS reading of 1,713 mg/L was taken.

Section III – AREAS OF CONCERN

This site has multiple concerns that EPA identified. There are some known and unknown potential production well, injection well, and abandoned well issues within this larger area of concern. EPA has not fully assessed this extent of these issues as a part of this inspection report, but will continue to work with OCC to assess the site.

I observed in particular, potential endangerment to underground sources of drinking water and lack of mechanical integrity for production wells and injection wells through the larger area of concern. There are potential pressure issues associated with the enhanced recovery operations across the field. The enhanced recovery operations, or water flood, is of large concern for EPA as potential conduits in the area are not fully assessed and thus potentially contributing to ongoing contamination. Historical contamination is also present and was never fully remediated or assessed, thus potentially endangering Undergrounds Sources of Drinking Water (USDWs). Further assessment is needed and should include: identification of potential public health and environmental issues within the larger area of concern, geological assessments, technical assessment of the wells in the area of concern, as well as any other appropriate information to identify potential concerns associated with the Safe Drinking Water Act and other OCC regulatory requirements.

The surface water quality across two tributaries and Walnut Creek showed elevated TDS levels throughout the inspection. This was a large concern as well as under the Clean Water Act. Potentially ongoing contamination as well as historical contamination has contributed to elevated TDS levels in the tributaries and in Walnut Creek. The surface in the area of concern had large erosion issues, lack of vegetation, and the soil appearance was indicative of brine/produced water contamination from upstream oil and gas field activities. EPA will continue to assess this issue under the Clean Water Act.

Well operations and maintenance throughout the area were of concern for multiple wells, including oil staining and other well daily operations lacking best management practices. EPA will continue to assess these concerns with OCC. EPA staff have referred any tank battery operations in the larger area of concern to the EPA Region 6 Spill Prevention, Control, and Countermeasure (SPCC) program to have further assessment for SPCC regulatory requirements.

Section IV – FOLLOW UP

EPA will continue to follow up with OCC and operators in the area of concern as needed.

Section V – LIST OF APPENDICES

Appendix A – Photo Log – 17 photos taken 4/13/2023

Appendix B – Wells within Main Area of Concern (GPS: 34.165328, -97.360706)

Appendix C – Mesonet Data near Area of Concern

Appendix A

Photograph Log 17 Photos



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 1

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: DSCN2370.JPEG

Orientation: N

Date of Photo: 04/13/2023

Time of Photo: 3:24 PM

Latitude: 34.1682567

Longitude: -97.3685767

Photographer: Jeanne Eckhart

Description: This was one of two active injection wells located on the A.E. Denney Lease B (#16 and #12).



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 2

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: DSCN2372.JPEG

Orientation: N

Date of Photo: 04/13/2023

Time of Photo: 3:24 PM

Latitude: 34.1682567

Longitude: -97.3685767

Photographer: Jeanne Eckhart

Description: This was one of two active injection wells located on the A.E. Denney Lease B (#16 and #12). This well's tubing gauge (company gauge) showed approximately 1000 psig during the inspection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 3

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: DSCN2373.JPEG

Orientation: NW

Date of Photo: 04/13/2023

Time of Photo: 3:25 PM

Latitude: 34.1682567

Longitude: -97.3685767

Photographer: Jeanne Eckhart

Description: This was second of two active injection wells located on the A.E. Denney Lease B (#16 and #12).



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 4

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: DSCN2376.JPEG

Orientation: N

Date of Photo: 04/13/2023

Time of Photo: 3:26 PM

Latitude: 34.1682567

Longitude: -97.3685767

Photographer: Jeanne Eckhart

Description: This was second of two active injection wells located on the A.E. Denney Lease B (#16 and #12). This well's tubing gauge (company gauge) showed approximately 600 psig during the inspection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 5

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: DSCN2389.JPEG

Orientation: W

Date of Photo: 04/13/2023

Time of Photo: 3:35 PM

Latitude: 34.1682567

Longitude: -97.3685767

Photographer: Jeanne Eckhart

Description: This shows some surface eroded and potentially contaminated area on the A.E. Denny B Lease located downhill from the nearby tank battery and directly south of the injection wells on the lease. This had some small pooling of fluids during the inspection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 6

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: DSCN2388.JPEG

Orientation: W

Date of Photo: 04/13/2023

Time of Photo: 3:35 PM

Latitude: 34.1682567

Longitude: -97.3685767

Photographer: Jeanne Eckhart

Description: This shows some surface eroded and potentially contaminated area on the A.E. Denny B Lease located downhill from the nearby tank battery and directly south of the injection wells on the lease. This had some small pooling of fluids during the inspection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 7

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: DSCN2388.JPEG

Orientation: W

Date of Photo: 04/13/2023

Time of Photo: 3:35 PM

Latitude: 34.1682567

Longitude: -97.3685767

Photographer: Jeanne Eckhart

Description: This photo shows that a Total Dissolved Solids (TDS) reading was taken with a properly calibrated YSI Pro 30 Conductivity Meter during the inspection of the fluids observed near the injection wells on the A.E. Denny B Lease (located downhill from the nearby tank battery and directly south of the injection wells on the lease). An elevated TDS reading of 11,794 milligrams per liter (mg/L) was observed during the inspection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 8

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: IMG_2315.JPEG

Orientation: NW

Date of Photo: 04/13/2023

Time of Photo: 1:58 PM

Latitude: 34.1689305

Longitude: -97.3594692

Photographer: Jeanne Eckhart

Description: This photo shows an upstream view of Walnut Creek during the inspection, downstream from multiple inspection points including the A.E. Denney B Lease and the Bayou Unit area. Walnut Creek had ordinary high water mark, bed features, bank features, and riparian vegetation at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 9

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: IMG_2314.JPEG

Orientation: NE

Date of Photo: 04/13/2023

Time of Photo: 1:58 PM

Latitude: 34.1689305

Longitude: -97.3594692

Photographer: Jeanne Eckhart

Description: This photo shows a downstream view of Walnut Creek during the inspection, downstream from multiple inspection points including the A.E. Denney B Lease and the Bayou Unit area. Walnut Creek had ordinary high water mark, bed features, bank features, and riparian vegetation at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 10

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: IMG_2316.JPEG

Orientation: NE

Date of Photo: 04/13/2023

Time of Photo: 1:58 PM

Latitude: 34.1689305

Longitude: -97.3594692

Photographer: Jeanne Eckhart

Description: This photo shows a view of Walnut Creek during the inspection, downstream from multiple inspection points including the A.E. Denney B Lease and the Bayou Unit area. Walnut Creek had ordinary high water mark, bed features, bank features, and riparian vegetation at this location. The water in this location was discolored in comparison to the rest of the creek and looked darker and black.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 11

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: IMG_2317.JPEG

Orientation: NE

Date of Photo: 04/13/2023

Time of Photo: 1:59 PM

Latitude: 34.1689305

Longitude: -97.3594692

Photographer: Jeanne Eckhart

Description: This photo shows a view of Walnut Creek during the inspection, downstream from multiple inspection points including the A.E. Denney B Lease and the Bayou Unit area. An elevated TDS reading of 11,431 mg/L was taken at this location during the inspection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 12

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: IMG_2396.JPEG

Orientation: NE

Date of Photo: 04/13/2023

Time of Photo: 4:40 PM

Latitude: 34.160936

Longitude: -97.334881

Photographer: Jeanne Eckhart

Description: This photo shows an upstream view of Walnut Creek. This location is downstream from the Bayou Unit and documented TDS readings along Walnut Creek. Bed, bank, and riparian vegetation were observed in this location of the creek. We were standing on a large bridge along Texaco Road over the creek at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 13

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: IMG_2396.JPEG

Orientation: NE

Date of Photo: 04/13/2023

Time of Photo: 4:40 PM

Latitude: 34.160936

Longitude: -97.334881

Photographer: Jeanne Eckhart

Description: This photo shows a downstream view of Walnut Creek. This location is downstream from the Bayou Unit and documented TDS readings along Walnut Creek. Bed, bank, and riparian vegetation were observed in this location of the creek. We were standing on a large bridge along Texaco Road over the creek at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 14

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: IMG_2396.JPEG

Orientation: NE

Date of Photo: 04/13/2023

Time of Photo: 4:40 PM

Latitude: 34.160936

Longitude: -97.334881

Photographer: Jeanne Eckhart

Description: This photo shows a TDS reading of 2,674 mg/L in Walnut Creek at this location. This location is downstream from the Bayou Unit and documented TDS readings along Walnut Creek. Bed, bank, and riparian vegetation were observed in this location of the creek. We were standing on a large bridge along Texaco Road over the creek at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 15

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: IMG_2393.JPEG

Orientation: NE

Date of Photo: 04/13/2023

Time of Photo: 4:13 PM

Latitude: 34.173383

Longitude: -97.372372

Photographer: Jeanne Eckhart

Description: This photo shows an upstream view of Walnut Creek at this location, which is background of Walnut Creek. This location is upstream from the Bayou Unit and documented TDS readings along Walnut Creek. Bed, bank, and riparian vegetation were observed in this location of the creek. We were under a large bridge along Hwy. 70 at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 16

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: IMG_2392.JPEG

Orientation: SE

Date of Photo: 04/13/2023

Time of Photo: 4:13 PM

Latitude: 34.173383

Longitude: -97.372372

Photographer: Jeanne Eckhart

Description: This photo shows a downstream view of Walnut Creek at this location, which is background of Walnut Creek. This location is upstream from the Bayou Unit and documented TDS readings along Walnut Creek. Bed, bank, and riparian vegetation were observed in this location of the creek. We were under a large bridge along Hwy. 70 at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 17

Location: 34.166360, -97.360020		
City: Lone Grove	City: Lone Grove	City: Lone Grove



Photo File Name: IMG_2391.JPEG

Orientation: SE

Date of Photo: 04/13/2023

Time of Photo: 4:13 PM

Latitude: 34.173383

Longitude: -97.372372

Photographer: Jeanne Eckhart

Description: This photo shows a downstream view of Walnut Creek at this location, which is background of Walnut Creek. This location is upstream from the Bayou Unit and documented TDS readings along Walnut Creek. A TDS reading was of 1,713 mg/L. We were under a large bridge along Hwy. 70 at this location.

Appendix B

Wells in Area of Concern

3501907054	OTC/OCC NOT ASSIGNED	J C SULLIVAN	#11	PA	OIL	36	04S	02W	E2	SE	NW	SW	-97.3664484	34.1629844	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37725
3501907056	OTC/OCC NOT ASSIGNED	BAYOU UNIT (SULLIVAN 12)	#38	PA	OIL	36	04S	02W		NW4	NW4	SW4	-97.3686299	34.1647976	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37728
3501907057	OTC/OCC NOT ASSIGNED	BAYOU UNIT (W.J. CASSIDY 1)	#95	PA	2RIn	36	04S	02W	C	NE	SE	SW	-97.3620855	34.1611713	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37729
3501907062	OTC/OCC NOT ASSIGNED	CASSIDY (BAYOU UNIT 97)	#1-B	PA	OIL	36	04S	02W		NE	SE	SW	-97.3620855	34.1611713	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37735
3501907068	OTC/OCC NOT ASSIGNED	BAYOU UNIT (SULLIVAN A16)	#102	PA	OIL	36	04S	02W	W2	NW	SE	SW	-97.3642669	34.1611711	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37742
3501907070	OTC/OCC NOT ASSIGNED	BAYOU UNIT (CLARK-MCALESTER 4)	#117	PA	2RIn	36	04S	02W	SE	SW	SE	SW	-97.3642669	34.1593577	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37744
3501907073	OTC/OCC NOT ASSIGNED	BAYOU UNIT (CLARK 4B)	#97	PA	OIL	36	04S	02W	NE	NE	SW	SW	-97.365903	34.1616243	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37747
3501907078	OTC/OCC NOT ASSIGNED	BAYOU UNIT (A.B. CLARK 4-C)	#106	PA	OIL	36	04S	02W	SE	NE	SW	SW	-97.3664484	34.1611709	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37752
3501911866	OTC/OCC NOT ASSIGNED	RAMSEY JESSIE M	#1	PA	OIL	36	04S	02W	NW	NW	SE	NW	-97.3648123	34.1688784	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=455148
3501920766	OTC/OCC NOT ASSIGNED	DENNY-SMITH UNIT	#1	PA	DRY	36	04S	02W		C	SW	NW	-97.3675392	34.1675179	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=43603
3501906979	RAMSEY GEORGE H ESTATE	RAMSEY	#1	AC	OIL	36	04S	02W		NW4	SE4	NW4	-97.36427	34.168425	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37637
3501907061	SIMMONS L B ENERGY INC	BAYOU (CLARK-MCALESTER 1)	#114	PA	TM	36	04S	02W		SW4	SE4	SW4	-97.3642669	34.1593577	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37734
3501907067	SIMMONS L B ENERGY INC	BAYOU (SULLIVAN A15)	#101	PA	OIL	36	04S	02W		NW4	SE4	SW4	-97.3642669	34.1611711	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37740
3501906973	SULLIVAN JESSE G	RAMSEY	#1	PA	OIL	36	04S	02W	C	SW	SE	NW	-97.3642669	34.1666116	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37629
3501907082	SULLIVAN JESSE G	RAMSEY	#2	PA	OIL	36	04S	02W	SW	SW	SE	NW	-97.3642669	34.1666116	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37756
3501911875	TEXACO EXPLORATION & PROD INC	A.E. DENNY "B"	#2	PA	OIL	36	04S	02W	SE	SE	NW	NW	-97.3659031	34.169785	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=41273
3501900655	TRIPLEDEE OPERATING COMPANY LLC	WESTHEIMER C	#1	PA	OIL	36	04S	02W	SW	SW	NE	NW	-97.36427	34.170239	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=31830
3501906967	TRIPLEDEE OPERATING COMPANY LLC	RAMSEY	#3	PA	TM	36	04S	02W	C	NW	SW	NE	-97.35946	34.16811	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37622
3501925346	WILLIAMS JACK W	CONWAY	#1	PA	DRY	36	04S	02W	C	NW	NW	NE	-97.36011111	34.17186111	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=455783
3501911865	WILLIFORD ENERGY COMPANY	M.D. SMITH	#1	PA	OIL	36	04S	02W	NE	SE	SW	NW	-97.365903	34.1670648	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=41265
3501900667	WILLIFORD PETROLEUM LLC	A E DENNY "B"	#4	AC	OIL	36	04S	02W	NE	NE	SW	NW	-97.36645	34.168425	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=31842
3501906988	WILLIFORD PETROLEUM LLC	A.E. DENNY "B"	#14	TA	OIL	36	04S	02W		NW4	SW4	NW4	-97.36848	34.16825	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37648
3501906989	WILLIFORD PETROLEUM LLC	A.E. DENNY "B"	#15	AC	OIL	36	04S	02W	W2	NE	SW	NW	-97.36645	34.168425	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37649
3501911878	WILLIFORD PETROLEUM LLC	DENNEY "B"	#6	AC	OIL	36	04S	02W				NW4	-97.3653577	34.1693317	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=41275
3501911883	WILLIFORD PETROLEUM LLC	DENNY A.E. "B"	#13	AC	OIL	36	04S	02W	C	NE	SW	NW	-97.36645	34.168425	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=41278
3501907575	WILLIFORD PETROLEUM LLC	DENNY A.E. "B"	#18	PA	OIL	36	04S	02W	C	SE	NW	NW	-97.36645	34.170238	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=38155
3501906986	WILLIFORD PETROLEUM LLC	A. E. DENNY "B"	#12	AC	2RIn	36	04S	02W		NW	SW	NW	-97.36857	34.16843	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=37645
3501911884	WILLIFORD PETROLEUM LLC	A E DENNY B	#16	AC	2RIn	36	04S	02W	C	NW	SW	NW	-97.3686042	34.1683301	http://wellbrowse.occ.ok.gov/Webforms/WellInformation.aspx?ID=41279

Table 2. Curernt Identified Water Wells in or near Area of Concern

Latitude	Longitude	Well ID	Work Type	Owner Name	Q1	Q2	Q3	Section	Township	Range	Use Class	Total Depth (ft)	First Water (ft)	Approximate Yield (GPM)	Construction Date	OWRB Link
34.17	-97.35	13474	Groundwater Well	Joey Offield	NE	NW	NW	31	04S	01WI	Domestic	160	50	25	1/21/1986	http://www.owrb.ok.gov/wd/reporting/printreport.php?siteid=13474
34.17	-97.33	13475	Groundwater Well	CNG Trailer House	SE	NW	NW	32	04S	01WI	Domestic	260	80	20	5/5/1989	http://www.owrb.ok.gov/wd/reporting/printreport.php?siteid=13475
34.16	-97.34	13570	Groundwater Well	Edwin Tailaffero	NW	NW	NE	6	05S	01WI	Domestic	140	39	22	4/18/1987	http://www.owrb.ok.gov/wd/reporting/printreport.php?siteid=13570
34.16	-97.36	104810	Groundwater Well	Noble Energy	SE	NE	SW	36	04S	02WI	Domestic	600			9/4/2006	http://www.owrb.ok.gov/wd/reporting/printreport.php?siteid=104810
34.16	-97.36	116773	Groundwater Well	Noble Energy	NW	NE	NE	1	05S	02WI	Domestic	80				http://www.owrb.ok.gov/wd/reporting/printreport.php?siteid=116773
34.16	-97.36	116774	Groundwater Well	Noble Energy	SW	SE	SE	36	04S	02WI	Domestic	120				http://www.owrb.ok.gov/wd/reporting/printreport.php?siteid=116774
34.16	-97.33	123970	Groundwater Well	Dean Ellis	NW	NW	NW	5	05S	01WI	Domestic	90	70	13	5/4/2009	http://www.owrb.ok.gov/wd/reporting/printreport.php?siteid=123970
34.16	-97.34	181709	Groundwater Well	Offield Bayou Ranch	SW	SW	SE	31	04S	01WI	Domestic	120	60	15	5/15/2017	http://www.owrb.ok.gov/wd/reporting/printreport.php?siteid=181709
34.17	-97.33	183969	Groundwater Well	Michael Shorter	SW	SE	NW	32	04S	01WI	Domestic	185	100	25	12/4/2017	http://www.owrb.ok.gov/wd/reporting/printreport.php?siteid=183969

Appendix C

Mesonet Data near Area of Concern

MESONET CLIMATOLOGICAL DATA SUMMARY (ARD2) Ardmore Latitude: 34-11-33	April 2023 Nearest City: 3.5 ENE Ardmore Longitude: 97-05-08	Time Zone: Midnight-Midnight CST County: Carter Elevation: 873 feet
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DAY	TEMPERATURE (F)				DEG DAYS		HUMIDITY (%)			RAIN	PRESSURE (in)		WIND SPEED (mph)			SOLAR	4" SOIL TEMPERATURES				
	MAX	MIN	AVG	DEWPT	HDD	CDD	MAX	MIN	AVG	(in)	STN	MSL	DIR	AVG	MAX	(MJ/m2)	SOD	BARE	MAX	MIN	
1	70	49	59.3	31.0	6	0	69	24	35	0.00	29.18	30.11	N	6.9	21.6	25.48	58.5	60.5	70	53	
2	78	47	61.4	48.2	2	0	99	34	65	0.49	28.92	29.85	SSE	9.2	33.5	15.52	58.4	60.5	68	54	
3	87	57	73.4	56.7	0	7	100	19	64	0.01	28.69	29.61	SSW	10.5	24.5	25.79	61.5	63.8	70	59	
4	79	69	73.8	67.6	0	9	93	69	81	0.00	28.61	29.53	S	13.0	30.4	10.76	64.5	66.8	69	64	
5	74*	43*	55.0*	36.1*	7*	0*	93*	26*	51*	0.00*	29.05*	29.98*	NNW*	9.8*	30.5*	NA	62.7*	64.6*	71*	57*	
6	62	40	50.9	29.5	14	0	69	27	46	0.00	29.34	30.28	NE	9.1	26.5	17.93	57.9	58.3	65	52	
7	67	39	53.5	37.6	12	0	81	33	57	0.00	29.31	30.25	E	6.2	21.4	23.05	56.8	59.3	70	50	
8	72	50	60.1	39.9	4	0	81	21	51	0.00	29.22	30.15	ENE	3.9	13.5	25.73	59.9	66.2	77	58	
9	74	44	60.1	49.2	6	0	90	50	68	0.00	29.24	30.18	E	4.7	15.5	19.60	59.6	65.3	74	57	
10	74	50	61.8	52.3	3	0	100	42	74	0.00	29.30	30.24	SE	5.0	15.2	22.80	61.2	67.6	78	59	
11	75	48	62.7	49.6	4	0	100	38	66	0.00	29.28	30.22	SE	5.9	18.7	25.56	61.9	68.9	79	60	
12	76	47	63.8	49.0	3	0	96	37	61	0.00	29.10	30.04	SSE	6.5	22.7	26.15	62.1	69.3	79	60	
13	78	53	65.6	51.0	0	0	93	33	63	0.00	28.88	29.80	S	7.3	20.3	26.18	63.1	70.7	80	62	
14	78	58	68.6	57.7	0	3	86	49	69	0.00	28.76	29.69	S	11.6	30.5	20.23	63.8	70.8	77	64	
15	69	49	64.6	52.2	6	0	99	39	67	0.00	28.95	29.88	NNW	10.6	29.6	24.16	65.1	72.0	79	67	
16	69	41	55.4	34.6	10	0	82	23	50	0.00	29.27	30.20	NW	6.9	28.5	27.14	61.9	67.7	77	59	
17	79	41	62.1	40.6	5	0	94	25	51	0.00	29.07	30.01	S	7.8	26.2	26.21	61.4	67.8	77	58	
18	76	55	65.5	55.1	0	1	86	50	70	0.00	28.88	29.81	SSE	11.5	29.0	14.65	62.6	68.3	74	63	
19	83	64	72.9	62.7	0	9	86	56	71	0.00	28.83	29.76	S	14.4	34.3	19.16	65.0	71.1	78	65	
20	72	54	66.8	53.3	2	0	85	40	63	0.00	28.96	29.89	N	9.7	32.8	17.03	66.3	72.4	78	69	
21	73	48	59.7	37.1	4	0	74	22	46	0.00	29.06	30.00	NNE	5.9	22.7	24.97	64.2	69.8	80	62	
22	59	42	50.4	36.8	14	0	93	37	63	0.09	29.11	30.05	NE	8.9	27.1	11.10	61.1	64.2	68	60	
23	56	40	47.4	41.2	17	0	98	51	81	0.03	29.21	30.15	NNE	3.2	12.9	10.28	59.0	59.4	64	57	
24	65	40	54.5	41.6	13	0	100	36	66	0.00	29.14	30.08	ESE	6.4	20.4	19.25	58.6	61.0	70	54	
25	66	52	56.3	47.7	6	0	86	58	73	0.00	29.02	29.95	E	9.9	23.1	10.15	59.7	62.6	66	59	
26	61	50	54.3	52.6	9	0	100	84	94	1.69	28.97	29.90	E	10.3	29.4	8.17	58.3	59.6	63	55	
27	61	48	56.2	53.4	10	0	100	71	91	0.07	28.89	29.82	WNW	4.7	20.6	8.68	59.5	60.5	63	58	
28	65	44	53.9	49.6	11	0	100	66	87	0.01	28.93	29.86	NNW	6.7	23.4	10.29	58.4	57.8	62	53	
29	69	49	57.5	43.5	6	0	89	34	63	0.00	29.00	29.93	NNW	9.3	27.3	27.46	59.7	60.0	67	54	
30	74	48	61.2	43.1	4	0	87	29	55	0.00	28.96	29.89	NE	6.2	24.3	27.31	61.0	63.1	74	54	
	71*	49*	60.3*	46.7*	<- Monthly Averages ->						29.04*	29.97*	S	*	8.1*	34.3*	19.68*	61.1*	65.0*	72*	59*
Temperature - Highest: 87*							Degree Days - Total HDD: 179*						Number of Days With: Tmax ≥ 90: 0* Rainfall ≥ 0.01 inch: 7* Tmax ≤ 32: 0* Rainfall ≥ 0.10 inch: 2* Tmin ≤ 32: 0* Avg Wind Speed ≥ 10 mph: 7* Tmin ≤ 0: 0* Max Wind Speed ≥ 30 mph: 6*								
Lowest: 39*							Total CDD: 29*														
Rainfall: Monthly Total: 2.39* in.							Humidity - Highest: 100*														
Greatest 24 Hr: 1.69* in.							Lowest: 19*														

MESONET CLIMATOLOGICAL DATA SUMMARY
(NEWP) Newport
Latitude: 34-13-41

April 2023
Nearest City: 7.0 WNW Ardmore
Longitude: 97-12-05

Time Zone: Midnight-Midnight CST
County: Carter
Elevation: 928 feet

DAY	TEMPERATURE (F)				DEG DAYS		HUMIDITY (%)			RAIN	PRESSURE (in)		WIND SPEED (mph)			SOLAR	4" SOIL TEMPERATURES				
	MAX	MIN	AVG	DEWPT	HDD	CDD	MAX	MIN	AVG	(in)	STN	MSL	DIR	AVG	MAX	(MJ/m2)	SOD	BARE	MAX	MIN	
1	69	49	58.8	30.6	6	0	55	23	35	0.00	29.12	30.11	N	7.9	26.2	25.74	55.7	58.9	68	52	
2	78	47	61.1	48.4	3	0	96	36	66	0.54	28.85	29.84	SE	10.5	39.8	16.13	55.8	58.3	66	52	
3	87	57	73.4	54.4	0	7	98	18	60	0.01	28.62	29.61	S	11.3	28.9	25.83	57.0	62.9	70	58	
4	78	69	73.6	67.1	0	9	91	70	80	0.00	28.55	29.53	S	15.9	31.8	10.73	58.8	65.9	69	63	
5	74*	42*	54.0*	35.2*	7*	0*	89*	29*	51*	0.00*	29.00*	29.99*	NNW*	11.6*	28.7*	NA	58.3*	61.4*	66*	55*	
6	62	42	51.4	28.4	13	0	62	24	42	0.00	29.27	30.27	NE	9.5	28.3	18.98	56.2	54.5	61	49	
7	67	40	53.8	35.3	11	0	76	27	52	0.00	29.25	30.25	NE	6.8	21.7	23.59	55.5	55.5	64	48	
8	73	53	61.1	38.2	2	0	71	20	45	0.00	29.16	30.15	E	4.5	14.7	25.93	56.4	61.5	71	55	
9	73	45	60.5	48.6	6	0	83	50	65	0.00	29.18	30.18	E	5.5	14.1	17.55	56.7	60.4	68	53	
10	75	50	61.6	51.6	3	0	98	40	72	0.00	29.24	30.24	E	5.4	16.6	21.81	57.3	62.7	71	55	
11	75	50	63.0	49.7	3	0	97	39	65	0.00	29.22	30.22	SE	6.7	19.2	25.56	57.8	64.1	73	56	
12	76	49	64.0	48.3	2	0	88	38	59	0.00	29.04	30.03	SSE	8.1	22.4	26.46	58.0	64.7	74	56	
13	78	53	65.6	50.4	0	1	92	34	61	0.00	28.81	29.80	SSE	9.2	21.6	26.31	58.5	66.2	76	58	
14	79	57	68.3	57.3	0	3	85	51	69	0.00	28.70	29.68	SSE	14.3	35.7	20.77	59.1	66.7	73	60	
15	70	48	63.8	50.7	6	0	97	39	65	0.00	28.90	29.89	NNW	11.9	34.2	25.19	59.7	67.8	74	63	
16	69	38	55.7	32.8	11	0	86	23	47	0.00	29.21	30.21	NW	7.8	24.3	27.35	58.1	62.7	71	54	
17	79	39	62.7	40.1	6	0	91	24	48	0.00	29.01	30.00	SSE	8.9	27.3	26.33	57.6	63.7	74	54	
18	74	55	64.9	54.9	1	0	87	53	70	0.00	28.82	29.81	SSE	12.9	31.3	14.30	58.4	64.5	70	59	
19	83	63	72.8	62.3	0	8	87	56	70	0.00	28.76	29.75	SSE	17.4	38.6	19.92	59.7	68.1	76	62	
20	73	55	66.7	51.5	1	0	83	34	60	0.00	28.90	29.89	S	11.1	36.1	16.12	60.6	68.7	73	64	
21	73	48	61.1	35.5	5	0	70	21	41	0.00	29.00	30.00	NNE	6.9	19.9	25.14	59.5	65.5	75	57	
22	59	44	51.3	36.3	14	0	88	39	58	0.06	29.05	30.05	NE	10.4	27.7	11.00	58.2	60.1	64	56	
23	57	42	48.0	39.8	16	0	95	47	75	0.05	29.15	30.15	NE	3.9	14.0	11.09	57.3	56.1	61	53	
24	65	41	54.5	41.0	12	0	95	38	64	0.00	29.08	30.07	ESE	7.0	19.3	19.49	57.1	58.3	66	52	
25	67	52	56.2	47.4	6	0	84	55	73	0.00	28.95	29.94	E	10.3	25.9	9.71	57.5	59.7	63	57	
26	60	49	54.0	51.4	10	0	97	82	91	1.40	28.91	29.90	E	10.6	29.0	7.21	56.8	57.4	60	54	
27	61	50	56.4	52.5	9	0	98	69	87	0.08	28.84	29.82	NW	5.8	21.2	9.50	57.1	59.1	62	57	
28	63	43	53.5	48.8	12	0	98	66	85	0.05	28.87	29.86	NNW	8.6	28.7	9.62	56.8	56.6	60	52	
29	69	48	57.8	42.5	7	0	88	32	60	0.00	28.94	29.93	NNW	11.5	32.9	27.76	56.9	58.3	65	53	
30	73	48	61.0	42.9	4	0	84	31	55	0.00	28.90	29.89	NNE	7.4	21.2	27.37	57.4	60.5	69	53	
	71*	49*	60.3*	45.8*	<- Monthly Averages ->						28.98* 29.97*		SSE* 9.3* 39.8*			19.74*	57.7*	61.7*	68*	56*	
Temperature - Highest: 87* Lowest: 38*							Degree Days - Total HDD: 174* Total CDD: 28*					Number of Days With: Tmax ≥ 90: 0* Rainfall ≥ 0.01 inch: 7* Tmax ≤ 32: 0* Rainfall ≥ 0.10 inch: 2* Tmin ≤ 32: 0* Avg Wind Speed ≥ 10 mph: 13* Tmin ≤ 0: 0* Max Wind Speed ≥ 30 mph: 8*									
Rainfall: Monthly Total: 2.19* in. Greatest 24 Hr: 1.40* in.							Humidity - Highest: 98* Lowest: 18*														

MESONET CLIMATOLOGICAL DATA SUMMARY (RING) Ringling Latitude: 34-11-37	April 2023 Nearest City: 1.0 N Ringling Longitude: 97-35-17	Time Zone: Midnight-Midnight CST County: Jefferson Elevation: 928 feet
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DAY	TEMPERATURE (F)				DEG DAYS		HUMIDITY (%)			RAIN	PRESSURE (in)		WIND SPEED (mph)			SOLAR	4" SOIL TEMPERATURES			
	MAX	MIN	AVG	DEWPT	HDD	CDD	MAX	MIN	AVG	(in)	STN	MSL	DIR	AVG	MAX	(MJ/m2)	SOD	BARE	MAX	MIN
1	70	47	56.9	32.9	6	0	67	22	41	0.00	29.12	30.12	N	7.7	23.8	25.81	57.3	59.7	71	50
2	80	48	61.3	49.5	1	0	97	39	67	0.26	28.84	29.83	SE	13.7	42.4	15.87	57.2	59.7	69	52
3	87	56	71.4	53.5	0	7	99	19	62	0.01	28.62	29.60	SSW	13.0	28.6	26.18	59.1	63.9	72	57
4	79	69	74.0	67.3	0	9	91	67	80	0.00	28.54	29.51	S	16.4	31.3	10.47	62.0	67.3	70	65
5	73	42	52.5	34.4	7	0	90	31	52	0.00	29.01	30.00	N	13.3	32.2	25.56	60.3	62.1	68	55
6	63	38	50.1	29.7	15	0	75	25	48	0.00	29.28	30.28	NE	11.9	28.8	20.89	56.9	56.4	65	49
7	69	38	53.2	35.6	12	0	79	25	55	0.00	29.25	30.25	ENE	9.1	25.4	25.64	56.2	58.1	70	48
8	72	50	60.0	41.7	4	0	79	31	53	0.00	29.16	30.15	ESE	5.3	13.8	25.30	58.2	65.1	77	57
9	73	46	59.9	48.7	6	0	89	52	67	0.00	29.18	30.18	E	7.3	17.0	19.81	58.4	64.1	74	55
10	74	50	62.2	52.2	3	0	98	39	73	0.00	29.24	30.23	ESE	7.7	19.3	23.28	59.6	67.0	78	57
11	75	50	62.3	50.0	3	0	96	40	67	0.00	29.21	30.21	SSE	8.9	20.5	25.98	60.3	68.4	79	59
12	76	48	62.2	48.0	3	0	88	38	62	0.00	29.04	30.03	SSE	9.9	25.6	26.69	60.2	68.0	79	58
13	78	50	64.4	51.2	1	0	93	41	65	0.00	28.81	29.79	SSE	10.7	22.5	26.48	60.7	69.1	80	59
14	78	57	68.2	58.1	0	2	89	57	71	0.00	28.68	29.67	SSE	16.2	33.6	22.65	61.7	70.2	78	62
15	71	46	62.6	49.5	6	0	97	36	65	0.00	28.91	29.90	NNW	13.0	35.2	25.13	62.3	70.2	78	65
16	70	38	54.9	33.9	11	0	88	22	50	0.00	29.22	30.21	NW	7.7	27.3	27.49	59.9	66.1	77	56
17	79	39	61.9	39.7	6	0	87	25	48	0.00	29.00	29.99	SSE	10.6	27.9	26.41	59.4	66.9	78	56
18	75	54	64.9	55.4	0	0	87	58	71	0.00	28.80	29.79	SSE	16.1	32.7	15.10	60.6	67.3	74	61
19	85	62	73.4	62.5	0	9	87	50	70	0.00	28.74	29.73	SSE	19.6	40.3	21.74	62.8	71.2	80	64
20	75	52	66.4	50.1	1	0	88	31	58	0.00	28.90	29.89	N	13.2	35.6	17.57	63.4	71.5	77	66
21	73	46	59.8	34.3	6	0	69	20	42	0.00	29.01	30.00	NNE	8.9	24.4	25.76	61.4	68.5	80	59
22	58	44	51.0	35.3	14	0	85	37	57	0.04	29.05	30.05	NNE	14.8	31.6	10.57	59.5	61.9	66	57
23	57	41	47.9	39.3	16	0	91	43	74	0.03	29.16	30.15	NNE	5.0	18.9	10.78	58.2	57.1	63	54
24	67	40	54.7	41.2	11	0	95	38	64	0.00	29.07	30.07	E	9.7	24.3	20.37	58.3	60.2	70	52
25	68	53	58.5	49.0	4	0	83	58	71	0.00	28.94	29.93	ESE	14.5	27.9	10.65	59.3	62.5	68	59
26	63	50	55.2	51.6	8	0	98	75	88	2.08	28.90	29.89	E	13.9	37.1	11.16	57.5	59.9	64	55
27	62	48	56.2	51.9	10	0	98	64	86	0.04	28.85	29.83	NW	8.2	24.4	12.03	58.9	60.6	64	57
28	63	46	53.5	48.9	11	0	97	66	85	0.10	28.88	29.87	NNW	11.4	32.1	8.06	58.2	56.5	60	53
29	70	44	57.8	42.5	8	0	92	34	60	0.00	28.96	29.95	NNW	12.1	31.8	28.66	58.7	58.3	66	51
30	74	47	60.9	43.9	5	0	89	32	57	0.00	28.90	29.89	NNE	8.6	21.3	26.94	59.5	60.6	69	52
	72	48	59.9	46.1	<- Monthly Averages ->						28.98	29.97	SSE	11.3	42.4	20.63	59.5	63.9	72	57

Temperature - Highest: 87 Lowest: 38	Degree Days - Total HDD: 181 Total CDD: 26	Number of Days With: Tmax ≥ 90: 0 Rainfall ≥ 0.01 inch: 7 Tmax ≤ 32: 0 Rainfall ≥ 0.10 inch: 3 Tmin ≤ 32: 0 Avg Wind Speed ≥ 10 mph: 17 Tmin ≤ 0: 0 Max Wind Speed ≥ 30 mph: 12
Rainfall: Monthly Total: 2.56 in. Greatest 24 Hr: 2.08 in.	Humidity - Highest: 99 Lowest: 19	