

Region 6 Compliance Assurance and Enforcement Division

INSPECTION REPORT

Inspection Date(s):	April 30, 2018		
Media:	Water (CWA)		
Regulatory Program(s)	NPDES – Brine		
Company Name:	Perdure Petroleum, LLC		
Facility Name:	<i>North Burbank Unit 56-12</i>		
Facility Physical Location:	36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
(city, state, zip code)	Shidler, Oklahoma 74652		
Mailing address:	101 N. Robinson Ave. 13th Floor		
(city, state, zip code)	Oklahoma City, Oklahoma 73102		
County/Parish:	Okmulgee		
Facility Contact:	Robert Sutherland		
	(281) 668 – 8488; bobs@perdurepetro.com		
FRS Number:	N/A		
Identification/Permit Number:	OKU000870		
Media Number:	N/A		
NAICS:	211111		
SIC:	1311		
Personnel participating in inspection:			
Kent W. Sanborn	EPA Region 6, 6EN-WR	Environmental Engineer	918-557-1615
EPA Lead Inspector Signature/Date			
	Kent W. Sanborn		Date
Supervisor Signature/Date			19 JUN 2018
	Guy Tidmore		Date

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

EPA Region 6 inspector Kent W. Sanborn arrived at the Perdure Petroleum, LLC, North Burbank Unit 56-12 lease on a property near Shidler, Osage County, Oklahoma at about 11:00 am on April 30, 2018 for an inspection. The inspection was initiated by a reported discharge of fluids into a nearby water body by Perdure Petroleum, LLC. There were several company representatives at the site during the inspection. The discharge had reached a tributary of Mud Creek. Cleanup activities were active at the site during the inspection. The inspection was conducted under the authority of Section 308 of the Clean Water Act (CWA). The scope of the inspection was to determine if the facility was in compliance with the CWA, including Section 301, and to identify and document discharges of produced wastewater (brine) to waters of the United States.

FACILITY DESCRIPTION

The origination point of discharge was from a plastic flowline that parted at a welded joint and leaked brine fluids to the tributary of Mud Creek. That line was just northwest of a tributary of Mud Creek. Mud Creek was braided with several tributaries joining together in this area and the discharge occurred in a tributary of Mud Creek. This facility is located directly behind the Perdure field office, which is west of Shidler, Oklahoma.

Section II – OBSERVATIONS

I initially arrived at the Perdure Petroleum, LLC, North Burbank Unit 56-12 lease at about 11:00 am on April 30, 2018. Photo 1 shows the nearest well to the flow line break located a few yards southeast of the discharge point of produced water, or brine. The flow line, which was repaired at the time of the inspection is shown in Photo 2. The flow path of brine and oil flowed south (Photo 3) then southeast (Photo 4) toward the tributary of Mud Creek. The point of entry to the tributary of Mud Creek and the first temporary dam are shown in Photo 5. A Specific Conductance field reading taken with a calibrated YSI 30 Conductivity Meter at the point of entry, from fluids at the first temporary dam, was 105.7 milliSiemens/centimeters (mS/cm), which was converted to 68,705 milligrams/Liter (mg/L) Total Dissolved Solids (TDS) as shown in Appendix 2 (Photo 6 in Appendix 1). A second dam was constructed on the tributary farther south, downstream from the point of entry (Photo 7). Numerous dead fish were seen at this point (Photos 8,9, and 10). A Specific Conductance field reading taken at the second temporary dam, from fluids at the second temporary dam was 77.7 mS/cm, which was converted to 50,505 mg/L TDS as shown in Appendix 2 (Photo 11 in Appendix 1). The third temporary dam was located downstream from the second temporary dam, where an additional branch to the tributary of Mud Creek was flowing into the tributary from the northeast shown in Photo 12. A Specific Conductance field reading taken at the third temporary dam, from fluids at the third temporary dam was 117.5 mS/cm, which was converted to 76,375 mg/L TDS as shown in Appendix 2 (Photo 13 in Appendix 1). Farther downstream trucks were removing brine from the tributary of Mud Creek (Photo 14). I observed several crayfish and a turtle were found dead in this area of the tributary (Photos 15, 16, and 17). An additional Specific Conductance field reading was taken at the third temporary dam and

was 101.9 mS/cm, which was converted to 66,235 mg/L TDS as shown in Appendix 2 (Photo 18 in Appendix 1). A pump was being used downstream to pump water from a 4th dammed area in the tributary of Mud Creek (Photo 19). That water was being sent to a frac tank (Photo 20) south. An additional Specific Conductance field reading was taken from the tributary of Mud Creek at Photo No. 20 location and was 5.45 mS/cm, which was converted to 3,542.5 mg/L TDS as shown in Appendix 2 (Photo 21 in Appendix 1). The tributary near the frac tank location is shown in Photo 22. The tributary of Mud Creek was joined by another branch of Mud Creek coming from the northeast. The confluence of these two tributaries was downstream of all the temporary dams within the tributary of Mud Creek. A Specific Conductance field reading was taken below the confluence of tributaries at Photo No. 22 location and was 1,227 microSiemens/centimeters (uS/cm), which was converted to 797.5 mg/L TDS as shown in Appendix 2 (Photo 23 in Appendix 1). An unaffected upstream area in a tributary of Mud Creek, which was upstream from the contaminated area near the third temporary dam and is shown in Photo 24. This tributary was the first branch that joined the contaminated tributary of Mud Creek near the third dam site. A Specific Conductance field reading was taken at the location shown in Photo No. 24, an unaffected portion of the tributary of Mud Creek and was 1,156 uS/cm, which was converted to 751.4 mg/L TDS as shown in Appendix 2 (Photo 25 in Appendix 1).

Section III – AREAS OF CONCERN

There was dead aquatic life along the tributary of Mud Creek, including less than 50 dead fish, dead crayfish, and one dead turtle. There were onsite remedial activities ongoing during the inspection. I observed elevated levels of TDS in the tributary of Mud Creek from a flow line that leaked. I observed a flow path from the flow line that leaked to the tributary of Mud Creek.

Section IV – FOLLOW UP

A follow up inspection will be conducted as needed.

Section V – LIST OF APPENDICES

Appendix 1 – Photo Log – 25 photos taken 4/30/2018.

Appendix 2 – Table 1: Conversion of Specific Conductance Readings to Total Dissolved Solids.

Appendix 1

Photographic Log (25 photos)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 1

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 1 (DSC_0034)

Orientation: South

Date of Photo: 04/30/2018

Time of Photo: 11:28 am

Latitude: 36.794062N

Longitude: -96.737850W

Photographer: K.W. Sanborn

Description: This photo shows the sign at the Perdure Petroleum, LLC, North Burbank Unit 56-12. A discharge of produced fluids (brine) originated in a line a few yards from the injection well at this site.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 2

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 2 (DSC_0035)

Orientation: Northwest

Date of Photo: 04/30/2018

Time of Photo: 11:28 am

Latitude: 36.794062N

Longitude: -96.737850W

Photographer: K.W. Sanborn

Description: The line shown parted and temporarily repaired after spilling produced water, or brine, and some oil to the nearby tributary of Mud Creek.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 3

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 3 (DSC_0033)

Orientation: Northwest

Date of Photo: 04/30/2018

Time of Photo: 11:28 am

Latitude: 36.794062N

Longitude: -96.737850W

Photographer: K.W. Sanborn

Description: The discharge of brine flowed from the leaking flow line south towards the tributary of Mud Creek, as shown in this photo.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 4

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 4 (DSC_0037)

Orientation: Southeast

Date of Photo: 04/30/2018

Time of Photo: 11:29 am

Latitude: 36.793801N

Longitude: -96.737920W

Photographer: K.W. Sanborn

Description: This discharge flow path flowed towards the tributary of Mud Creek located near the tank truck seen in this photo.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 5

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 5 (DSC_0038)

Orientation: South

Date of Photo: 04/30/2018

Time of Photo: 11:33 am

Latitude: 36.791907N

Longitude: -96.737520W

Photographer: K.W. Sanborn

Description: The first temporary dam along the flow path at the point of entry to the tributary of Mud Creek is shown here. I observed oil sheen at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 6

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 6 (DSC_0046)

Orientation: South

Date of Photo: 04/30/2018

Time of Photo: 11:58 am

Latitude: 36.791907N

Longitude: -96.737520W

Photographer: K.W. Sanborn

Description: A Specific Conductance field reading was taken with a calibrated YSI 30 Conductivity Meter at the point of entry, from fluids at the first temporary dam was 105.7 milliSiemens/centimeters (mS/cm), which was converted to 68,705 milligrams/Liter (mg/L) Total Dissolved Solids (TDS) as shown in Appendix 2.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 7

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 7 (DSC_0039)

Orientation: South

Date of Photo: 04/30/2018

Time of Photo: 11:34 am

Latitude: 36.791442N

Longitude: -96.737577W

Photographer: K.W. Sanborn

Description: The brine flowed south to the second temporary dam in the tributary of Mud Creek shown here.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 8

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 8 (DSC_0040)

Orientation: South

Date of Photo: 04/30/2018

Time of Photo: 11:35 am

Latitude: 36.791442N

Longitude: -96.737577W

Photographer: K.W. Sanborn

Description: I observed dead fish along the tributary of Mud Creek the second temporary dam location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 9

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 9 (DSC_0041)

Orientation: East

Date of Photo: 04/30/2018

Time of Photo: 791442N

Latitude: 36.737577W

Longitude: -96.120737W

Photographer: K.W. Sanborn

Description: I observed more dead fish in and around the second temporary dam 2 location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 10

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 10 (DSC_0042)

Orientation: East

Date of Photo: 04/30/2018

Time of Photo: 11:35 am

Latitude: 36.791442N

Longitude: -96.737577W

Photographer: K.W. Sanborn

Description: I observed another dead fish at the second dam site in the tributary of Mud Creek.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 11

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 11 (DSC_0048)

Orientation: East

Date of Photo: 04/30/2018

Time of Photo: 11:58 am

Latitude: 36.791442N

Longitude: -96.737577W

Photographer: K.W. Sanborn

Description: A Specific Conductance field reading was taken at the second temporary dam, from fluids at the second temporary dam was 77.7 mS/cm, which was converted to 50,505 mg/L TDS as shown in Appendix 2.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 12

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 12 (DSC_0050)

Orientation: North

Date of Photo: 04/30/2018

Time of Photo: 12:03 pm

Latitude: 36.790455N

Longitude: -96.737533W

Photographer: K.W. Sanborn

Description: The third temporary dam shown here is located downstream from the second temporary dam, where an additional branch to the tributary of Mud Creek was flowing into the tributary from the northeast.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 13

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 13 (DSC_0049)

Orientation: North

Date of Photo: 04/30/2018

Time of Photo: 11:59 am

Latitude: 36.790455N

Longitude: -96.737533W

Photographer: K.W. Sanborn

Description: A Specific Conductance field reading was taken at the third temporary dam, from fluids at the third temporary dam was 117.5 mS/cm, which was converted to 76,375 mg/L TDS as shown in Appendix 2.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 14

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 14 (DSC_0058)

Orientation: North

Date of Photo: 04/30/2018

Time of Photo: 12:09 pm

Latitude: 36.789708N

Longitude: -96.737530W

Photographer: K.W. Sanborn

Description: The tributary of Mud Creek south of the third temporary dam is shown here. I observed that trucks were pumping out the tributary during the inspection at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 15

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 15 (DSC_0044)

Orientation: East

Date of Photo: 04/30/2018

Time of Photo: 11:38 am

Latitude: 36.789708N

Longitude: -96.737530W

Photographer: K.W. Sanborn

Description: I observed one dead crayfish near the location shown in Photo 14 in the tributary of Mud Creek.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 16

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 16 (DSC_0045)

Orientation: East

Date of Photo: 04/30/2018

Time of Photo: 11:38 am

Latitude: 36.789708N

Longitude: -96.737530W

Photographer: K.W. Sanborn

Description: I observed an additional dead crayfish near the third temporary dam site in the tributary of Mud Creek.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 17

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 17 (DSC_0056)

Orientation: West

Date of Photo: 04/30/2018

Time of Photo: 12:07 pm

Latitude: 36.789708N

Longitude: -96.737530W

Photographer: K.W. Sanborn

Description: I observed a dead turtle in the tributary of Mud Creek near the third temporary dam during the inspection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 18

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 18 (DSC_0057)

Orientation: West

Date of Photo: 04/30/2018

Time of Photo: 12:09 pm

Latitude: 36.789708N

Longitude: -96.737530W

Photographer: K.W. Sanborn

Description: An additional Specific Conductance field reading was taken at the third temporary dam and was 101.9 mS/cm, which was converted to 66,235 mg/L TDS as shown in Appendix 2.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 19

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo file Name: Photo 19 (DSC_0061)

Orientation: North

Date of Photo: 04/30/2018

Time of Photo: 12:27 pm

Latitude: 36.788731N

Longitude: -96.738708W

Photographer: K.W. Sanborn

Description: I observed a fourth temporary dam, which is shown here in this photo. A pump was being used to pump tributary fluids to a frac tank south of this area.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 20

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 20 (DSC_0062)

Orientation: South

Date of Photo: 04/30/2018

Time of Photo: 12:27 pm

Latitude: 36.788731N

Longitude: -96.738708W

Photographer: K.W. Sanborn

Description: This photo shows a view of the tributary of Mud Creek south of the fourth temporary dam. I observed that most of the fluids upstream of this point along the tributary had been removed due to pumping out activities.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 21

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 21 (DSC_0063)

Orientation: West

Date of Photo: 04/30/2018

Time of Photo: 12:28 pm

Latitude: 36.788731N

Longitude: -96.738708W

Photographer: K. W. Sanborn

Description: An additional Specific Conductance field reading was taken at Photo No. 20 and was 5.45 mS/cm, which was converted to 3,542.5 mg/L TDS as shown in Appendix 2.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 22

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 22 (DSC_0065)

Orientation: Northeast

Date of Photo: 04/30/2018

Time of Photo: 1:15 pm

Latitude: 36.786398N

Longitude: -96.739476W

Photographer: K.W. Sanborn

Description: The tributary of Mud Creek was joined by another branch of Mud Creek coming from the northeast shown here. The confluence of the two tributaries was downstream of all the temporary dams within the tributary of Mud Creek.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 23

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 23 (DSC_0064)

Orientation: North

Date of Photo: 04/30/2018

Time of Photo: 1:15 pm

Latitude: 36.786398N

Longitude: -96.739476W

Photographer: K.W. Sanborn

Description: A Specific Conductance field reading was taken at Photo No. 22 and was 1,227 microSiemens/centimeters (uS/cm), which was converted to 797.5 mg/L TDS as shown in Appendix 2.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 24

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 24 (DSC_0053)

Orientation: Northeast

Date of Photo: 04/30/2018

Time of Photo: 12:06 pm

Latitude: 36.790455N

Longitude: -96.737533W

Photographer: K.W. Sanborn

Description: This photo shows an unaffected upstream area in a tributary of Mud Creek, which is upstream from the contaminated area near the third temporary dam. This tributary was the first branch that joined the contaminated tributary of Mud Creek near the third dam site.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 25

36.793783N, -96.738003W (Sect. 26, T 27N, R 5E)		
City: Shidler	County: Osage	State: Oklahoma



Photo File Name: Photo 25 (DSC_0054)

Orientation: North

Date of Photo: 04/30/2018

Time of Photo: 12:06 pm

Latitude: 36.790455N

Longitude: -96.737533W

Photographer: K.W. Sanborn

Description: A Specific Conductance field reading was taken at Photo No. 24, an unaffected portion of the tributary of Mud Creek and was 1,156 uS/cm, which was converted to 751.4 mg/L TDS as shown in Appendix 2.

Appendix 2

Table 1: Conversion of Specific Conductance Readings to Total
Dissolved Solids

Table 1

Conversion from Specific Conductance
(milliSiemens/centimeter) Field Readings to Total Dissolved
Solids (milligrams/Liter) Measurements taken with a calibrated
YSI 30 Conductivity Meter

Inspection Report Photo No.	Specific Conductance Reading (mS/cm)	Specific Conductance (uS/cm)	Converted Total Dissolved Solids (mg/L)*
Photo No. 6	105.7 mS/cm	105,700 uS/cm	68,705 mg/L
Photo No. 11	77.7 mS/cm	77,700 uS/cm	50,505 mg/L
Photo No. 13	117.5 mS/cm	117,500 uS/cm	76,375 mg/L
Photo No. 18	101.9 mS/cm	101,900 uS/cm	66,235 mg/L
Photo No. 21	5.45 mS/cm	5,450 uS/cm	3,542.5 mg/L
Photo No. 22	N/A	12227 uS/cm	797.5 mg/L
Photo No.	N/A	1156 uS/cm	751.4 mg/L

*The default conversion value to convert specific conductance (uS/cm) to Total Dissolved Solids (TDS) used in this inspection report was 0.65. For example, 105.7 uS/cm multiplied by 0.65 equates to 68,705 mg/L TDS.