

UICI - 8

QUARTERLY

REPORT

(Qtr. 4)

2023



November 9, 2023

Mr. Carl Chavez, CHMM
New Mexico Oil Conservation Division (Albuquerque Office)
Energy, Minerals and Natural Resources Department
5200 Oakland Avenue, NE
Albuquerque, NM 87113

Certified Mail Receipt
7020 3160 0001 9690 7850

RE: FFY 2023 4th Quarter Injection Report for HF Sinclair UIC Wells WDW-1, WDW-2, WDW-3 and WDW-4

Dear Mr. Chavez,

Enclosed, please find the federal fiscal year 2023 (FFY 2023) fourth quarter (Q4) report for fluids injected into WDW-1, WDW-2, WDW-3 and WDW-4. This report has been prepared in accordance with Class I Non-Hazardous Waste Injection Well Discharge Permit UICI-8 (approved December 2017) and covers data collection efforts from July 1, 2023 through September 30, 2023. Condition 2.I of the permit requires reporting of the following four items:

Item #1: Physical, chemical and other relevant characteristics of injected fluids (per Condition 2.A)

One sampling event occurred during FFY 2023 Q4 on September 15, 2023. Table 1 presents results for this event; the corresponding lab report is given in Attachment A. For parameters identified as toxic contaminants in 40 CFR 261.24(b) (EPA Hazardous waste No. D004 through D043), all results were less than the Toxicity Characteristic Leaching Procedure (TCLP) regulatory level and do not exhibit the characteristic of toxicity. TCLP parameters were analyzed as total fractions; results were less than the corresponding reporting level (RL).

Item #2: Monthly average, maximum and minimum values for injection pressure, flow rate, injected volume, and annular pressure (per Condition 3.C)

A summary of monthly injection pressure, flow rate, injected volume, and annular pressure for FFY 2023 Q4 is given in Table 2. Statistics for injection pressure, flow rate and annular pressure for each month were calculated from continuous monitoring recorded on an hourly basis. For example, a month containing 31 days would have a total of 744 hourly data results, assuming no issues with signal communication. For injection flowrate, hourly readings reported as 0 gpm were deleted from the database (representative of either a signal communication issue or a well down for maintenance, testing, etc.). Totalized volume is not recorded hourly, therefore the monthly injected volume was calculated as the average monthly flow rate multiplied by the number of days in the corresponding month.

HF Sinclair disposed a total of 1,860,172 barrels of fluid into the four wells during FFY 2023 Q4. The total Q4 volume per well was:

- 158,207 barrels into WDW-1: 30-015-27592
- 152,826 barrels into WDW-2: 30-015-20894
- 617,898 barrels into WDW-3: 30-015-26575
- 931,241 barrels into WDW-4: 30-015-44677

HollyFrontier Navajo Refining LLC
501 East Main, Artesia, NM 88210
575-748-3311 | HFSinclair.com



In terms of Discharge Permit UICI-8 compliance, the hourly maximum injection pressures (occurring during FFY 2023 Q4) were within limits given in Condition 3.B as follows:

- WDW-1: max = 1,401 psi (limit = 1,585 psi)
- WDW-2: max = 1,400 psi (limit = 1,514 psi)
- WDW-3: max = 1,401 psi (limit = 1,530 psi)
- WDW-4: max = 723 psi (limit = 2,080 psi)

There were no significant losses as measured from the glycol expansion tanks Well Annulus Monitoring System (WAMS).

Item #3: Groundwater monitoring well Information from Condition 2.B

Discharge Permit UICI-8 Condition 2.B requires the installation of at least one downgradient monitoring well in the proximity of each injection well (WDW-1, 2, 3, and 4). Installation of monitoring wells at WDW-2, WDW-3, and WDW-4 has been approved by the Bureau of Land Management (BLM) and discussions are on-going for access to WDW-1 with ConocoPhillips. Well installation activities that occurred during FFY 2023 Q4 at WDW-2, WDW-3, and WDW-4 are given below. Installation has not been completed at any well so characterization data do not yet exist. After completion of well installation, future quarterly reports will include the required monitoring well data.

Item #4: Continuous monitoring charts and information from Permit Condition 3.C

Discharge Permit UICI-8 Condition 3.C requires the use of a continuous monitoring device to measure and record hourly values of injection pressure, injection rate, totalized injection volume, and annular pressure. HF Sinclair uses a digital recording device that can log the results of the above parameters at a user defined-frequency (i.e., can be greater or less than a one-hour interval). This recording/logging system is known as the "PI Historian" system and does not use any pen/chart apparatus described in Condition 3.C. The logged hourly data have been processed graphically and are given for each well in Figures 1 to 3 (July 2023), Figures 4 to 6 (August 2023), and Figures 7 to 9 (September 2023). As mentioned in Item #2 above, "gaps" in charted data reflect periods where signal communication issues occurred or when hourly injection flow was reported as 0 gpm. Archived spreadsheets of the FFY 2023 Q4 data used to generate the graphs are available upon request.

Conclusions and Recommendations

From the observations presented in the Items #1, #2, #3, and #4 above, HF Sinclair concludes that the injection of fluids (i.e., treated wastewater) into UIC Wells WDW-1, WDW-2, WDW-3, and WDW-4 during FFY 2023 Q4 was in compliance with the requirements and limitations given in Discharge Permit UICI-8. Specifically, the injection concentrations did not exhibit toxicity as regulated in Discharge Permit Condition 2.A (per reference of 40 CFR 261.24(b)). Further, injection pressures did not exceed limitations given Discharge Permit Condition 3.B for each well.

Other UIC Activities During FFY 2023 Q4:

1. In regard to the Groundwater Monitoring Wells per UICI-8 Discharge Permit Condition 2.B:
 - a. Contract driller (Cascade) signed Master Services Agreement on July 7, 2023 and was awarded the Groundwater Investigation Project on July 24, 2023
 - b. Field schedule was sent to OCD on August 10, 2023



- c. Hydrovac excavation (clearance) commenced on September 18, 2023 and was completed to partial depth of 4 ft (WDW-2), 8 ft (WDW-3), and 1.5 ft (WDW-4). Remaining excavation was completed by mechanical means to 10 ft (WDW-2), 8 ft (WDW-3), and 9 ft (WDW-4).
 - d. Negotiation of access agreements for WDW-1 with ConocoPhillips continued.
2. In regard to Mechanical Integrity Testing (MIT) and Fall Off Testing (FOT) of the injection wells:
 - a. The annual MIT/FOT report for WDW-1 (API Number: 30-015-27592) was uploaded to the OCD Permitting Site under Action ID# 249236 on August 7, 2023.
 - b. The annual MIT/FOT report for WDW-2 (API Number: 30-015-20894) was uploaded to the OCD Permitting Site under Action ID# 255870 on August 23, 2023.
 - c. WDW-3 FOT conducted August 30 – September 1, 2023, with an annulus pressure test on September 1, 2023.
 - d. WDW-4 FOT conducted September 26-28, 2023, with an annulus pressure test and temperature log on September 28, 2023.
3. On August 31, 2023, OCD sent an email to HFSNR regarding the four draft UICI-8 Discharge Permits (April 28, 2023 version). OCD acknowledged receipt of the June 29, 2023 HFSNR comments (including text redlines) on these draft permits. Further, OCD stated their intention to “complete the WQCC Administrative Completeness review to resume the permit process” once the Groundwater Monitoring Wells are installed and functional.

Planned UIC Activities for FFY 2024 Q1:

1. Obtain access from ConocoPhillips for the installation of an OCD-approved groundwater monitoring well at WDW-1. Obtain subsequent OSE monitor well permit and schedule contract driller mobilization for WDW-1.
2. Continuation of groundwater monitoring well installation at WDW-2, WDW-3, and WDW4.
3. WDW-1, WDW-2, and WDW-3 well stimulation tentatively planned for November 2023; exact dates and procedures are to be determined.
4. Annual MIT/FOT reports for WDW-3 and WDW-4 to be uploaded to the OCD Permitting Site.

This report is signed and certified in accordance with NMAC Section 20.6.2.5101.G. If there are any questions or comments, please contact Nat Paengpongsavanh at 575-746-0681.

Respectfully,

A handwritten signature in black ink, appearing to read 'Case Hinkins'. The signature is stylized with a large, looped 'C' and a trailing flourish.

Case Hinkins
Environmental Manager
HF Sinclair

TABLE 1. FFY 2023 Q4 CONCENTRATIONS OF WASTEWATER INJECTED INTO WELLS WDW-1, WDW-2, WDW-3, AND WDW-4

" < " = value less than the laboratory reporting level (RL)

Parameter	Units	UICI-8 Condition 2.A Regulatory Level	9/15/2023 Concentration
Alkalinity, bicarbonate	mg/L	--	573.3
Alkalinity, carbonate	mg/L	--	<2
Alkalinity, total	mg/L	--	573.3
Conductivity	uS/cm	--	7700
Cyanide (Reactivity)	mg/L	--	0.0814
Flashpoint (Ignitability)	deg F	--	>170
Oxidation Reduction Potential	mV	--	219.0
pH (Corrosivity)	su	--	7.64
Specific Gravity	su	--	0.9993
Sulfide (Reactivity)	mg/L	--	<0.25
Total Dissolved Solids	mg/L	--	5320
Total Suspended Solids	mg/L	--	11
Bromide	mg/L	--	<0.5
Chloride	mg/L	--	470
Fluoride	mg/L	--	110
Nitrate	mg/L	--	--
Nitrate + Nitrite	mg/L	--	<1.0
Nitrite	mg/L	--	--
Phosphorus, total	mg/L	--	<2.5
Sulfate	mg/L	--	3000
Calcium	mg/L	--	400
Magnesium	mg/L	--	130
Potassium	mg/L	--	420
Sodium	mg/L	--	910
Arsenic	mg/L	TCLP=5	<5
Barium	mg/L	TCLP=100	<100
Cadmium	mg/L	TCLP=1	<1
Chromium	mg/L	TCLP=5	<5
Lead	mg/L	TCLP=5	<5
Mercury	mg/L	TCLP=0.2	<0.02
Selenium	mg/L	TCLP=1	<1
Silver	mg/L	TCLP=5	<5
Chlordane	mg/L	TCLP=0.03	<0.03
1,1-Dichloroethene	mg/L	TCLP=0.7	<0.7
1,2-Dichloroethane	mg/L	TCLP=0.5	<0.5
1,4-Dichlorobenzene	mg/L	TCLP=7.5	<7.5
2,4,5-Trichlorophenol	mg/L	TCLP=400	<400
2,4,6-Trichlorophenol	mg/L	TCLP=2	<2
2,4-Dinitrotoluene	mg/L	TCLP=0.13	<0.13
2-Butanone	mg/L	TCLP=200	<200
2-Methylphenol	mg/L	TCLP=200	<200
3+4-Methylphenol	mg/L	TCLP=200	<200
Benzene	mg/L	TCLP=0.5	<0.5
Carbon tetrachloride	mg/L	TCLP=0.5	<0.5
Chlorobenzene	mg/L	TCLP=100	<100
Chloroform	mg/L	TCLP=6	<6
Cresols	mg/L	TCLP=200	<200
Hexachlorobenzene	mg/L	TCLP=0.13	<0.13
Hexachlorobutadiene	mg/L	TCLP=0.5	<0.5
Hexachloroethane	mg/L	TCLP=3	<3
Nitrobenzene	mg/L	TCLP=2	<2
Pentachlorophenol	mg/L	TCLP=100	<100
Pyridine	mg/L	TCLP=5	<5
Tetrachloroethene	mg/L	TCLP=0.7	<0.7
Trichloroethene	mg/L	TCLP=0.5	<0.5
Vinyl chloride	mg/L	TCLP=0.2	<0.2

TCLP = Toxicity Characteristic Leaching Procedure with regulatory level given in 40 CFR 261.24(b)

TABLE 2. FFY 2023 FOURTH QUARTER MONTHLY INJECTION PRESSURE, FLOW RATE, ANNULAR PRESSURE, AND VOLUME

Based on continuous monitors that record pressure and flow rate data on an hourly basis (per UICI-8 Condition 3.C)

Month	Injection Pressure			Injection Flowrate			Annular Pressure			Totalized Injected Volume	
	Average (psi)	Maximum (psi)	Minimum (psi)	Average (gpm)	Maximum (gpm)	Minimum (gpm)	Average (psi)	Maximum (psi)	Minimum (psi)	Monthly (barrels)	Cumulative (barrels)
30-015-27592 WDW-1											
Jul-23	1,068	1,325	914	43	103	0.1		718	234	45,279	51,084,516
Aug-23	1,120	1,400	942	54	112	0.3		784	194	56,964	51,129,795
Sep-23	1,119	1,401	907	54	119	0.09		797	204	55,964	51,186,759
											51,242,723
30-015-20894 WDW-2											
Jul-23	1,209	1,400	901	48	79	0.1		1,372	240	51,189	31,577,610
Aug-23	1,194	1,400	929	45	319	0.2		1,437	571	47,460	31,628,799
Sep-23	1,209	1,400	912	53	78	0.2		1,191	406	54,176	31,676,259
											31,730,436
30-015-26575 WDW-3											
Jul-23	1,134	1,399	982	115	162	85		922	568	122,387	23,741,907
Aug-23	1,140	1,400	489	116	187	0.04		929	227	123,386	23,864,294
Sep-23	1,182	1,401	515	362	653	0.05		865	226	372,124	23,987,680
											24,359,805
30-015-44677 WDW-4											
Jul-23	305	370	192	304	390	56		414	216	323,232	12,557,433
Aug-23	308	432	191	293	426	42		408	80	311,706	12,880,666
Sep-23	334	723	192	288	421	36		350	1	296,303	13,192,372
											13,488,675

Figure 1. FFY 2023 Q4 Injection Pressure - July 2023

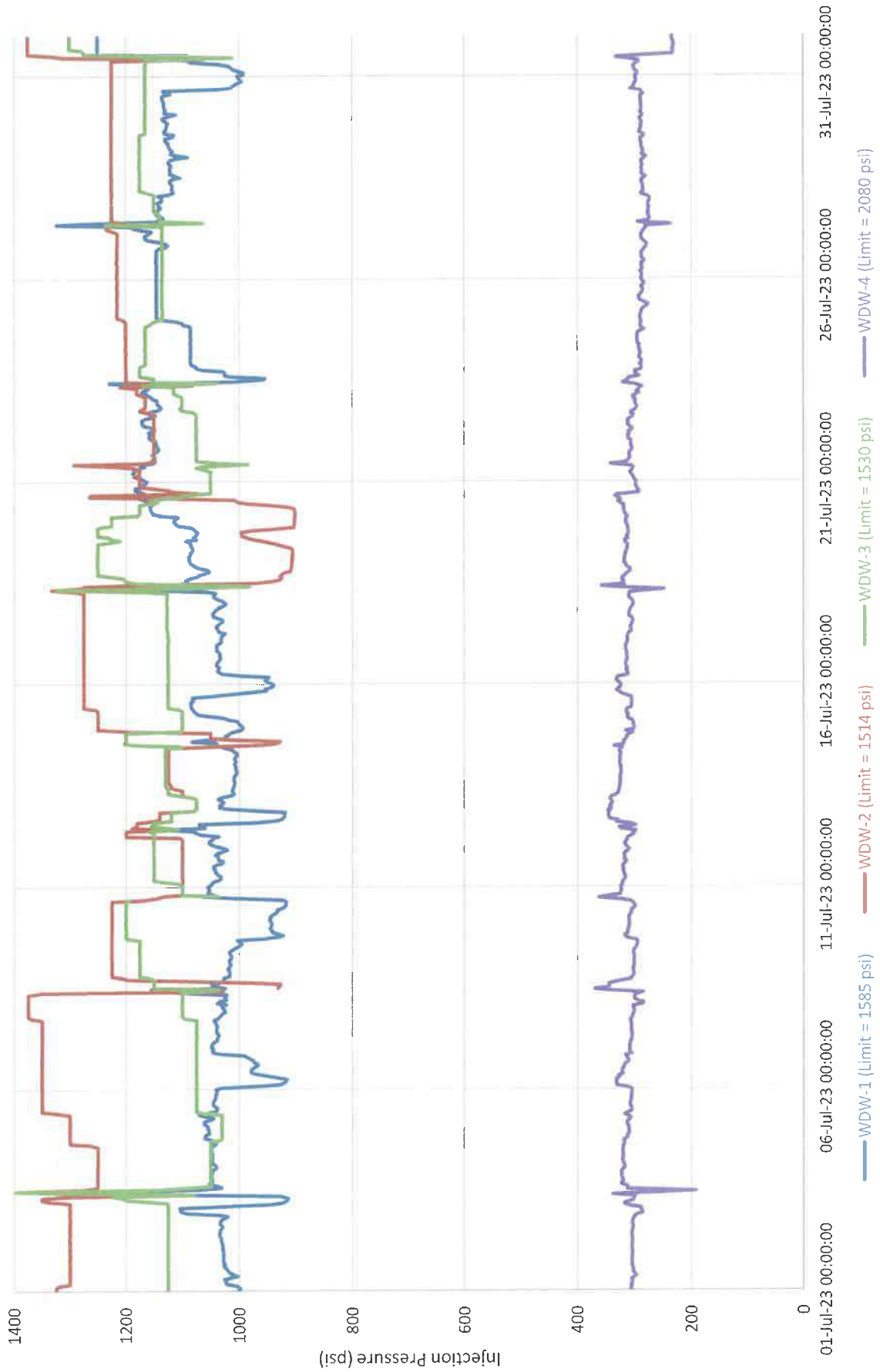


Figure 2. FFY 2023 Q4 Annular Pressure - July 2023

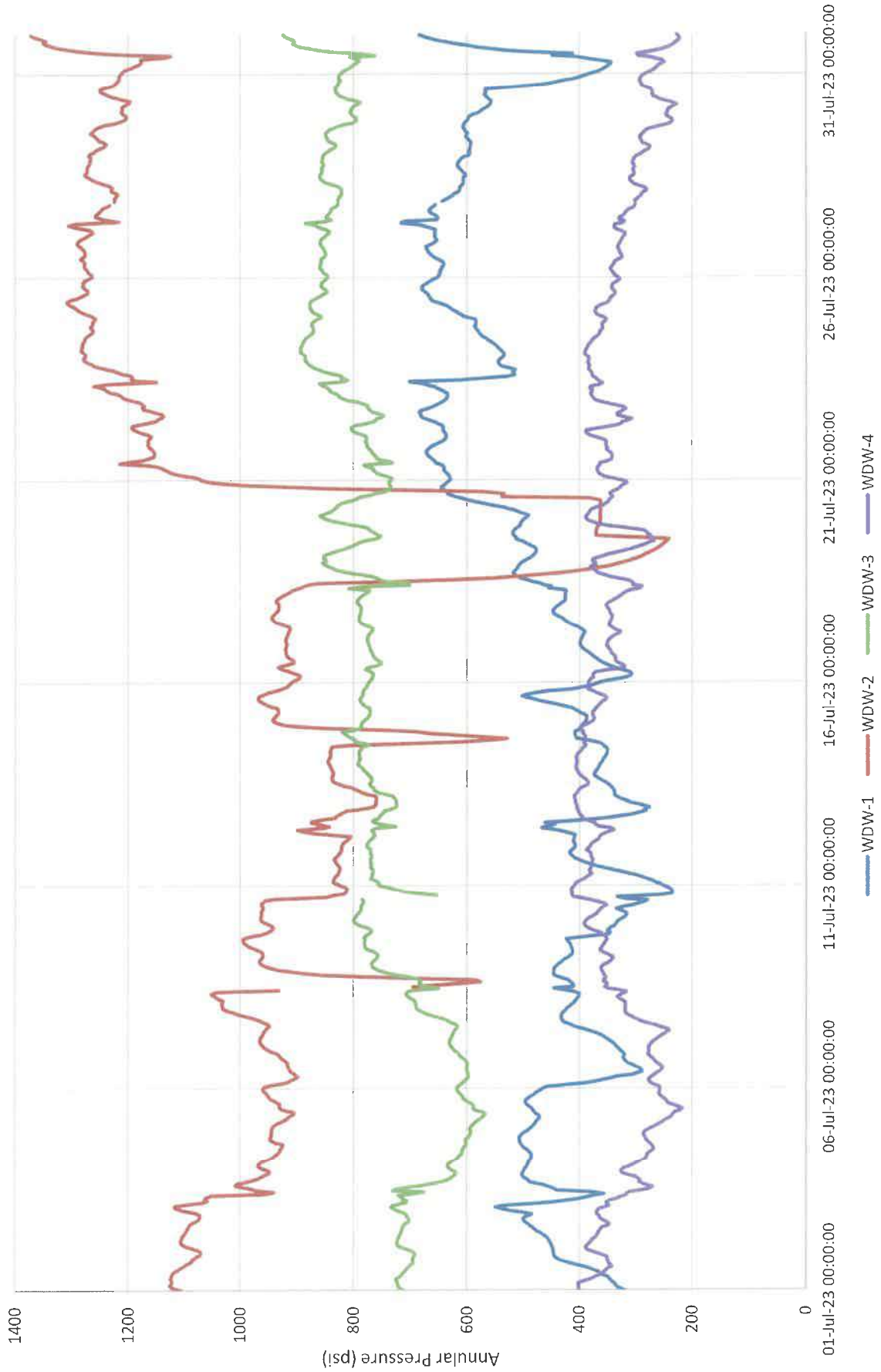


Figure 3. FFY 2023 Q4 Injection Flowrate - July 2023

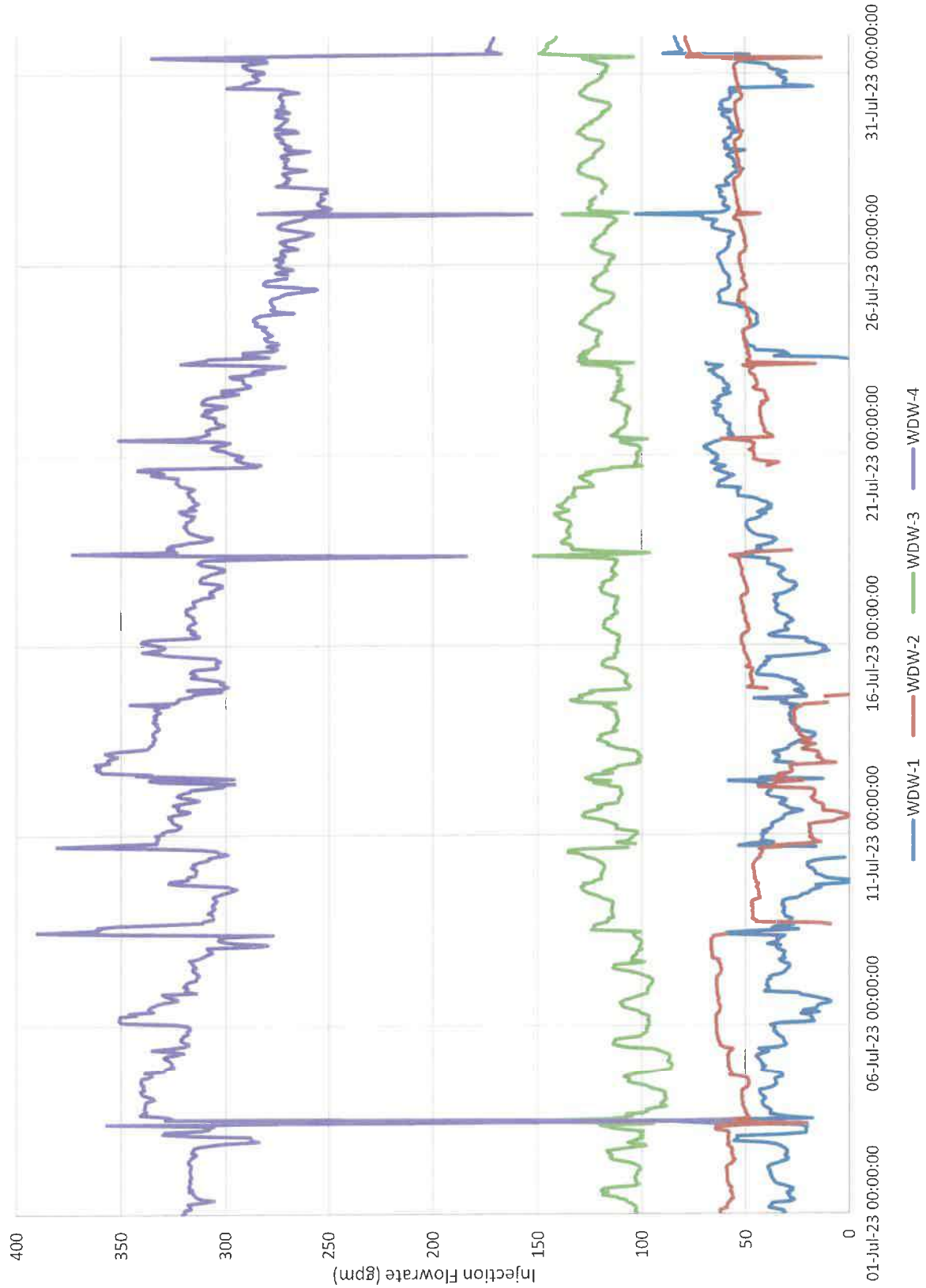


Figure 4. FFY 2023 Q4 Injection Pressure - August 2023

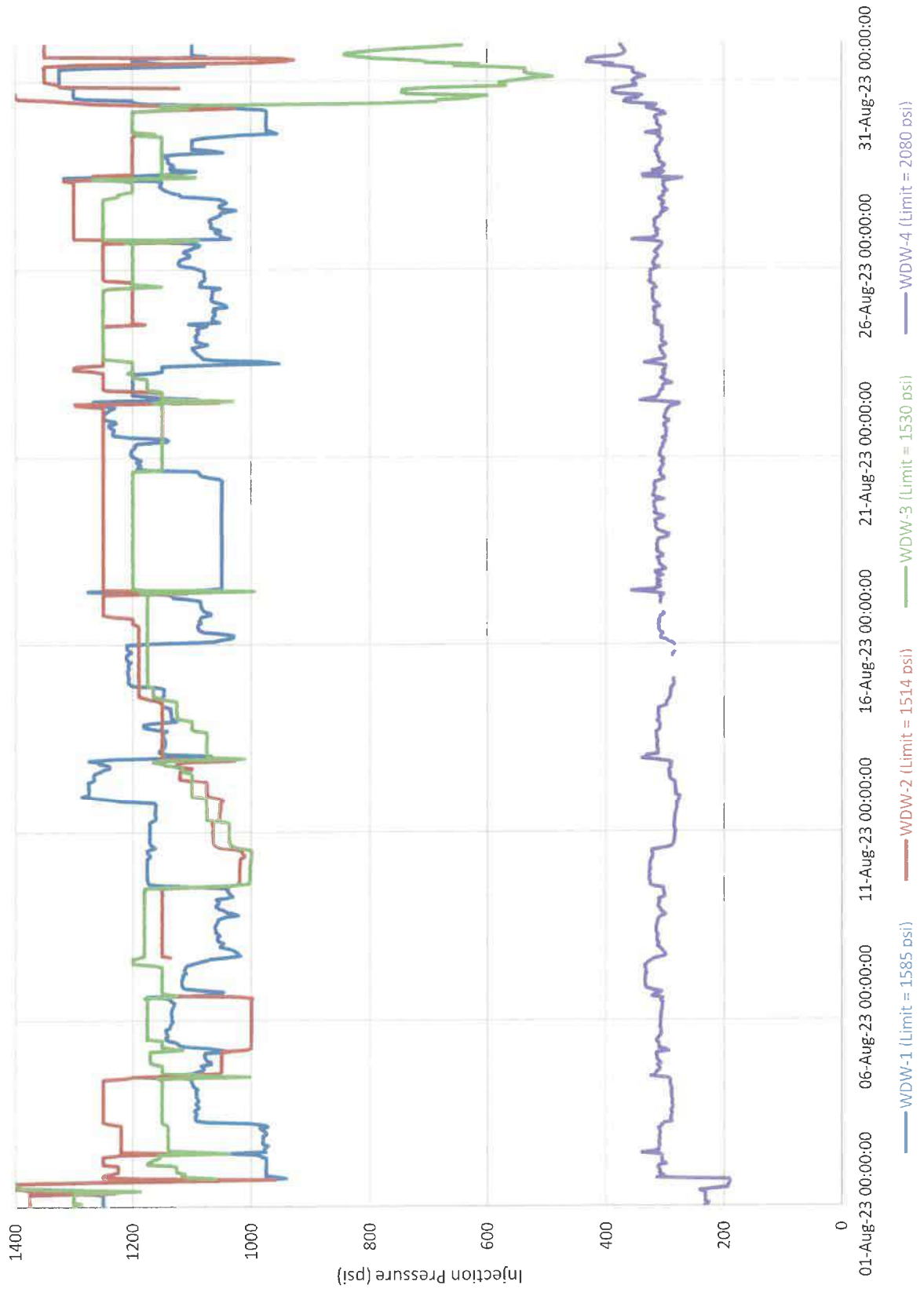


Figure 5. FFY 2023 Q4 Annular Pressure - August 2023

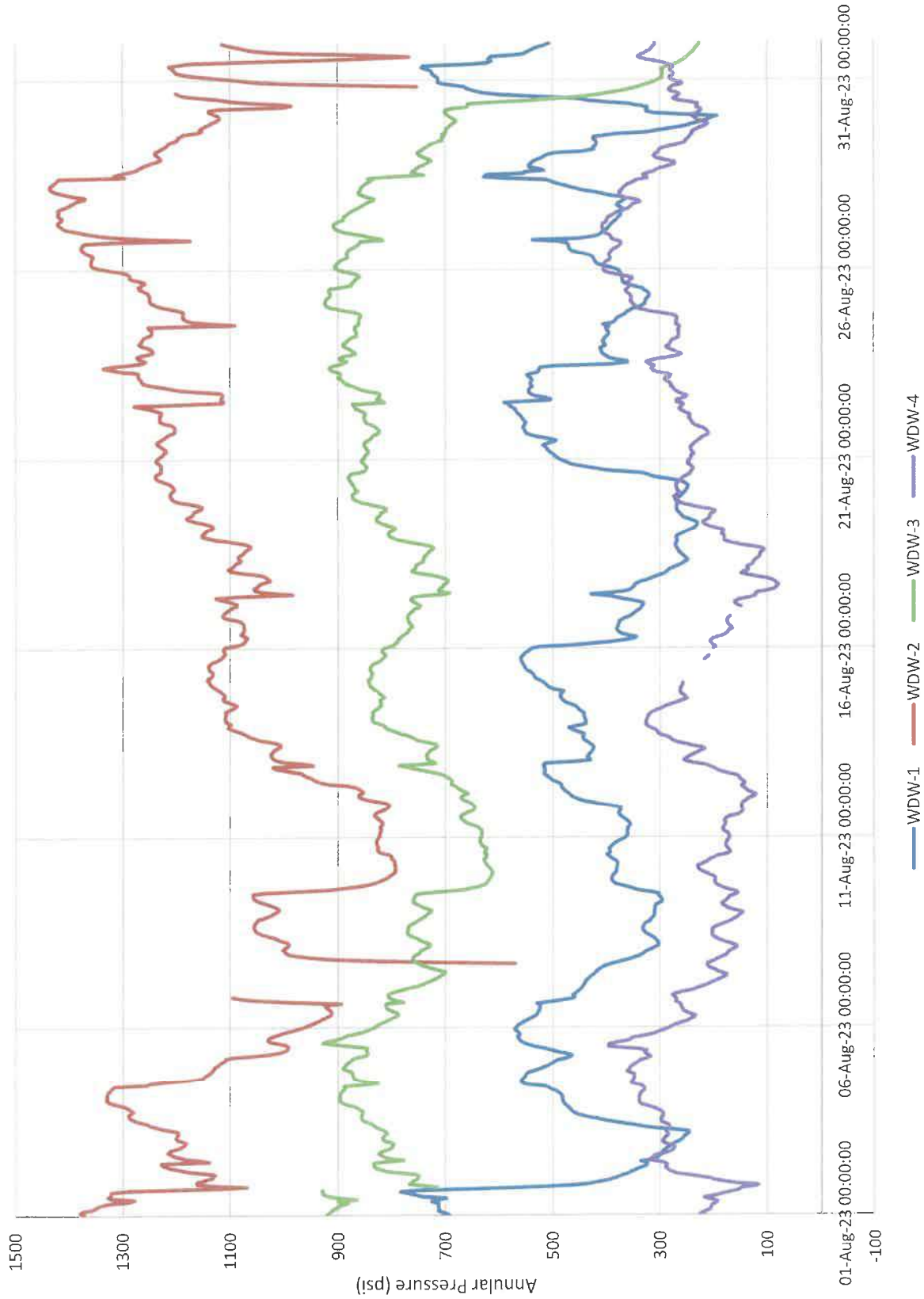


Figure 6. FFY 2023 Q4 Injection Flowrate - August 2023

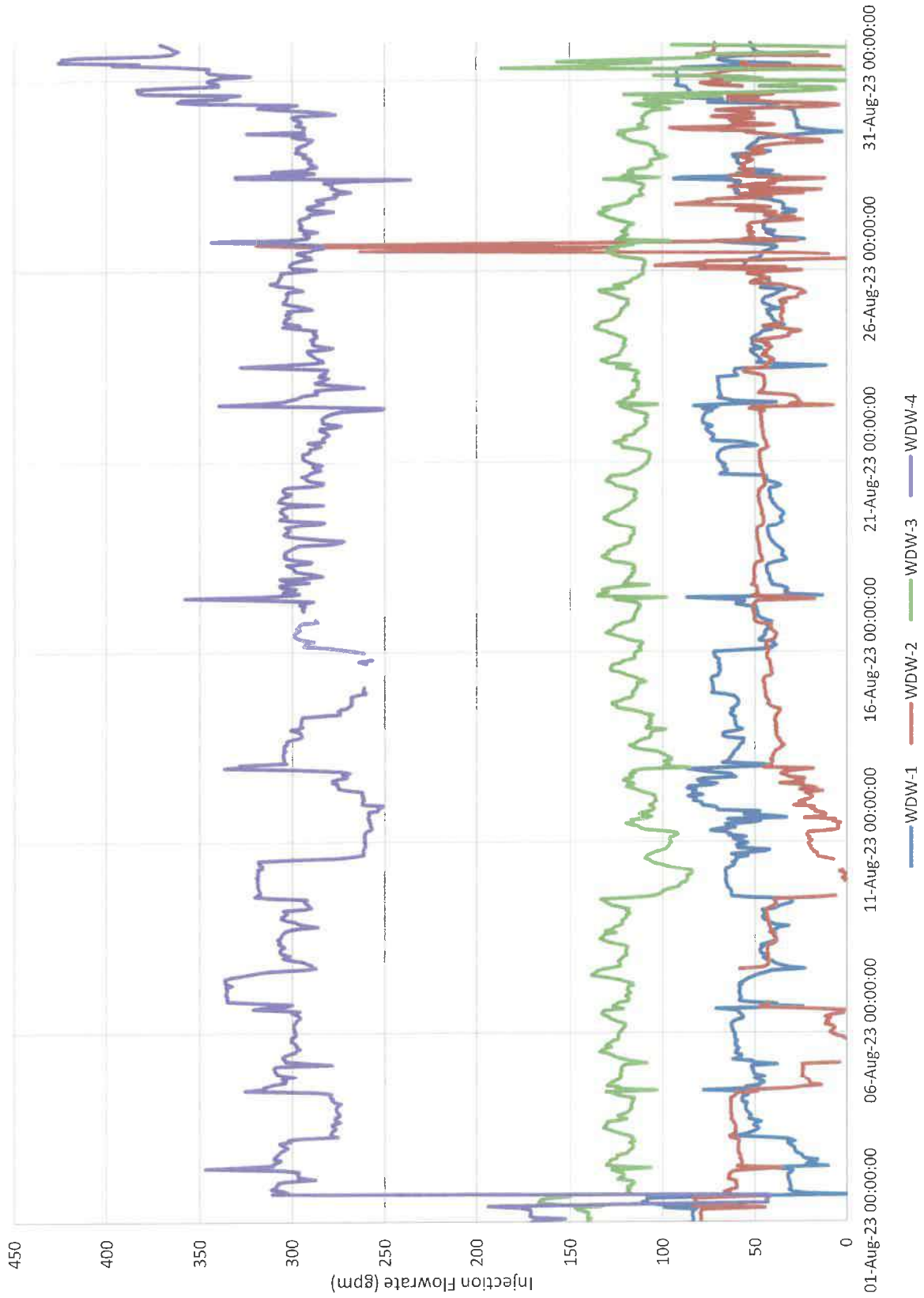


Figure 7. FFY 2023 Q4 Injection Pressure - September 2023

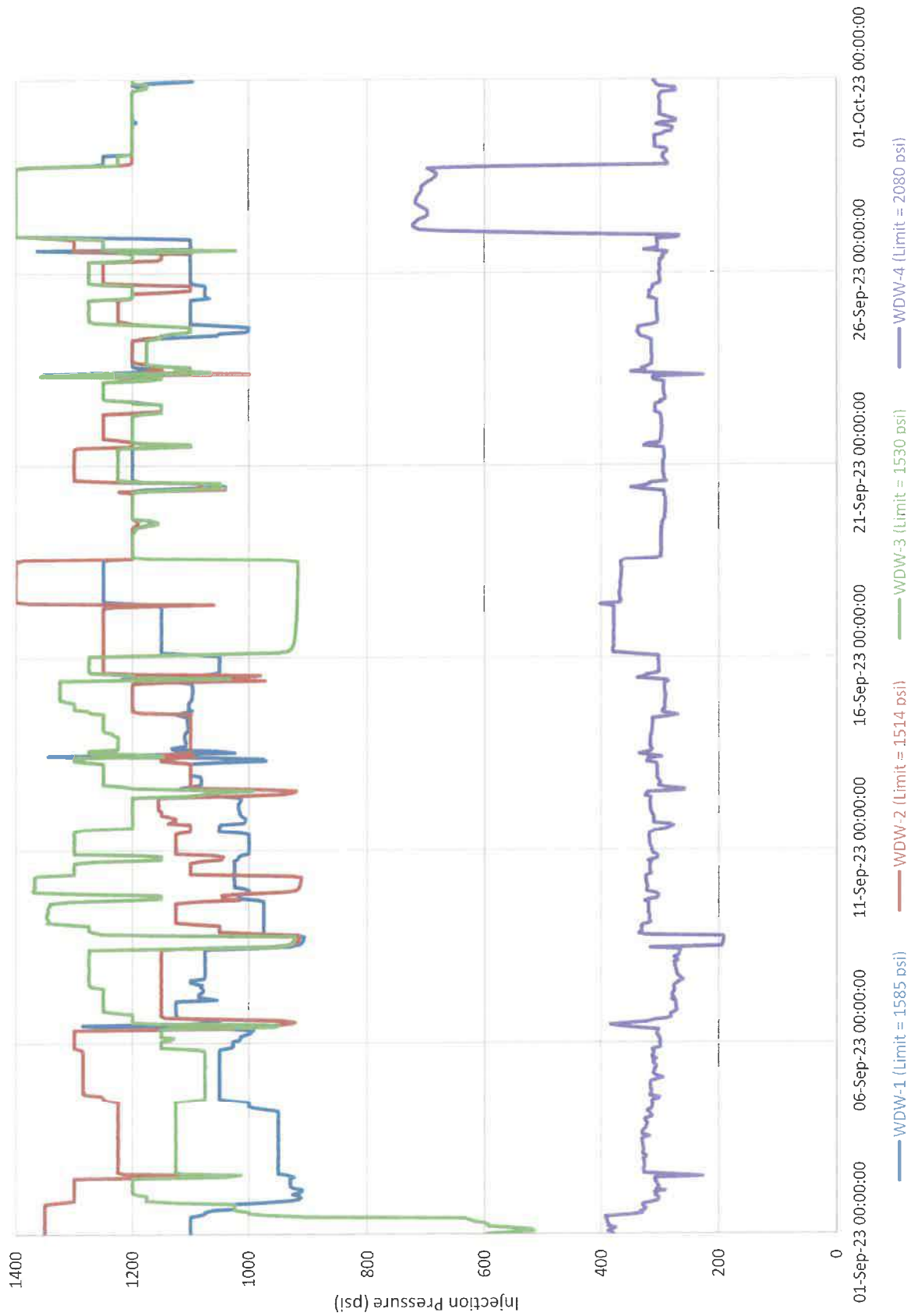


Figure 8. FFY 2023 Q4 Annular Pressure - September 2023

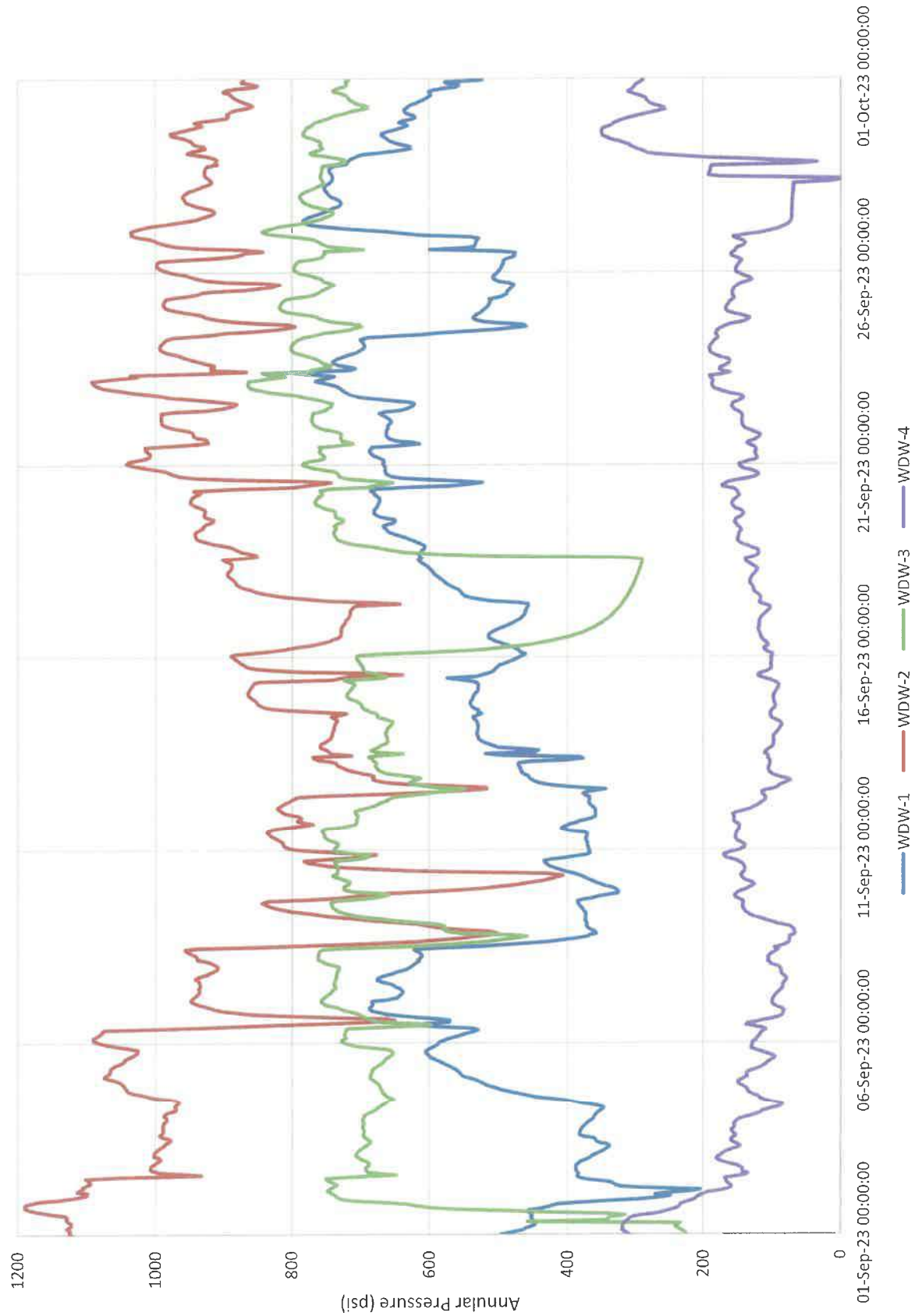
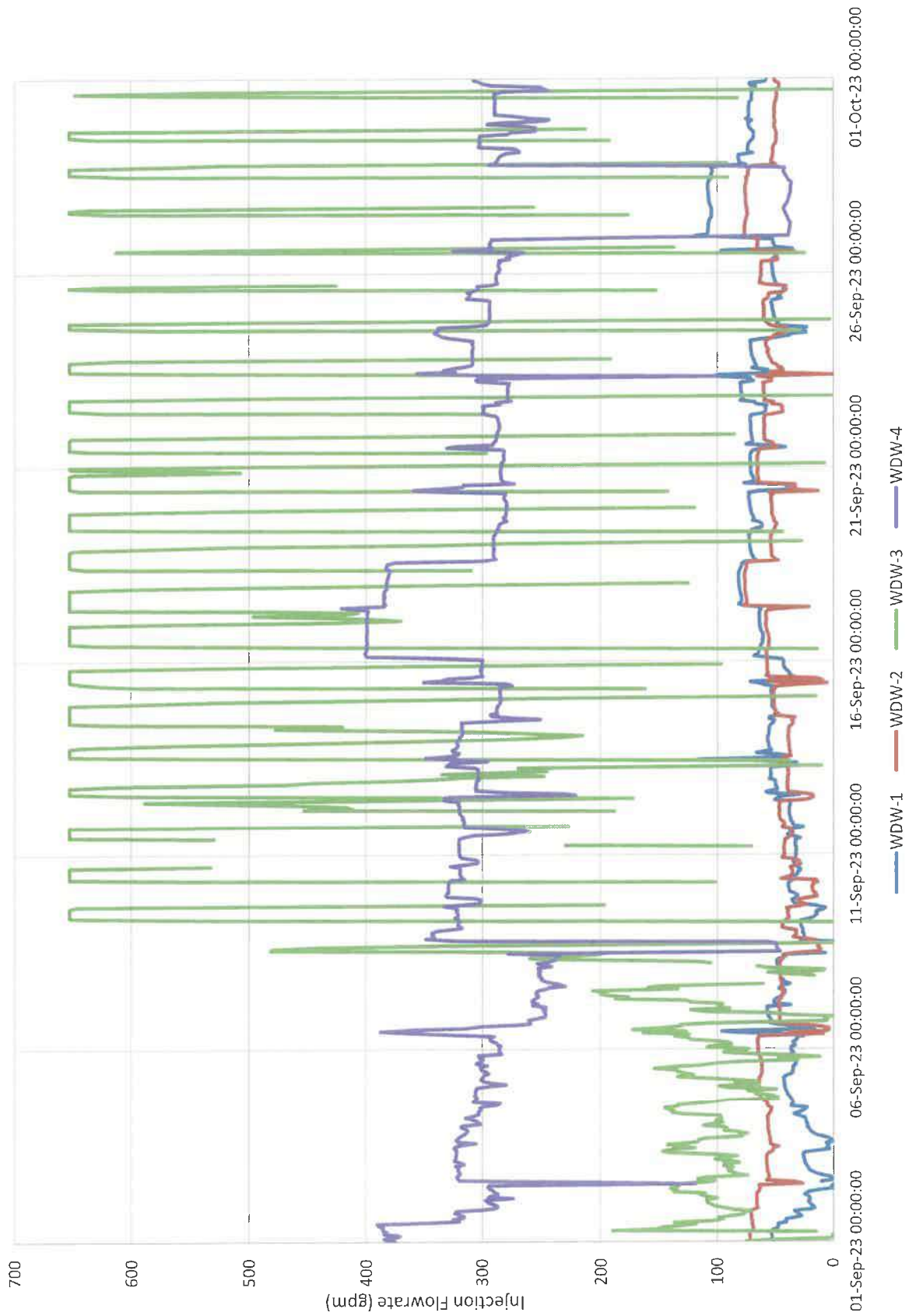


Figure 9. FFY 2023 Q4 Injection Flowrate - September 2023





ATTACHMENT A

Analytical Lab Report(s)



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 20, 2023

Jason Roberts

HF Sinclair Asphalt Navajo Refining LLC

P.O. Box 159

Artesia, NM 88211-0159

TEL: (575) 748-3311

FAX:

RE: Quarterly WDW 1 2 3 4 Inj Well

OrderNo.: 2309926

Dear Jason Roberts:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/16/2023 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued October 13, 2023.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman".

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Case Narrative

WO#: 2309926
Date: 10/20/2023

CLIENT: HF Sinclair Asphalt Navajo Refining LLC

Project: Quarterly WDW 1 2 3 4 Inj Well

Analytical Notes:

TCLP parameters were requested for the sample in this report. Per the TCLP Method 1311, "If a total analysis of the waste demonstrates that individual analytes are not present in the waste, or that they are present but at such low concentrations that the appropriate regulatory levels could not possibly be exceeded, the TCLP need not be run". All TCLP compounds are reported as totals in this report, at the TCLP Limits, since the low solids content did not require filtration. The TCLP term is used in the method header; this is used to represent that the compounds listed are the specific TCLP compounds and that these compounds are reported at the TCLP regulatory limits.

The cations were filtered using a 0.45um filter for the C/A balance determination.

Analytical Report

Lab Order 2309926

Date Reported: 10/20/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HF Sinclair Asphalt Navajo Refining LL

Client Sample ID: WDW-1,2,3 & 4 Effluent

Project: Quarterly WDW 1 2 3 4 Inj Well

Collection Date: 9/15/2023 10:40:00 AM

Lab ID: 2309926-001

Matrix: AQUEOUS

Received Date: 9/16/2023 7:30:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8081: PESTICIDES TCLP							Analyst: SB	
Chlordane	ND	0.0025	0.030	D	mg/L	5	9/28/2023 11:22:37 AM	77632
Surr: Decachlorobiphenyl	87.1	0	40.9-111	D	%Rec	5	9/28/2023 11:22:37 AM	77632
Surr: Tetrachloro-m-xylene	104	0	15-107	D	%Rec	5	9/28/2023 11:22:37 AM	77632
EPA METHOD 300.0: ANIONS							Analyst: RBC	
Fluoride	110	2.3	5.0	*	mg/L	50	10/2/2023 11:29:09 PM	R10015
Chloride	470	12	25	*	mg/L	50	10/2/2023 11:29:09 PM	R10015
Bromide	ND	0.25	0.50		mg/L	5	9/18/2023 1:05:22 PM	R99767
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	9/18/2023 1:05:22 PM	R99767
Sulfate	3000	25	50	*	mg/L	100	10/4/2023 12:52:34 PM	R10022
Nitrate+Nitrite as N	0.91	0.11	1.0	J	mg/L	5	10/5/2023 8:43:23 PM	R10027
EPA METHOD 6020A: TCLP METALS							Analyst: ELS	
Arsenic	0.011	0.0050	5.0	J	mg/L	10	9/27/2023 2:54:53 PM	77653
Lead	ND	0.0060	5.0		mg/L	10	9/27/2023 2:54:53 PM	77653
Selenium	0.21	0.0080	1.0	J	mg/L	10	9/27/2023 2:54:53 PM	77653
EPA METHOD 7470A: MERCURY							Analyst: tem	
Mercury	ND	0.000081	0.00020		mg/L	1	9/26/2023 2:30:03 PM	77726
EPA METHOD 6010B: DISSOLVED METALS							Analyst: VP	
Calcium	400	0.45	5.0		mg/L	5	9/20/2023 1:58:02 PM	A99857
Magnesium	130	0.49	5.0		mg/L	5	9/20/2023 1:58:02 PM	A99857
Potassium	420	0.67	5.0		mg/L	5	9/20/2023 1:58:02 PM	A99857
Sodium	910	5.9	20		mg/L	20	9/20/2023 2:48:13 PM	A99857
EPA 6010B: TCLP METALS							Analyst: VP	
Barium	0.035	0.00044	100	J	mg/L	1	9/26/2023 3:28:03 PM	77653
Cadmium	ND	0.0012	1.0		mg/L	1	9/26/2023 3:28:03 PM	77653
Chromium	ND	0.0012	5.0		mg/L	1	9/26/2023 3:28:03 PM	77653
Silver	0.0098	0.0013	5.0	J	mg/L	1	9/26/2023 3:28:03 PM	77653
EPA METHOD 8270C TCLP							Analyst: DAM	
2-Methylphenol	ND	0.0050	200		mg/L	1	9/20/2023 5:02:26 PM	77598
3+4-Methylphenol	ND	0.0051	200		mg/L	1	9/20/2023 5:02:26 PM	77598
2,4-Dinitrotoluene	ND	0.0049	0.13		mg/L	1	9/20/2023 5:02:26 PM	77598
Hexachlorobenzene	ND	0.019	0.13		mg/L	1	9/20/2023 5:02:26 PM	77598
Hexachlorobutadiene	ND	0.017	0.50		mg/L	1	9/20/2023 5:02:26 PM	77598
Hexachloroethane	ND	0.014	3.0		mg/L	1	9/20/2023 5:02:26 PM	77598
Nitrobenzene	ND	0.0049	2.0		mg/L	1	9/20/2023 5:02:26 PM	77598
Pentachlorophenol	ND	0.027	100		mg/L	1	9/20/2023 5:02:26 PM	77598
Pyridine	ND	0.014	5.0		mg/L	1	9/20/2023 5:02:26 PM	77598

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL	Practical Quantitative Limit	RL Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.	

Analytical Report

Lab Order 2309926

Date Reported: 10/20/2023

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HF Sinclair Asphalt Navajo Refining LL

Client Sample ID: WDW-1,2,3 & 4 Effluent

Project: Quarterly WDW 1 2 3 4 Inj Well

Collection Date: 9/15/2023 10:40:00 AM

Lab ID: 2309926-001

Matrix: AQUEOUS

Received Date: 9/16/2023 7:30:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C TCLP							Analyst: DAM	
2,4,5-Trichlorophenol	ND	0.0063	400		mg/L	1	9/20/2023 5:02:26 PM	77598
2,4,6-Trichlorophenol	ND	0.0059	2.0		mg/L	1	9/20/2023 5:02:26 PM	77598
Cresols, Total	ND	0.027	200		mg/L	1	9/20/2023 5:02:26 PM	77598
Surr: 2-Fluorophenol	44.8	0	20.8-71.9		%Rec	1	9/20/2023 5:02:26 PM	77598
Surr: Phenol-d5	35.0	0	16.2-54.5		%Rec	1	9/20/2023 5:02:26 PM	77598
Surr: 2,4,6-Tribromophenol	55.3	0	18.8-117		%Rec	1	9/20/2023 5:02:26 PM	77598
Surr: Nitrobenzene-d5	47.9	0	33-85.9		%Rec	1	9/20/2023 5:02:26 PM	77598
Surr: 2-Fluorobiphenyl	44.0	0	26.3-79.6		%Rec	1	9/20/2023 5:02:26 PM	77598
Surr: 4-Terphenyl-d14	79.3	0	53.9-124		%Rec	1	9/20/2023 5:02:26 PM	77598
TCLP VOLATILES BY 8260B							Analyst: JR	
Benzene	ND	0.50	0.50		mg/L	200	9/21/2023 8:21:25 PM	T99899
1,2-Dichloroethane (EDC)	ND	0.50	0.50		mg/L	200	9/21/2023 8:21:25 PM	T99899
2-Butanone	ND	200	200		mg/L	200	9/21/2023 8:21:25 PM	T99899
Carbon Tetrachloride	ND	0.50	0.50		mg/L	200	9/21/2023 8:21:25 PM	T99899
Chloroform	ND	6.0	6.0		mg/L	200	9/21/2023 8:21:25 PM	T99899
1,4-Dichlorobenzene	ND	7.5	7.5		mg/L	200	9/21/2023 8:21:25 PM	T99899
1,1-Dichloroethene	ND	0.70	0.70		mg/L	200	9/21/2023 8:21:25 PM	T99899
Tetrachloroethene (PCE)	ND	0.70	0.70		mg/L	200	9/21/2023 8:21:25 PM	T99899
Trichloroethene (TCE)	ND	0.50	0.50		mg/L	200	9/21/2023 8:21:25 PM	T99899
Vinyl chloride	ND	0.20	0.20		mg/L	200	9/21/2023 8:21:25 PM	T99899
Chlorobenzene	ND	100	100		mg/L	200	9/21/2023 8:21:25 PM	T99899
Surr: 1,2-Dichloroethane-d4	103	0	70-130		%Rec	200	9/21/2023 8:21:25 PM	T99899
Surr: 4-Bromofluorobenzene	97.8	0	70-130		%Rec	200	9/21/2023 8:21:25 PM	T99899
Surr: Dibromofluoromethane	98.4	0	70-130		%Rec	200	9/21/2023 8:21:25 PM	T99899
Surr: Toluene-d8	101	0	70-130		%Rec	200	9/21/2023 8:21:25 PM	T99899
SM2510B: SPECIFIC CONDUCTANCE							Analyst: RBC	
Conductivity	7700	10	10		µmhos/c	1	9/20/2023 3:03:26 PM	R99871
SM4500-H+B / 9040C: PH							Analyst: RBC	
pH	7.81			H	pH units	1	9/20/2023 3:03:26 PM	R99871
SM2320B: ALKALINITY							Analyst: RBC	
Bicarbonate (As CaCO3)	573.3	20.00	20.00		mg/L Ca	1	9/20/2023 3:03:26 PM	R99871
Carbonate (As CaCO3)	ND	2.000	2.000		mg/L Ca	1	9/20/2023 3:03:26 PM	R99871
Total Alkalinity (as CaCO3)	573.3	20.00	20.00		mg/L Ca	1	9/20/2023 3:03:26 PM	R99871
SPECIFIC GRAVITY							Analyst: RBC	
Specific Gravity	0.9993	0	0			1	9/22/2023 2:10:00 PM	R99926
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: MCA	

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

CLIENT: HF Sinclair Asphalt Navajo Refining LL
Project: Quarterly WDW 1 2 3 4 Inj Well
Lab ID: 2309926-001

Matrix: AQUEOUS

Client Sample ID: WDW-1,2,3 & 4 Effluent
Collection Date: 9/15/2023 10:40:00 AM
Received Date: 9/16/2023 7:30:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: MCA	
Total Dissolved Solids	5320	50.0	100	*D	mg/L	1	9/21/2023 3:28:00 PM	77640
SM 2540D: TSS							Analyst: KS	
Suspended Solids	11	4.0	4.0		mg/L	1	9/20/2023 2:16:00 PM	77615

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	•	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		



ANALYTICAL REPORT

September 28, 2023

Hall Environmental Analysis Laboratory

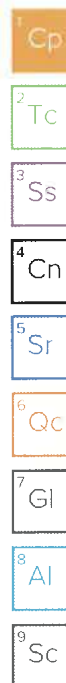
Sample Delivery Group: L1657347

Samples Received: 09/19/2023

Project Number:

Description:

Report To: Andy Freeman
4901 Hawkins NE
Albuquerque, NM 87109



Entire Report Reviewed By:

A handwritten signature in blue ink that reads "Alan Harvill".

T. Alan Harvill
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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Hall Environmental Analysis Laboratory

L1657347

09/28/23 16:21

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Cn: Case Narrative	4	
Sr: Sample Results	5	³ Ss
2309926-001F WDW-1,2,3 & EFFLUENT L1657347-01	5	⁴ Cn
Qc: Quality Control Summary	6	
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SAMPLE SUMMARY

2309926-001F WDW-1,2,3 & EFFLUENT L1657347-01 GW

Collected by: Collected date/time: 09/15/23 10:40 Received date/time: 09/19/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2580	WG2136544	1	09/23/23 15:06	09/23/23 15:06	NTG	Mt. Juliet, TN
Wet Chemistry by Method 4500 CN E-2016	WG2135618	1	09/24/23 16:13	09/25/23 01:50	LDT	Mt. Juliet, TN
Wet Chemistry by Method 4500 S2 D-2011	WG2135637	5	09/20/23 13:32	09/20/23 13:32	CAH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2140468	1	09/28/23 09:05	09/28/23 09:05	ARD	Mt. Juliet, TN
Wet Chemistry by Method D93/1010A	WG2138556	1	09/25/23 02:44	09/25/23 02:44	WOS	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

CASE NARRATIVE

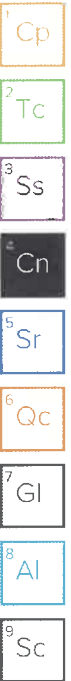
All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



T. Alan Harvill
Project Manager

Project Narrative

All Reactive Cyanide results reported in the attached report were determined as totals using method 4500 CN E-2016.
All Reactive Sulfide results reported in the attached report were determined as totals using method 4500 S2 D-2011.



2309926-001F WDW-1,2,3 & EFFLUENT

SAMPLE RESULTS - 01

Collected date/time: 09/15/23 10:40

L1657347

Wet Chemistry by Method 2580

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
ORP	219	T8	1	09/23/2023 15:06	WG2136544

1 Cp

2 Tc

Wet Chemistry by Method 4500 CN E-2016

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive Cyanide	0.0814		0.00500	1	09/25/2023 01:50	WG2135618

3 Ss

4 Cn

Wet Chemistry by Method 4500 S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive Sulfide	ND		0.250	5	09/20/2023 13:32	WG2135637

5 Sr

6 Qc

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.64	T8	1	09/28/2023 09:05	WG2140468

7 GI

8 Al

Sample Narrative:

L1657347-01 WG2140468: 7.64 at 20.7C

9 Sc

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Flashpoint	DNF at 170		1	09/25/2023 02:44	WG2138556

WG2136544

Wet Chemistry by Method 2580

QUALITY CONTROL SUMMARY

L1657347-01

L1657347-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1657347-01 09/23/23 15:06 • (DUP) R3976931-3 09/23/23 15:06

Analyte	Original Result mV	DUP Result mV	Dilution	DUP Diff mV	DUP Qualifier	DUP Diff Limits mV
ORP	219	218	1	0.700		20

L1658054-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1658054-01 09/23/23 15:06 • (DUP) R3976931-4 09/23/23 15:06

Analyte	Original Result mV	DUP Result mV	Dilution	DUP Diff mV	DUP Qualifier	DUP Diff Limits mV
ORP	58.2	61.6	1	3.40		20

L1658054-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1658054-02 09/23/23 15:06 • (DUP) R3976931-5 09/23/23 15:06

Analyte	Original Result mV	DUP Result mV	Dilution	DUP Diff mV	DUP Qualifier	DUP Diff Limits mV
ORP	81.9	85.0	1	3.10		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3976931-1 09/23/23 15:06 • (LCSD) R3976931-2 09/23/23 15:06

Analyte	Spike Amount mV	LCS Result mV	LCSD Result mV	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	Diff mV	Diff Limits mV
ORP	97.0	106	105	109	109	90.0-110			0.600	20

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WG2135618

Wet Chemistry by Method 4500 CN E-2016

QUALITY CONTROL SUMMARY

L1657347-01

Method Blank (MB)

(MB) R3977135-1 09/25/23 01:11

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Reactive Cyanide	U	0.00180	0.00180	0.00500

L1657345-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1657345-01 09/25/23 01:28 • (DUP) R3977135-3 09/25/23 01:30

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Cyanide	ND	ND	1	0.000		20

L1657345-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1657345-06 09/25/23 01:40 • (DUP) R3977135-6 09/25/23 01:41

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Cyanide	0.0222	0.0218	1	1.82		20

Laboratory Control Sample (LCS)

(LCS) R3977135-2 09/25/23 01:12

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Cyanide	0.100	0.0979	97.9	87.1-120	

L1657345-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1657345-04 09/25/23 01:34 • (MS) R3977135-4 09/25/23 01:35 • (MSD) R3977135-5 09/25/23 01:37

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Cyanide	0.100	0.0273	0.121	0.119	1	90.0-110		1.67		20

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WG2135637

Wet Chemistry by Method 4500 S2 D-2011

QUALITY CONTROL SUMMARY

L1657347-01

Method Blank (MB)

(MB) R3975389-1 09/20/23 13:14

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Reactive Sulfide	U		0.0250	0.0500

L1657353-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1657353-01 09/20/23 13:33 • (DUP) R3975389-5 09/20/23 13:34

Analyte	Original Result mg/l	DUP Result mg/l	Dilution %	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Reactive Sulfide	ND	ND	5	6.06		20

Laboratory Control Sample (LCS)

(LCS) R3975389-2 09/20/23 13:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Sulfide	0.500	0.508	102	85.0-115	

L1657347-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1657347-01 09/20/23 13:32 • (MS) R3975389-3 09/20/23 13:32 • (MSD) R3975389-4 09/20/23 13:33

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	Dilution %	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Sulfide	2.50	ND	2.92	2.94	5	80.0-120			0.512	20

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WG2140468

Wet Chemistry by Method 9040C

QUALITY CONTROL SUMMARY

L1657347-01

L1657347-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1657347-01 09/28/23 09:05 • (DUP) R3978806-2 09/28/23 09:05

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	7.64	7.63	1	0.131		1

Sample Narrative:

OS: 7.64 at 20.7C

DUP: 7.63 at 20.5C

L1659935-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1659935-01 09/28/23 09:05 • (DUP) R3978806-3 09/28/23 09:05

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	7.72	7.74	1	0.259		1

Sample Narrative:

OS: 7.72 at 20.7C

DUP: 7.74 at 20.7C

Laboratory Control Sample (LCS)

(LCS) R3978806-1 09/28/23 09:05

Analyte	Spike Amount su	LCS Result su	LCS Rec. %	Rec. Limits %	LCS Qualifier
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.01 at 21C

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Hall Environmental Analysis Laboratory

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WG2138556

Wet Chemistry by Method D93/1010A

QUALITY CONTROL SUMMARY

L1657347-01

L1657437-01 Original Sample (OS) • Duplicate (DUP)

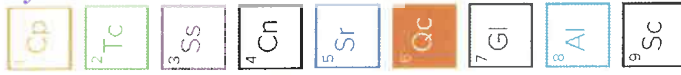
(OS) L1657437-01 09/25/23 02:44 • (DUP) R3977136-3 09/25/23 02:44

Analyte	Original Result deg F	DUP Result deg F	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Flashpoint	DNF at 200	DNF at 200	1	0.000		10

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3977136-1 09/25/23 02:44 • (LCSD) R3977136-2 09/25/23 02:44

Analyte	Spike Amount deg F	LCS Result deg F	LCSD Result deg F	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Flashpoint	126	131	129	104	102	96.0-104		1.54	10	



GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

T8	Sample(s) received past/too close to holding time expiration.
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ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

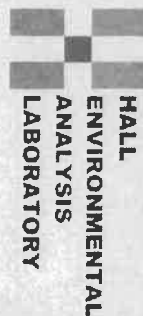
Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.





CHAIN OF CUSTODY RECORD

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H1019

Full Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975
FAX: 505-345-4107
If e bysite: www.fullenvironmental.com

SUB CONTRACTOR		COMPANY	PHONE	FAX			
Pace TN		PACE TN	(800) 767-5859	(615) 758-5859			
ADDRESS		12065 Lebanon Rd	ACCOUNT #	EMAIL			
CITY, STATE, ZIP		Mt. Juliet, TN 37122					
ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS
1	2309926-001F	WDW-1,2,3 & 4 Effluent	500HDPE	Aqueous	9/15/2023 10:40:00 AM	3 RCL, ORP	<div> <div>71657347</div> <div>-01</div> </div>

Coc Seal Present: ☒ Y ☐ N
 Coc Signed Accretate: ☒ Y ☐ N
 Bottles arrive intact: ☒ Y ☐ N
 Correct bottles used: ☒ Y ☐ N
 Sufficient volume sent: ☒ Y ☐ N
 RA screen <0.5 mR/hr: ☒ Y ☐ N

Sample Receipt Checklist
 If Applicable
 VOA Zero Headspace: ☒ Y ☐ N
 Pres. To GC/MS: ☒ Y ☐ N
 GC# 1.1+0=1.7
 6841 8348 3407

SPECIAL INSTRUCTIONS / COMMENTS

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please email results to lab@allenenvironmental.com. Please return all coolers and blue ice. Thank you.

Please include the LAB ID and the CLIENT SAMPLE ID on all final reports. Please e-mail results to lab@hallenvironmental.com. Please return all coolers and blue ice. Thank you.

Relinquished By: <i>Ch</i>	Date: 9/18/2023	Time: 9:15 AM	Received By: <i>Eric Howard</i>	Date: 9-14-23	Time: 9:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received by:	Date:	Time:
TAT: Standard <input checked="" type="checkbox"/>	FLUSH	Next BD <input type="checkbox"/>	2nd BD <input type="checkbox"/>	3rd BD <input type="checkbox"/>	
Comments: _____					
Temp of samples: _____ Attempt to Cool: _____					
FOR LAB USE ONLY					
REPORT TRANSMITTAL DESIRED <input type="checkbox"/> HARD COPY (extra cost) <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE					

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QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: MB	SampType: MBLK	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R99767	RunNo: 99767								
Prep Date:	Analysis Date: 9/18/2023	SeqNo: 3647984 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Bromide	ND	0.10								
Phosphorus, Orthophosphate (As P)	ND	0.50								

Sample ID: LCS	SampType: LCS	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R99767	RunNo: 99767								
Prep Date:	Analysis Date: 9/18/2023	SeqNo: 3647991 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Bromide	2.4	0.10	2.500	0	94.6	90	110			
Phosphorus, Orthophosphate (As P)	4.5	0.50	5.000	0	90.4	90	110			

Sample ID: 2309926-001CMS	SampType: MS	TestCode: EPA Method 300.0: Anions								
Client ID: WDW-1,2,3 & 4 Efflu	Batch ID: R99767	RunNo: 99767								
Prep Date:	Analysis Date: 9/18/2023	SeqNo: 3647996 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Bromide	12	0.50	12.50	0	96.6	80	120			
Phosphorus, Orthophosphate (As P)	22	2.5	25.00	0	89.4	80	120			

Sample ID: 2309926-001CMSD	SampType: MSD	TestCode: EPA Method 300.0: Anions								
Client ID: WDW-1,2,3 & 4 Efflu	Batch ID: R99767	RunNo: 99767								
Prep Date:	Analysis Date: 9/18/2023	SeqNo: 3647997 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Bromide	12	0.50	12.50	0	98.4	80	120	1.83	20	
Phosphorus, Orthophosphate (As P)	23	2.5	25.00	0	90.7	80	120	1.42	20	

Sample ID: MB	SampType: MBLK	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R100159	RunNo: 100159								
Prep Date:	Analysis Date: 10/2/2023	SeqNo: 3665599 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								

Sample ID: LCS	SampType: LCS	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R100159	RunNo: 100159								
Prep Date:	Analysis Date: 10/2/2023	SeqNo: 3665601 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Above Quantitation Range/Estimated Value
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.	

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: LCS	SampType: LCS	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R100159	RunNo: 100159								
Prep Date:	Analysis Date: 10/2/2023	SeqNo: 3665601 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.49	0.10	0.5000	0	97.2	90	110			
Chloride	4.6	0.50	5.000	0	92.8	90	110			

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R100221	RunNo: 100221								
Prep Date:	Analysis Date: 10/4/2023	SeqNo: 3669108 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID: LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R100221	RunNo: 100221								
Prep Date:	Analysis Date: 10/4/2023	SeqNo: 3669109 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.5	0.50	10.00	0	95.2	90	110			

Sample ID: MB	SampType: MBLK	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R100273	RunNo: 100273								
Prep Date:	Analysis Date: 10/5/2023	SeqNo: 3671710 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	ND	0.20								

Sample ID: LCS	SampType: LCS	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R100273	RunNo: 100273								
Prep Date:	Analysis Date: 10/5/2023	SeqNo: 3671711 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	3.5	0.20	3.500	0	100	90	110			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Above Quantitation Range/Estimated Value
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.	

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: MB-77653	SampType: MBLK	TestCode: EPA Method 6020A: TCLP Metals								
Client ID: PBW	Batch ID: 77653	RunNo: 100058								
Prep Date: 9/20/2023	Analysis Date: 9/27/2023	SeqNo: 3661283 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Lead	ND	0.0010								
Selenium	ND	0.0010								

Sample ID: MSLCSLL-77653	SampType: LCSLL	TestCode: EPA Method 6020A: TCLP Metals								
Client ID: BatchQC	Batch ID: 77653	RunNo: 100058								
Prep Date: 9/20/2023	Analysis Date: 9/27/2023	SeqNo: 3661284 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.0011	0.0010	0.001000	0	110	70	130			
Lead	0.0011	0.0010	0.001000	0	114	70	130			
Selenium	0.00071	0.0010	0.001000	0	71.5	70	130			J

Sample ID: MSLCS-77653	SampType: LCS	TestCode: EPA Method 6020A: TCLP Metals								
Client ID: LCSW	Batch ID: 77653	RunNo: 100058								
Prep Date: 9/20/2023	Analysis Date: 9/27/2023	SeqNo: 3661285 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.049	0.0010	0.05000	0	97.9	80	120			
Lead	0.052	0.0010	0.05000	0	105	80	120			
Selenium	0.049	0.0010	0.05000	0	98.1	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Above Quantitation Range/Estimated Value
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: MB-77632	SampType: MBLK	TestCode: EPA Method 8081: Pesticides TCLP								
Client ID: PBW	Batch ID: 77632	RunNo: 100074								
Prep Date: 9/20/2023	Analysis Date: 9/28/2023	SeqNo: 3662436 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chlordane	ND	0.030								
Surr: Decachlorobiphenyl	0.0023		0.002500		91.8	40.9	111			
Surr: Tetrachloro-m-xylene	0.0018		0.002500		73.5	15	107			

Sample ID: LCS-77632	SampType: LCS	TestCode: EPA Method 8081: Pesticides TCLP								
Client ID: LCSSW	Batch ID: 77632	RunNo: 100074								
Prep Date: 9/20/2023	Analysis Date: 9/28/2023	SeqNo: 3662437 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	0.0020		0.002500		80.4	40.9	111			
Surr: Tetrachloro-m-xylene	0.0016		0.002500		62.2	15	107			

Sample ID: LCSD-77632	SampType: LCSD	TestCode: EPA Method 8081: Pesticides TCLP								
Client ID: LCSS02	Batch ID: 77632	RunNo: 100074								
Prep Date: 9/20/2023	Analysis Date: 9/28/2023	SeqNo: 3662438 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	0.0024		0.002500		95.1	40.9	111	0	0	
Surr: Tetrachloro-m-xylene	0.0021		0.002500		83.4	15	107	0	0	

Sample ID: MB-77632	SampType: MBLK	TestCode: EPA Method 8081: Pesticides TCLP								
Client ID: PBW	Batch ID: 77632	RunNo: 100074								
Prep Date: 9/20/2023	Analysis Date: 9/28/2023	SeqNo: 3662439 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chlordane	ND	0.030								
Surr: Decachlorobiphenyl	0.0023		0.002500		93.2	40.9	111			
Surr: Tetrachloro-m-xylene	0.0018		0.002500		71.5	15	107			

Sample ID: LCS-77632	SampType: LCS	TestCode: EPA Method 8081: Pesticides TCLP								
Client ID: LCSSW	Batch ID: 77632	RunNo: 100074								
Prep Date: 9/20/2023	Analysis Date: 9/28/2023	SeqNo: 3662440 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	0.0020		0.002500		80.6	40.9	111			
Surr: Tetrachloro-m-xylene	0.0015		0.002500		60.0	15	107			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Above Quantitation Range/Estimated Value
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: LCSD-77632	SampType: LCSD	TestCode: EPA Method 8081: Pesticides TCLP								
Client ID: LCSS02	Batch ID: 77632	RunNo: 100074								
Prep Date: 9/20/2023	Analysis Date: 9/28/2023	SeqNo: 3662441		Units: %Rec						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	0.0024		0.002500		95.8	40.9	111	0	0	
Surr: Tetrachloro-m-xylene	0.0020		0.002500		81.6	15	107	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: 100ng lcs2	SampType: LCS	TestCode: TCLP Volatiles by 8260B								
Client ID: LCSW	Batch ID: T99899	RunNo: 99899								
Prep Date:	Analysis Date: 9/21/2023	SeqNo: 3652913 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.024	0.010	0.02000	0	121	70	130			
1,1-Dichloroethene	0.021	0.010	0.02000	0	105	70	130			
Trichloroethene (TCE)	0.022	0.010	0.02000	0	108	70	130			
Chlorobenzene	0.023	0.010	0.02000	0	116	70	130			
Surr: 1,2-Dichloroethane-d4	0.011		0.01000		108	70	130			
Surr: 4-Bromofluorobenzene	0.010		0.01000		104	70	130			
Surr: Dibromofluoromethane	0.0096		0.01000		95.8	70	130			
Surr: Toluene-d8	0.010		0.01000		101	70	130			

Sample ID: mb	SampType: MBLK	TestCode: TCLP Volatiles by 8260B								
Client ID: PBW	Batch ID: T99899	RunNo: 99899								
Prep Date:	Analysis Date: 9/21/2023	SeqNo: 3652916 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.50								
1,2-Dichloroethane (EDC)	ND	0.50								
2-Butanone	ND	200								
Carbon Tetrachloride	ND	0.50								
Chloroform	ND	6.0								
1,4-Dichlorobenzene	ND	7.5								
1,1-Dichloroethene	ND	0.70								
Tetrachloroethene (PCE)	ND	0.70								
Trichloroethene (TCE)	ND	0.50								
Vinyl chloride	ND	0.20								
Chlorobenzene	ND	100								
Surr: 1,2-Dichloroethane-d4	0.010		0.01000		104	70	130			
Surr: 4-Bromofluorobenzene	0.010		0.01000		104	70	130			
Surr: Dibromofluoromethane	0.0098		0.01000		97.7	70	130			
Surr: Toluene-d8	0.0099		0.01000		99.0	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: mb-77598	SampType: MBLK	TestCode: EPA Method 8270C TCLP								
Client ID: PBW	Batch ID: 77598	RunNo: 99882								
Prep Date: 9/19/2023	Analysis Date: 9/20/2023	SeqNo: 3652787 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	ND	200								
3+4-Methylphenol	ND	200								
2,4-Dinitrotoluene	ND	0.13								
Hexachlorobenzene	ND	0.13								
Hexachlorobutadiene	ND	0.50								
Hexachloroethane	ND	3.0								
Nitrobenzene	ND	2.0								
Pentachlorophenol	ND	100								
Pyridine	ND	5.0								
2,4,5-Trichlorophenol	ND	400								
2,4,6-Trichlorophenol	ND	2.0								
Cresols, Total	ND	200								
Surr: 2-Fluorophenol	0.11		0.2000		57.0	20.8	71.9			
Surr: Phenol-d5	0.084		0.2000		41.9	16.2	54.5			
Surr: 2,4,6-Tribromophenol	0.13		0.2000		63.3	18.8	117			
Surr: Nitrobenzene-d5	0.059		0.1000		59.1	33	85.9			
Surr: 2-Fluorobiphenyl	0.050		0.1000		50.2	26.3	79.6			
Surr: 4-Terphenyl-d14	0.092		0.1000		91.8	53.9	124			

Sample ID: lcs-77598	SampType: LCS	TestCode: EPA Method 8270C TCLP								
Client ID: LCSW	Batch ID: 77598	RunNo: 99882								
Prep Date: 9/19/2023	Analysis Date: 9/20/2023	SeqNo: 3652788 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	0.062	0.0050	0.1000	0	62.1	26.8	92.9			
3+4-Methylphenol	0.12	0.0051	0.2000	0	62.4	23.7	100			
2,4-Dinitrotoluene	0.048	0.0049	0.1000	0	47.9	22.3	71.2			
Hexachlorobenzene	0.071	0.019	0.1000	0	71.5	26.1	91.6			
Hexachlorobutadiene	0.033	0.017	0.1000	0	33.0	15	74.2			
Hexachloroethane	0.034	0.014	0.1000	0	33.8	15	85.4			
Nitrobenzene	0.058	0.0049	0.1000	0	57.6	26.1	89.6			
Pentachlorophenol	0.044	0.027	0.1000	0	44.3	21.7	89.4			
Pyridine	0.026	0.014	0.1000	0	25.6	15	68.4			
2,4,5-Trichlorophenol	0.061	0.0063	0.1000	0	61.3	27	97.9			
2,4,6-Trichlorophenol	0.064	0.0059	0.1000	0	63.6	27.9	92.6			
Cresols, Total	0.19	0.027	0.3000	0	62.3	24.8	97.7			
Surr: 2-Fluorophenol	0.10		0.2000		51.5	20.8	71.9			
Surr: Phenol-d5	0.078		0.2000		38.9	16.2	54.5			
Surr: 2,4,6-Tribromophenol	0.12		0.2000		60.8	18.8	117			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank
E Above Quantitation Range/Estimated Value
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC

Project: Quarterly WDW 1 2 3 4 Inj Well

Sample ID: Ics-77598	SampType: LCS			TestCode: EPA Method 8270C TCLP						
Client ID: LCSW	Batch ID: 77598			RunNo: 99882						
Prep Date: 9/19/2023	Analysis Date: 9/20/2023			SeqNo: 3652788			Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Nitrobenzene-d5	0.059		0.1000		59.3	33	85.9			
Surr: 2-Fluorobiphenyl	0.051		0.1000		51.3	26.3	79.6			
Surr: 4-Terphenyl-d14	0.083		0.1000		82.8	53.9	124			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: LCS-1 99.5uS eC	SampType: LCS	TestCode: SM2510B: Specific Conductance								
Client ID: LCSW	Batch ID: R99871	RunNo: 99871								
Prep Date:	Analysis Date: 9/20/2023	SeqNo: 3651649	Units: µmhos/cm							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	10	99.50	0	103	85	115			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Above Quantitation Range/Estimated Value
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.	

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: MB-77726	SampType: MBLK	TestCode: EPA Method 7470A: Mercury								
Client ID: PBW	Batch ID: 77726	RunNo: 100006								
Prep Date: 9/25/2023	Analysis Date: 9/26/2023	SeqNo: 3658490 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID: LCSLL-77726		SampType: LCSLL		TestCode: EPA Method 7470A: Mercury						
Client ID: BatchQC		Batch ID: 77726		RunNo: 100006						
Prep Date: 9/25/2023		Analysis Date: 9/26/2023		SeqNo: 3658491		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.00013	0.00020	0.0001500	0	86.7	50	150			J

Sample ID: LCS-77726		SampType: LCS		TestCode: EPA Method 7470A: Mercury						
Client ID: LCSW		Batch ID: 77726		RunNo: 100006						
Prep Date: 9/25/2023		Analysis Date: 9/26/2023		SeqNo: 3658494		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0047	0.00020	0.005000	0	93.3	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: MB-A	SampType: MBLK	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: PBW	Batch ID: A99857	RunNo: 99857								
Prep Date:	Analysis Date: 9/20/2023	SeqNo: 3650538 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID: LCS-A	SampType: LCS	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: LCSW	Batch ID: A99857	RunNo: 99857								
Prep Date:	Analysis Date: 9/20/2023	SeqNo: 3650540 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	49	1.0	50.00	0	98.1	80	120			
Magnesium	49	1.0	50.00	0	98.1	80	120			
Potassium	48	1.0	50.00	0	96.2	80	120			
Sodium	49	1.0	50.00	0	98.8	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: MB-77653	SampType: MBLK		TestCode: EPA 6010B: TCLP Metals							
Client ID: PBW	Batch ID: 77653		RunNo: 99996							
Prep Date: 9/20/2023	Analysis Date: 9/26/2023		SeqNo: 3657805		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Silver	ND	0.0050								

Sample ID: LCS-77653		SampType: LCS		TestCode: EPA 6010B: TCLP Metals						
Client ID: LCSW		Batch ID: 77653		RunNo: 99996						
Prep Date: 9/20/2023		Analysis Date: 9/26/2023		SeqNo: 3657806			Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.47	0.0020	0.5000	0	94.4	80	120			
Cadmium	0.47	0.0020	0.5000	0	93.2	80	120			
Chromium	0.47	0.0060	0.5000	0	95.0	80	120			
Silver	0.093	0.0050	0.1000	0	92.9	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Above Quantitation Range/Estimated Value
II Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.	

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: MB-1 Alk	SampType: MBLK			TestCode: SM2320B: Alkalinity						
Client ID: PBW	Batch ID: R99871			RunNo: 99871						
Prep Date:	Analysis Date: 9/20/2023			SeqNo: 3651614			Units: mg/L CaCO3			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID: LCS-1 Alk		SampType: LCS			TestCode: SM2320B: Alkalinity					
Client ID: LCSW		Batch ID: R99871			RunNo: 99871					
Prep Date:		Analysis Date: 9/20/2023			SeqNo: 3651615		Units: mg/L CaCO3			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	79.56	20.00	80.00	0	99.4	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: MB-77640	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids								
Client ID: PBW	Batch ID: 77640	RunNo: 99894								
Prep Date: 9/20/2023	Analysis Date: 9/21/2023	SeqNo: 3652827 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	50.0								

Sample ID: LCS-77640	SampType: LCS	TestCode: SM2540C MOD: Total Dissolved Solids								
Client ID: LCSW	Batch ID: 77640	RunNo: 99894								
Prep Date: 9/20/2023	Analysis Date: 9/21/2023	SeqNo: 3652828 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1040	50.0	1000	0	104	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Above Quantitation Range/Estimated Value
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.	

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2309926

20-Oct-23

Client: HF Sinclair Asphalt Navajo Refining LLC**Project:** Quarterly WDW 1 2 3 4 Inj Well

Sample ID: MB-77615	SampType: MBLK	TestCode: SM 2540D: TSS								
Client ID: PBW	Batch ID: 77615	RunNo: 99852								
Prep Date: 9/19/2023	Analysis Date: 9/20/2023	SeqNo: 3650485	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	ND	4.0								

Sample ID: LCS-77615	SampType: LCS	TestCode: SM 2540D: TSS								
Client ID: LCSW	Batch ID: 77615	RunNo: 99852								
Prep Date: 9/19/2023	Analysis Date: 9/20/2023	SeqNo: 3650486	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	89	4.0	91.90	0	96.8	83.89	119.7			

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Above Quantitation Range/Estimated Value
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.	



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: HF Sinclair Asphalt
Navajo Refining LLC

Work Order Number: 2309926

RcptNo: 1

Received By: Juan Rojas 9/16/2023 7:30:00 AM

Completed By: Cheyenne Cason 9/18/2023 9:11:33 AM

Reviewed By: *ma 9/18/23*

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☐ No ☒ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☒ No ☒ NA ☐
9. Received at least 1 vial with headspace $<1/4"$ for AQ VOA? Yes ☒ No ☒ NA ☐
10. Were any sample containers received broken? Yes ☒ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH:

4 scm 9/18/23
3.1 scm 9/18/23
3.2
(2 or 12 unless noted)

Adjusted?

YES

Checked by:

SCM 9/18/23

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:

Date:

By Whom:

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks: *POURED OFF ~ 125mLs FROM SAMPLE 001 B 2 OF 2 TO MAKE SAMPLE 001D. ADDED FILTERED*
USING LOT# 57675001. ADDED ~ 0.4mLs HNO₃ (LOT# 7281) TO SAMPLE 001D FOR METALS ANALYSIS. ADDED
17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	-1.9	Good	Not Present	Yogi		

SAMPLE 001A RECEIVED WITH AIR BUBBLES. SCM 9/18/23

~ 0.5mLs HNO₃ (LOT# 7281) TO
SAMPLE 001E FOR pH < 2. SCM 9/18/23

Chain-of-Custody Record

Client: Navajo Refining Co.

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Mailing Address: P.O. Box 159

Quarterly WDW-1, 2, 3 & 4 Inj Well

Artesia, NM 88211-0159

Project #:

Phone #: 575-748-3311

email or Fax#: 575-746-5451

Project Manager:

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)Accreditation: ☐ Az Compliance☐ NELAC ☐ Other☐ EDD (Type)

Jason Roberts

Sampler:

On Ice: ☒ Yes ☐ No

of Coolers: 1

Cooler Temp (including cfi): -18.0-13.1g

Date Time Matrix Sample Name

9/15/2023	10:40	Liquid	WDW-1, 2, 3 & 4 Effluent
9/15/2023	10:40	Liquid	WDW-1, 2, 3 & 4 Effluent
9/15/2023	10:40	Liquid	WDW-1, 2, 3 & 4 Effluent
9/15/2023	10:40	Liquid	WDW-1, 2, 3 & 4 Effluent
9/15/2023	10:40	Liquid	WDW-1, 2, 3 & 4 Effluent
9/15/2023	10:40	Liquid	WDW-1, 2, 3 & 4 Effluent

Container Type and #	Preservative Type	HEAL No.
**	**	7300926
3-40ml VOA HCL		
1-1L Amber	none	
***	***	
1-250ml P	HNO3	
1-1L Amber	none	

Date: 9/15/23

Time: 12:30

Relinquished by: Brady Hubbard

Brady Hubbard

Received by: [Signature]

Date: 9/15/23

Time: 12:30

Remarks: Dissolved Cations by EPA Method 200.7.

***1-500ml unpreserved p, 1-125ml H2SO4 p, 1-125ml HNO3 p, ***1-500ml unpreserved p, 1-500ml NaOH p, 1-500ml NaOH/ZnAcetate p

Date: 9/15/23

Time: 19:00

Relinquished by: [Signature]

[Signature]

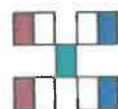
Received by: [Signature]

Date: 9/16/23

Time: 7:30

Remarks: Dissolved Cations by EPA Method 200.7.

***1-500ml unpreserved p, 1-125ml H2SO4 p, 1-125ml HNO3 p, ***1-500ml unpreserved p, 1-500ml NaOH p, 1-500ml NaOH/ZnAcetate p



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Specific Gravity, C/A Balance, ORP, pH, TSS

8260 TCLP Compounds

8270 TCLP Compounds

RCI

RCRA 8 Metals

8081 TCLP Compounds

District I

1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720

District II

811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170

District IV

1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

COMMENTS

Action 286404

COMMENTS

Operator: HF Sinclair Navajo Refining LLC ATTN: GENERAL COUNSEL Dallas, TX 75201	OGRID:
	15694
	Action Number: 286404
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

COMMENTS

Created By	Comment	Comment Date
cchavez	Quarterly Report UICI-8-4 WDW-4 Submittal	11/20/2023
cchavez	OCD observes from FY23 Quarterly Sampling that the Renewable Diesel Unit (RDU) has not resulted in exceedances to the quarterly effluent environmental analytical laboratory data results. OCD language pertaining to installation of monitor wells (MWs) did not explain or clarify the situation where groundwater is not present or is insufficient to install a monitor MW. Consequently, a MW may be installed at WDWs where groundwater is present and sufficient to allow for the installation of a MW. Monitoring of groundwater via MW is a function of the above and the permit provision would not apply in cases where a MW is not installed per the current discharge permit.	11/20/2023

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
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District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 286404

CONDITIONS

Operator: HF Sinclair Navajo Refining LLC ATTN: GENERAL COUNSEL Dallas, TX 75201	OGRID: 15694
	Action Number: 286404
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

CONDITIONS

Created By	Condition	Condition Date
cchavez	None	11/20/2023