

UICI – 8 - 1

**Quarterly Injection
Reports (2)**

2020

From: [Dade, Randy](#)
To: [Chavez, Carl J. EMNRD](#); [Denton, Scott](#); [Combs, Robert](#)
Cc: [Dade, Randy](#)
Subject: [EXT] 2020 1st Quarter Injection Report July to September
Date: Tuesday, November 3, 2020 1:59:36 PM
Attachments: [1Q Jul - Sept INJECTION 2020.xlsx](#)
[Rpt_2009F63_Quarterly_WDW-1, 2, & 3_Inj_Well_Final_v1.pdf](#)
[2020 1st Quarter Injection Report Cover Letter.pdf](#)

Carl,

Please find attached the 2020 First Quarter Cover Letter and Injection report for HollyFrontier. This report covers the period of July 1, 2020 through September 30, 2020. Also attached is the Well Injection Analytical Report. If you have any comments or questions, please call.

Thanks again for your help, Randy

Lewis R. (Randy) Dade
Environmental Specialist
The HollyFrontier Companies
501 E. Main / P.O. Box 159
Artesia, NM 88210 / 88211-0159
575-746-5281 (o)
575-703-4735 (c)
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Email: Lewis.Dade@hollyfrontier.com

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November 03, 2020

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

**RE: 2020 1st Quarter Injection Report for Wells WDW-1, WDW-2, WDW-3, WDW-4
HollyFrontier Navajo Refining LLC**

Dear Mr. Chavez,

Enclosed, please find the first quarter 2020 sampling results for fluids injected into WDW-1, WDW-2, WDW-3 and WDW-4 and a table showing the volumes and pressures as required under Permit Condition 2.I.1, Quarterly Reports.

Over the first quarter, the average injection pressure for each well was 1109 psig for WDW-1, 1054 psig for WDW-2, 966 psig for WDW-3 and 106 psig for WDW-4. The average flows were 131 gpm for WDW-1, 62 gpm for WDW-2, 86 gpm for WDW-3 and 166 gpm for WDW-4. There were no significant losses from the glycol expansion tanks Well Annulus Monitoring System (WAMS). The quarterly effluent analyses indicate parameters are within permit limits.

This report covers the period from July 1, 2020 to September 30, 2020. Navajo has disposed a total of 1,405,473 barrels of fluid into the four wells during the first quarter of 2020. The volume per well is:

- 412,936 barrels into WDW-1; 30-015-27592
- 195,498 barrels into WDW-2; 30-015-20894
- 271,920 barrels into WDW-3; 30-015-26575
- 525,119 barrels into WDW-4; 30-015-44677

This report is signed and certified in accordance with WQCC section 5101.G. If there are any questions, please contact Randy Dade at 575-746-5281.

Respectfully,

Scott M. Denton
Environmental Manager
HollyFrontier Navajo Refining LLC

HollyFrontier Navajo Refining LLC
501 East Main • Artesia, NM 88210
(575) 748-3311 • <http://www.hollyfrontier.com>

2020 FIRST QUARTER MONTHLY INJECTION PRESSURES, RATES, AND VOLUMES

Average Pressure (psig)	Average Flow (gpm)	Maximum Flow (gpm)		Minimum Flow (gpm)		Average Annular Pressure (psig)		Maximum Annular Pressure (psig)		Minimum Annular Pressure (psig)		Average Volume (bpd)	Maximum Volume (bpd)	Minimum Volume (bpd)	Volume (barrels)	CUMULATIVE Volume (barrels)	TOTAL
		Flow (gpm)	(gpm)	Flow (gpm)	(gpm)	Av (psig)	Mx (psig)	Annular Pressure (psig)	Minimum Pressure (psig)	Annular Pressure (psig)	Maximum Pressure (psig)						
30-015-27592 WDW-1																	
Jul-20	123	133	103	461	660	329	4,217	4,560	3,531	130,731	45,933,781						
Aug-20	131	150	96	266	397	104	4,491	5,143	3,291	139,234	46,064,512						
Sep-20	139	163	125	202	343	119	4,766	5,589	4,286	142,971	46,346,717						
Monthly Avg	131								TOTAL	412,936							
30-015-20894 WDW-2																	
Jul-20	59	85	32	725	1,166	458	2,023	2,914	1,097	62,709	28,792,996						
Aug-20	63	78	49	488	868	191	2,160	2,674	1,680	66,960	28,855,705						
Sep-20	64	77	54	232	375	130	2,194	2,640	1,851	65,829	28,922,665						
Monthly Avg	62								TOTAL	195,498							
30-015-26575 WDW-3																	
Jul-20	76	97	15	744	949	582	2,606	3,326	514	80,777	20,521,419						
Aug-20	85	122	51	541	867	316	2,914	4,183	1,749	90,343	20,602,196						
Sep-20	98	142	55	371	520	240	3,360	4,869	1,886	100,800	20,692,539						
Monthly Avg	86								TOTAL	271,920							
30-015-44677 WDW-4																	
Jul-20	179	225	115	178	262	99	6,137	7,714	3,121	190,251	4,617,362						
Aug-20	167	230	84	184	249	66	5,726	7,886	2,880	177,497	4,807,613						
Sep-20	153	213	0	151	224	75	5,246	7,269	0	157,371	4,985,110						
Monthly Avg	166								TOTAL	525,119	5,142,481						
Total BBLS Beginning Volume																Ending Volume	
WDW1																412,936	45,933,781
WDW2																195,498	28,792,996
WDW3																271,920	20,521,419
WDW4																525,119	5,142,481



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

October 19, 2020

Robert Combs
Navajo Refining Company
P.O. Box 159
Artesia, NM 88211-0159
TEL: (575) 748-3311
FAX:

RE: Quarterly WDW-1, 2, & 3 Inj Well

OrderNo.: 2009F63

Dear Robert Combs:

Hall Environmental Analysis Laboratory received 2 sample(s) on 9/25/2020 for the analyses presented in the following report.

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. In order to properly interpret your results, it is imperative that you review this report in its entirety. 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. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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', is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2009F63

Date Reported: 10/19/2020

CLIENT: Navajo Refining Company

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

Project: Quarterly WDW-1, 2, & 3 Inj Well

Collection Date: 9/24/2020 7:05:00 AM

Lab ID: 2009F63-001

Matrix: AQUEOUS

Received Date: 9/25/2020 9:50:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8081: PESTICIDES TCLP								
						Analyst: JME		
Chlordane	ND	0.00050	0.030		mg/L	1	10/14/2020 1:45:21 PM	55595
Surr: Decachlorobiphenyl	57.3	0	38.2-102		%Rec	1	10/14/2020 1:45:21 PM	55595
Surr: Tetrachloro-m-xylene	52.6	0	32.3-92.4		%Rec	1	10/14/2020 1:45:21 PM	55595
EPA METHOD 300.0: ANIONS								
						Analyst: CAS		
Fluoride	28	0.87	2.0	*	mg/L	20	9/25/2020 4:25:04 PM	R72192
Chloride	860	25	50	*	mg/L	100	10/9/2020 6:35:44 PM	A72576
Nitrogen, Nitrite (As N)	0.26	0.070	0.50	J	mg/L	5	9/25/2020 3:47:51 PM	R72192
Bromide	1.3	0.25	0.50		mg/L	5	9/25/2020 3:47:51 PM	R72192
Nitrogen, Nitrate (As N)	0.79	0.10	0.50		mg/L	5	9/25/2020 3:47:51 PM	R72192
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5		mg/L	5	9/25/2020 3:47:51 PM	R72192
Sulfate	2400	25	50	*	mg/L	100	10/9/2020 6:35:44 PM	A72576
EPA METHOD 7470: MERCURY								
						Analyst: VP		
Mercury	ND	0.00012	0.00020		mg/L	1	10/5/2020 6:14:41 PM	55637
EPA METHOD 6010B: DISSOLVED METALS								
						Analyst: pmf		
Calcium	390	0.46	10		mg/L	10	9/29/2020 5:27:12 AM	A72243
Magnesium	130	0.097	5.0		mg/L	5	9/29/2020 5:20:50 AM	A72243
Potassium	360	2.1	10		mg/L	10	9/29/2020 5:27:12 AM	A72243
Sodium	1000	5.3	20		mg/L	20	9/28/2020 5:36:49 AM	A72203
EPA 6010B: TOTAL RECOVERABLE METALS								
						Analyst: pmf		
Arsenic	0.029	0.022	5.0	J	mg/L	1	10/2/2020 3:50:44 AM	55452
Barium	0.042	0.0011	100	J	mg/L	1	10/2/2020 3:50:44 AM	55452
Cadmium	ND	0.00090	1.0		mg/L	1	10/2/2020 3:50:44 AM	55452
Chromium	ND	0.0014	5.0		mg/L	1	10/2/2020 3:50:44 AM	55452
Lead	ND	0.013	5.0		mg/L	1	10/2/2020 5:22:03 AM	55452
Selenium	0.027	0.021	1.0	J	mg/L	1	10/7/2020 2:56:29 PM	55452
Silver	0.0038	0.0013	5.0	J	mg/L	1	10/2/2020 3:50:44 AM	55452
EPA METHOD 8270C TCLP								
						Analyst: DAM		
2-Methylphenol	ND	0.0033	200		mg/L	1	10/2/2020 1:03:39 AM	55549
3+4-Methylphenol	ND	0.0042	200		mg/L	1	10/2/2020 1:03:39 AM	55549
2,4-Dinitrotoluene	ND	0.0045	0.13		mg/L	1	10/2/2020 1:03:39 AM	55549
Hexachlorobenzene	ND	0.0033	0.13		mg/L	1	10/2/2020 1:03:39 AM	55549
Hexachlorobutadiene	ND	0.018	0.50		mg/L	1	10/2/2020 1:03:39 AM	55549
Hexachloroethane	ND	0.0038	3.0		mg/L	1	10/2/2020 1:03:39 AM	55549
Nitrobenzene	ND	0.0035	2.0		mg/L	1	10/2/2020 1:03:39 AM	55549
Pentachlorophenol	ND	0.0077	100		mg/L	1	10/2/2020 1:03:39 AM	55549
Pyridine	ND	0.0047	5.0		mg/L	1	10/2/2020 1:03:39 AM	55549
2,4,5-Trichlorophenol	ND	0.0038	400		mg/L	1	10/2/2020 1:03:39 AM	55549

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

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 range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2009F63

Date Reported: 10/19/2020

CLIENT: Navajo Refining Company

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

Project: Quarterly WDW-1, 2, & 3 Inj Well

Collection Date: 9/24/2020 7:05:00 AM

Lab ID: 2009F63-001

Matrix: AQUEOUS

Received Date: 9/25/2020 9:50:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C TCLP								
						Analyst: DAM		
2,4,6-Trichlorophenol	ND	0.0036	2.0		mg/L	1	10/2/2020 1:03:39 AM	55549
Cresols, Total	ND	0.0063	200		mg/L	1	10/2/2020 1:03:39 AM	55549
Surr: 2-Fluorophenol	52.3	0	15-81.1		%Rec	1	10/2/2020 1:03:39 AM	55549
Surr: Phenol-d5	39.5	0	15-61.1		%Rec	1	10/2/2020 1:03:39 AM	55549
Surr: 2,4,6-Tribromophenol	37.1	0	17.2-108		%Rec	1	10/2/2020 1:03:39 AM	55549
Surr: Nitrobenzene-d5	62.4	0	18.7-120		%Rec	1	10/2/2020 1:03:39 AM	55549
Surr: 2-Fluorobiphenyl	60.6	0	23.6-103		%Rec	1	10/2/2020 1:03:39 AM	55549
Surr: 4-Terphenyl-d14	63.1	0	24.1-105		%Rec	1	10/2/2020 1:03:39 AM	55549
TCLP VOLATILES BY 8260B								
						Analyst: RAA		
Benzene	ND	0.00023	0.50		mg/L	200	9/30/2020 9:54:00 PM	T72272
1,2-Dichloroethane (EDC)	ND	0.00022	0.50		mg/L	200	9/30/2020 9:54:00 PM	T72272
2-Butanone	ND	0.0011	200		mg/L	200	9/30/2020 9:54:00 PM	T72272
Carbon Tetrachloride	ND	0.00018	0.50		mg/L	200	9/30/2020 9:54:00 PM	T72272
Chloroform	ND	0.00013	6.0		mg/L	200	9/30/2020 9:54:00 PM	T72272
1,4-Dichlorobenzene	ND	0.00021	7.5		mg/L	200	9/30/2020 9:54:00 PM	T72272
1,1-Dichloroethene	ND	0.00013	0.70		mg/L	200	9/30/2020 9:54:00 PM	T72272
Tetrachloroethene (PCE)	ND	0.00036	0.70		mg/L	200	9/30/2020 9:54:00 PM	T72272
Trichloroethene (TCE)	ND	0.00020	0.50		mg/L	200	9/30/2020 9:54:00 PM	T72272
Vinyl chloride	ND	0.00020	0.20		mg/L	200	9/30/2020 9:54:00 PM	T72272
Chlorobenzene	ND	0.00014	100		mg/L	200	9/30/2020 9:54:00 PM	T72272
Surr: 1,2-Dichloroethane-d4	102	0	70-130		%Rec	200	9/30/2020 9:54:00 PM	T72272
Surr: 4-Bromofluorobenzene	97.5	0	70-130		%Rec	200	9/30/2020 9:54:00 PM	T72272
Surr: Dibromofluoromethane	103	0	70-130		%Rec	200	9/30/2020 9:54:00 PM	T72272
Surr: Toluene-d8	100	0	70-130		%Rec	200	9/30/2020 9:54:00 PM	T72272
SM2510B: SPECIFIC CONDUCTANCE								
						Analyst: MH		
Conductivity	7700	10	10		µmhos/c	1	9/28/2020 2:21:02 PM	R72211
SM2320B: ALKALINITY								
						Analyst: MH		
Bicarbonate (As CaCO3)	474.4	20.00	20.00		mg/L Ca	1	9/28/2020 2:21:02 PM	R72211
Carbonate (As CaCO3)	ND	2.000	2.000		mg/L Ca	1	9/28/2020 2:21:02 PM	R72211
Total Alkalinity (as CaCO3)	474.4	20.00	20.00		mg/L Ca	1	9/28/2020 2:21:02 PM	R72211
SPECIFIC GRAVITY								
						Analyst: JRR		
Specific Gravity	1.000	0	0			1	10/5/2020 8:18:00 AM	R72378
SM2540C MOD: TOTAL DISSOLVED SOLIDS								
						Analyst: MH		
Total Dissolved Solids	5850	40.0	40.0	*D	mg/L	1	10/1/2020 3:11:00 PM	55560

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

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 range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2009F63

Date Reported: 10/19/2020

CLIENT: Navajo Refining Company

Client Sample ID: TRIP BLANK

Project: Quarterly WDW-1, 2, & 3 Inj Well

Collection Date:

Lab ID: 2009F63-002

Matrix: TRIP BLANK

Received Date: 9/25/2020 9:50:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
TCLP VOLATILES BY 8260B							Analyst: RAA	
Benzene	ND	0.00023	0.50		mg/L	1	9/30/2020 10:18:00 PM	T72272
1,2-Dichloroethane (EDC)	ND	0.00022	0.50		mg/L	1	9/30/2020 10:18:00 PM	T72272
2-Butanone	ND	0.0011	200		mg/L	1	9/30/2020 10:18:00 PM	T72272
Carbon Tetrachloride	ND	0.00018	0.50		mg/L	1	9/30/2020 10:18:00 PM	T72272
Chloroform	ND	0.00013	6.0		mg/L	1	9/30/2020 10:18:00 PM	T72272
1,4-Dichlorobenzene	ND	0.00021	7.5		mg/L	1	9/30/2020 10:18:00 PM	T72272
1,1-Dichloroethene	ND	0.00013	0.70		mg/L	1	9/30/2020 10:18:00 PM	T72272
Tetrachloroethene (PCE)	ND	0.00036	0.70		mg/L	1	9/30/2020 10:18:00 PM	T72272
Trichloroethene (TCE)	ND	0.00020	0.50		mg/L	1	9/30/2020 10:18:00 PM	T72272
Vinyl chloride	ND	0.00020	0.20		mg/L	1	9/30/2020 10:18:00 PM	T72272
Chlorobenzene	ND	0.00014	100		mg/L	1	9/30/2020 10:18:00 PM	T72272
Surr: 1,2-Dichloroethane-d4	102	0	70-130		%Rec	1	9/30/2020 10:18:00 PM	T72272
Surr: 4-Bromofluorobenzene	98.8	0	70-130		%Rec	1	9/30/2020 10:18:00 PM	T72272
Surr: Dibromofluoromethane	105	0	70-130		%Rec	1	9/30/2020 10:18:00 PM	T72272
Surr: Toluene-d8	100	0	70-130		%Rec	1	9/30/2020 10:18:00 PM	T72272

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

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 range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

October 07, 2020

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Hall Environmental Analysis Laboratory

Sample Delivery Group: L1267162
Samples Received: 09/26/2020
Project Number:
Description:

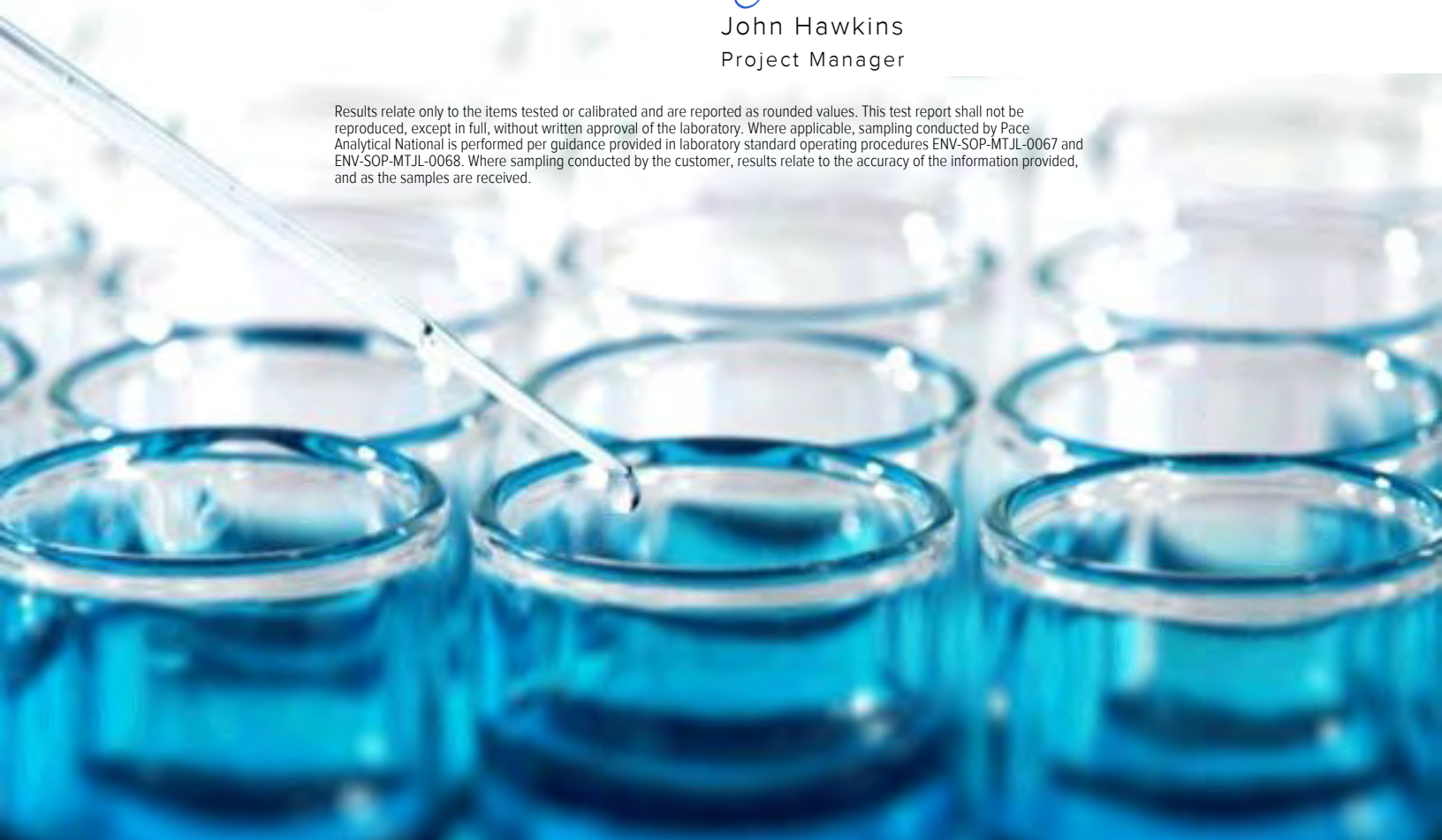
Report To: Jackie Bolte
4901 Hawkins NE
Albuquerque, NM 87109

Entire Report Reviewed By:



John Hawkins
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.





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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



2009F63-001EFG WDW-1,2,3&4 EFFLUENT L1267162-01 GW

Collected by

Collected date/time

Received date/time

09/24/20 07:05

09/26/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2580	WG1552078	1	09/30/20 20:30	09/30/20 20:30	JIC	Mt. Juliet, TN
Wet Chemistry by Method 4500 CN E-2011	WG1554573	1	10/06/20 10:00	10/06/20 17:15	SDL	Mt. Juliet, TN
Wet Chemistry by Method 9034-9030B	WG1551353	1	09/29/20 19:53	09/29/20 19:53	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1552343	1	10/01/20 21:41	10/01/20 21:41	JIC	Mt. Juliet, TN
Wet Chemistry by Method D93/1010A	WG1553014	1	10/02/20 16:00	10/02/20 16:00	CO	Mt. Juliet, TN

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

ACCOUNT:

Hall Environmental Analysis Laboratory

PROJECT:

SDG:

L1267162

DATE/TIME:

10/07/20 07:55

PAGE:

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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.

John Hawkins
Project Manager

Project Narrative

All Reactive Cyanide results reported in the attached report were determined as totals using method 9012B.

All Reactive Sulfide results reported in the attached report were determined as totals using method 9034/9030B.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Wet Chemistry by Method 2580

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
ORP	171	<u>T8</u>	1	09/30/2020 20:30	WG1552078

¹ Cp² Tc

Wet Chemistry by Method 4500 CN E-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive Cyanide	0.0379		0.00500	1	10/06/2020 17:15	WG1554573

³ Ss⁴ Cn

Wet Chemistry by Method 9034-9030B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Reactive Sulfide	ND		0.0500	1	09/29/2020 19:53	WG1551353

⁵ Sr⁶ Qc

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Corrosivity by pH	7.53	<u>T8</u>	1	10/01/2020 21:41	WG1552343

⁷ Gl⁸ Al

Sample Narrative:

L1267162-01 WG1552343: 7.53 at 21.7C

⁹ Sc

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Flashpoint	DNF at 170		1	10/02/2020 16:00	WG1553014



L1264912-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1264912-03 09/30/20 20:30 • (DUP) R3576362-3 09/30/20 20:30					
Analyte	Original Result mV	DUP Result mV	Dilution	DUP Diff mV	DUP Qualifier mV
ORP	202	200	1	2.70	20

L1264912-16 Original Sample (OS) • Duplicate (DUP)

(OS) L1264912-16 09/30/20 20:30 • (DUP) R3576362-4 09/30/20 20:30					
Analyte	Original Result mV	DUP Result mV	Dilution	DUP Diff mV	DUP Qualifier mV
ORP	198	188	1	9.70	20

L1264916-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1264916-04 09/30/20 20:30 • (DUP) R3576362-5 09/30/20 20:30					
Analyte	Original Result mV	DUP Result mV	Dilution	DUP Diff mV	DUP Qualifier mV
ORP	179	198	1	18.8	20

L1267162-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1267162-01 09/30/20 20:30 • (DUP) R3576362-6 09/30/20 20:30					
Analyte	Original Result mV	DUP Result mV	Dilution	DUP Diff mV	DUP Qualifier mV
ORP	171	170	1	1.50	20

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

(LCS) R3576362-1 09/30/20 20:30 • (LCSD) R3576362-2 09/30/20 20:30									
Analyte	Spike Amount mV	LCS Result mV	LCSD Result mV	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier mV	LCSD Qualifier mV	Diff Limits mV
ORP	228	227	226	99.4	99.3	86.0-105	0.300	20	20



Method Blank (MB)

(MB) R3578499-1 10/06/20 16:50

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

L1265051-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1265051-02 10/06/20 17:00 • (DUP) R3578499-3 10/06/20 17:01

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

L1267710-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1267710-01 10/06/20 17:23 • (DUP) R3578499-6 10/06/20 17:24

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

Laboratory Control Sample (LCS)

(LCS) R3578499-2 10/06/20 16:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Cyanide	0.100	0.0991	99.1	90.0-117	

L1267358-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1267358-02 10/06/20 17:16 • (MS) R3578499-4 10/06/20 17:17 • (MSD) R3578499-5 10/06/20 17:18

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Cyanide	0.100	ND	0.0954	0.0980	95.4	98.0	1	90.0-110		2.69		20

L1267710-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1267710-02 10/06/20 17:25 • (MS) R3578499-7 10/06/20 17:32 • (MSD) R3578499-8 10/06/20 17:33

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Cyanide	0.100	ND	0.0951	0.0926	95.1	92.6	1	90.0-110		2.66		20



Method Blank (MB)

(MB) R3575879-1 09/29/20 19:35

Analyte	MB Result mg/l	<u>MB Qualifier</u> mg/l	MB MDL mg/l	MB RDL mg/l
Reactive Sulfide	U	0.00650	0.00650	0.0500

Laboratory Control Sample (LCS)

(LCS) R3575879-2 09/29/20 19:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Reactive Sulfide	0.500	0.545	109	85.0-115	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Laboratory Control Sample (LCS)

(LCS) R3576829-1 10/01/20 21:41

Analyte	Spike Amount SU	LCS Result SU	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Corrosivity by pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.03 at 21.6C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



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

(LCS) R3577260-1 10/02/20 16:00 • (LCSD) R3577260-2 10/02/20 16:00

Analyte	Spike Amount		LCS Result		LCSD Result		LCS Rec.		LCSD Rec.		Rec. Limits		<u>LCS Qualifier</u>		<u>LCSD Qualifier</u>		RPD		RPD Limits	
	deg F		deg F	%	deg F	%	%		%		%		%		%	%		%		%
Flashpoint	126		125	98.8	127	100	96.0-104		96.0-104		1.59		10							

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



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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1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 GI

8 AI

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* 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 National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
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}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

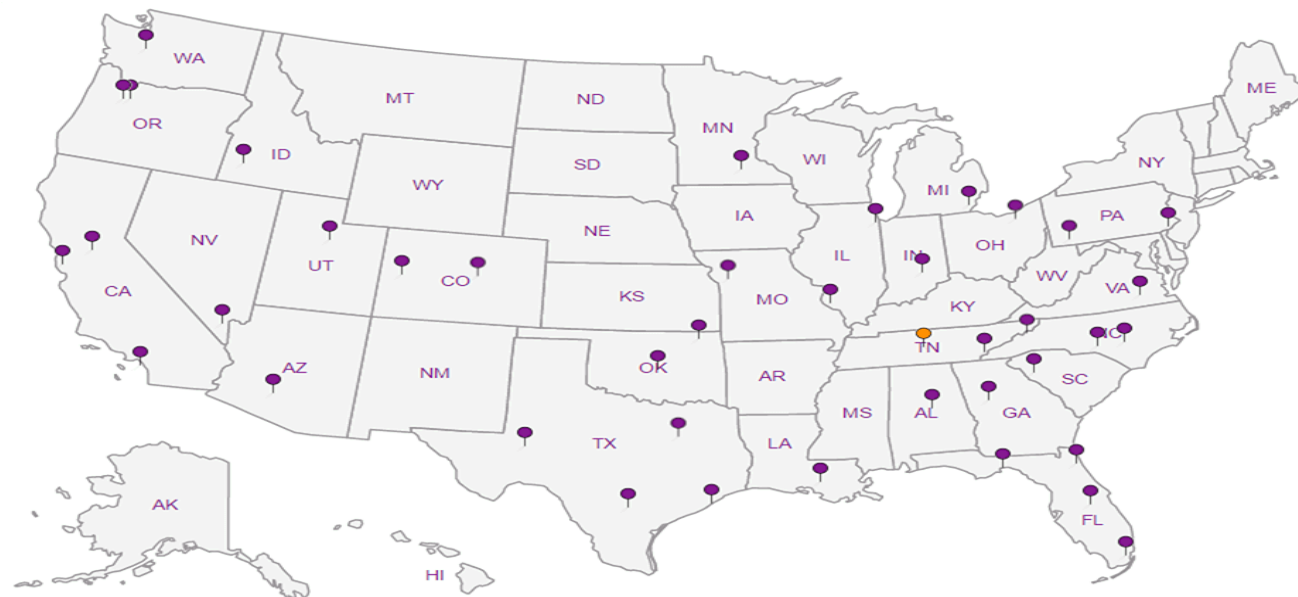
Third Party Federal Accreditations

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.





CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975
FAX: 505-345-4107

Website: clients.hallenvironmental.com

H013

SUB CONTRACTOR		Pace TN		COMPANY:		PACE TN		PHONE:	(800) 767-5859	FAX:	(615) 758-5859
ADDRESS:		12065 Lebanon Rd									
CITY, STATE, ZIP:		Mt. Juliet, TN 37122									
ITEM	SAMPLE	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	COLLECTION DATE	# CONTAINERS	ANALYTICAL COMMENTS				
1	2009F63-001E	WDW-1,2,3 & 4 Effluent	500HDPE	Aqueous	9/24/2020 7:05:00 AM	1	Reactivity, Corrosivity, and Ignitability, ORP				
2	2009F63-001F	WDW-1,2,3 & 4 Effluent	500PLNAOH	Aqueous	9/24/2020 7:05:00 AM	1	Reactivity, Corrosivity, and Ignitability				
3	2009F63-001G	WDW-1,2,3 & 4 Effluent	500PL-NAOH	Aqueous	9/24/2020 7:05:00 AM	1	Reactivity, Corrosivity, and Ignitability				

L1267167

~01

Sample Receipt Checklist
COC Seal Present/Intact: Y N If Applicable
COC Signed/Accurate: Y N VOA Zero Headspace: Y N
Bottles arrive intact: Y N Pres. Correct/Check: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
RAD Screen <0.5 mR/ht: Y N

1.0-1=1.5 ^{very} A-3 COC SI

SPECIAL INSTRUCTIONS / COMMENTS:

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:	9M	Date:	9/25/2020	Time:	11:14 AM	Received By:	R-L	Date:	9/25	Time:	9:00
Relinquished By:		Date:		Time:		Received By:		Date:		Time:	
Relinquished By:		Date:		Time:		Received By:		Date:		Time:	
TAT:		Standard ☐		RUSH		Next BD ☐		2nd BD ☐		3rd BD ☐	
REPORT TRANSMITTAL DESIRED: ☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE											
FOR LAB USE ONLY											
Temp of samples _____ °C Attempt to Cool? _____											
Comments: _____											

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009F63

19-Oct-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, & 3 Inj Well

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R72192	RunNo: 72192								
Prep Date:	Analysis Date: 9/25/2020	SeqNo: 2531067		Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	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: R72192	RunNo: 72192								
Prep Date:	Analysis Date: 9/25/2020	SeqNo: 2531068		Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.47	0.10	0.5000	0	93.9	90	110			
Nitrogen, Nitrite (As N)	0.93	0.10	1.000	0	93.4	90	110			
Bromide	2.4	0.10	2.500	0	94.3	90	110			
Nitrogen, Nitrate (As N)	2.4	0.10	2.500	0	95.9	90	110			
Phosphorus, Orthophosphate (As P)	4.5	0.50	5.000	0	90.3	90	110			

Sample ID: 2009F63-001AMS	SampType: ms	TestCode: EPA Method 300.0: Anions								
Client ID: WDW-1,2,3 & 4 Effl	Batch ID: R72192	RunNo: 72192								
Prep Date:	Analysis Date: 9/25/2020	SeqNo: 2531080		Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	3.9	0.50	5.000	0.2560	73.1	61.9	108			
Bromide	13	0.50	12.50	1.319	92.2	85.1	105			
Nitrogen, Nitrate (As N)	13	0.50	12.50	0.7880	94.2	88.3	109			
Phosphorus, Orthophosphate (As P)	19	2.5	25.00	0	74.7	68.1	110			

Sample ID: 2009F63-001AMSD	SampType: msd	TestCode: EPA Method 300.0: Anions								
Client ID: WDW-1,2,3 & 4 Effl	Batch ID: R72192	RunNo: 72192								
Prep Date:	Analysis Date: 9/25/2020	SeqNo: 2531081		Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	3.9	0.50	5.000	0.2560	73.2	61.9	108	0.192	20	
Bromide	13	0.50	12.50	1.319	93.1	85.1	105	0.946	20	
Nitrogen, Nitrate (As N)	13	0.50	12.50	0.7880	94.6	88.3	109	0.409	20	
Phosphorus, Orthophosphate (As P)	19	2.5	25.00	0	74.2	68.1	110	0.596	20	

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009F63

19-Oct-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, & 3 Inj Well

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: A72576	RunNo: 72576								
Prep Date:	Analysis Date: 10/9/2020	SeqNo: 2548341	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Sulfate	ND	0.50								

Sample ID: LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: A72576	RunNo: 72576								
Prep Date:	Analysis Date: 10/9/2020	SeqNo: 2548342	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.6	0.50	5.000	0	91.2	90	110			
Sulfate	9.2	0.50	10.00	0	92.4	90	110			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009F63

19-Oct-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, & 3 Inj Well

Sample ID: MB-55595	SampType: MBLK	TestCode: EPA Method 8081: Pesticides TCLP								
Client ID: PBW	Batch ID: 55595	RunNo: 72665								
Prep Date: 10/1/2020	Analysis Date: 10/14/2020	SeqNo: 2552301			Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chlordane	ND	0.030								
Surr: Decachlorobiphenyl	0.0019		0.002500		74.1	38.2	102			
Surr: Tetrachloro-m-xylene	0.0017		0.002500		68.3	32.3	92.4			

Sample ID: MB-55595	SampType: MBLK	TestCode: EPA Method 8081: Pesticides TCLP								
Client ID: PBW	Batch ID: 55595	RunNo: 72665								
Prep Date: 10/1/2020	Analysis Date: 10/14/2020	SeqNo: 2552302			Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chlordane	ND	0.030								
Surr: Decachlorobiphenyl	0.0019		0.002500		74.1	38.2	102			
Surr: Tetrachloro-m-xylene	0.0017		0.002500		69.9	32.3	92.4			

Sample ID: LCS-55595	SampType: LCS	TestCode: EPA Method 8081: Pesticides TCLP								
Client ID: LCSW	Batch ID: 55595	RunNo: 72665								
Prep Date: 10/1/2020	Analysis Date: 10/14/2020	SeqNo: 2552303			Units: %Rec					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	0.0024		0.002500		94.3	38.2	102			
Surr: Tetrachloro-m-xylene	0.0021		0.002500		82.2	32.3	92.4			

Sample ID: LCSD-55595	SampType: LCSD	TestCode: EPA Method 8081: Pesticides TCLP								
Client ID: LCSS02	Batch ID: 55595	RunNo: 72665								
Prep Date: 10/1/2020	Analysis Date: 10/14/2020	SeqNo: 2552304			Units: %Rec					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	0.0023		0.002500		91.2	38.2	102	0	0	
Surr: Tetrachloro-m-xylene	0.0020		0.002500		79.1	32.3	92.4	0	0	

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009F63

19-Oct-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, & 3 Inj Well

Sample ID: 100ng lcs	SampType: LCS		TestCode: TCLP Volatiles by 8260B							
Client ID: LCSW	Batch ID: T72272		RunNo: 72272							
Prep Date:	Analysis Date: 9/30/2020		SeqNo: 2536355		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.022	0.00023	0.02000	0	108	70	130			
1,1-Dichloroethene	0.018	0.00013	0.02000	0	90.0	70	130			
Trichloroethene (TCE)	0.019	0.00020	0.02000	0	93.0	70	130			
Chlorobenzene	0.020	0.00014	0.02000	0	102	70	130			
Surr: 1,2-Dichloroethane-d4	0.010		0.01000		103	70	130			
Surr: 4-Bromofluorobenzene	0.010		0.01000		99.7	70	130			
Surr: Dibromofluoromethane	0.010		0.01000		99.6	70	130			
Surr: Toluene-d8	0.0099		0.01000		98.5	70	130			

Sample ID: mb	SampType: MBLK		TestCode: TCLP Volatiles by 8260B							
Client ID: PBW	Batch ID: T72272		RunNo: 72272							
Prep Date:	Analysis Date: 9/30/2020		SeqNo: 2536356		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	0.0091		0.01000		90.8	70	130			
Surr: 4-Bromofluorobenzene	0.010		0.01000		102	70	130			
Surr: Dibromofluoromethane	0.010		0.01000		101	70	130			
Surr: Toluene-d8	0.0098		0.01000		98.0	70	130			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009F63

19-Oct-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, & 3 Inj Well

Sample ID: Ics-1 99.2uS eC	SampType: Ics		TestCode: SM2510B: Specific Conductance							
Client ID: LCSW	Batch ID: R72211		RunNo: 72211							
Prep Date:	Analysis Date: 9/28/2020		SeqNo: 2532015		Units: µmhos/cm					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	98	10	99.20	0	98.7	85	115			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009F63

19-Oct-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, & 3 Inj Well

Sample ID: MB-55637	SampType: MBLK	TestCode: EPA Method 7470: Mercury
Client ID: PBW	Batch ID: 55637	RunNo: 72435
Prep Date: 10/5/2020	Analysis Date: 10/5/2020	SeqNo: 2541693 Units: mg/L
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Mercury	ND 0.00020	

Sample ID: LCSLL-55637	SampType: LCSLL	TestCode: EPA Method 7470: Mercury
Client ID: BatchQC	Batch ID: 55637	RunNo: 72435
Prep Date: 10/5/2020	Analysis Date: 10/5/2020	SeqNo: 2541694 Units: mg/L
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Mercury	0.00012 0.00020 0.0001500	0 80.2 50 150 J

Sample ID: LCS-55637	SampType: LCS	TestCode: EPA Method 7470: Mercury
Client ID: LCSW	Batch ID: 55637	RunNo: 72435
Prep Date: 10/5/2020	Analysis Date: 10/5/2020	SeqNo: 2541695 Units: mg/L
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Mercury	0.0049 0.00020 0.005000	0 97.9 80 120

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009F63

19-Oct-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, & 3 Inj Well

Sample ID: MB	SampType: MBLK	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: PBW	Batch ID: A72203	RunNo: 72203								
Prep Date:	Analysis Date: 9/28/2020	SeqNo: 2531414 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								

Sample ID: LCS	SampType: LCS	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: LCSW	Batch ID: A72203	RunNo: 72203								
Prep Date:	Analysis Date: 9/28/2020	SeqNo: 2531416 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	49	1.0	50.00	0	98.2	80	120			

Sample ID: LCS D	SampType: LCS D	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: LCS S02	Batch ID: A72203	RunNo: 72203								
Prep Date:	Analysis Date: 9/28/2020	SeqNo: 2531417 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	50	1.0	50.00	0	99.5	80	120	1.34	20	

Sample ID: 2009F63-001BMS	SampType: MS	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: WDW-1,2,3 & 4 Effl	Batch ID: A72243	RunNo: 72243								
Prep Date:	Analysis Date: 9/29/2020	SeqNo: 2533392 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	380	5.0	250.0	132.8	100	75	125			

Sample ID: 2009F63-001BMS D	SampType: MS D	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: WDW-1,2,3 & 4 Effl	Batch ID: A72243	RunNo: 72243								
Prep Date:	Analysis Date: 9/29/2020	SeqNo: 2533393 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	380	5.0	250.0	132.8	99.1	75	125	0.760	20	

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009F63

19-Oct-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, & 3 Inj Well

Sample ID: MB-55452	SampType: MBLK	TestCode: EPA 6010B: Total Recoverable Metals								
Client ID: PBW	Batch ID: 55452	RunNo: 72243								
Prep Date: 9/25/2020	Analysis Date: 9/29/2020	SeqNo: 2533349	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.030								
Barium	ND	0.0020								
Chromium	ND	0.0060								
Lead	ND	0.020								
Silver	ND	0.0050								

Sample ID: LCS-55452	SampType: LCS	TestCode: EPA 6010B: Total Recoverable Metals								
Client ID: LCSW	Batch ID: 55452	RunNo: 72243								
Prep Date: 9/25/2020	Analysis Date: 9/29/2020	SeqNo: 2533351	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.45	0.030	0.5000	0	90.4	80	120			
Barium	0.47	0.0020	0.5000	0	94.1	80	120			
Chromium	0.46	0.0060	0.5000	0	91.7	80	120			
Lead	0.47	0.020	0.5000	0	94.9	80	120			
Silver	0.095	0.0050	0.1000	0	95.4	80	120			

Sample ID: MB-55452	SampType: MBLK	TestCode: EPA 6010B: Total Recoverable Metals								
Client ID: PBW	Batch ID: 55452	RunNo: 72287								
Prep Date: 9/25/2020	Analysis Date: 9/30/2020	SeqNo: 2535107	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	ND	0.0020								
Selenium	ND	0.050								

Sample ID: LCS-55452	SampType: LCS	TestCode: EPA 6010B: Total Recoverable Metals								
Client ID: LCSW	Batch ID: 55452	RunNo: 72287								
Prep Date: 9/25/2020	Analysis Date: 9/30/2020	SeqNo: 2535109	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	0.45	0.0020	0.5000	0	89.4	80	120			
Selenium	0.47	0.050	0.5000	0	94.0	80	120			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009F63

19-Oct-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, & 3 Inj Well

Sample ID: mb-1 alk	SampType: mblk	TestCode: SM2320B: Alkalinity								
Client ID: PBW	Batch ID: R72211	RunNo: 72211								
Prep Date:	Analysis Date: 9/28/2020	SeqNo: 2531976	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: R72211	RunNo: 72211								
Prep Date:	Analysis Date: 9/28/2020	SeqNo: 2531977	Units: mg/L CaCO3							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.28	20.00	80.00	0	96.6	90	110			

Sample ID: mb-2 alk	SampType: mblk	TestCode: SM2320B: Alkalinity								
Client ID: PBW	Batch ID: R72211	RunNo: 72211								
Prep Date:	Analysis Date: 9/28/2020	SeqNo: 2531999	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-2 alk	SampType: lcs	TestCode: SM2320B: Alkalinity								
Client ID: LCSW	Batch ID: R72211	RunNo: 72211								
Prep Date:	Analysis Date: 9/28/2020	SeqNo: 2532000	Units: mg/L CaCO3							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.44	20.00	80.00	0	96.8	90	110			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009F63

19-Oct-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, & 3 Inj Well

Sample ID: MB-55560	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids								
Client ID: PBW	Batch ID: 55560	RunNo: 72322								
Prep Date: 9/30/2020	Analysis Date: 10/1/2020	SeqNo: 2536564	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: LCS-55560	SampType: LCS	TestCode: SM2540C MOD: Total Dissolved Solids								
Client ID: LCSW	Batch ID: 55560	RunNo: 72322								
Prep Date: 9/30/2020	Analysis Date: 10/1/2020	SeqNo: 2536565	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	964	20.0	1000	0	96.4	80	120			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Sample Log-In Check List

Client Name: **Navajo Refining**

Work Order Number: **2009F63**

RcptNo: 1

Received By: **Emily Mocho**

9/25/2020 9:50:00 AM

Completed By: **Emily Mocho**

9/25/2020 11:09:36 AM

Reviewed By: *Em 9/25/20*

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 ☐ Not frozen
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: *(3) (1)*
(≤ 2 or >12 unless noted)

Adjusted? *no*

Checked by: *Em 9/25/20*

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:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	-1.4	Good	No			

Chain-of-Custody Record		Turn-Around Time:
Client: Navajo Refining Co.		X Standard ☐ Rush
		Project Name:
Mailing Address: P.O. Box 159 Artesia,		Quarterly WDW-1, 2, & 3 Inj Well
NM 88211-0159		Project #: P.O. # 251841
Phone #: 575-748-3311		
email or Fax#: 575-746-5451		Project Manager:
QA/QC Package:		Robert Combs / Scott Denton / Randy Dade
☐ Standard	☐ Level 4 (Full Validation)	
☐ Other _____		Sampler: Brady Hubbard
☐ EDD (Type) _____		On Ice: ☒ Yes ☐ No
		Sample Temperature: -10 to -14

☒ Standard ☐ Rush

X Standard	Project Name:
------------	---------------

Project #: P.O. # 251841

Phone #: 575-748-3311

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

☐ Other☐ EDD (Type)

9/24/20	7:05	Liquid	WDW-1, 2, 3 & 4 Effluent
---------	------	--------	--------------------------

9/24/20	7:05	Liquid	WDW-1, 2, 3 & 4 Effluent
---------	------	--------	--------------------------

9/24/20	7:05	Liquid	WDW-1, 2, 3 & 4 Effluent
---------	------	--------	--------------------------

9/24/20	7:05	Liquid	WDW-1, 2, 3 & 4 Effluent
---------	------	--------	--------------------------

9/24/20	7:05	Liquid	WDW-1, 2, 3 & 4 Effluent
---------	------	--------	--------------------------

Date:	Time:
-------	-------

9-24-20

Relinquished by:

Date:

Time:

Relinquished by:

and by: Rachel L. S. S. S.

Relinquished by:

Received by:	Date	Time
--------------	------	------

Date _____ Time _____

Received by:	Date	Time
--------------	------	------

Date	Time
------	------

[illegible]

pH 7.40, 37.6°C

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



July 28, 2020

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

RE: 2020 4th Quarter Injection Report for Wells WDW-1, WDW-2, WDW-3, WDW-4 HollyFrontier Navajo Refining LLC

Dear Mr. Chavez,

Enclosed, please find the fourth quarter 2020 sampling results for fluids injected into WDW-1, WDW-2, WDW-3 and WDW-4 and a table showing various volumes and pressures as required under Permit Condition 2.I.1, Quarterly Reports.

Over the fourth quarter, the average injection pressure for each well was 1133 psig for WDW-1, 1074 psig for WDW-2, 1078 psig for WDW-3 and 101 psig for WDW-4. The average flows were 153 gpm for WDW-1, 51 gpm for WDW-2, 61 gpm for WDW-3 and 171 gpm for WDW-4. There were no significant losses from the glycol expansion tanks Well Annulus Monitoring System (WAMS). The quarterly effluent analyses indicate parameters are within permit limits.

This report covers the period from April 1, 2020 to June 30, 2020. Navajo has disposed a total of 1,609,602 barrels of fluid into the four wells during the fourth quarter of 2020. The volume per well is:

- 498,475 barrels into WDW-1; 30-015-27592
- 160,007 barrels into WDW-2; 30-015-20894
- 156,685 barrels into WDW-3; 30-015-26575
- 794,435 barrels into WDW-4; 30-015-44677

This report is signed and certified in accordance with WQCC section 5101.G. If there are any questions, please contact Randy Dade at 575-746-5281.

Respectfully,

Scott M. Denton
Environmental Manager
HollyFrontier Navajo Refining LLC

HollyFrontier Navajo Refining LLC
501 East Main • Artesia, NM 88210
(575) 748-3311 • <http://www.hollyfrontier.com>

2020 FOURTH QUARTER MONTHLY INJECTION PRESSURES, RATES, AND VOLUMES

	Average Pressure (psig)	Average				Maximum				Minimum				Average Volume (bpd)	Maximum Volume (bpd)	Minimum Volume (bpd)	Volume (barrels)	CUMULATIVE Volume (barrels)
		Flow (gpm)	Flow (gpm)	Flow (gpm)	Flow (gpm)	Annular Pressure (psig)	Annular Pressure (psig)	Annular Pressure (psig)	Annular Pressure (psig)	Annular Pressure (psig)	Annular Pressure (psig)	Annular Pressure (psig)	Annular Pressure (psig)					
30-015-27592 WDW-1																		
Apr-20	1,205	134	153	120	531	707	391	4,594	5,246	4,114	157,371	45,592,677						
May-20	1,094	169	224	121	453	658	341	5,794	7,680	4,149	179,614	45,772,291						
Jun-20	1,099	157	189	121	473	687	300	5,383	6,480	4,149	161,490	45,933,781						
Monthly Avg	1,133	153								TOTAL	498,475							
30-015-20894 WDW-2																		
Apr-20	1,109	52	68	25	792	944	628	1,783	2,331	857	53,486	28,686,485						
May-20	1,049	47	62	40	763	886	657	1,611	2,126	1,371	49,941	28,736,416						
Jun-20	1,064	55	90	0	622	952	345	1,886	3,086	0	56,580	28,792,996						
Monthly Avg	1,074	51								TOTAL	160,007							
30-015-26575 WDW-3																		
Apr-20	992	66	84	39	753	838	655	2,263	2,880	1,337	45,703	20,410,437						
May-20	982	58	85	19	691	793	556	1,989	2,914	651	39,771	20,450,208						
Jun-20	979	58	96	0	644	892	350	1,989	3,291	0	71,211	20,521,419						
Monthly Avg	1,078	61								TOTAL	156,685							
30-015-44677 WDW-4																		
Apr-20	110	197	247	138	189	265	112	6,754	8,469	4,731	262,526	4,085,453						
May-20	97	159	203	101	199	265	118	3,326	6,960	3,463	239,623	4,325,076						
Jun-20	97	158	202	92	189	265	95	3,326	6,926	3,154	292,286	4,617,362						
Monthly Avg	101	171								TOTAL	794,435							
Total BBLS Beginning Volume Ending Volume																		
WDW1 498,475 45,435,306 45,933,781																		
WDW2 160,007 28,632,989 28,792,996																		
WDW3 156,685 20,364,734 20,521,419																		
WDW4 794,435 3,822,927 4,617,362																		



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

July 23, 2020

Robert Combs
Navajo Refining Company
P.O. Box 159
Artesia, NM 88211-0159
TEL: (575) 748-3311
FAX:

RE: Quarterly WDW-1, 2, &3 Inj Well

OrderNo.: 2007093

Dear Robert Combs:

Hall Environmental Analysis Laboratory received 1 sample(s) on 7/2/2020 for the analyses presented in the following report.

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. In order to properly interpret your results, it is imperative that you review this report in its entirety. 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. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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", is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2007093

Date Reported: 7/23/2020

CLIENT: Navajo Refining Company

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

Project: Quarterly WDW-1, 2, &3 Inj Well

Collection Date: 6/30/2020 9:05:00 AM

Lab ID: 2007093-001

Matrix: AQUEOUS

Received Date: 7/2/2020 8:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS								
							Analyst: CJS	
Fluoride	44	0.87	2.0	*	mg/L	20	7/6/2020 2:23:56 PM	R70144
Chloride	440	25	50	*	mg/L	100	7/9/2020 1:11:08 AM	R70207
Bromide	ND	0.25	0.50		mg/L	5	7/6/2020 2:11:04 PM	R70144
Phosphorus, Orthophosphate (As P)	ND	1.2	2.5	H	mg/L	5	7/6/2020 2:11:04 PM	R70144
Sulfate	3400	25	50	*	mg/L	100	7/9/2020 1:11:08 AM	R70207
Nitrate+Nitrite as N	0.54	0.061	1.0	J	mg/L	5	7/6/2020 3:41:10 PM	R70144
EPA METHOD 7470: MERCURY								
							Analyst: JLF	
Mercury	ND	0.00012	0.00020		mg/L	1	7/7/2020 4:35:05 PM	53531
EPA METHOD 6010B: DISSOLVED METALS								
							Analyst: ELS	
Calcium	430	0.23	5.0		mg/L	5	7/6/2020 11:43:52 AM	A70109
Magnesium	140	0.097	5.0		mg/L	5	7/6/2020 11:43:52 AM	A70109
Potassium	290	1.0	5.0		mg/L	5	7/6/2020 11:43:52 AM	A70109
Sodium	1300	5.3	20		mg/L	20	7/6/2020 11:51:54 AM	A70109
EPA 6010B: TOTAL RECOVERABLE METALS								
							Analyst: ELS	
Arsenic	0.028	0.022	0.030	J	mg/L	1	7/8/2020 1:08:57 PM	53551
Barium	0.053	0.0011	0.0020		mg/L	1	7/8/2020 1:08:57 PM	53551
Cadmium	ND	0.00090	0.0020		mg/L	1	7/8/2020 1:08:57 PM	53551
Chromium	0.0021	0.0014	0.0060	J	mg/L	1	7/8/2020 1:08:57 PM	53551
Lead	ND	0.013	0.020		mg/L	1	7/8/2020 1:08:57 PM	53551
Selenium	ND	0.021	0.050		mg/L	1	7/8/2020 1:08:57 PM	53551
Silver	0.0068	0.0013	0.0050		mg/L	1	7/9/2020 10:46:38 AM	53551
EPA METHOD 8270C TCLP								
							Analyst: DAM	
2-Methylphenol	ND	0.033	2000		mg/L	1	7/22/2020 10:36:15 PM	53528
3+4-Methylphenol	ND	0.042	2000		mg/L	1	7/22/2020 10:36:15 PM	53528
2,4-Dinitrotoluene	ND	0.045	1.3		mg/L	1	7/22/2020 10:36:15 PM	53528
Hexachlorobenzene	ND	0.033	1.3		mg/L	1	7/22/2020 10:36:15 PM	53528
Hexachlorobutadiene	ND	0.18	5.0		mg/L	1	7/22/2020 10:36:15 PM	53528
Hexachloroethane	ND	0.038	30		mg/L	1	7/22/2020 10:36:15 PM	53528
Nitrobenzene	ND	0.035	20		mg/L	1	7/22/2020 10:36:15 PM	53528
Pentachlorophenol	ND	0.077	1000		mg/L	1	7/22/2020 10:36:15 PM	53528
Pyridine	ND	0.047	50		mg/L	1	7/22/2020 10:36:15 PM	53528
2,4,5-Trichlorophenol	ND	0.038	4000		mg/L	1	7/22/2020 10:36:15 PM	53528
2,4,6-Trichlorophenol	ND	0.036	20		mg/L	1	7/22/2020 10:36:15 PM	53528
Cresols, Total	ND	0.063	2000		mg/L	1	7/22/2020 10:36:15 PM	53528
Surr: 2-Fluorophenol	43.1	0	15-81.1		%Rec	1	7/22/2020 10:36:15 PM	53528
Surr: Phenol-d5	33.2	0	15-61.1		%Rec	1	7/22/2020 10:36:15 PM	53528
Surr: 2,4,6-Tribromophenol	62.3	0	17.2-108		%Rec	1	7/22/2020 10:36:15 PM	53528

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 Value above quantitation range
	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 range due to dilution or matrix	

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2007093

Date Reported: 7/23/2020

CLIENT: Navajo Refining Company

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

Project: Quarterly WDW-1, 2, &3 Inj Well

Collection Date: 6/30/2020 9:05:00 AM

Lab ID: 2007093-001

Matrix: AQUEOUS

Received Date: 7/2/2020 8:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C TCLP								
						Analyst: DAM		
Surr: Nitrobenzene-d5	53.1	0	18.7-120		%Rec	1	7/22/2020 10:36:15 PM	53528
Surr: 2-Fluorobiphenyl	39.0	0	23.6-103		%Rec	1	7/22/2020 10:36:15 PM	53528
Surr: 4-Terphenyl-d14	78.1	0	24.1-105		%Rec	1	7/22/2020 10:36:15 PM	53528
TCLP VOLATILES BY 8260B								
						Analyst: RAA		
Benzene	ND	0.00023	0.50		mg/L	200	7/3/2020 9:01:00 AM	T70092
1,2-Dichloroethane (EDC)	ND	0.00022	0.50		mg/L	200	7/3/2020 9:01:00 AM	T70092
2-Butanone	ND	0.0011	200		mg/L	200	7/3/2020 9:01:00 AM	T70092
Carbon Tetrachloride	ND	0.00018	0.50		mg/L	200	7/3/2020 9:01:00 AM	T70092
Chloroform	ND	0.00013	6.0		mg/L	200	7/3/2020 9:01:00 AM	T70092
1,4-Dichlorobenzene	ND	0.00021	7.5		mg/L	200	7/3/2020 9:01:00 AM	T70092
1,1-Dichloroethene	ND	0.00013	0.70		mg/L	200	7/3/2020 9:01:00 AM	T70092
Tetrachloroethene (PCE)	ND	0.00036	0.70		mg/L	200	7/3/2020 9:01:00 AM	T70092
Trichloroethene (TCE)	ND	0.00020	0.50		mg/L	200	7/3/2020 9:01:00 AM	T70092
Vinyl chloride	ND	0.00020	0.20		mg/L	200	7/3/2020 9:01:00 AM	T70092
Chlorobenzene	ND	0.00014	100		mg/L	200	7/3/2020 9:01:00 AM	T70092
Surr: 1,2-Dichloroethane-d4	100	0	70-130		%Rec	200	7/3/2020 9:01:00 AM	T70092
Surr: 4-Bromofluorobenzene	100	0	70-130		%Rec	200	7/3/2020 9:01:00 AM	T70092
Surr: Dibromofluoromethane	99.0	0	70-130		%Rec	200	7/3/2020 9:01:00 AM	T70092
Surr: Toluene-d8	102	0	70-130		%Rec	200	7/3/2020 9:01:00 AM	T70092
SM2510B: SPECIFIC CONDUCTANCE								
						Analyst: JRR		
Conductivity	8000	10	10		µmhos/c	1	7/7/2020 1:55:42 PM	R70195
SM2320B: ALKALINITY								
						Analyst: JRR		
Bicarbonate (As CaCO3)	600.2	20.00	20.00		mg/L Ca	1	7/7/2020 1:55:42 PM	R70195
Carbonate (As CaCO3)	ND	2.000	2.000		mg/L Ca	1	7/7/2020 1:55:42 PM	R70195
Total Alkalinity (as CaCO3)	600.2	20.00	20.00		mg/L Ca	1	7/7/2020 1:55:42 PM	R70195
SPECIFIC GRAVITY								
						Analyst: JRR		
Specific Gravity	1.006	0	0			1	7/17/2020 9:28:00 AM	R70411
SM2540C MOD: TOTAL DISSOLVED SOLIDS								
						Analyst: KS		
Total Dissolved Solids	5830	200	200	*D	mg/L	1	7/8/2020 6:10:00 PM	53532

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

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 range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

July 13, 2020

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Hall Environmental Analysis Laboratory

Sample Delivery Group: L1236410
Samples Received: 07/03/2020
Project Number:
Description:

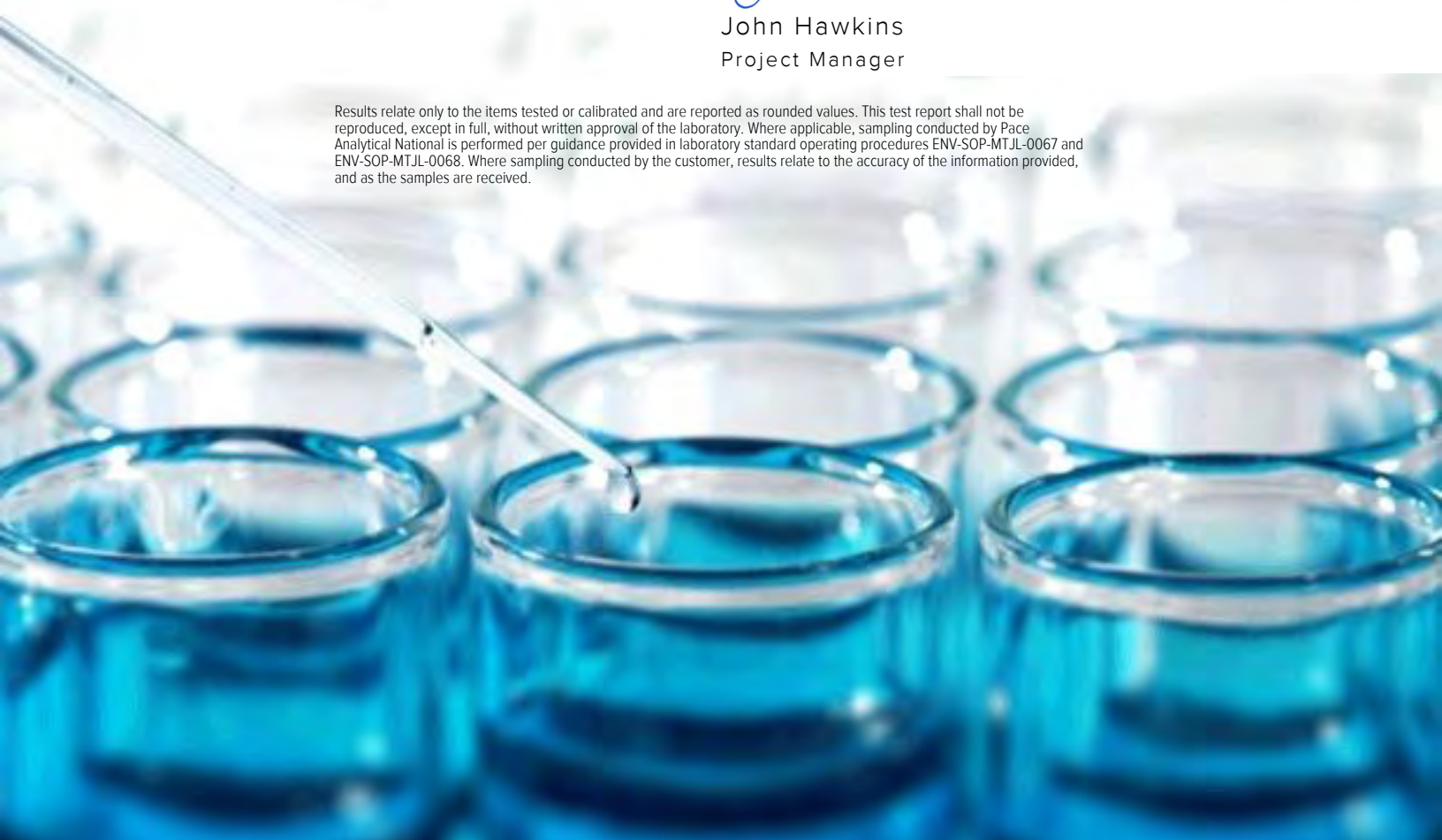
Report To: Jackie Bolte
4901 Hawkins NE
Albuquerque, NM 87109

Entire Report Reviewed By:



John Hawkins
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.





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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



2007093-001E WDW-1,2,3&4 EFFLUENT L1236410-01 WW

				Collected by	Collected date/time	Received date/time
					06/30/20 09:05	07/03/20 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2580	WG1504658	1	07/07/20 05:39	07/07/20 05:39	AKA	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1504187	1	07/06/20 18:00	07/06/20 18:00	KEG	Mt. Juliet, TN
Wet Chemistry by Method D93/1010A	WG1506806	1	07/11/20 19:15	07/11/20 19:15	JIC	Mt. Juliet, TN

¹Cp

²Tc

³Ss

2007093-001F WDW-1,2,3&4 EFFLUENT L1236410-02 WW

				Collected by	Collected date/time	Received date/time
					06/30/20 09:05	07/03/20 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9034-9030B	WG1504791	1	07/07/20 15:24	07/07/20 15:24	SL	Mt. Juliet, TN

⁴Cn

⁵Sr

⁶Qc

2007093-001G WDW-1,2,3&4 EFFLUENT L1236410-03 WW

				Collected by	Collected date/time	Received date/time
					06/30/20 09:05	07/03/20 08:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 4500 CN E-2011	WG1507317	1	07/11/20 09:00	07/11/20 13:49	SDL	Mt. Juliet, TN

⁷Gl

⁸Al

⁹Sc

ACCOUNT:

Hall Environmental Analysis Laboratory

PROJECT:

SDG:

L1236410

DATE/TIME:

07/13/20 07:08

PAGE:

3 of 16



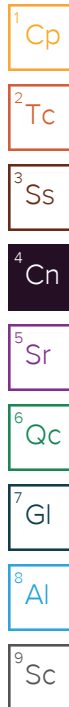
All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples 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.

John Hawkins
Project Manager

Project Narrative

All Reactive Cyanide results reported in the attached report were determined as totals using method 9012B.

All Reactive Sulfide results reported in the attached report were determined as totals using method 9034/9030B.





Wet Chemistry by Method 2580

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
ORP	53.0	Q	1	07/07/2020 05:39	WG1504658

¹ Cp² Tc

Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Corrosivity by pH	7.77	T8	1	07/06/2020 18:00	WG1504187

³ Ss⁴ Cn

Sample Narrative:

L1236410-01 WG1504187: 7.77 at 23.4C

⁵ Sr

Wet Chemistry by Method D93/1010A

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Flashpoint	DNF at 170		1	07/11/2020 19:15	WG1506806

⁶ Qc⁷ Gl⁸ Al⁹ Sc



Wet Chemistry by Method 9034-9030B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Reactive Sulfide	0.0840		0.0500	1	07/07/2020 15:24	WG1504791

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Wet Chemistry by Method 4500 CN E-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Reactive Cyanide	0.0585		0.00500	1	07/11/2020 13:49	WG1507317

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



L1236077-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1236077-01 07/07/20 05:39 • (DUP) R3546691-2 07/07/20 05:39					
Analyte	Original Result mV	DUP Result mV	Dilution	DUP Diff mV	<u>DUP Qualifier</u> DUP Diff Limits mV
ORP	37.7	55.8	1	18.1	20

Laboratory Control Sample (LCS)

(LCS) R3546691-1 07/07/20 05:39					
Analyte	Spike Amount mV	LCS Result mV	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
ORP	228	226	99.0	86.0-105	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3548467-1 07/11/20 13:34

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

L1236173-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1236173-02 07/11/20 13:39 • (DUP) R3548467-3 07/11/20 13:40

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

L1238167-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1238167-01 07/11/20 14:07 • (DUP) R3548467-8 07/11/20 14:08

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

Laboratory Control Sample (LCS)

(LCS) R3548467-2 07/11/20 13:35

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Reactive Cyanide	0.100	0.110	110	90.0-110	

L1236175-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1236175-02 07/11/20 13:41 • (MS) R3548467-4 07/11/20 13:42 • (MSD) R3548467-5 07/11/20 13:43

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Cyanide	0.100	ND	0.102	0.102	102	102	1	75.0-125			0.000	20

L1236410-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1236410-03 07/11/20 13:49 • (MS) R3548467-6 07/11/20 13:50 • (MSD) R3548467-7 07/11/20 13:51

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Reactive Cyanide	0.100	0.0585	0.142	0.139	83.5	80.5	1	75.0-125			2.14	20



Laboratory Control Sample (LCS)

(LCS) R3546621-1 07/06/20 18:00

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

Sample Narrative:

LCS: 10.04 at 22.7C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3547698-1 07/07/20 14:56

Analyte	MB Result mg/l	<u>MB Qualifier</u>	MB MDL mg/l	MB RDL mg/l
Reactive Sulfide	U		0.00650	0.0500

Laboratory Control Sample (LCS)

(LCS) R3547698-2 07/07/20 14:56

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Reactive Sulfide	0.500	0.473	94.6	85.0-115	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



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

(LCS) R3548542-1 07/11/20 19:15 • (LCSD) R3548542-2 07/11/20 19:15

Analyte	Spike Amount deg F	LCS Result deg F	LCSD Result deg F	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Flashpoint	126	127	125	101	99.1	96.0-104		1.59	10	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



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

Q	Sample was prepared and/or analyzed past holding time as defined in the method. Concentrations should be considered minimum values.
T8	Sample(s) received past/too close to holding time expiration.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 GI

8 AI

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* 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 National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
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}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

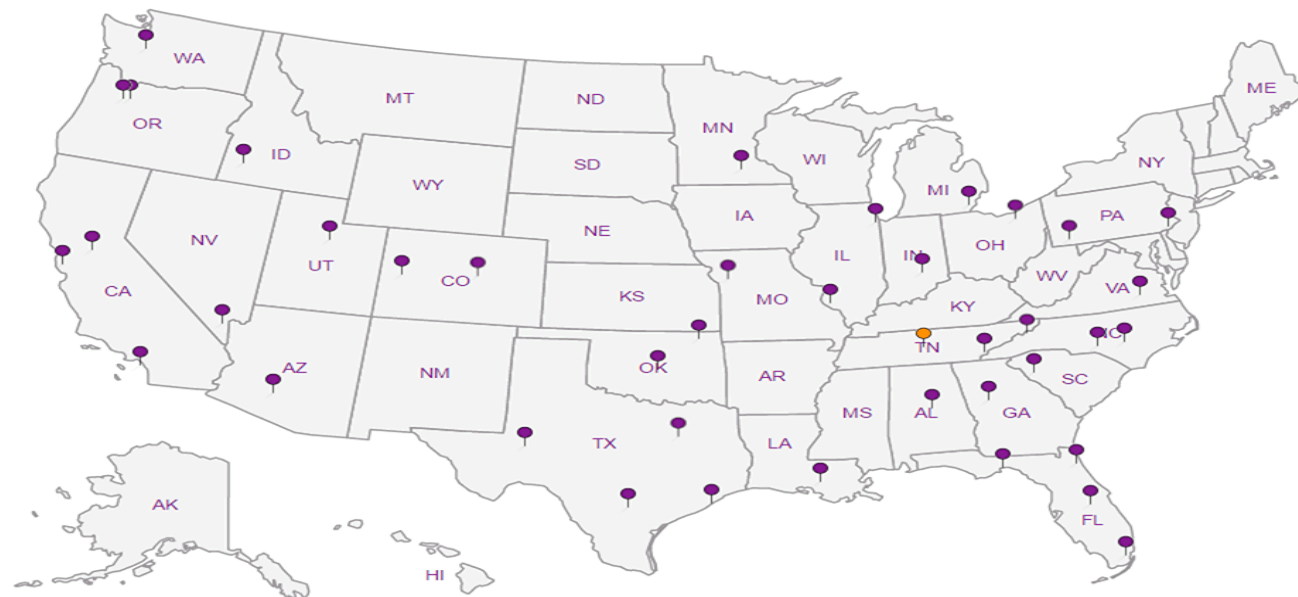
Third Party Federal Accreditations

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.





CHAIN OF CUSTODY RECORD

PAGE: 1 OF: 1

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

C107

L1236410

SUB CONTRACTOR: Pace TN		COMPANY: PACE TN		PHONE: (800) 767-5859	FAX: (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	2007093-001E	WDW-1,2,3 & 4 Effluent	500HDPE	Aqueous	6/30/2020 9:05:00 AM	1	Reactivity, Corrosivity, and Ignitability, ORP -01
2	2007093-001F	WDW-1,2,3 & 4 Effluent	500PL-NAOH ZnAc	Aqueous	6/30/2020 9:05:00 AM	1	Reactivity, Corrosivity, and Ignitability >12 NC✓ -02
3	2007093-001G	WDW-1,2,3 & 4 Effluent	500PL-NAOH	Aqueous	6/30/2020 9:05:00 AM	1	Reactivity, Corrosivity, and Ignitability >12 NC✓ -03

SPECIAL INSTRUCTIONS / COMMENTS:

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: EM	Date: 7/2/2020	Time: 1:13 PM	Received By: CM	Date: 7/3/20	Time: 8:30
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
TAT: Standard ☐	RUSH ☐		Next BD ☐	2nd BD ☐	3rd BD ☐
REPORT TRANSMITTAL DESIRED: ☐ HARDCOPY (extra cost) ☐ FAX ☐ EMAIL ☐ ONLINE					
FOR LAB USE ONLY Temp of samples 1.240-1.244 attempt to Cool? Comments:					

1749 5598 5682 Total 1-2

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: <i>HALLENAN</i>	<i>L1236410</i>	
Cooler Received/Opened On: <i>7/3/20</i>	Temperature: <i>1.2</i>	
Received By: <i>Cole Medley</i>		
Signature: <i>CM</i>		
Receipt Check List		
COC Seal Present / Intact?	NP	Yes No
COC Signed / Accurate?		
Bottles arrive intact?		
Correct bottles used?		
Sufficient volume sent?		
If Applicable		
VOA Zero headspace?		
Preservation Correct / Checked?		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R70144	RunNo: 70144								
Prep Date:	Analysis Date: 7/6/2020	SeqNo: 2437459 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Bromide	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID: LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R70144	RunNo: 70144								
Prep Date:	Analysis Date: 7/6/2020	SeqNo: 2437460 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.46	0.10	0.5000	0	91.4	90	110			
Bromide	2.4	0.10	2.500	0	97.2	90	110			
Phosphorus, Orthophosphate (As P	4.6	0.50	5.000	0	93.0	90	110			
Nitrate+Nitrite as N	3.4	0.20	3.500	0	95.9	90	110			

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R70207	RunNo: 70207								
Prep Date:	Analysis Date: 7/8/2020	SeqNo: 2439817 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Sulfate	ND	0.50								

Sample ID: LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R70207	RunNo: 70207								
Prep Date:	Analysis Date: 7/8/2020	SeqNo: 2439818 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.9	0.50	5.000	0	97.6	90	110			
Sulfate	9.7	0.50	10.00	0	97.0	90	110			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: 100ng lcs2	SampType: LCS			TestCode: TCLP Volatiles by 8260B						
Client ID: LCSW	Batch ID: T70092			RunNo: 70092						
Prep Date:	Analysis Date: 7/3/2020			SeqNo: 2435469		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.019	0.015	0.02000	0	93.9	70	130			
1,1-Dichloroethene	0.019	0.015	0.02000	0	95.6	70	130			
Trichloroethene (TCE)	0.017	0.015	0.02000	0	85.0	70	130			
Chlorobenzene	0.020	0.015	0.02000	0	102	70	130			
Surr: 1,2-Dichloroethane-d4	0.0098		0.01000		97.9	70	130			
Surr: 4-Bromofluorobenzene	0.010		0.01000		100	70	130			
Surr: Dibromofluoromethane	0.0095		0.01000		95.3	70	130			
Surr: Toluene-d8	0.010		0.01000		102	70	130			

Sample ID: mb2	SampType: MBLK			TestCode: TCLP Volatiles by 8260B						
Client ID: PBW	Batch ID: T70092			RunNo: 70092						
Prep Date:	Analysis Date: 7/3/2020			SeqNo: 2435470		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	0.0098		0.01000		98.0	70	130			
Surr: 4-Bromofluorobenzene	0.010		0.01000		102	70	130			
Surr: Dibromofluoromethane	0.0097		0.01000		97.0	70	130			
Surr: Toluene-d8	0.010		0.01000		102	70	130			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: mb-53528	SampType: MBLK			TestCode: EPA Method 8270C TCLP						
Client ID: PBW	Batch ID: 53528			RunNo: 70542						
Prep Date: 7/7/2020	Analysis Date: 7/22/2020			SeqNo: 2453803		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	0.13		0.2000		67.3	15	81.1			
Surr: Phenol-d5	0.10		0.2000		52.1	15	61.1			
Surr: 2,4,6-Tribromophenol	0.15		0.2000		74.1	17.2	108			
Surr: Nitrobenzene-d5	0.078		0.1000		77.9	18.7	120			
Surr: 2-Fluorobiphenyl	0.059		0.1000		59.0	23.6	103			
Surr: 4-Terphenyl-d14	0.11		0.1000		114	24.1	105			S

Sample ID: lcs-53528	SampType: LCS			TestCode: EPA Method 8270C TCLP						
Client ID: LCSW	Batch ID: 53528			RunNo: 70542						
Prep Date: 7/7/2020	Analysis Date: 7/22/2020			SeqNo: 2453804		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	0.077	0.0010	0.1000	0	76.5	33.8	121			
3+4-Methylphenol	0.16	0.0010	0.2000	0	81.8	33.6	109			
2,4-Dinitrotoluene	0.055	0.0010	0.1000	0	54.8	50.4	124			
Hexachlorobenzene	0.088	0.0010	0.1000	0	88.1	50.1	120			
Hexachlorobutadiene	0.043	0.0010	0.1000	0	42.5	16.1	103			
Hexachloroethane	0.042	0.0010	0.1000	0	42.3	15	94.2			
Nitrobenzene	0.087	0.0010	0.1000	0	87.4	32.4	125			
Pentachlorophenol	0.080	0.0010	0.1000	0	79.7	44.6	114			
Pyridine	0.011	0.0010	0.1000	0	11.2	15	67			S
2,4,5-Trichlorophenol	0.082	0.0010	0.1000	0	81.9	49.4	118			
2,4,6-Trichlorophenol	0.083	0.0010	0.1000	0	82.6	50.3	116			
Cresols, Total	0.24	0.0010	0.3000	0	80.0	33.8	109			
Surr: 2-Fluorophenol	0.12		0.2000		61.5	15	81.1			
Surr: Phenol-d5	0.092		0.2000		45.8	15	61.1			
Surr: 2,4,6-Tribromophenol	0.14		0.2000		72.4	17.2	108			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: Ics-53528		SampType: LCS		TestCode: EPA Method 8270C TCLP						
Client ID: LCSW		Batch ID: 53528		RunNo: 70542						
Prep Date: 7/7/2020		Analysis Date: 7/22/2020		SeqNo: 2453804			Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Nitrobenzene-d5	0.080		0.1000		80.5	18.7	120			
Surr: 2-Fluorobiphenyl	0.060		0.1000		59.6	23.6	103			
Surr: 4-Terphenyl-d14	0.11		0.1000		108	24.1	105			S

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: Ics-1 99.5uS eC	SampType: Ics			TestCode: SM2510B: Specific Conductance						
Client ID: LCSW	Batch ID: R70195			RunNo: 70195						
Prep Date:	Analysis Date: 7/7/2020			SeqNo: 2439134		Units: µmhos/cm				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	99	10	99.50	0	99.8	85	115			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: MB-53531	SampType: MBLK	TestCode: EPA Method 7470: Mercury
Client ID: PBW	Batch ID: 53531	RunNo: 70152
Prep Date: 7/7/2020	Analysis Date: 7/7/2020	SeqNo: 2437876 Units: mg/L
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Mercury	ND 0.00020	

Sample ID: LL LCS-53531	SampType: LCSLL	TestCode: EPA Method 7470: Mercury
Client ID: BatchQC	Batch ID: 53531	RunNo: 70152
Prep Date: 7/7/2020	Analysis Date: 7/7/2020	SeqNo: 2437877 Units: mg/L
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Mercury	0.00014 0.00020 0.0001500	0 96.1 50 150 J

Sample ID: LCS-53531	SampType: LCS	TestCode: EPA Method 7470: Mercury
Client ID: LCSW	Batch ID: 53531	RunNo: 70152
Prep Date: 7/7/2020	Analysis Date: 7/7/2020	SeqNo: 2437878 Units: mg/L
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Mercury	0.0049 0.00020 0.005000	0 98.2 80 120

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: MB	SampType: MBLK	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: PBW	Batch ID: A70109	RunNo: 70109								
Prep Date:	Analysis Date: 7/6/2020	SeqNo: 2436395 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	SampType: LCS	TestCode: EPA Method 6010B: Dissolved Metals								
Client ID: LCSW	Batch ID: A70109	RunNo: 70109								
Prep Date:	Analysis Date: 7/6/2020	SeqNo: 2436396 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	49	1.0	50.00	0	98.3	80	120			
Magnesium	50	1.0	50.00	0	99.4	80	120			
Potassium	49	1.0	50.00	0	97.8	80	120			
Sodium	49	1.0	50.00	0	98.9	80	120			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: MB-53551	SampType: MBLK	TestCode: EPA 6010B: Total Recoverable Metals								
Client ID: PBW	Batch ID: 53551	RunNo: 70197								
Prep Date: 7/7/2020	Analysis Date: 7/8/2020	SeqNo: 2439313	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.030								
Barium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Lead	ND	0.020								
Selenium	ND	0.050								
Silver	ND	0.0050								

Sample ID: LCS-53551	SampType: LCS	TestCode: EPA 6010B: Total Recoverable Metals								
Client ID: LCSW	Batch ID: 53551	RunNo: 70197								
Prep Date: 7/7/2020	Analysis Date: 7/8/2020	SeqNo: 2439314	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.45	0.030	0.5000	0	89.1	80	120			
Barium	0.47	0.0020	0.5000	0	93.1	80	120			
Cadmium	0.46	0.0020	0.5000	0	92.8	80	120			
Chromium	0.45	0.0060	0.5000	0	89.1	80	120			
Lead	0.45	0.020	0.5000	0	90.6	80	120			
Selenium	0.45	0.050	0.5000	0	90.1	80	120			
Silver	0.095	0.0050	0.1000	0	95.0	80	120			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: mb-1 alk	SampType: mblk	TestCode: SM2320B: Alkalinity								
Client ID: PBW	Batch ID: R70195	RunNo: 70195								
Prep Date:	Analysis Date: 7/7/2020	SeqNo: 2439098	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: R70195	RunNo: 70195								
Prep Date:	Analysis Date: 7/7/2020	SeqNo: 2439099	Units: mg/L CaCO3							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	76.40	20.00	80.00	0	95.5	90	110			

Sample ID: mb-2 alk	SampType: mblk	TestCode: SM2320B: Alkalinity								
Client ID: PBW	Batch ID: R70195	RunNo: 70195								
Prep Date:	Analysis Date: 7/7/2020	SeqNo: 2439121	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-2 alk	SampType: lcs	TestCode: SM2320B: Alkalinity								
Client ID: LCSW	Batch ID: R70195	RunNo: 70195								
Prep Date:	Analysis Date: 7/7/2020	SeqNo: 2439122	Units: mg/L CaCO3							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.32	20.00	80.00	0	96.7	90	110			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: 2007093-001ADUP		SampType: DUP		TestCode: Specific Gravity						
Client ID: WDW-1,2,3 & 4 Effl		Batch ID: R70411		RunNo: 70411						
Prep Date:		Analysis Date: 7/17/2020		SeqNo: 2447669		Units:				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Specific Gravity	1.008	0						0.159	20	

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2007093

23-Jul-20

Client: Navajo Refining Company
Project: Quarterly WDW-1, 2, &3 Inj Well

Sample ID: MB-53532	SampType: MBLK		TestCode: SM2540C MOD: Total Dissolved Solids							
Client ID: PBW	Batch ID: 53532		RunNo: 70189							
Prep Date: 7/7/2020	Analysis Date: 7/8/2020		SeqNo: 2438885		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: LCS-53532	SampType: LCS		TestCode: SM2540C MOD: Total Dissolved Solids							
Client ID: LCSW	Batch ID: 53532		RunNo: 70189							
Prep Date: 7/7/2020	Analysis Date: 7/8/2020		SeqNo: 2438886		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	995	20.0	1000	0	99.5	80	120			

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 range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Sample Log-In Check List

Client Name: **Navajo Refining**

Work Order Number: **2007093**

RcptNo: 1

Received By: **Emily Mocho**

7/2/2020 8:00:00 AM

Completed By: **Emily Mocho**

7/2/2020 8:44:04 AM

Reviewed By: *LB*

7/2/20

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 ☒ *Em* NA ☐
9. Received at least 1 vial with headspace $<1/4"$ for AQ VOA? Yes ☐ No ☐ *7/2/20* NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels? Yes ☒ No ☐
(Note discrepancies on chain of custody)
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? Yes ☒ No ☐
(If no, notify customer for authorization.)

of preserved bottles checked for pH: *(3) (1)*
(<2 or >12 unless noted)

Adjusted? *yes*

Checked by: *Em 7/2/20*

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: *Added 0.5 mL HNO₃ to vial H for pH <2 for metals analysis*

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.6	Good	Not Present			

Em 7/2/20

2020 FIRST QUARTER MONTHLY INJECTION PRESSURES, RATES, AND VOLUMES

Average Pressure (psig)	Average Flow (gpm)	Maximum				Average				Minimum Volume (bpd)	Minimum Volume (bpd)	Volume (barrels)	TOTAL CUMULATIVE Volume (barrels)
		Flow (gpm)	Flow (gpm)	Flow (gpm)	Flow (gpm)	Annular Pressure (psig)	Annular Pressure (psig)	Annular Pressure (psig)	Annular Pressure (psig)				
30-015-27592 WDW-1	Jul-20	123	133	103	461	660	329	4,217	4,560	3,531	130,731	45,933,781	
	Aug-20	131	150	96	266	397	104	4,491	5,143	3,291	139,234	46,064,512	
	Sep-20	139	163	125	202	343	119	4,766	5,589	4,286	142,971	46,203,746	
	Monthly Avg	131								TOTAL	412,936	46,346,717	
30-015-20894 WDW-2	Jul-20	59	85	32	725	1,166	458	2,023	2,914	1,097	62,709	28,792,996	
	Aug-20	63	78	49	488	868	191	2,160	2,674	1,680	66,960	28,855,705	
	Sep-20	64	77	54	232	375	130	2,194	2,640	1,851	65,829	28,922,665	
	Monthly Avg	62								TOTAL	195,498	28,988,494	
30-015-26575 WDW-3	Jul-20	76	97	15	744	949	582	2,606	3,326	514	80,777	20,521,419	
	Aug-20	85	122	51	541	867	316	2,914	4,183	1,749	90,343	20,602,196	
	Sep-20	98	142	55	371	520	240	3,360	4,869	1,886	100,800	20,692,539	
	Monthly Avg	86								TOTAL	271,920	20,793,339	
30-015-44677 WDW-4	Jul-20	179	225	115	178	262	99	6,137	7,714	3,121	190,251	4,617,362	
	Aug-20	167	230	84	184	249	66	5,726	7,886	2,880	177,497	4,807,613	
	Sep-20	153	213	0	151	224	75	5,246	7,269	0	157,371	4,985,110	
	Monthly Avg	166								TOTAL	525,119	5,142,481	
Total BBLS											Beginning Volume	Ending Volume	
WDW1											412,936	45,933,781	46,346,717
WDW2											195,498	28,792,996	28,988,494
WDW3											271,920	20,521,419	20,793,339
WDW4											525,119	4,617,362	5,142,481