BW-028

ANNUAL REPORT

2020

Performance *is* Key

ANNUAL CLASS III WELL REPORT FOR 2020

Key Energy Services, Inc.
State S Brine Station
Permit BW-028
API No. 30-025-33547
July 1, 2021

Prepared for:

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APPENDICES

1.0 Introduction

Etech Environmental & Safety Solutions, Inc. (Etech), on behalf of Key Energy Services, LLC. (Key) prepared this Annual Class III Well Report for 2020 report to document activities associated with Discharge Permit BW-28 for Well #1 (API #30-025-33547) which is located at the State S Brine Station, 1,340 FNL and 330 FWL (SW/4, NW/4, Unit Letter E) in Section 15, Township 21 South, Range 37 East, NMPM, Lea County, New Mexico (the Site). The Site is located approximately two miles north of Eunice, New Mexico along the east side of NM 207/CR18. This Annual Class III Well Report has been prepared pursuant to 20.6.2.3107 of the New Mexico Administrative Code and addresses all required content detailed in Section 2.J of the renewed permit dated December 26, 2019.

2.0 2.J. Bullet 2 – Summary of Operations

(Permit Condition 2.J.2 Annual Report: "Summary of Class III well operations for the year including a description and reason for any remedial or major work on the well with a copy of C-103")

There was no major or remedial well work during the 2020 year.

Key Energy has a web-based monitoring and automation system at this site. This system monitors all equipment, fluid levels, and driver access. The integrated Control System (ICS) system also sends out alarms to personnel via text or Email, as well as allows users to monitor and control remotely via the internet.

3.0 2.J. Bullet 3 – Injection/Production/Carry-Over Volumes

(Permit condition 2.J.3 "Monthly fluid injection and brine production volume, including the cumulative total carried over each year")

Key has an electronic card system that tracks sales of both fresh and brine water. In addition, in 2019 Key installed new Halliburton calibrated flow meters on the well to improve the monitor accuracy for both water injected and brine produced. The operator reads these flow meters daily. The meters are not currently connected to the ICS system.

Monthly, Yearly and Lifetime Injection and Production Volumes:
The monthly, yearly and lifetime freshwater injection and brine production volumes are attached herein for review as tables in ***Appendix A*****.** The total 2020 freshwater injection volume was 134,438 barrels (bbl), production volume was 119,00 bbl, and the lifetime production volume is 6,223,319 bbl.

4.0 2.J. Bullet 4 – Injection Pressure Data

A submersible centrifugal injection pump was installed in the freshwater storage tank in 2014. The system has an automatic shut-down switch set at 224 pounds per square inch (psig). For this reason, permit condition 3.B.2. Pressure Limiting Device, *"The operator shall have a working pressure limiting device or controls to prevent overpressure."*, is conditionally met.

The average injection pressure is taken either from a pressure gauge mounted on the wellhead inlet, and/or can be from the ICS and is noted by Key's personnel. The noted injection pressures averaged 185 psig during 2020.

5.0 2.J. Bullet 5- Chemical analysis shall be included with data summary and all QA/QC information

Per Permit condition 2.A. "Semi-annual Monitoring Requirements for Class III Wells", injection fluid and brine fluid samples were collected quarterly. The semi-annual injection fluid samples were analyzed for pH, density (or specific gravity), total dissolved solids, and chlorides. The semi-annual brine fluid samples were analyzed for pH, density, total dissolved solids, chloride, and sodium. Please find attached in ***Appendix B*** the semi-annual laboratory analytical results and chain-of-custodies for the brine and freshwater injection water samples.

Due to COVID-19 restrictions in 2020, one semi-annual sampling event was not conducted. A total of three sampling events will be conducted in 2021 to compensate for the missing 2020 data. The first semi-annual laboratory analytical results for 2021 are included in ***Appendix B*** for reference.

6.0 2.J. Bullet 6 – Mechanical Integrity

(Permit condition 2.J.6 "Copy of any mechanical integrity test chart, including the type of test, i.e., duration, gauge pressure, etc.")

A 4-hour Cavern Mechanical Integrity Test (MIT) was successfully ran and passed on February 02, 2017 and subsequently approved by OCD.

The next five-year test will be scheduled for November of 2021, unless otherwise required by OCD for good cause shown, or permit condition requirements.

7.0 2.J. Bullet 7 – Deviations from Normal Production Methods

(Permit condition 2.J.7 "Brief explanation describing deviations from normal operations")

Key operates the brine well using "conventional flow" i.e., freshwater down the tubing and producing brine up the casing annulus and only reverses for maintenance only. There were no deviations from normal operation in 2020.

8.0 2.J. Bullet 8 – Leak & Spill Reports

(Permit condition 2.J.8 "Results of any leaks and spill reports")

The brine station is designed with an impermeable liner under the brine tanks and loading pads. The entire facility is bermed to prevent run-on or run-off. The concrete loading pads are designed to catch *de minimus* drips from hose connections and are piped to two 250-bbl fiberglass tanks. This liquid material is routinely recycled or disposed of at a New Mexico Oil Conservation Division (OCD)-approved facility.

Rainwater that collects inside the lined and bermed area is routinely pumped out and recycled or disposed of at an OCD-approved facility. Small quantities of rainwater, which cannot be pumped are left to evaporate.

Any reportable or non-reportable spill is cleaned up pursuant to OCD rules and guidance.

9.0 2.J. Bullet 9 – Area of Review Update Summary

(Permit condition 2.J.9 "An Area of Review (AOR) update summary")

Key's approach on the AOR update has been to research OCD well files and perform site surveillance yearly. All existing and new wells within ¼ mile are logged and reviewed for casing program status, casing/cementing status, and if corrective actions required.

Key utilizes a critical zone method by using the current estimated radius of the brine well and applying a 10:1 safety factor. As the brine well grows, the critical AOR is expanded, and new wells are added for yearly review.

Appendix C contains a comprehensive list of all wells within adjacent quarter sections of the BW-28 location. The list includes API#, Operator well name, UL, Section, Township and Range, and footages, wells within the critical radius and ¼-mile radius from the brine well, BW-28.

There are 44 wells located within these adjacent units. Within a ¼ mile radius of the brine well there are 18 wells, and 5 wells are within the 830-foot critical radius. A plot plan is included in **Appendix C** for reference.

All five wells located in the critical zone were verified in May 2020 by reviewing the OCD on-line well records. They are identified as:

- API# 30-025-09914 is proposed by Apache Corporation to become an injection well. This well is close or at the 810 feet critical range as determine by Key. Notified OCD E-mail dated May 19, 2020. Plans submitted to OCD indicate well will be plugged/cemented across salt section.
- API# 30-025-09913 well has been plugged and abandoned.
- API# 30-025-06586 well has been previously checked and no change was noted in the 2020 review.
- API# 30-025-39277 well has been previously checked and no change was noted in the 2020 review.
- API# 30-025-37223 well has been checked and is plugged across the salt section according to OCD records.

10.0 2.J. Bullet 10 – Subsidence/Cavern Volumes/Geometric Measurements

(Permit condition 2.J.10 "A summary with interpretations of MITs, surface subsidence surveys, cavern volume and geometric measurements with conclusion(s) and recommendation(s)")

10.1. Cavern Volumes

Cavern surveys did not provide adequate information pertaining to the size of the cavern. This has been an issue with many brine wells and until the validity of using sonar test is resolved, an alternate method will be employed. The alternate method involves calculating the maximum diameter of the cavern by using a worst-case scenario of an "inverted cone" with the cone base located at the top.

The Solution Mining Research Institute (SMRI), other state agencies, OCD workgroup, along with various studies conducted during the permitting of the USDOE Waste Isolation Pilot Plant (WIPP) site, has concluded that failures, such as "catastrophic collapses", have a higher probability when the roof diameter of the cavern exceeds a certain value compared to the actual depth of the cavern. This number is typically called D/H where "D" is the diameter of the cavity and "H" is the depth from surface to the casing shoe. OCD concluded that when a ratio of D/H reaches or exceeds 0.66 then the probably of collapse increases to a point that the well may be considered un-safe, thus closing procedures, such as proper plugging and abandonment, and possible long term subsidence monitoring should be considered.

This alternate method has been discussed with Jim Griswold, OCD, and it was mutually decided that an estimated worst-case diameter was to be determined in order to provide maximum protection and ensure the permit conditions are being met.

The cavern volume is calculated using the lifetime brine production volume and multiplying it by a *"rule of thumb"* conversion factor to determine the volumetric size of the cavern. The rule of thumb conversion factor was taken from the 1982 Wilson Report, which equates that every barrel of brine produced, will create approximately one cubic foot of cavity.

A wellbore sketch depicting the volume calculations for the brine well, and the lifetime brine production tally of approximately 6.22 million barrels of brine produced as of December 2020, has been included in ***Appendix D***. The maximum diameter was calculated to be approximately 147 feet with a corresponding D/H ratio of 0.11, updated for the 2020 year.

The current brine well status meets and exceeds the recommended safety value by six times when the current D/H ratio of 0.11 is compared to the 0.66 value mentioned above.

10.2. 2.B.1 Surface Subsidence Monitoring Plan

(Permit Condition 2.B.1 "The Permittee shall submit a Surface Subsidence Monitoring Plan to OCD within 180 days of the effective data of this permit. The Surface Subsidence Monitoring Plan shall specify that the Permittee will install at least three survey monuments and shall include a proposal to monitor the elevation of the monuments at least semiannually

The Permittee shall survey each benchmark at least semiannually to monitor for possible surface subsidence and shall tie each survey to the nearest USGS benchmark. The Permittee shall employ a licensed professional surveyor to conduct the subsidence-monitoring program. The Permittee shall submit the results of all subsidence surveys to OCD within 15 days of the survey. If the monitored surface subsidence at any measuring point reaches 0.10 feet compared to its baseline elevation, then the Permittee shall suspend operation of the Class III well. If the Permittee cannot demonstrate the integrity of the cavern and well to the satisfaction of OCD, then it shall cease all brine production and submit a corrective action plan to mitigate the subsidence.")

There were no significant changes to the survey monuments in 2020. Due to COVID restrictions, only one survey was performed in 2020. The May 27, 2021 survey is included in this report. Key will continue to monitor, and if any trend is noted, Key will notify OCD. A copy of the 2020 subsidence monitoring reports are included in ***Appendix E***.

10.3. Solution Cavern Characterization Plan

(Permit Condition 2.B.2 "The Permittee shall submit a Solution Cavern Characterization Plan to characterize the size and shape of the solution cavern using geophysical methods within 180 days of the effective date of this permit. The Permittee shall characterize the size and shape of the solution cavern using a geophysical methods approved by OCD at least once before November 8, 2018. The Permittee shall demonstrate that at least 90% of the calculated volume of salt removed based upon injection and production volumes has been accounted for by the approved geophysical method(s) for such testing to be considered truly representative.")

Since the BW-28 well never had any logs run, a well log was obtained from a nearby well and annotated to reflect the geophysical characterization of the area lithology. In addition, a mass balance has been calculated and the results are included in ***Appendix D***. The mass balance compares the measured salt removed to the calculated salt removed. The comparison was within 8%, which satisfies permit condition 2.

11.0 2.J. Bullet 11 – Ratio of Injection & Produced Fluids

(Permit condition 2.J.11. "A summary of the ratio of the volume of injected fluids to the volume of produced brine")

Enclosed in ***Appendix A*** are the report tables documenting the injection and production data and the comparison chart of injected water to produced water with comments. The 2020 results indicate an average variance of 112.97 %, while the average total variance during the lifetime of the well has been 110.50%.

12.0 2.J. Bullet 12 – Summary of Activities

(Permit condition 2.J.12 "A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations)

There was no major or remedial well work during the 2020 year.

13.0 2.J. Bullet 13 – Annual Certification

(Permit condition 2.J.13 "Annual Certification in accordance with Permit Condition 2.B.3. "2.B.3. Annual Certification: The Permittee shall certify annually that continued salt solution mining will not cause cavern collapse, surface subsidence, property damage, or otherwise threaten public health and the environment, based on geologic and engineering data.")

Based on all current information and on-site observance, the operator of record herby certifies that the current operations pose no threat to public health and the environment at the time of report submission. If any substantial event that has, or may cause, this current certification to change, then the operator will notify OCD and take the necessary actions to protect the public and environment.

By signing the cover sheet, the operator hereby certifies this condition of the permit as well as permit condition 2.J. Bullet 1.

14.0 2.J. Bullet 14 – Groundwater Monitoring

(Permit condition 2.J.14 "A summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken")

The site does not have any groundwater monitoring wells associated with BW-28. There are no planned or intentional discharges of water contaminants that may move directly or indirectly into groundwater. Any unintentional discharge, leak, spill, or drip is handled pursuant to the permit conditions.

Installation of a groundwater monitoring well is proposed for the second half of 2021.

15.0 2.J. Bullet 15 – Annual Reporting

(Permit condition 2.J.15 "The Permittee shall file its Annual Report in an electronic format with a hard copy submitted to OCD's Environmental Bureau.")

The operator hereby submits a PDF file on flash drive and will submit a hard copy to the OCD's Environmental Bureau upon request.

16.0 Limitations

Etech has prepared this 2020 Annual Class III Well Report to the best of its ability. No other warranty, expressed or implied, is made or intended.

Etech has examined and relied upon documents referenced in the report and has relied on oral statements made by certain individuals. Etech has not conducted an independent examination of the facts contained in referenced materials and statements. We have presumed the genuineness of the documents and that the information provided in documents or statements is true and accurate. Etech has prepared this report in a professional manner, using the degree of skill and care exercised by similar environmental consultants. Etech also notes that the facts and conditions referenced in this report may change over time and the conclusions and recommendations set forth herein are applicable only to the facts and conditions as described at the time of this report. Etech is not responsible for any errors or omissions, or for any future liability concerning this report.

This report has been prepared for the benefit of Key. The information contained in this report, including all exhibits and attachments, may not be used by any other party without the express consent of Etech and/or Key.

Appendix A – Injection & Production Fluids Tables and Comparison Chart

TABLE 1

TABLE 1 BW-28 Annual Report Brine Well Production Volumes and Lifetime History Volumes

Year	Month	Reported Monthly Brine Production	Quarterly Brine Production (bbls)	Annual Brine Production (bbls)	Reported Monthly Freshwater Injection (bbls)	Quarterly Freshwater Injection (bbls)	Annual Freshwater Injection (bbls)	Comments	Operator
1996	October	10,588			10,588				Goldstar SWD
	November	17,770			17,743				
	December	32,223	60,581	60,581	33,004	61,335	61,335		
1997	January	20,194			20,445			estimate (1)	
	February	20,194			20,445			estimate (1)	
	March	20,194	60,582		20,445	61,335		estimate (1)	
	April	48,226			47,714				
	May	38,000			36,571				
	June	47,970	134,196		42,264	126,549			
	July	24,711			24,271				
	August	31,817			31,559				
	September	38,120	94,648		38,697	94,527			
	October	27,462			25,512				
	November	26,618			26,261				
	December	16,137	70,217	359,643	15,850	67,623	350,034		
1998	January	13,301			13,614				
	February	47,212			49,552				
	March	42,337	102,850		44,964	108,130			
	April	27,072			27,519				
	May	18,084			18,161				
	June	26,699	71,855		26,976	72,656			
	July	16,535			15,929				
	August	8,287			7,488				
	September	9,994	34,816		9,021	32,438			
	October	13,312			17,302				
	November	9,822			9,873				
	December	8,287	31,421	240,942	9,497	36,672	249,896		
1999	January	4,026			4,607				
	February	6,867			8,138				
	March	5,641	16,534		6,030	18,775			
	April	7,873			7,338				
	May	34,100			32,461				
	June	20,708	62,681		20,171	59,970			
	July	35,278			34,566				
	August	35,876			35,995				
	September	43,196	114,350		42,724	113,285			
	October	9,700			10,097				
	November	8,383			9,080				
	December	28,662	46,745	240,310	29,721	48,898	240,928		
2000	January	65,492			65,028				
	February	37,709			36,909				
	March	40,409	143,610		40,414	142,351			
	April	20,181			20,404				
	May	52,092			50,373				
	June	41,371	113,644		37,776	108,553			
	July	33,860			31,757				
	August	37,535			35,492				
	September	58,042	129,437		53,288	120,537			
	October	28,777			27,216				
	November	22,677			24,130				
	December	17,670	69,124	455,815	17,369	68,715	440,156		
2001	January	32,427			37,083				
	February	17,493			23,076				
	March	34,050	83,970		33,216	93,375			
	April	32,900			36,064				Change to Yale E. Key
	May	66,724			52,555				
	June	37,607	137,231		42,347	130,966			
	July	16,399			15,588				
	August	10,173			33,664				
	September	16,185	42,757		16,200	65,452			
	October	25,184			24,147				
	November	10,447			8,666				
	December	21,061	56,692	320,650	18,733	51,546	341,339		
2002	January	11,809			10,135				
	February	22,700			23,733				
	March	4,693	39,202		4,369	38,237			
	April	15,160			16,776				
	May	16,321			17,283				
	June	13,938	45,419		15,276	49,335			
	July	8,301			10,688				
	August	7,079			6,842				
	September	18,560	33,940		17,240	34,770			
	October	7,040			7,823				
	November	9,788			10,950				
	December	11,666	28,494	147,055	19,667	38,440	160,782		
2003	January	20,278			23,526				
	February	8,603			5,310				
	March	37,680	66,561		35,548	64,384			
	April	31,782			31,619				
	May	17,767			13,305				
	June	10,733	60,282		9,260	54,184			
	July	27,104			13,927				
	August	9,555			7,197				
	September	7,945	44,604		5,056	26,180			
	October	12,014			10,394				
	November	26,100			12,438				
	December	38,748	76,862	248,309	18,218	41,050	185,798		
2004	January	7,980			8,539				
	February	8,130			8,797				
	March	8,220	24,330		8,894	26,230			
	April	29,898			31,931				
	May	14,233			15,428				
	June	28,716	72,847		30,410	77,769			
	July	1,840			2,060				
	August	29,898			30,201				
	September	20,277	52,015		20,266	52,527			
	October	24,436			23,784				
	November	21,925			22,430				
	December	32,225	78,586	227,778	33,630	79,844	236,370		
2005	January	17,873			19,160				
	February	23,929			24,958				
	March	37,896	79,698		40,435	84,553			
	April	29,882			31,794				
	May	39,575			42,385				
	June	22,766	92,223		23,995	98,174			
	July	7,593			7,640				
	August	31,573			29,316				
	September	47,305	86,471		48,230	85,186			
	October	38,571			51,232				
	November	31,533			27,670				
	December	36,430	106,534	364,926	36,412	115,314	383,227		
2006	January	18,480			19,977				
	February	33,250			35,511				
	March	39,492	91,222		38,630	94,118			
	April	40,194			43,605				
	May	51,009			54,630				

TABLE 1

TABLE 1 BW-28 Annual Report Brine Well Production Volumes and Lifetime History Volumes

Year	Month	Reported Monthly Brine Production	Quarterly Brine Production (bbls)	Annual Brine Production (bbls)	Reported Monthly Freshwater Injection (bbls)	Quarterly Freshwater Injection (bbls)	Annual Freshwater Injection (bbls)	Comments	Operator
	June	22,374	113,577		24,832	123,067			
	July	38,208			37,613				
	August	35,627			36,201				
	September	48,784	122,619		47,312	121,126			
	October	50,375			51,232				
	November	26,084			27,670				
	December	8,224	84,683	412,101	10,202	89,104	427,415		
2007	January	31,540			33,320				
	February	24,313			25,260				Change to Key Energy Services
	March	40,514	96,367		38,412	96,992			
	April	34,095			35,120				
	May	19,308			23,130				
	June	9,170	62,573		11,009	69,259			
	July	30,857			28,468				
	August	12,394			18,884				
	September	25,970	69,221		23,360	70,712			
	October	7,882			7,643				
	November	2,476			2,630				
	December	3,933	14,291	242,452	4,528	14,801	251,764		
2008	January	1,706			1,982				
	February	5,845			6,203				
	March	21,386	28,937		21,673	29,858			
	April	25,787			22,704				
	May	17,100			19,842				
	June	16,598	59,485		17,479	60,025			
	July	32,458			36,448				
	August	37,458			38,377				
	September	39,945	109,861		37,203	112,028			
	October	25,572			26,551				
	November	27,325			25,792				
	December	26,825	79,722	278,005	28,694	81,037	282,948		
2009	January	20,990			21,310				
	February	650			1,306				
	March	3,249	24,889		3,420	26,036			
	April	5,428			5,360				
	May	1,343			1,762				
	June	630	7,401		1,232	8,354			
	July	1,546			1,673				
	August	881			1,031				
	September	2,672	5,099		2,930	5,634			
	October	9,898			8,861				
	November	3,716			3,618				
	December	1,474	15,088	52,477	2,035	14,514	54,538		
2010	January	0			0				
	February	1,650			1,810				
	March	4,092	5,742		4,789	6,599			
	April	5,092			6,150				
	May	12,256			14,953				
	June	2,099	19,447		2,033	23,136			
	July	5,068			6,322				
	August	10,270			15,126				
	September	11,281	26,619		10,334	31,782			
	October	7,575			8,802				
	November	20,304			24,494				
	December	36,765	64,644	116,452	44,153	77,449	138,966		
2011	January	44,126			52,975				
	February	24,388			29,666				
	March	19,421	87,935		23,284	105,925			
	April	18,356			22,365				
	May	9,828			11,754				
	June	15,661	43,845		18,902	53,021			
	July	17,503			20,961				
	August	14,401			17,273				
	September	5,430	37,334		16,000	54,234			
	October	11,359			8,284				
	November	18,585			19,662				
	December	23,228	53,172	222,286	27,806	55,752	268,932		
2012	January	21,570			25,897				
	February	12,230			14,854				
	March	10,124	43,924		12,190	52,941			
	April	18,185			22,110				
	May	23,761			28,667				
	June	31,207	73,153		37,707	88,484			
	July	20,931			25,225				
	August	31,025			35,837				
	September	29,414	81,370		34,226	95,288			
	October	17,507			21,138				
	November	28,038			33,360				
	December	23,015	68,560	267,007	25,205	79,703	316,416		
2013	January	16,097			21,395				
	February	17,379			20,812				
	March	14,816	48,292		21,978	64,185			
	April	19,374			23,799				
	May	23,932			25,979				
	June	34,926	78,232		38,500	88,278			
	July	18,446			22,414				
	August	29,958			35,877				
	September	16,923	65,327		20,230	78,521			
	October	22,409			25,868				
	November	14,139			16,972				
	December	24,920	61,468	253,319	29,762	72,602	303,586		
2014	January	31,460			35,865				
	February	38,614			45,444				
	March	43,210	113,284		50,710	132,019			
	April	36,217			44,597				
	May	45,170			54,007				
	June	24,524	105,911		23,748	122,352			
	July	19,428			20,442				
	August	15,545			24,683				
	September	23,652	58,625		26,341	71,466			
	October	5,692			7,057				
	November	10,914			13,136				
	December	15,966	32,572	310,392	17,466	37,659	363,496		
2015	January	28,665			30,266				
	February	26,229			29,541				
	March	24,106	79,000		29,666	89,473			
	April	19,087			24,034				
	May	19,573			22,921				
	June	27,070	65,730		32,555	79,510			
	July	34,975			39,132				
	August	19,234			23,879				
	September	16,952	71,161		20,455	83,466			
	October	23,972			25,739				
	November	18,722			21,557				
	December	13,942	56,636	272,527	17,412	64,708	317,157		

Table 1

Table 1 BW-28 Annual Report brine Well Production Volumes and Lifetime History Volumes

Year	Month	Reported Monthly Brine Production (bbls)	Quarterly Brine Production (bbls)	Annual Brine Production (bbls)	Reported monthy Freshwater Injections (bbls)	Quarterly Freshwater Injection (bbls)	Annual Freshwater Injections (bbls)	Comments	Operator
2016	January	15,897			18,182				
	February	15,649			17,434				
	March	10,759	42,305		120,951	156,567			
	April	8,608			9,575				
	May	12,202			14,032				
	June	19,354	40,164		20,745	44,352			
	July	20,725			23,809				
	August	20,410			22,859				
	September	18,278	59,413		21,020	67,688			
	October	24,944			28,521				
	November	22,899			25,928				
	December	11,516	59,359	201,241	13,940	68,389	336,996	Ratio FW/BW	
2017	January	21,709			23,795			109.61%	
	February	11,551			14,531			125.80%	
	March	20,673	53,933		21,931	60,257		106.09%	
	April	29,467			30,958			105.06%	
	May	26,817			27,209			101.46%	
	June	15,463	71,747		18,156	76,323		117.42%	
	July	800			1,428			178.50%	*System Shut Down to Check Water Quality
	August	7,743			6,228			80.43%	*
	September	6,279	14,822		4,357	12,013		69.39%	*
	October	23,253			24,108			103.68%	
	November	24,204			27,380			113.12%	
	December	32,237	79,694	220,196	32,445	83,933	232,526	105.60%	Monthly/year End Average Average
2018	January	27,325			30,717			112.41%	
	February	30,315			26,203			86.44%	
	March	14,616	72,256		18,419	75,339		126.02%	
	April	15,198			15,669			103.10%	
	May	18,492			22,230			120.21%	
	June	14,296	47,986		17,296	55,195		120.98%	
	July	22,568			25,597			113.42%	
	August	32,500			27,635			85.03%	
	September	17,381	72,449		15,153	68,385		87.18%	
	October	19,346			18,009			93.09%	
	November	14,575			16,993			116.59%	
	December	21,860	55,781	248,472	23,352	58,354	257,273	103.54%	Monthly/year End Average Average
2019	January	21,647			24,415			112.79%	
	February	23,735			24,599			103.64%	
	March	31,990	77,372		36,841	85,855		115.16%	
	April	15,075			18,568			123.17%	0.811880655
	May	9,145			11,073			121.08%	
	June	13,605	37,825		16,562	46,203		121.73%	
	July	20,135			19,593			97.31%	
	August	24,319			25,557			105.09%	

	September	15,245	59,699		19,810	64,960		129.94%	
	October	21,712			23,917			110.16%	
	November	22,390			23,206			103.64%	
	December	22,385	66,487	241,383	23,376	70,499	267,517	110.83%	Monthly/year End Average Average
2020	January	19,925			22,734			114.10%	
	February	21,495			23,933			111.34%	
	March	18,955	60,375		24,711	71,378		130.37%	
	April	13,415			12,395			92.40%	
	May	4,330			4,838			111.73%	
	June	5,180	22,925		5,649	22,882		109.05%	
	July	3,490			4,764			136.50%	
	August	4,190			4,785			114.20%	
	September	7,410	15,090		8,056	17,605		108.72%	
	October	7,070			6,428			90.92%	
	November	13,540			16,145			119.24%	
	December		20,610	119,000		22,573	134,438	112.97%	Monthly/year End Average Average

Total (bbls)	**6,223,319**		**Total (bbls)**	**6,876,834**	**110.50%**	**Total Average**	

Appendix B – Quarterly Laboratory Analytical Reports

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

October 05, 2020

Key Energy Services

Sample Delivery Group:	L1266826
Samples Received:	09/25/2020
Project Number:	1ST HALF
Description:	Key Energy Eunice BW
Site:	BW-28
Report To:	Jill Best 1301 McKinney Street Suite 1800 Houston, TX 77010

Entire Report Reviewed By:

Olivia Studebaker
Project Manager

TABLE OF CONTENTS

FRESH WATER L1266826-01 GW

Collected by: Wayne Prize
Collected date/time: 09/23/20 13:30
Received date/time: 09/25/20 09:00

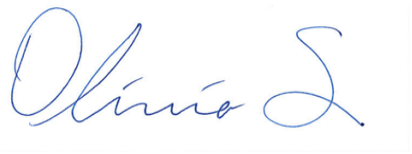
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1551992	1	09/30/20 19:18	09/30/20 19:58	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2710 F-2011	WG1550965	1	09/29/20 16:10	09/29/20 16:10	SRG	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1552193	1	10/01/20 10:00	10/01/20 10:00	SAC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1551947	20	10/02/20 00:30	10/02/20 00:30	MSP	Mt. Juliet, TN

BRINE WATER L1266826-02 GW

Collected by: Wayne Prize
Collected date/time: 09/23/20 13:50
Received date/time: 09/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1551992	1	09/30/20 19:18	09/30/20 19:58	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2710 F-2011	WG1550965	1	09/29/20 16:10	09/29/20 16:10	SRG	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1552193	1	10/01/20 10:00	10/01/20 10:00	SAC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1551947	10000	10/02/20 01:09	10/02/20 01:09	MSP	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1551485	100	09/30/20 22:03	10/02/20 10:24	TRB	Mt. Juliet, TN

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.



Olivia Studebaker
Project Manager

This data package consists of this signature page, the laboratory review checklist, and the following reportable data as applicable:

R1 - Field chain-of-custody documentation;

R2 - Sample identification cross-reference;

R3 - Test reports (analytical data sheets) for each environmental sample that includes:

a. Items consistent with NELAC Chapter 5,

b. dilution factors,

c. preparation methods,

d. cleanup methods, and

e. if required for the project, tentatively identified compounds (TICs).

R4 - Surrogate recovery data including:

a. Calculated recovery (%R), and

b. The laboratory's surrogate QC limits.

R5 - Test reports/summary forms for blank samples;

R6 - Test reports/summary forms for laboratory control samples (LCSs) including:

a. LCS spiking amounts,

b. Calculated %R for each analyte, and

c. The laboratory's LCS QC limits.

R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a. Samples associated with the MS/MSD clearly identified,

b. MS/MSD spiking amounts,

c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d. Calculated %Rs and relative percent differences (RPDs), and

e. The laboratory's MS/MSD QC limits

R8 - Laboratory analytical duplicate (if applicable) recovery and precision:

a. The amount of analyte measured in the duplicate,

b. The calculated RPD, and

c. The laboratory's QC limits for analytical duplicates.

R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 - Other problems or anomalies.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Olivia Studebaker
Project Manager

Laboratory Review Checklist: Reportable Data

Laboratory Name: Pace Analytical National	LRC Date: 10/05/2020 07:45
Project Name: Key Energy Eunice BW	Laboratory Job Number: L1266826-01 and 02
Reviewer Name: Olivia Studebaker	Prep Batch Number(s): WG1550965, WG1552193, WG1551992, WG1551485 and WG1551947

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	Chain-of-custody (C-O-C)					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and quality control (QC) identification					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test reports					
		Were all samples prepared and analyzed within holding times?		X			1
		Other than those results < MQL, were all other raw values bracketed by calibration standards?		X			2
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	Surrogate recovery data					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	Test reports/summary forms for blank samples					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	Laboratory control samples (LCS):					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			3
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical duplicate data					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method quantitation limits (MQLs):					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other problems/anomalies					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data

Laboratory Name: Pace Analytical National	LRC Date: 10/05/2020 07:45
Project Name: Key Energy Eunice BW	Laboratory Job Number: L1266826-01 and 02
Reviewer Name: Olivia Studebaker	Prep Batch Number(s): WG1550965, WG1552193, WG1551992, WG1551485 and WG1551947

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	Initial calibration (ICAL)					
		Were response factors and/or relative response factors for each analyte within QC limits?			X		
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass spectral tuning					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	Internal standards (IS)					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw data (NELAC Section 5.5.10)					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?			X		
S6	O	Dual column confirmation					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively identified compounds (TICs)					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) results					
		Were percent recoveries within method QC limits?	X				
S9	I	Serial dilutions, post digestion spikes, and method of standard additions					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	Method detection limit (MDL) studies					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency test reports					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards documentation					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/analyte identification procedures					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of analyst competency (DOC)					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/validation documentation for methods (NELAC Chapter 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory standard operating procedures (SOPs)					
		Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports

Laboratory Name: Pace Analytical National	LRC Date: 10/05/2020 07:45
Project Name: Key Energy Eunice BW	Laboratory Job Number: L1266826-01 and 02
Reviewer Name: Olivia Studebaker	Prep Batch Number(s): WG1550965, WG1552193, WG1551992, WG1551485 and WG1551947

ER #[1]	Description
1	9040C WG1552193 L1266826-01 and 02: Prepared and/or analyzed past holding time as defined in the method. Concentrations should be considered minimum values.
2	9056A WG1551947 R3577169-6: The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
3	9056A WG1551947 Chloride: Percent Recovery is outside of established control limits.

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Dissolved Solids	3030		5.64	20.0	20.0	1	09/30/2020 19:58	WG1551992

Wet Chemistry by Method 2710 F-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	g/cm3			date / time	
Density	1.00		1	09/29/2020 16:10	WG1550965

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	8.03	T8	1	10/01/2020 10:00	WG1552193

Sample Narrative:

L1266826-01 WG1552193: 8.03 at 20.4C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Chloride	1800		7.58	1.00	20.0	20	10/02/2020 00:30	WG1551947

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Dissolved Solids	271000		56.4	200	200	1	09/30/2020 19:58	WG1551992

Wet Chemistry by Method 2710 F-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	g/cm3			date / time	
Density	0.981		1	09/29/2020 16:10	WG1550965

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.84	T8	1	10/01/2020 10:00	WG1552193

Sample Narrative:

L1266826-02 WG1552193: 6.84 at 20.8C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Chloride	180000		3790	1.00	10000	10000	10/02/2020 01:09	WG1551947

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Sodium	94400		50.4	3.00	300	100	10/02/2020 10:24	WG1551485

Method Blank (MB)

(MB) R3576769-1 09/30/20 19:58

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1265820-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1265820-02 09/30/20 19:58 • (DUP) R3576769-3 09/30/20 19:58

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	10400	10500	1	0.839		5

L1266826-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1266826-01 09/30/20 19:58 • (DUP) R3576769-4 09/30/20 19:58

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	3030	3020	1	0.264		5

Laboratory Control Sample (LCS)

(LCS) R3576769-2 09/30/20 19:58

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8370	95.1	77.4-123	

L1266826-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1266826-01 09/29/20 16:10 • (DUP) R3575803-1 09/29/20 16:10

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	g/cm3	g/cm3		%		%
Density	1.00	1.00	1	0.120		20

L1266725-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1266725-01 10/01/20 10:00 • (DUP) R3576482-2 10/01/20 10:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.00	7.00	1	0.000		1

Sample Narrative:

OS: 7 at 20C

DUP: 7 at 22.1C

Laboratory Control Sample (LCS)

(LCS) R3576482-1 10/01/20 10:00

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

Sample Narrative:

LCS: 10.04 at 20.1C

1 Cp
2 Tc
3 Ss
4 Cn
5 Tr
6 Sr
7 Qc
8 Gl
9 Al
10 Sc

Method Blank (MB)

(MB) R3577169-1 10/01/20 13:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00

L1263673-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1263673-02 10/01/20 16:02 • (DUP) R3577169-3 10/01/20 16:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	0.511	0.514	1	0.722	J	15

L1266427-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1266427-01 10/01/20 22:33 • (DUP) R3577169-7 10/01/20 22:46

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	5.32	5.73	1	7.34		15

Laboratory Control Sample (LCS)

(LCS) R3577169-2 10/01/20 13:28

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.4	98.5	80.0-120	

L1263673-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1263673-04 10/01/20 16:54 • (MS) R3577169-4 10/01/20 17:07 • (MSD) R3577169-5 10/01/20 17:21

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 %
Chloride	50.0	1.35	52.1	52.2	101	102	1	80.0-120			0.276	15

L1266929-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1266929-01 10/01/20 21:42 • (MS) R3577169-6 10/01/20 21:54

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	258	296	75.7	1	80.0-120	E V

Method Blank (MB)

(MB) R3576883-1 10/01/20 23:01

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Sodium	U		0.504	3.00

Laboratory Control Sample (LCS)

(LCS) R3576883-2 10/01/20 23:03

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sodium	10.0	10.4	104	80.0-120	

L1266850-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1266850-01 10/01/20 23:06 • (MS) R3576883-4 10/01/20 23:11 • (MSD) R3576883-5 10/01/20 23:13

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 %
Sodium	10.0	3.08	13.0	13.0	99.1	99.2	1	75.0-125			0.0560	20

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.
MQL	Method Quantitation Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
SDL	Sample Detection Limit.
U	Not detected at the Sample Detection Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.
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
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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	LAO00356
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

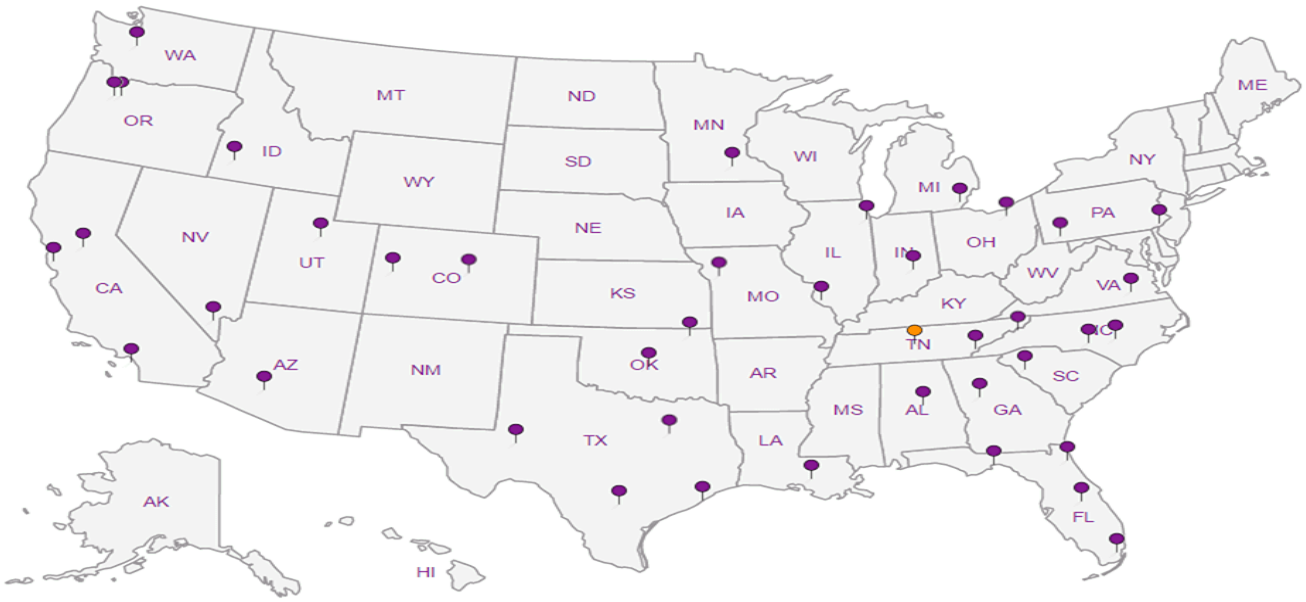
Third Party Federal Accreditations

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.



Key Energy Services

1301 McKinney Street
Suite 1800
Houston, TX 77010

Report to: Jill Best

Billing Information:
Jill Best
1301 McKinney Street
Suite 1800
Houston, TX 77010

Email To: jbest@keyenergy.com
+ WAYNE PRICE@q.COM

Project Description: Key Energy ~~Eunice Yard~~ EUNICE BW

City/State Collected: LEA Co. NM

Please Circle: PT MT CT ET

Phone: 713-651-4442

Client Project # ISE HALS

Lab Project # KEYENEHTX-EUNICE

Collected by (print): WAYNE PRICE

Site/Facility ID # BW-28

P.O. #

Collected by (signature): WAYNE PRICE - PRICE LLC

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	CHLORIDE,PH 1L-HDPE NoPres	DENSITY 1L-HDPE NoPres SG.	NAICP 250mlHDPE-HNO3	TDS 1L-HDPE NoPres	Remarks	Sample # (lab only)
FRESH WATER	GRAB	FGW	—	9/23/20	1:30 PM	1	✓	✓		✓		-01
BRINE WATER	11	BGW	—	11	1:50 PM	1	✓	✓	✓	✓		02
		GW										
		PRESERVATIVES ICE ONLY										

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1266826

C169

Acctnum: KEYENEHTX
Template: T171011
Prelogin: P786054
PM: 823 - Olivia Studebaker
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: FW- FRESH WATER BW- BRINE WATER FROM WELL
FW-FROM FW TK OUTLET TO BRINE WELL
BW- FROM BRINE WELL CASING OUTLET

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking # 1845 4329 3472

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y ✓N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR	If preservation required by Login: Date/Time
WAYNE PRICE	9/24/20	11:36 AM		0	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: NBAT °C 18-4=14 Bottles Received: 2	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 09/25/2020 Time: 09:00	Hold: / Condition: (NCF) / OK

Matt Shacklock

Pace Analytical®
National Center for Testing & Innovation

Login #: L1266826	Client: KEYENEHTX	Date: 9/25/20	Evaluated by: Jeremy

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time		Login Clarification Needed		**If Broken Container:**
	Temperature not in range		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
x	pH not in range.		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Couri
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Metals for BRINE WATER received Unpreserved. Total or Dissolved?

Client informed by:		Call		Email		Voice Mail		Date: 9/28/20	Time: 1303
TSR Initials: OS	Client Contact:								

Please log for Total NAICP

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

February 16, 2021

Key Energy Services

Sample Delivery Group:	L1314536
Samples Received:	02/05/2021
Project Number:	
Description:	Key Energy Eunice Yard

Report To:

Jill Best
1301 McKinney Street
Suite 1800
Houston, TX 77010

Entire Report Reviewed By:

Olivia Studebaker
Project Manager

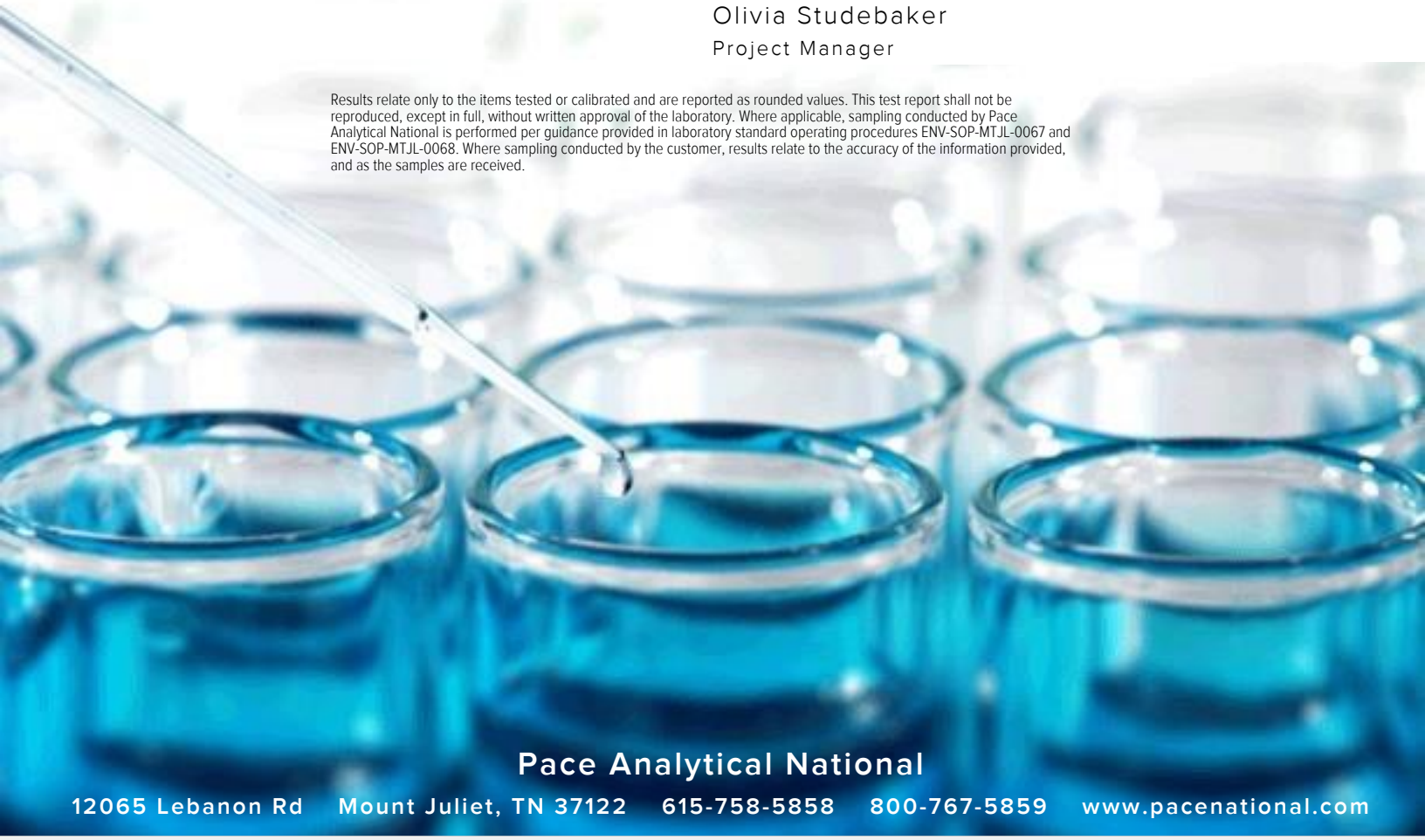


TABLE OF CONTENTS

FRESH WATER L1314536-01 GW

Collected by: Wayne Prize
Collected date/time: 02/03/21 13:00
Received date/time: 02/05/21 09:00

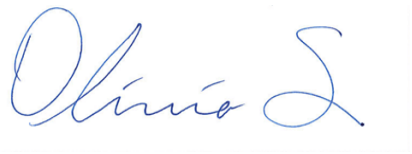
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1618386	1	02/09/21 04:32	02/09/21 05:35	CAT	Mt. Juliet, TN
Wet Chemistry by Method 2710 F-2011	WG1618470	1	02/09/21 16:06	02/09/21 16:06	SRG	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1617807	1	02/08/21 01:42	02/08/21 01:42	WOS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1618819	1	02/11/21 21:03	02/11/21 21:03	MCG	Mt. Juliet, TN

BRINE WATER L1314536-02 GW

Collected by: Wayne Prize
Collected date/time: 02/03/21 12:50
Received date/time: 02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1618386	1	02/09/21 04:32	02/09/21 05:35	CAT	Mt. Juliet, TN
Wet Chemistry by Method 2710 F-2011	WG1618470	1	02/09/21 16:06	02/09/21 16:06	SRG	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1617807	1	02/08/21 01:42	02/08/21 01:42	WOS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1618819	10000	02/11/21 21:55	02/11/21 21:55	MCG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1618516	200	02/11/21 16:01	02/11/21 23:01	CCE	Mt. Juliet, TN

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.



Olivia Studebaker
Project Manager

This data package consists of this signature page, the laboratory review checklist, and the following reportable data as applicable:

R1 - Field chain-of-custody documentation;

R2 - Sample identification cross-reference;

R3 - Test reports (analytical data sheets) for each environmental sample that includes:

a. Items consistent with NELAC Chapter 5,

b. dilution factors,

c. preparation methods,

d. cleanup methods, and

e. if required for the project, tentatively identified compounds (TICs).

R4 - Surrogate recovery data including:

a. Calculated recovery (%R), and

b. The laboratory's surrogate QC limits.

R5 - Test reports/summary forms for blank samples;

R6 - Test reports/summary forms for laboratory control samples (LCSs) including:

a. LCS spiking amounts,

b. Calculated %R for each analyte, and

c. The laboratory's LCS QC limits.

R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a. Samples associated with the MS/MSD clearly identified,

b. MS/MSD spiking amounts,

c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,

d. Calculated %Rs and relative percent differences (RPDs), and

e. The laboratory's MS/MSD QC limits

R8 - Laboratory analytical duplicate (if applicable) recovery and precision:

a. The amount of analyte measured in the duplicate,

b. The calculated RPD, and

c. The laboratory's QC limits for analytical duplicates.

R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 - Other problems or anomalies.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Olivia Studebaker
Project Manager

Laboratory Review Checklist: Reportable Data

Laboratory Name: Pace Analytical National	LRC Date: 02/16/2021 10:44
Project Name: Key Energy Eunice Yard	Laboratory Job Number: L1314536-01 and 02
Reviewer Name: Olivia Studebaker	Prep Batch Number(s): WG1617807, WG1618470, WG1618386, WG1618516, WG1618819 and WG1620057

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	Chain-of-custody (C-O-C)					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?			X		
R2	OI	Sample and quality control (QC) identification					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test reports					
		Were all samples prepared and analyzed within holding times?		X			1
		Other than those results < MQL, were all other raw values bracketed by calibration standards?		X			2
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	Surrogate recovery data					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	Test reports/summary forms for blank samples					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	Laboratory control samples (LCS):					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical duplicate data					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?		X			3
R9	OI	Method quantitation limits (MQLs):					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	Other problems/anomalies					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data

Laboratory Name: Pace Analytical National	LRC Date: 02/16/2021 10:44
Project Name: Key Energy Eunice Yard	Laboratory Job Number: L1314536-01 and 02
Reviewer Name: Olivia Studebaker	Prep Batch Number(s): WG1617807, WG1618470, WG1618386, WG1618516, WG1618819 and WG1620057

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	Initial calibration (ICAL)					
		Were response factors and/or relative response factors for each analyte within QC limits?			X		
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	Mass spectral tuning					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	Internal standards (IS)					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw data (NELAC Section 5.5.10)					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?			X		
S6	O	Dual column confirmation					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	Tentatively identified compounds (TICs)					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	Interference Check Sample (ICS) results					
		Were percent recoveries within method QC limits?	X				
S9	I	Serial dilutions, post digestion spikes, and method of standard additions					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	Method detection limit (MDL) studies					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	Proficiency test reports					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	Standards documentation					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	Compound/analyte identification procedures					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	Demonstration of analyst competency (DOC)					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	Verification/validation documentation for methods (NELAC Chapter 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	Laboratory standard operating procedures (SOPs)					
		Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
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4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports

Laboratory Name: Pace Analytical National	LRC Date: 02/16/2021 10:44
Project Name: Key Energy Eunice Yard	Laboratory Job Number: L1314536-01 and 02
Reviewer Name: Olivia Studebaker	Prep Batch Number(s): WG1617807, WG1618470, WG1618386, WG1618516, WG1618819 and WG1620057

ER #[1]	Description
1	9040C WG1617807 L1314536-01 and 02: Prepared and/or analyzed past holding time as defined in the method. Concentrations should be considered minimum values.
2	9056A WG1618819 R3621989-8 and 9: The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
3	2540 C-2011 WG1618386 Dissolved Solids: Relative Percent Difference is outside of established control limits.

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Dissolved Solids	383		2.82	10.0	10.0	1	02/09/2021 05:35	WG1618386

Wet Chemistry by Method 2710 F-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	g/cm3			date / time	
Density	0.995		1	02/09/2021 16:06	WG1618470

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	8.11	T8	1	02/08/2021 01:42	WG1617807

Sample Narrative:

L1314536-01 WG1617807: 8.11 at 19C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Chloride	38.0		0.379	1.00	1.00	1	02/11/2021 21:03	WG1618819

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Dissolved Solids	288000		282	1000	1000	1	02/09/2021 05:35	WG1618386

Wet Chemistry by Method 2710 F-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	g/cm3			date / time	
Density	1.17		1	02/09/2021 16:06	WG1618470

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.93	T8	1	02/08/2021 01:42	WG1617807

Sample Narrative:

L1314536-02 WG1617807: 6.93 at 18.7C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Chloride	190000		3790	1.00	10000	10000	02/11/2021 21:55	WG1618819

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	SDL	Unadj. MQL	MQL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l	mg/l		date / time	
Sodium	96800		101	3.00	600	200	02/11/2021 23:01	WG1618516

Method Blank (MB)

(MB) R3621441-1 02/09/21 05:35

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1313779-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1313779-01 02/09/21 05:35 • (DUP) R3621441-3 02/09/21 05:35

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	73.0	165	1	77.3	J3	5

L1314536-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1314536-01 02/09/21 05:35 • (DUP) R3621441-4 02/09/21 05:35

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	383	385	1	0.521		5

Laboratory Control Sample (LCS)

(LCS) R3621441-2 02/09/21 05:35

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	7810	88.8	77.4-123	

L1314536-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1314536-01 02/09/21 16:06 • (DUP) R3620862-1 02/09/21 16:06

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	g/cm3	g/cm3		%		%
Density	0.995	0.999	1	0.431		20

L1312965-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1312965-01 02/08/21 01:42 • (DUP) R3620251-2 02/08/21 01:42

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	SU	su		%		%
pH	7.80	7.80	1	0.000		1

Sample Narrative:

OS: 7.8 at 18.5C

DUP: 7.8 at 18.3C

L1314561-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1314561-01 02/08/21 01:42 • (DUP) R3620251-3 02/08/21 01:42

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.50	7.50	1	0.000		1

Sample Narrative:

OS: 7.5 at 18.4C

DUP: 7.5 at 18.3C

Laboratory Control Sample (LCS)

(LCS) R3620251-1 02/08/21 01:42

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

Sample Narrative:

LCS: 10.03 at 18.4C

1 Cp
2 Tc
3 Ss
4 Cn
5 Tr
6 Sr
7 Qc
8 Gl
9 Al
10 Sc

Method Blank (MB)

(MB) R3621989-1 02/11/21 10:25

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00

L1314344-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1314344-02 02/11/21 15:25 • (DUP) R3621989-3 02/11/21 15:38

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	U	U	5	0.000		15

L1314536-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1314536-01 02/11/21 21:03 • (DUP) R3621989-10 02/11/21 21:16

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	38.0	38.5	1	1.32		15

Laboratory Control Sample (LCS)

(LCS) R3621989-2 02/11/21 10:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.9	99.7	80.0-120	

L1314464-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1314464-02 02/11/21 17:08 • (MS) R3621989-4 02/11/21 17:21 • (MSD) R3621989-5 02/11/21 17:34

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 %
Chloride	50.0	10.5	60.4	61.5	99.9	102	1	80.0-120			1.84	15

L1314460-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1314460-02 02/11/21 19:18 • (MS) R3621989-6 02/11/21 19:32 • (MSD) R3621989-7 02/11/21 19:45

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 %
Chloride	50.0	16.8	66.7	67.5	99.8	101	1	80.0-120			1.15	15

L1314503-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1314503-01 02/11/21 19:58 • (MS) R3621989-8 02/11/21 20:11 • (MSD) R3621989-9 02/11/21 20:24

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 %
Chloride	50.0	59.3	107	104	94.8	88.9	1	80.0-120	E	E	2.80	15

Method Blank (MB)

(MB) R3621871-1 02/11/21 18:58

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Sodium	U		0.504	3.00

Laboratory Control Sample (LCS)

(LCS) R3621871-2 02/11/21 19:01

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sodium	10.0	9.89	98.9	80.0-120	

L1314460-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1314460-02 02/11/21 19:04 • (MS) R3621871-4 02/11/21 19:09 • (MSD) R3621871-5 02/11/21 19:12

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 %
Sodium	10.0	26.4	35.5	34.8	90.3	84.1	1	75.0-125			1.77	20

L1314464-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1314464-02 02/11/21 19:15 • (MS) R3621871-6 02/11/21 19:17 • (MSD) R3621871-7 02/11/21 19:20

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 %
Sodium	10.0	10.4	20.0	20.2	95.9	97.6	1	75.0-125			0.844	20

L1314558-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1314558-10 02/11/21 19:23 • (MS) R3621871-8 02/11/21 19:31 • (MSD) R3621871-9 02/11/21 19:34

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 %
Sodium	10.0	55.1	63.0	63.0	78.9	79.0	1	75.0-125			0.0128	20

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.
MQL	Method Quantitation Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
SDL	Sample Detection Limit.
U	Not detected at the Sample Detection Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.
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
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J3	The associated batch QC was outside the established quality control range for precision.
T8	Sample(s) received past/too close to holding time expiration.

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.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN, 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

Pace Analytical National 1313 Point Mallard Parkway SE Suite B Decatur, AL, 35601

Alabama	40160
ANSI National Accreditation Board	L2239

Pace Analytical National 660 Bercut Dr. Ste. C Sacramento, CA, 95811

California	2961	Oregon	CA300002
Minnesota	006-999-465	Washington	C926
North Dakota	R-214		

Pace Analytical National 6000 South Eastern Avenue Ste 9A Las Vegas, NV, 89119

Nevada	NV009412021-1

Pace Analytical National 1606 E. Brazos Street Suite D Victoria, TX, 77901

Texas	T104704328-20-18

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

Key Energy Services

1301 McKinney Street
Suite 1800
Houston, TX 77010

Billing Information:
Jill Best
1301 McKinney Street
Suite 1800
Houston, TX 77010

Email To: jbest@keyenergy.com

Report to: Jill Best

Project Description: Key Energy Eunice Yard

City/State Collected: NM

Please Circle: PT MT CT ET

Phone: 713-651-4442

Client Project #

Lab Project # KEYENEHTX-EUNICE

Collected by (print): WAYNE PRICE

Site/Facility ID #

P.O. #

Collected by (signature):

Quote #

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	CHLORIDE, PH 1L-HDPE NoPres	NAICP 250mlHDPE-HNO3	TDS, DENSITY 1L-HDPE NoPres
FRESH WATER	GRAB	GW		2/3/21	12:50 PM	2	✓		✓
BRINE WATER	"	GW		"	12:50	3	✓	✓	✓
		GW							

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # 131536

Table #

Acctnum: KEYENEHTX
Template: T171011
Prelogin: P823396
PM: 823 - Olivia Studebaker
PB: CK 1/22/21
Shipped Via: FedEX Ground

Remarks | Sample # (lab only)

30 2

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: BRINE WATER WEST LOAD LINE
FRESH WATER FW TANK LINE TO BRINE WELL

pH _____ Temp _____
Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier _____

Tracking # 9817 8154 4577

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
WAYNE PRICE	2/4/21	10:51 MT	CHAVEZ
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: 1.2 °C Bottles Received: 5

Date: 2/5/21 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Appendix C – Area of Review Data

2020 BW-28 AOR Review
Well Status List

API #	WELL STATUS	WELL NAME	UL	SECTION	TS	RG	FOOTAGE	WITHIN 1/4 MI AOR (*within 800 ft)	CASING PROGRAM CHECKED	CASED &/or CEMENTED ACROSS SALT SECTION	CORRECTIVE ACTION REQUIRED
30-025-33547	***Active***	***Key-State #001***	***E***	***15***	***21S***	***37E***	***1340 FNL & 330 FWL***	***NA***	***NA***	***NA***	***NA***
30-025-37223	Active	Apache NEDU #628	E	15	21S	37E	1410 FNL & 380 FWL	Yes*	Yes	Yes	No
30-025-06591	**Active**	**Apache NEDU #604**	**E**	**15**	**21S**	**37E**	**2310 FNL & 990 FWL**	**Yes**	**No**	**Will check if critical radius approaches**	
30-025-35271	Active	Apache NEDU #625	E	15	21S	37E	2580 FNL & 1300 FWL	No	NA	NA	NA
30-025-09913	Plugged (site released)	Shell NEDU #603	E	15	21S	37E	3390 FSL & 4520 FEL	Yes*	Yes	Yes	No
30-025-41600	**Active**	**Apache NEDU #544**	**E**	**15**	**21S**	**37E**	**1355 FNL & 1190 FWL**	**Yes**	**No**	**Will check if critical radius approaches**	
30-025-09914	Active	Apache NEDU #602	E	15	21S	37E	1980 FNL & 660 FWL	Yes*	Yes	Yes	No
30-025-06613	Active	Apache NEDU #605	C	15	21S	37E	760 FNL & 1980 FWL	No	NA	NA	NA
30-025-41598	Active	Apache NEDU #558	C	15	21S	37E	150 FNL & 2295 FWL	No	NA	NA	NA
30-025-34886	Active	Apache NEDU # 524	C	15	21S	37E	1610 FNL & 1350 FWL	No	NA	NA	NA
30-025-34887	**Active**	**Apache NEDU #624**	**C**	**15**	**21S**	**37E**	**1250 FNL & 1368 FWL**	**Yes**	**No**	**Will check if critical radius approaches**	
30-025-06609	Plugged (site released)	Chevron State S #002	C	15	21S	37E	660 FNL 1980 FWL	No	NA	NA	NA
30-025-41583	Active	Apache NEDU 661	C	15	21S	37E	1240 FNL & 1930 FWL	No	NA	NA	NA
30-025-41485	**Active**	**Chevron State S #012**	**C**	**15**	**21S**	**37E**	**990 FNL & 1330 FWL**	**Yes**	**No**	**Will check if critical radius approaches**	
30-025-39831	Cancelled 12/19/12	Chevron State S #012C	C	15	21S	37E	991 FNL & 1331 FWL	NA	NA	NA	NA
30-025-06611	Active	Chevron State S #004H	C	15	21S	37E	660 FNL & 2080 FWL	No	NA	NA	NA
30-025-34649	Active	Apache NEDU #622	C	15	21S	37E	1229 FNL & 2498 FWL	No	NA	NA	NA
30-025-06586	Active	Chevron St. #001	D	15	21S	37E	660 FNL & 660 FWL	Yes*	Yes	Yes	No
30-025-06612	**Plugged (site released)**	**Chevron St. #005**	**D**	**15**	**21S**	**37E**	**660 FNL & 990 FWL**	**Yes**	**Yes**	**Yes**	**No**
30-025-06614	**Plugged (site released)**	**Apache NEDU #601**	**D**	**15**	**21S**	**37E**	**600 FNL & 990 FWL**	**Yes**	**Yes**	**Yes**	**No**
30-025-36809	**Active**	**Apache NEDU #526**	**D**	**15**	**21S**	**37E**	**130 FNL & 330 FWL**	**Yes**	**No**	**Will check if critical radius approaches**	
30-025-45456	Cancelled 1/3/2021	Apache NEDU #649C	D	15	21S	37E	870 FNL & 800 FWL	NA	NA	NA	NA
30-025-06585	Plugged (site released)	Apache St. #002	F	15	21S	37E	1980 FNL & 1980 FWL	No	NA	NA	NA
30-025-06587	Active	Apache NEDU #606	F	15	21S	37E	3375 FSL & 3225 FEL	No	NA	NA	NA
30-025-06590	Plugged (site released)	Apache NEDU #608	F	15	21S	37E	1980 FNL & 1880 FWL	No	NA	NA	NA
30-025-41275	Active	Apache NEDU #650	F	15	21S	37E	2550 FNL & 1925 FWL	No	NA	NA	NA
30-025-42236	Cancelled	Apache NEDU #647	F	15	21S	37E	1710 FNL & 2360 FWL	No	NA	NA	NA
30-025-06603	Active	Apache Argo #006	K	15	21S	37E	1650 FSL & 2310 FWL	No	NA	NA	NA
30-025-06607	Active	Apache Argo #0ll	K	15	21S	37E	2080 FSL & 1650 FWL	No	NA	NA	NA
30-025-09918	Active	Apache NEDU #703	K	15	21S	37E	1980 FSL & 1980 FWL	No	NA	NA	NA
30-025-39828	Active	Apache Argo #014	K	15	21S	37E	2190 FSL & 2130 FWL	No	NA	NA	NA
30-025-34657	Active	Apache NEDU #623	K	15	21S	37E	2540 FSL & 2482 FWL	No	NA	NA	NA
30-025-06606	Plugged (site released)	Apache Argo #010	L	15	21S	37E	1880 FSL & 760 FWL	No	NA	NA	NA
30-025-09915	Active	Apache Argo #007	L	15	21S	37E	2310 FSL & 990 FWL	No	NA	NA	NA
30-025-09916	Active	Apache NEDU #701	L	15	21S	37E	1980 FSL & 660 FWL	No	NA	NA	NA
30-025-34888	Active	Apache NEDU #713	L	15	21S	37E	1330 FSL & 1142 FWL	No	NA	NA	NA
30-025-37238	**Active**	**Apache NEDU #629**	**L**	**15**	**21S**	**37E**	**2630 FSL & 330 FWL**	**Yes**	**No**	**Will check if critical radius approaches**	
30-025-42232	Cancelled	Apache NEDU #639C	L	15	21S	37E	1960 FSL & 740 FWL	No	NA	NA	NA
30-025-06623	**Active**	**Apache WBDU #057**	**A**	**16**	**21S**	**37E**	**660 FNL & 660 FEL**	**Yes**	**No**	**Will check if critical radius approaches**	
30-025-25198	Active	Chevron HLNCT #006	A	16	21S	37E	330 FNL & 600 FEL	No	No	NA	NA
30-025-39277	Active	Apache WBDU #113	A	16	21S	37E	1290 FNL & 330 FEL	Yes*	Yes	Yes	No
30-025-06621	**Active**	**Apache WBDU #056**	**H**	**16**	**21S**	**37E**	**1980 FNL & 660 FEL**	**Yes**	**No**	**Will check if critical radius approaches**	

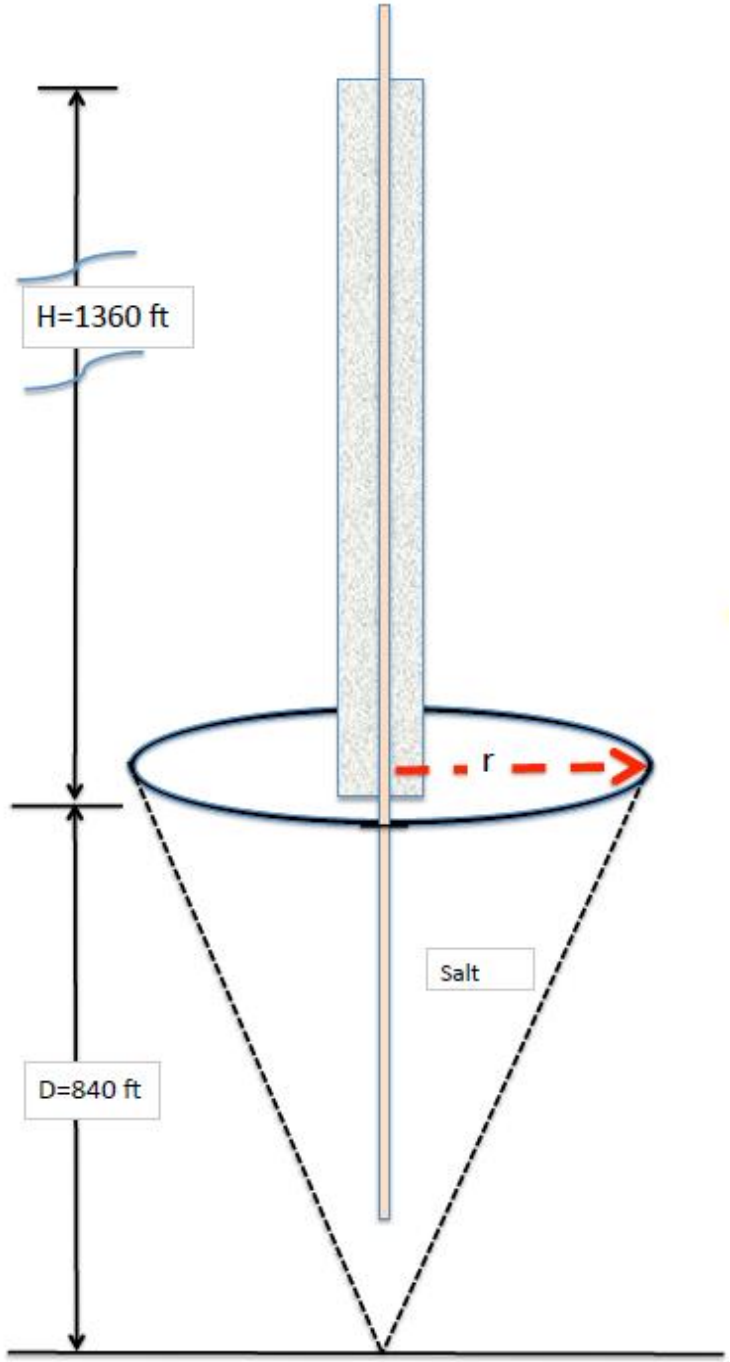
2020 BW-28 AOR Review
Well Status List

API #	WELL STATUS	WELL NAME	UL	SECTION	TS	RG	FOOTAGE	WITHIN 1/4 MI AOR (*within 800 ft)	CASING PROGRAM CHECKED	CASED &/or CEMENTED ACROSS SALT SECTION	CORRECTIVE ACTION REQUIRED
30-025-06624	**Active**	**Chevron HLNCT #005**	**H**	**16**	**21S**	**37E**	**2310 FNL & 330 FEL**	**Yes**	**No**	**Will check if critical radius approaches**	
30-025-36741	Active	Chevron HLNCT #007	H	16	21S	37E	1330 FNL & 1070 FEL	No	NA	NA	NA
30-025-37834	Plugged (site released)	Chevron HLNCT #008	H	16	21S	37E	2310 FNL & 030 FEL	**Yes**	Yes	Yes	No
30-025-42537	**Cancelled**	**Apache WBDU #164C**	**H**	**17**	**21S**	**37E**	**2610 FNL & 300 FEL**	**Yes**	**No**	**Will check if critical radius approaches**	
30-025-06617	Active	Apache St. DA #005	I	16	21S	37E	1980 FSL & 330 FEL	No	NA	NA	NA
30-025-06619	Active	Apache WBDU #078	I	16	21S	37E	1980 FSL & 660 FEL	No	NA	NA	NA
30-025-37916	Active	Apache St. DA #013	I	16	21S	37E	1650 FSL & 780 FEL	No	NA	NA	NA

44 Total # of wells in adjacent quarter sections
5 Total # of wells that are within 800 foot of the outside radius of Key State No .001
18 Total # of wells that are within 1/4 mile AOR

* Denotes well is within the calculated critical outside radius of brine well and casing program will be checked annually.
Critial radius is ten times the calcualted brine well radius

Appendix D – Cavity calculations, well bore superimposed on log, and mass balance.



2020 Calculations

Radius (r) = √{(V*Kf*3)/(π*d)}

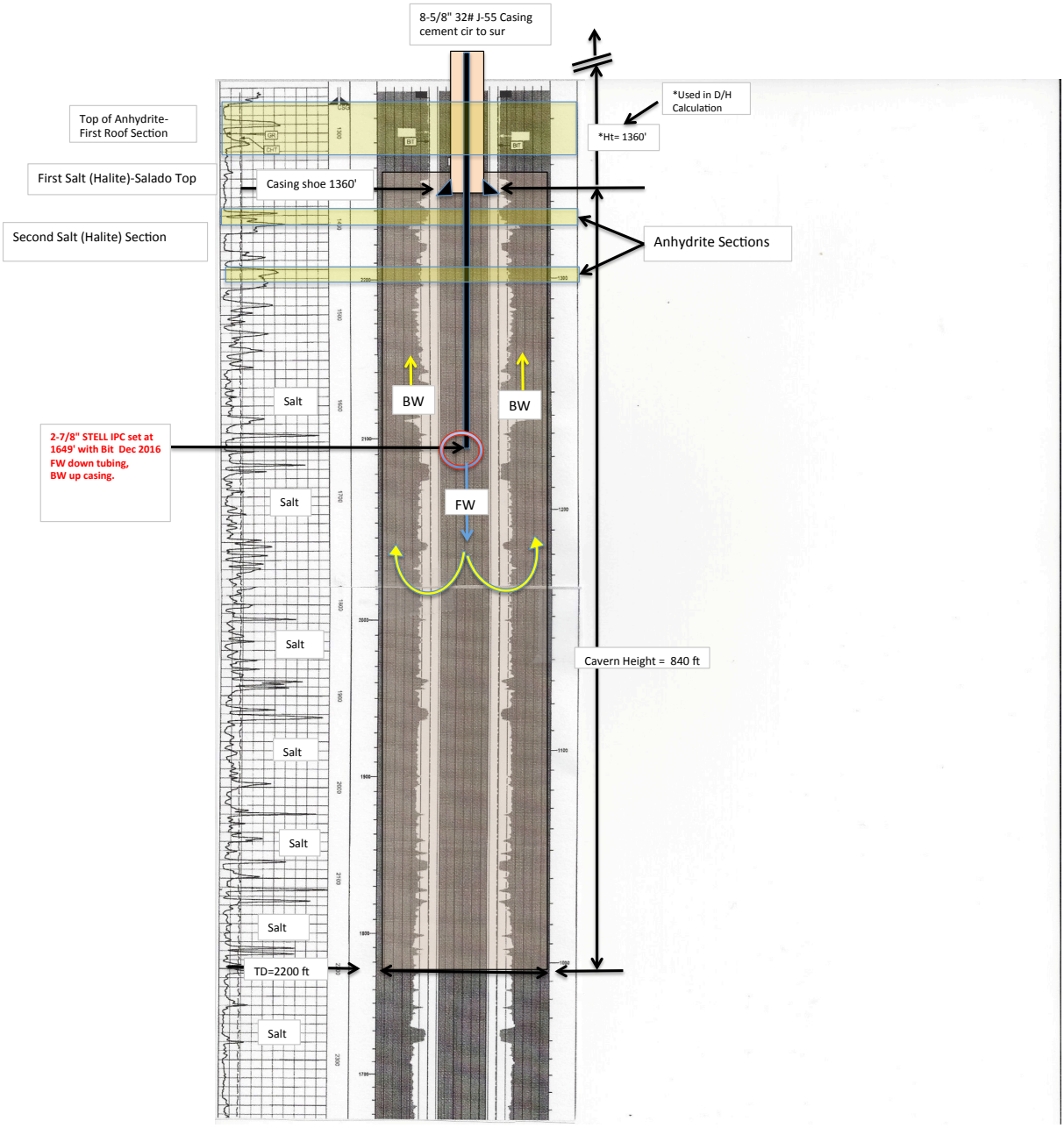
Volume (V)	6,223,319 bbls
Depth (d)	840 ft
Height (H)	1,360 ft
Ft3 salt/bbl (Kf)*	0.763 est*

r =	73.49 ft
Diameter (D) =	146.98 ft

D/H =	0.11

*Original conversion based on 55 gallons per bbl. Modified to reflect 42 gallons per bbl.

Key BW-28 Cavern Superimposed on the Apache
NEDU 544D well Log Located 600 ft west of Brine Well.
BW-28 orginally Completed w 2074' of 2-7/8" FG Tubing Aug 96.
Last Completed w 2-7/8" STELL IPC set at 1649' with Bit Dec 2016.
Last Radius Calculation = 166 ft. D/ht = .12
Annotated by Price LLC May 19, 2020



BW-28 Mass Balance

Measured Salt Removed VS Calculated Salt Removed

2020 Lifetime Total Production Volume	6,223,319.00	bbls
Average Density lbs/gal Produced Water Measured	9.92	lbs/gal
Average Salt Density-Est*	80	lbs/ft^3
ft^3/bbl	5.6145	ft^3/bbl
Lbs of Salt/gal	1.575	lbs/gal
Lbs of Salt/bbl	66.15	lbs/bbl
Total lbs of Salt Removed	411,672,551.85	lbs
Estimated ft^3 of Salt Removed Based on Production Numbers	5,145,906.90	ft^3

*Used OCD number for salt density 1bbl = 42 gallons

Geo-Physical Worst Case Cone Calculation

$$V = \pi * r^2 * (h/3)$$

Where	r = Radius	Radius	73.49	ft
	h = Height from log	Height	840	ft
	"Worst Case" Volume of Salt Removed		4,748,392.40	ft^3
	Percent Variance from "Worst Case" and Calclated Volumes		**8%**	

-within 10% passes

Positive % means "Worst Case" cone volume is less than estimated volume of salt removed

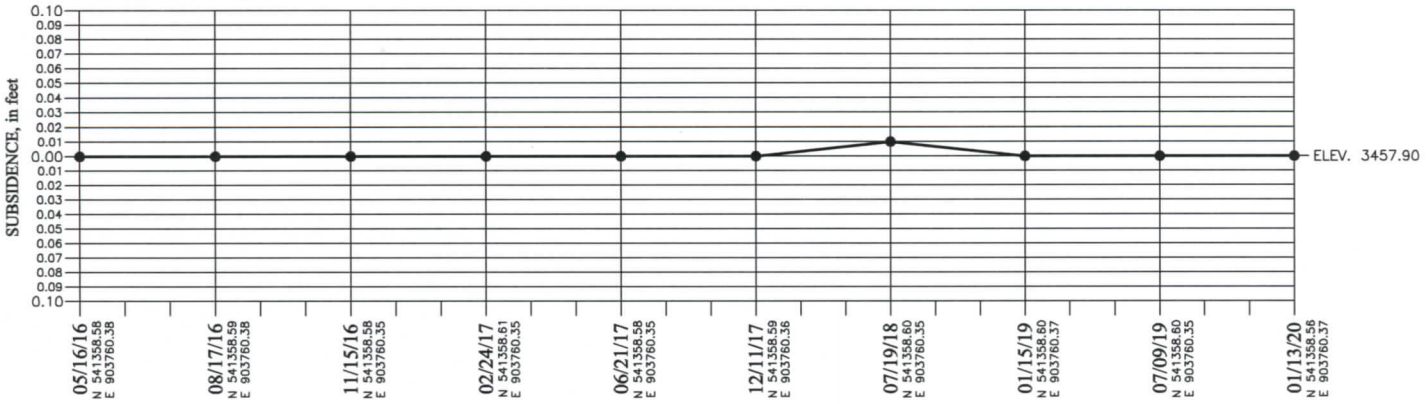
Negative % means "Worst Case" cone volume is more than estimated volume of salt removed

Appendix E – Subsidence Reports

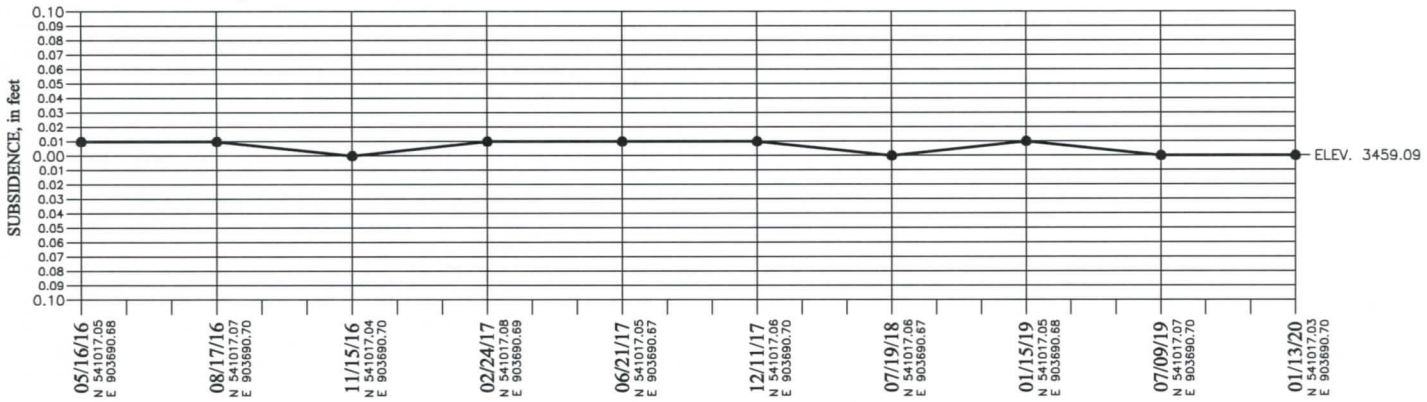
VERTICAL SUBSIDENCE TABLE
KEY ENERGY SERVICES, LLC. – STATE #1

NEW MEXICO EAST NAD 83

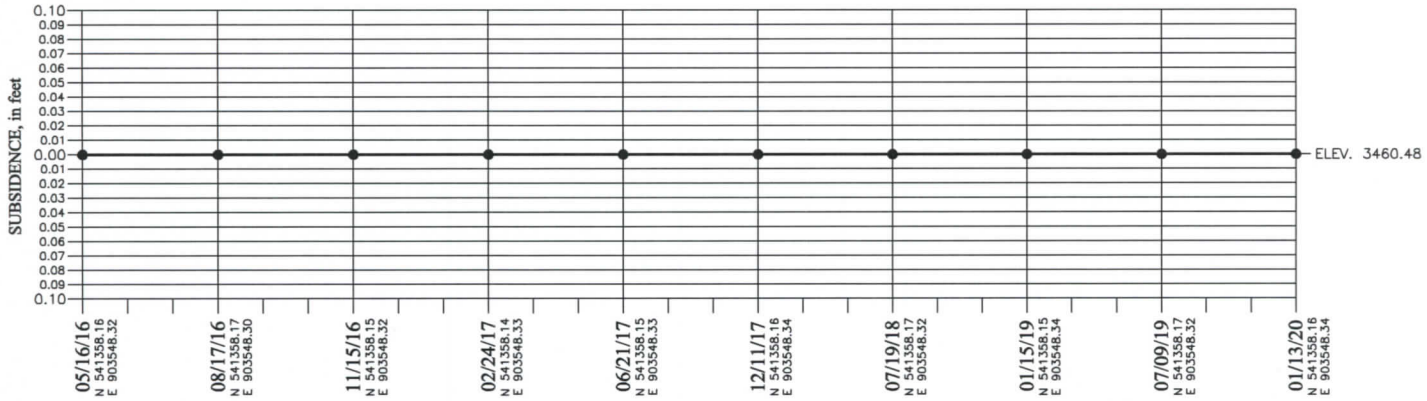
MONUMENT #1



MONUMENT #2



MONUMENT #3



BASIS OF ELEVATIONS: US C & GS BENCH MARK
"L–98 1935" – CVO320
ELEV. = 3434.37

SURVEYORS CERTIFICATE

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

TERRY J. ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

Terry J. Asel 1/15/2020

Terry J. Asel N.M. R.P.L.S. No. 15079

Asel Surveying

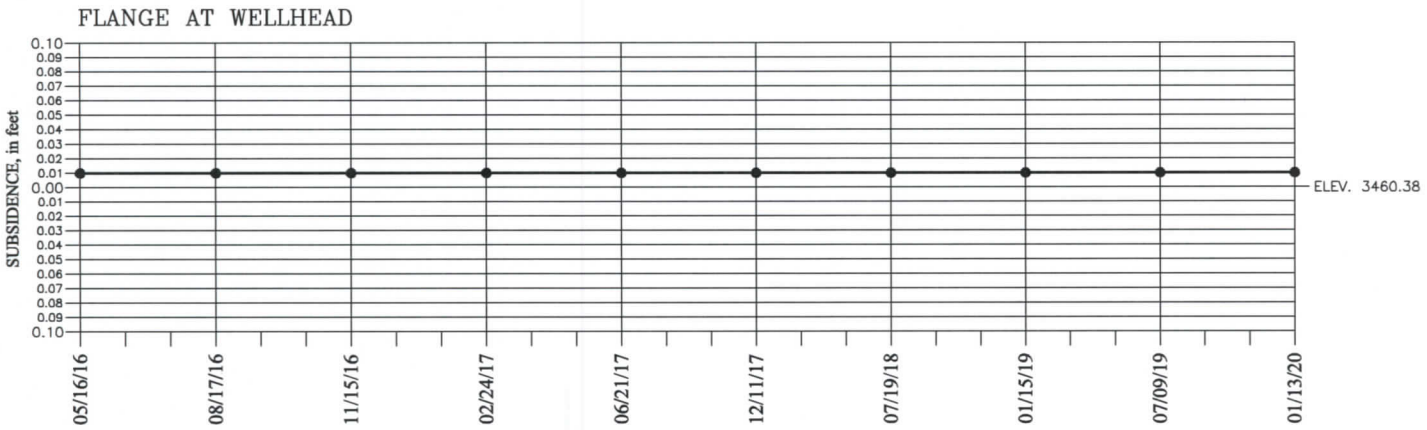
P.O. BOX 393 – 310 W. TAYLOR
HOBBS, NEW MEXICO – 575–393–9146

KEY ENERGY SERVICES, LLC.

SUBSIDENCE MONITORING FOR THE KEY ENERGY SERVICES, LLC. – EUNICE STATE #1 WELL IN SECTION 15, TOWNSHIP 21 SOUTH, RANGE 37 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

Survey Date: 01/13/20	Sheet 1 of 2 Sheets	
W.O. Number: 200113MS	Drawn By: KA	Rev:
Date: 01/14/20	200113MS	Scale:1"=1000'

VERTICAL ELEVATION TABLE
KEY ENERGY SERVICES, LLC. – STATE #1



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KEY ENERGY SERVICES, LLC. – STATE #1

NEW MEXICO EAST NAD 83

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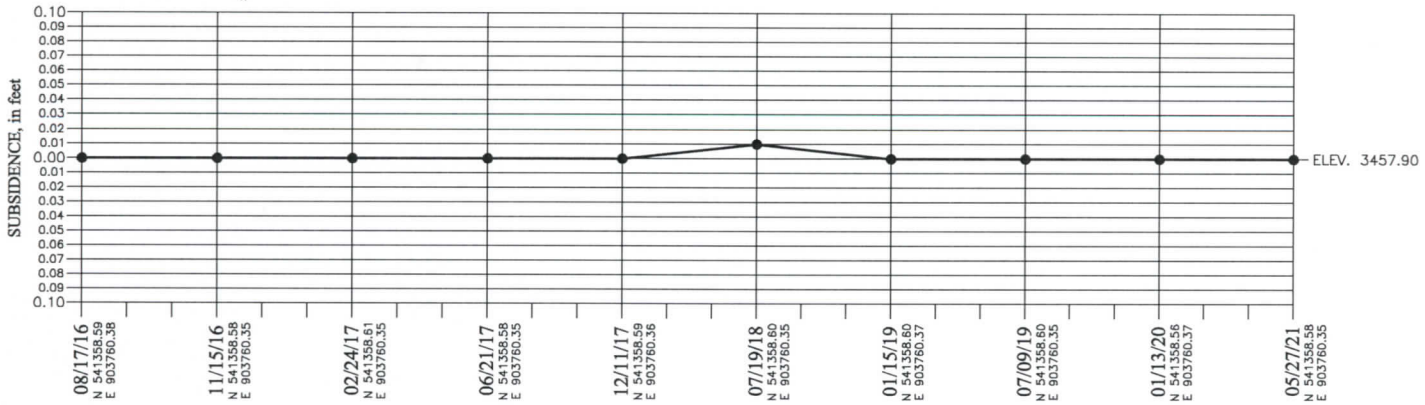
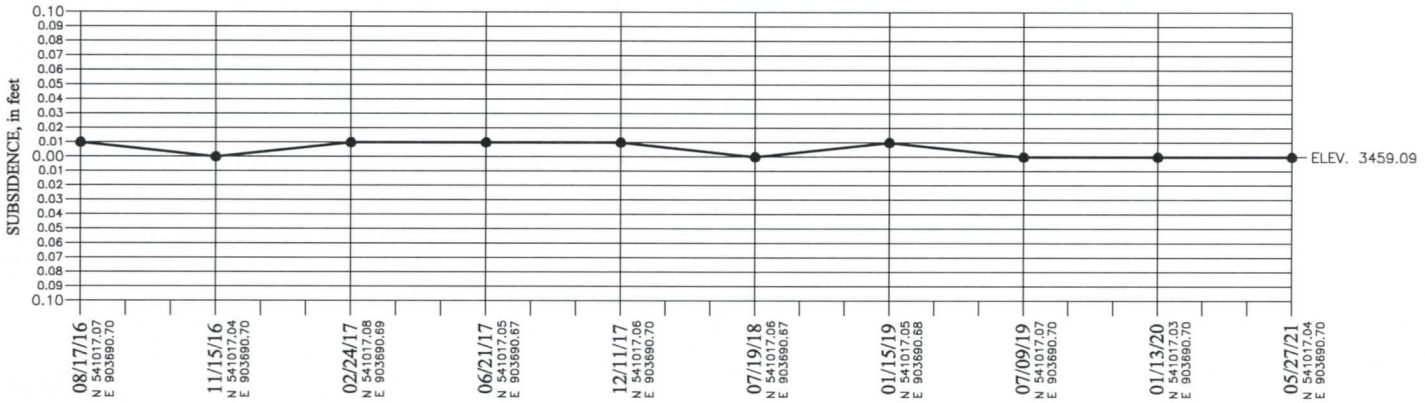


MONUMENT #2



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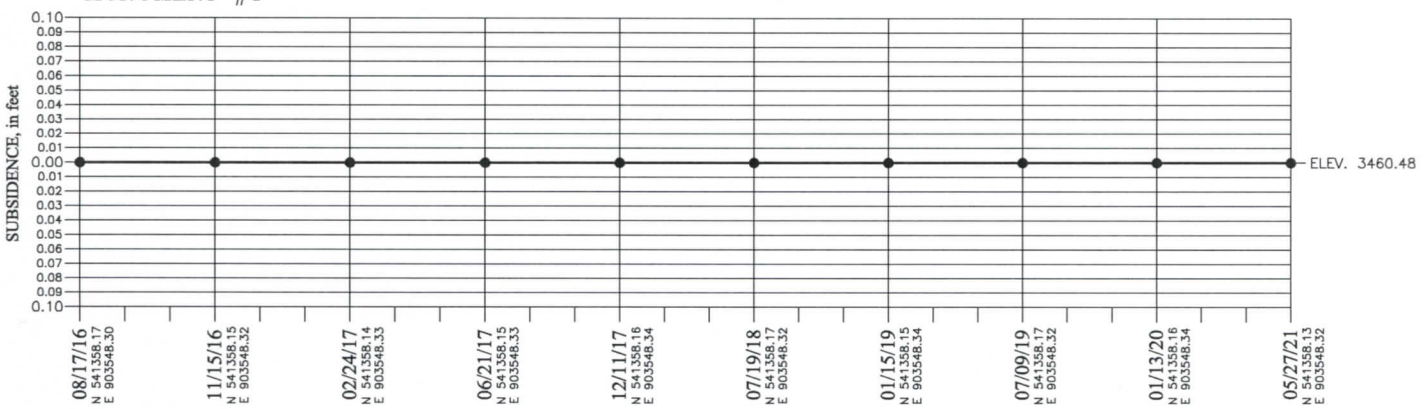

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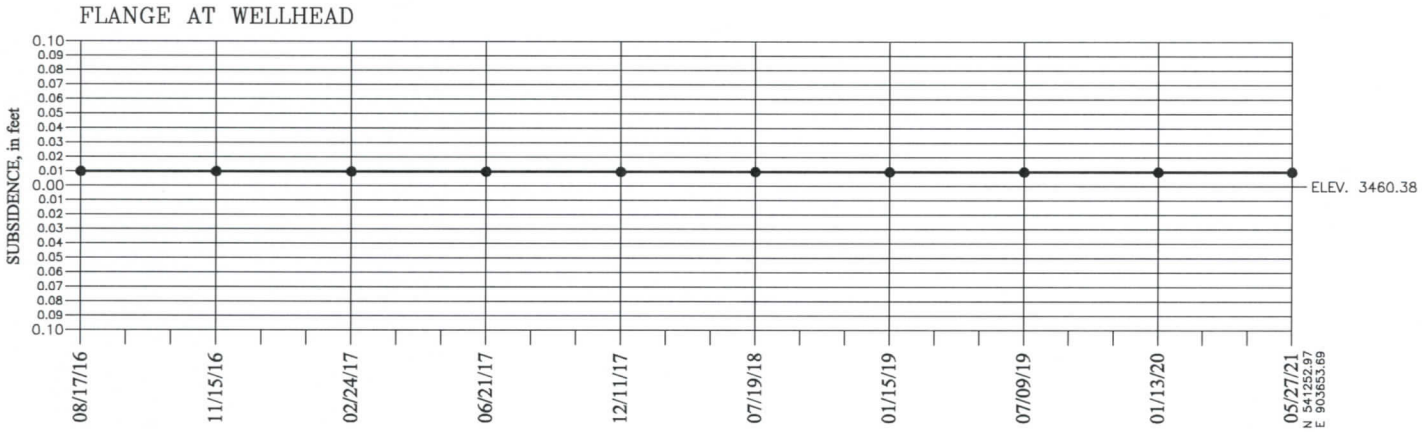
Survey Date: 05/27/21	Sheet 1 of 2 Sheets	
W.O. Number: 210527MS	Drawn By: KA	Rev:
Date: 05/27/21	210527MS	Scale:1"=1000'

VERTICAL ELEVATION TABLE
KEY ENERGY SERVICES, LLC. – STATE #1



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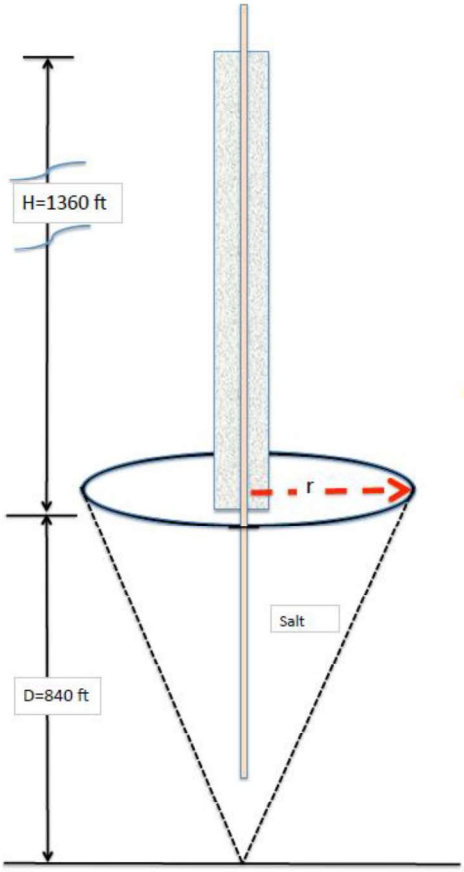
Appendix D – Cavity calculations, well bore superimposed on log, and mass balance.



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Diameter (D) =	146.98 ft
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NEDU 544D well Log Located 600 ft west of Brine Well.
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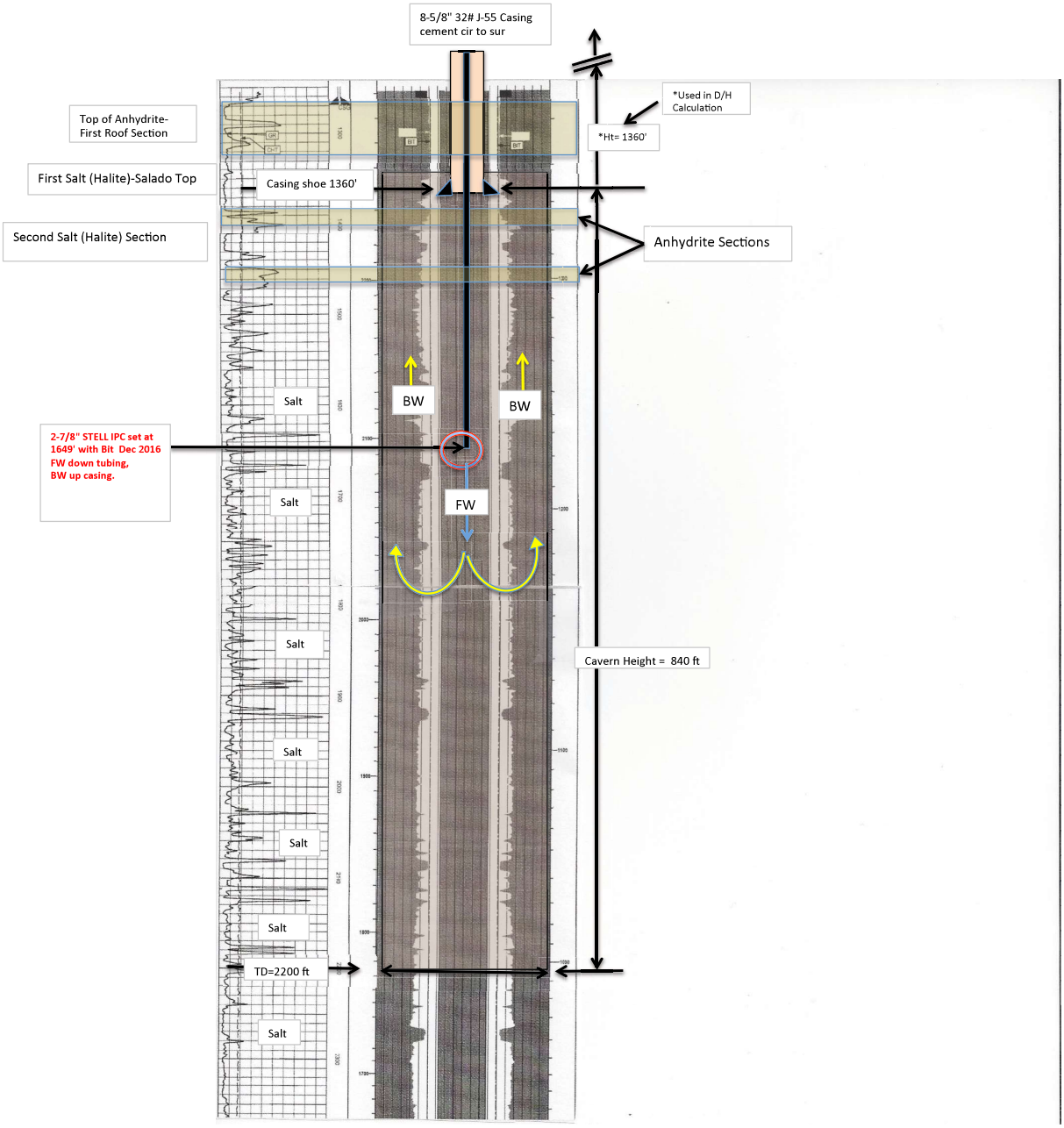

BW-28 Mass Balance

Measured Salt Removed VS Calculated Salt Removed

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Average Density lbs/gal Produced Water Measured	9.92	lbs/gal
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ft^3/bbl	5.6145	ft^3/bbl
Lbs of Salt/gal	1.575	lbs/gal
Lbs of Salt/bbl	66.15	lbs/bbl
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Where	r = Radius	Radius	73.49	ft
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	Percent Variance from "Worst Case" and Calclated Volumes		**8%**	

-within 10% passes

Positive % means "Worst Case" cone volume is less than estimated volume of salt removed

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Appendix E – Subsidence Reports

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NEW MEXICO EAST NAD 83

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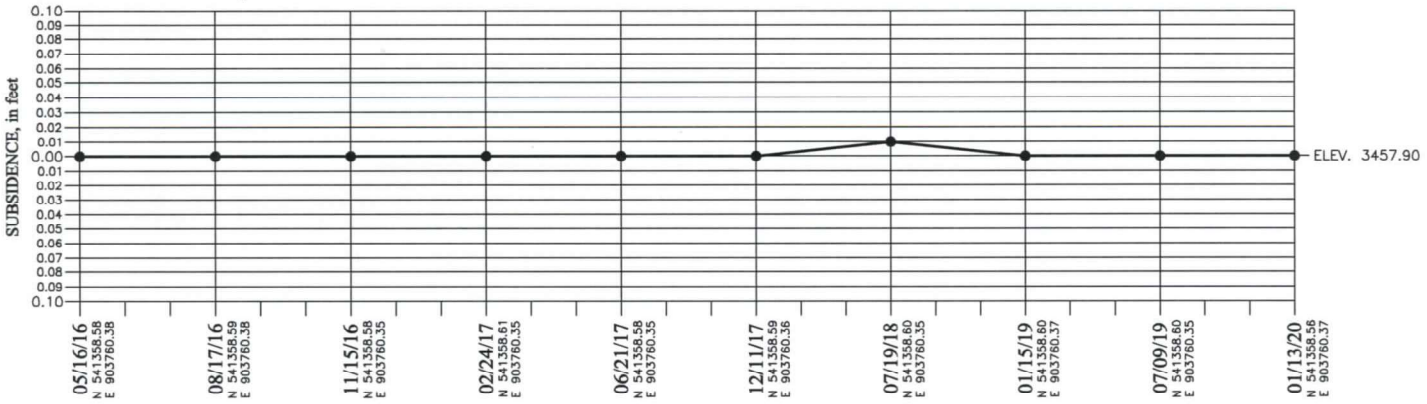
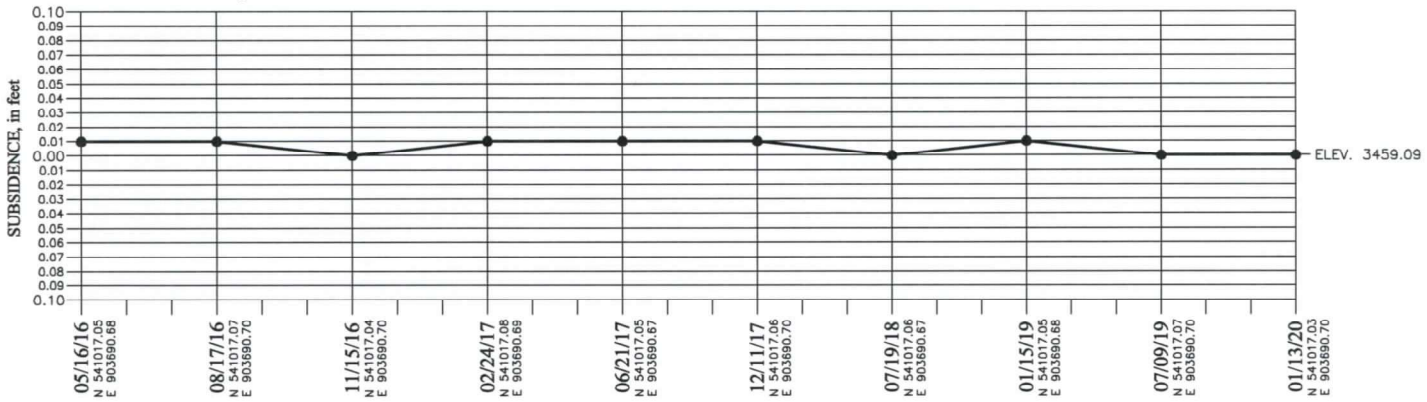


MONUMENT #2



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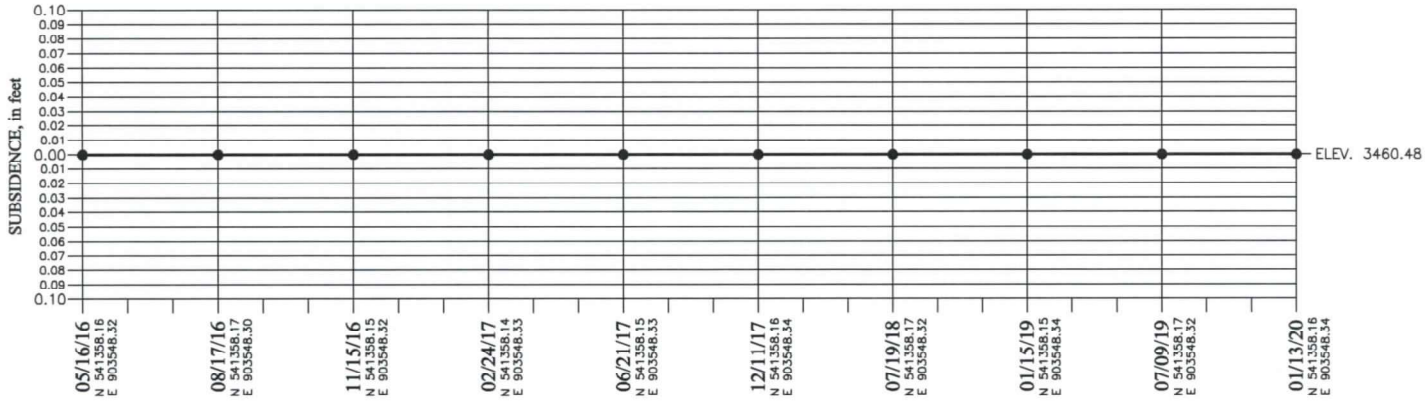

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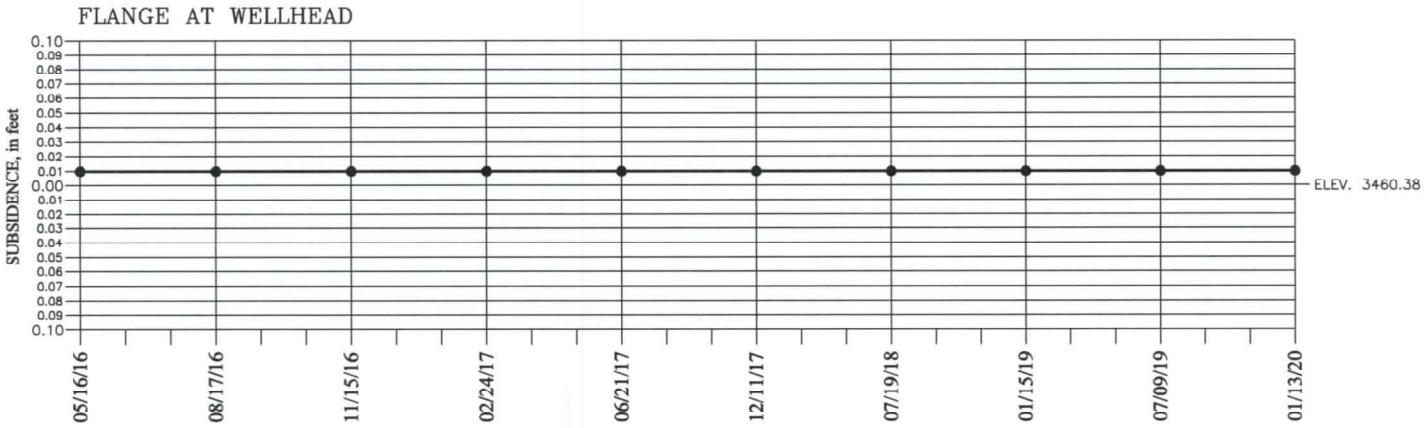
KEY ENERGY SERVICES, LLC. – STATE #1



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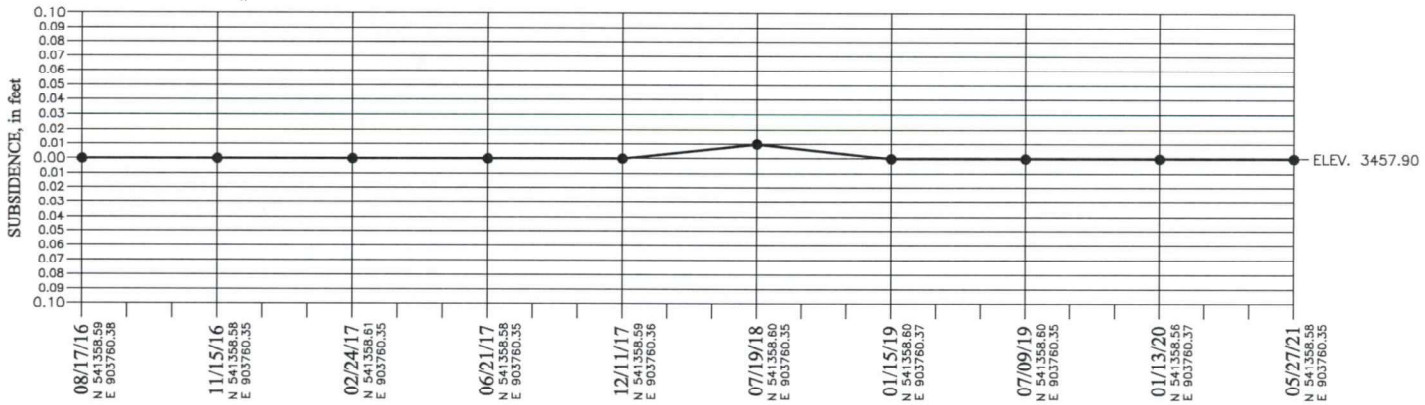
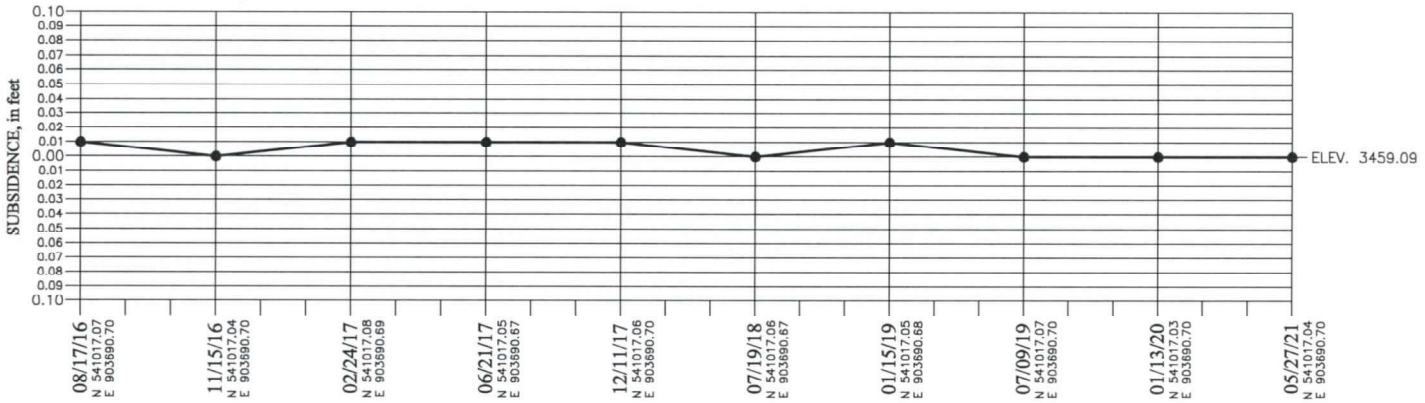
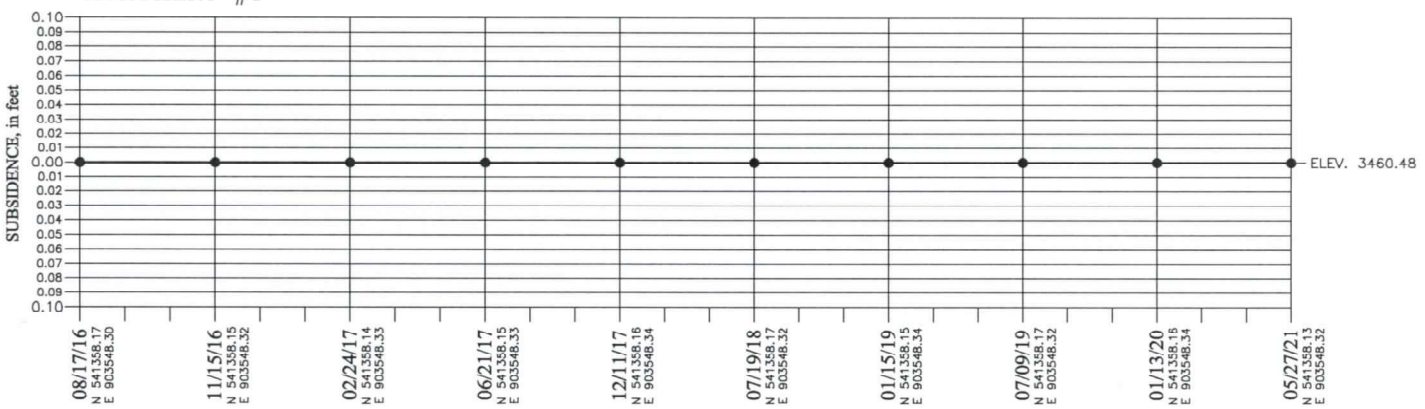


MONUMENT #2



MONUMENT #3



BASIS OF ELEVATIONS: US C & GS BENCH MARK
"L–98 1935" – CVO320
ELEV. = 3434.37

SURVEYORS CERTIFICATE

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

TERRY J ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

Terry J. Asel 5/27/2021

Terry J. Asel, N.M. R.P.L.S. No. 15079

Asel Surveying

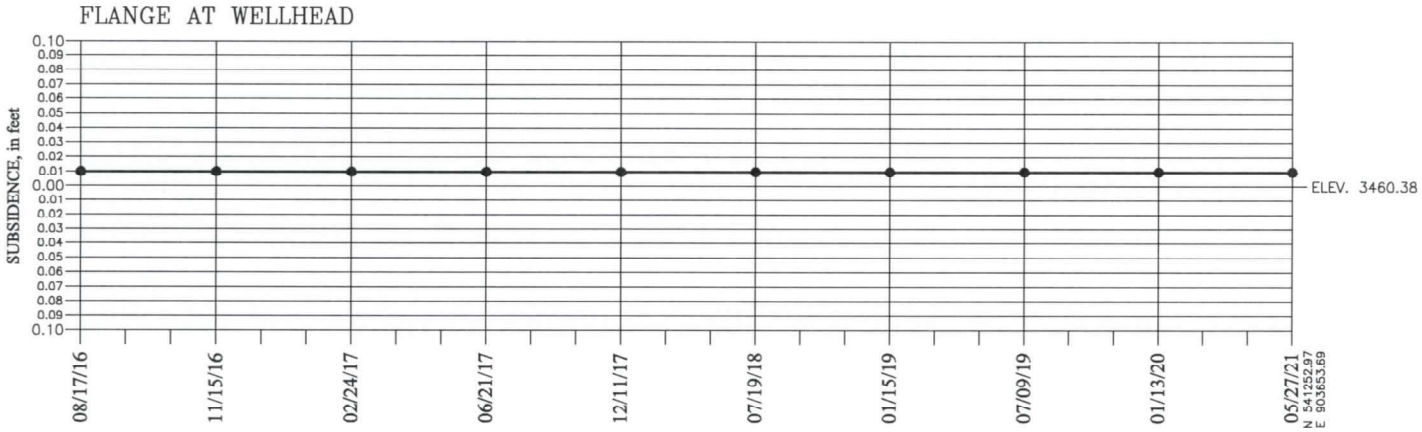
P.O. BOX 393 – 310 W. TAYLOR
HOBBS, NEW MEXICO – 575-393-9146

KEY ENERGY SERVICES, LLC.

SUBSIDENCE MONITORING FOR THE KEY ENERGY SERVICES, LLC. – EUNICE STATE #1 WELL IN SECTION 15, TOWNSHIP 21 SOUTH, RANGE 37 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

Survey Date: 05/27/21	Sheet 1 of 2 Sheets	
W.O. Number: 210527MS	Drawn By: KA	Rev:
Date: 05/27/21	210527MS	Scale: 1"=1000'

VERTICAL ELEVATION TABLE
KEY ENERGY SERVICES, LLC. – STATE #1



TERRY J ASEL
NEW MEXICO
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Survey Date: 05/27/21	Sheet 2 of 2 Sheets	
W.O. Number: 210527MS	Drawn By: KA	Rev:
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