District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	NRM2016043944
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party: Centennial Resource Production, Inc	OGRID: 372165
Contact Name: Jamon Hohensee	Contact Telephone: 432-243-4283
Contact email: jamon.hohensee@cdevinc.com	Incident # *(assigned by OCD)*
Contact mailing address: 500 W. Illinois Ave, Suite 500, Midland Texas 79701	

Location of Release Source

Latitude 32.40084 Longitude -103.43481
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Chimichanga 12 State Com 601 lease road	Site Type: lease road
Date Release Discovered: 4/14/2020	API# *3002546614000*

Unit Letter	Section	Township	Range	County
P	11	22S	34E	Lea

Surface Owner: ☒ State ☐ Federal ☐ Tribal ☐ Private (*Name:* _____)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☐ Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☒ Other (describe) **Fresh Water**	Volume/Weight Released (provide units) 12 bbls	Volume/Weight Recovered (provide units) 0 bbls

Cause of Release:
Release of fresh water along lease road from frac tank. A detailed description has been attached.
The released volume was calculated by taking the cubic footage estimate and factoring in porosity and saturation for a hard packed caliche road.
Cristina Eads has been in contact with Centennial regarding this incident.

State of New Mexico
Oil Conservation Division

Incident ID	NRM2016043944
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☒ No	If YES, for what reason(s) does the responsible party consider this a major release?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

☒ The source of the release has been stopped.
☐ The impacted area has been secured to protect human health and the environment.
☐ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☐ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:
-Considering the liquid was relatively small amount of fresh water, human health and environment were not in danger.
-The water immediately absorbed into the road.
-There were no freestanding liquids to recover.

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Jamon Hohensee Title: Sr. Environmental Analyst

Signature: _____ Date: 6/5/2020

email: jamon.hohensee@cdevinc.com Telephone: 432-241-4283

OCD Only

Received by: Ramona Marcus Date: 6/8/2020

Form C-141
Page 3

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	_____ (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☐ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☐ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☐ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☐ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☐ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☐ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☐ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☐ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☐ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☐ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☐ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☐ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

- ☐ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☐ Field data
- ☐ Data table of soil contaminant concentration data
- ☐ Depth to water determination
- ☐ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☐ Boring or excavation logs
- ☐ Photographs including date and GIS information
- ☐ Topographic/Aerial maps
- ☐ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: _____ Title: _____

Signature: _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

Form C-141
Page 5

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Remediation Plan

Remediation Plan Checklist: ***Each of the following items must be included in the plan.***

- ☐ Detailed description of proposed remediation technique
- ☐ Scaled sitemap with GPS coordinates showing delineation points
- ☐ Estimated volume of material to be remediated
- ☐ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☐ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: ***Each of the following items must be confirmed as part of any request for deferral of remediation.***

- ☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- ☐ Extents of contamination must be fully delineated.
- ☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: _____ Title: _____

Signature: _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____

Form C-141
Page 6

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: ***Each of the following items must be included in the closure report.***

☐ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

☐ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

☐ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

☐ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: _____ Title: _____

Signature: _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

CENTENNIAL
RESOURCE DEVELOPMENT LLC

NRM2016043944

June 5, 2020

Jamon Hohensee
Sr. Environmental Analyst
Centennial Resource Development, Inc
500 W. Illinois Ave, Midland, Texas 79701

Re: Release of fresh water from Chimichanga 12 State Com 601 on CR 32

On April 14, 2020 a truck hauling a frac tank was noticed driving south down CR 32 west of Eunice, NM. The frac tank (#500707) was releasing fresh water from its rear ball valve (Appendix A). The substance was unknown at the time and the incident was treated as an illegal dump of produced water. The origin point of the release was located at 32.40084, -103.43481 and contined south on CR 32 for 2.87 miles (Appendix B). Initial sampling of the origin point spill area indicated that the road materials were uncontaminated. However, seven samples that were taken along the assumed path of the release were over 600mg/Kg for chlorides and 100mg/Kg for total TPH as indicated in Table 1 (Appendix C). A total of 36 samples were taken at regular intervals along the path of the release.

Centennial has concluded that the fluid released from the frac tank was fresh water associated a cement job on the Chimichanga 12 State com 601, and that the elevated concentrations in Table 1 were from unrelated incidents by various operators in the area. Centennial's drilling superintendent also confirmed that the frac tanks used on location were to hold fresh water for the mixing process of cement.

Figure 1 shows the location of the first four samples (AH1- AH4) collected on the 2 track road leading to the south and within the origin point spill area oulined in yellow. Because there was not a sample collected from the fluid released directly from the frac tank, we can use these samples as being a true representation of the released fluid due to the prestine nature of the 2-track road. This smaller road does not receive the volume of heavy traffic and higher potential for cross contamination compared to the main road. The samples analitical results is further evidence that there was not prior cross-contamination along the smaller 2-track road.

Because the majority of released fluid was in this area, we would assume to see the highest concentrations in these four samples versus other samples taken. The results in Table 1 of AH1-AH4 not only show low levels of chlorides, TPH, and BTEX, but also give credibility to the additional evidence that this was fresh water.

With the information described above, it would be logical to conculde that the fresh water that was released on CR 32 did not cause the spikes in TPH and chlorids that were seen in several samples show in Table 1. These spikes were most likely cause by unreported incidents from the numerous operators and service companies that use this road frequently.

We have included supporting documentation (Appendix D) that the fluids released were fresh water.

1. The *National Tank & Equipment* invoice shows that the frac tank #500707 was on location during the cement job on the Chimichanga 12 State Com 601 that that started on 4/10/2020.

CENTENNIAL
RESOURCE DEVELOPMENT LLC

2. The *Duke Oilfield Service, LLC* invoice shows that the water delivered to the location was fresh water for the cement job on the well at the same time.
3. The *Compass Cementing* job invoice and summary provide an accurate description of the events and times of the cementng.
    a. Page 3 shows the job log which corresponds with the frac tank a water invoices
    b. Page 5 gives a test value of the water used during cementing with chlorides levels at 500ppm (mg/Kg)

Appendix A – Photos taken of the incident
Appendix B – Figure 1, Figure 2 – Aerial maps showing release location
Appendix C – Table 1 – Sample analytical table
Appendix D – Supporting documents and invoices

CENTENNIAL
RESOURCE DEVELOPMENT, LLC

Appendix A

CENTENNIAL
RESOURCE DEVELOPMENT, LLC

Frac Tank #FRC500707

Open ball valve on back of frac tank

CENTENNIAL
RESOURCE DEVELOPMENT, LLC

Origin of release

2-Track road leading South at release origin

CENTENNIAL
RESOURCE DEVELOPMENT, LLC

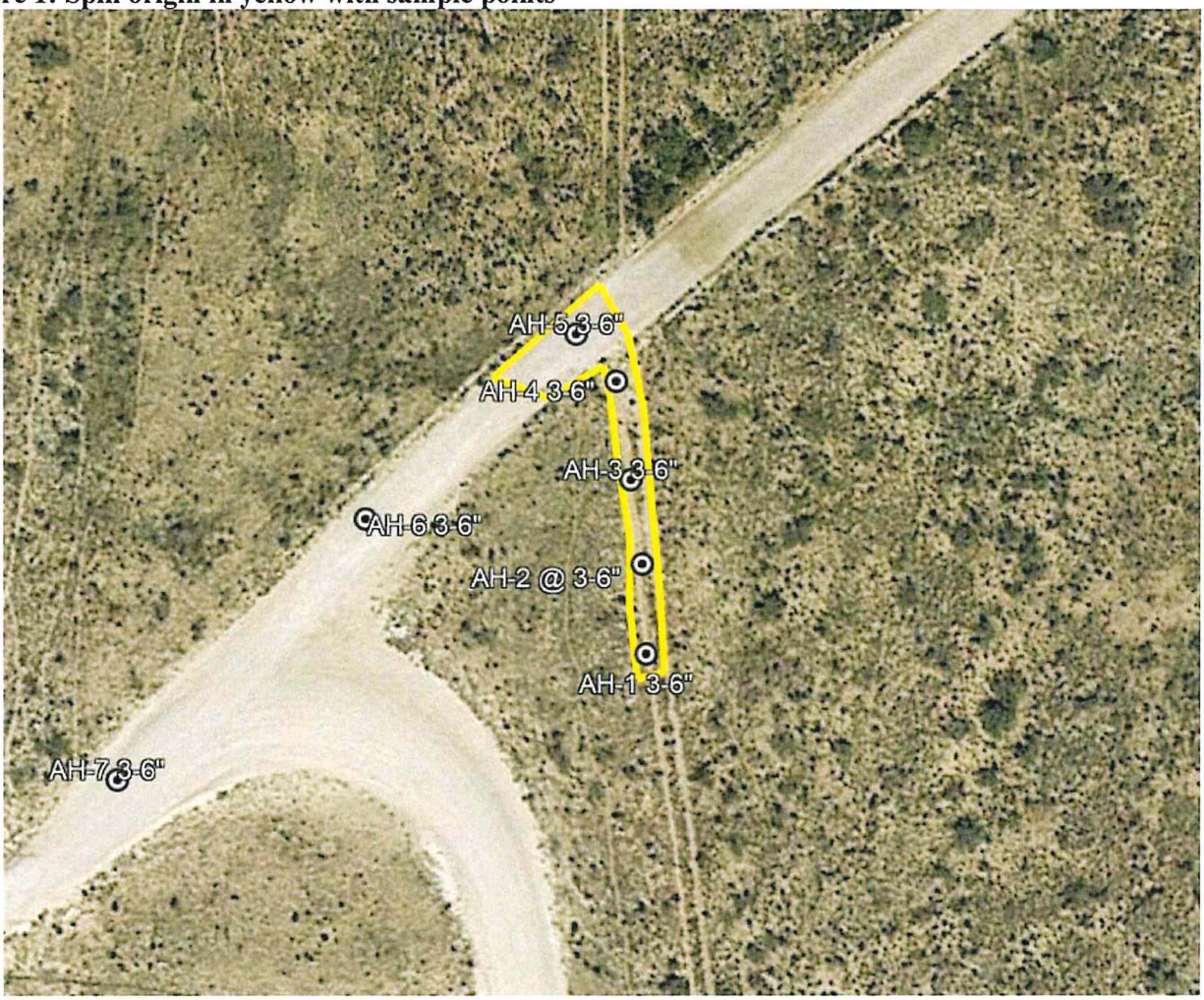
View of release along CR 32

CENTENNIAL
RESOURCE DEVELOPMENT, LLC

Appendix B

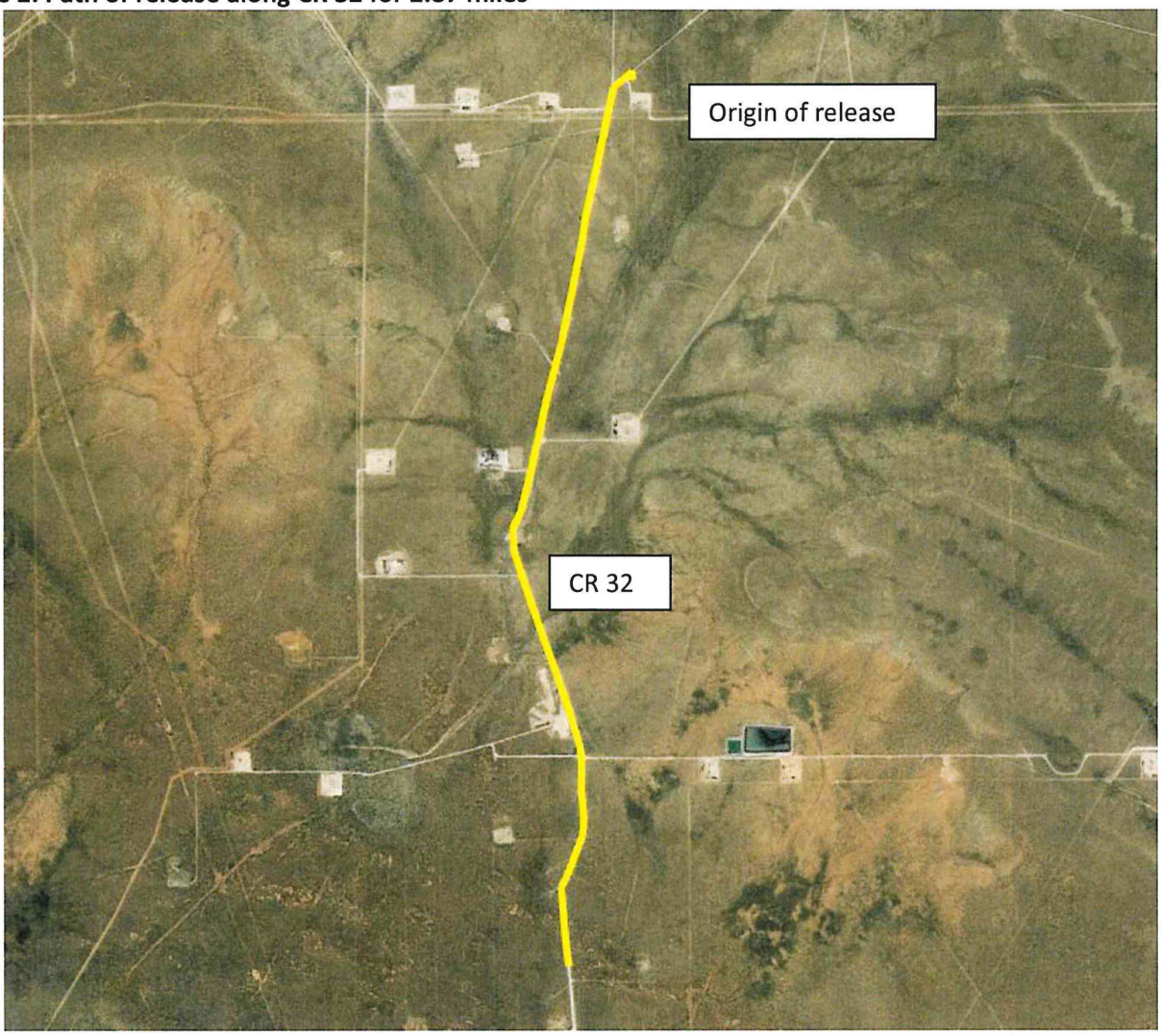
CENTENNIAL
RESOURCE DEVELOPMENT LLC

Figure 1: Spill origin in yellow with sample points



CENTENNIAL
RESOURCE DEVELOPMENT, LLC

Figure 2: Path of release along CR 32 for 2.87 miles



CENTENNIAL
RESOURCE DEVELOPMENT, LLC

Appendix C

TABLE 1

CONCENTRATIONS OF BENZENE, BTEX, TPH AND CHLORIDE IN SOIL

CENTENNIAL RESOURCE DEVELOPMENT, INC.

CHIMICHANGA ILLEGAL DUMP RELEASE SITE
LEA COUNTY, NEW MEXICO

All concentrations are reported in mg/Kg

SAMPLE LOCATION	SAMPLE DATE	METHODS: SW 846-8021B						METHOD: SW 8015M					E 300.1
		BENZENE	TOLUENE	ETHYL-BENZENE	m, p - XYLENES	o - XYLENE	TOTAL XYLENES	TOTAL BTEX	TPH GRO C_6-C_{12}	TPH DRO C_{12}-C_{28}	TPH ORO C_{28}-C_{35}	TOTAL TPH C_6-C_{35}	CHLORIDE
Limits		10 mg/Kg						50 mg/Kg				100 mg/Kg	600 mg/Kg
Auger Hole Sample Results													
AH1 3-6"	4/16/2020	<0.000450	<0.000233	<0.000307	<0.000340	<0.000340	<0.000340	<0.000450	<50.0	<50.0	<50.0	<50.0	103
AH2 3-6"	4/16/2020	<0.00900	<0.00466	<0.00614	<0.00679	<0.00679	<0.00679	<0.00900	<50.0	<50.0	<50.0	<50.0	84.5
AH3 3-6"	4/16/2020	<0.00899	<0.00465	<0.00612	<0.00678	<0.00678	<0.00678	<0.00899	<49.9	<49.9	<49.9	<49.9	67.4
AH4 3-6"	4/16/2020	<0.00900	<0.00466	<0.00614	<0.00679	<0.00679	<0.00679	<0.00900	<50.0	<50.0	<50.0	<50.0	96.5
AH5 3-6"	4/16/2020	<0.00908	<0.00470	<0.00618	<0.00685	<0.00685	<0.00685	<0.00908	<50.0	<50.0	<50.0	<50.0	35.7
AH6 3-6"	4/16/2020	<0.00897	<0.00464	<0.00611	<0.00677	<0.00677	<0.00677	<0.00897	<49.9	208	<49.9	208	42.5
AH7 3-6"	4/16/2020	<0.00909	<0.00471	<0.00620	<0.00686	<0.00686	<0.00686	<0.00909	<50.0	<50.0	<50.0	<50.0	76.4
AH8 3-6"	4/16/2020	<0.00904	<0.00468	<0.00616	<0.00682	<0.00682	<0.00682	<0.00904	<49.9	115	<49.9	115	125
AH9 3-6"	4/16/2020	<0.00895	<0.00463	<0.00610	<0.00675	<0.00675	<0.00675	<0.00895	<49.8	<49.8	<49.8	<49.8	260
AH10 3"	4/16/2020	<0.000452	0.000400	<0.000308	<0.000341	<0.000341	<0.000341	0.000400	<50.0	<50.0	<50.0	<50.0	208
AH11 3"	4/16/2020	<0.000448	<0.000232	<0.000306	<0.000338	<0.000338	<0.000338	<0.000448	<49.9	<49.9	<49.9	<49.9	66.9
AH12 3"	4/16/2020	<0.000455	<0.000235	<0.000310	<0.000343	<0.000343	<0.000343	<0.000455	<50.0	<50.0	<50.0	<50.0	382
AH13 3"	4/16/2020	<0.000449	<0.000233	<0.000306	<0.000339	<0.000339	<0.000339	<0.000449	<50.0	<50.0	<50.0	<50.0	627
AH14 3"	4/16/2020	<0.000454	<0.000235	<0.000309	<0.000342	<0.000342	<0.000342	<0.000454	<49.9	<49.9	<49.9	<49.9	422
AH15 3"	4/16/2020	<0.000448	<0.000232	<0.000305	<0.000338	<0.000338	<0.000338	<0.000448	<50.0	59.2	<50.0	59.2	308
AH16 3"	4/16/2020	<0.000450	<0.000233	<0.000307	<0.000340	<0.000340	<0.000340	<0.000450	<49.8	<49.8	<49.8	<49.8	210
AH17 3"	4/16/2020	<0.000453	<0.000234	<0.000309	<0.000342	<0.000342	<0.000342	<0.000453	<50.0	<50.0	<50.0	<50.0	363
AH18 3"	4/16/2020	<0.000450	<0.000233	<0.000307	<0.000340	<0.000340	<0.000340	<0.000450	<49.9	<49.9	<49.9	<49.9	723
AH19 3"	4/16/2020	<0.000453	<0.000234	<0.000309	<0.000342	<0.000342	<0.000342	<0.000453	<50.0	<50.0	<50.0	<50.0	705
AH20 3"	4/16/2020	<0.000453	<0.000234	<0.000309	<0.000342	<0.000342	<0.000342	<0.000453	<50.0	<50.0	<50.0	<50.0	95.2
AH21 3"	4/16/2020	<0.00909	<0.00471	<0.00620	<0.00686	<0.00686	<0.00686	<0.00909	<50.0	<50.0	<50.0	<50.0	96.3
AH22 3"	4/16/2020	<0.000451	<0.000234	<0.000307	<0.000340	<0.000340	<0.000340	<0.000451	<49.8	<49.8	<49.8	<49.8	330
AH23 3"	4/16/2020	<0.000457	<0.000236	<0.000311	<0.000344	<0.000344	<0.000344	<0.000457	<50.0	<50.0	<50.0	<50.0	250
AH24 3"	4/16/2020	<0.000451	<0.000234	<0.00307	<0.00340	<0.00340	<0.00340	<0.000451	<50.0	<50.0	<50.0	<50.0	412
AH25 3"	4/16/2020	<0.000448	<0.000232	<0.000306	<0.000338	<0.000338	<0.000338	<0.000448	<49.9	59.4	<49.9	59.4	446
AH26 3"	4/16/2020	<0.000452	<0.000234	<0.000308	<0.000341	<0.000341	<0.000341	<0.000452	<50.0	<50.0	<50.0	<50.0	213
AH27 3"	4/16/2020	<0.000452	<0.000234	<0.000308	<0.000341	<0.000341	<0.000341	<0.000452	<49.8	54.4	<49.8	54.4	537
AH28 3"	4/16/2020	<0.00908	<0.00470	<0.00618	<0.00685	<0.00685	<0.00685	<0.00908	<50.0	<50.0	<50.0	<50.0	276
AH29 3"	4/16/2020	<0.00904	<0.00468	<0.00616	<0.00682	<0.00682	<0.00682	<0.00904	<49.9	<49.9	<49.9	<49.9	884
AH30 3"	4/16/2020	<0.00895	<0.00463	<0.00610	<0.00675	<0.00675	<0.00675	<0.00895	<50.0	<50.0	<50.0	<50.0	513
AH31 3"	4/16/2020	<0.00904	<0.00468	<0.00616	<0.00682	<0.00682	<0.00682	<0.00904	<49.9	<49.9	<49.9	<49.9	592

TABLE 1

CONCENTRATIONS OF BENZENE, BTEX, TPH AND CHLORIDE IN SOIL

CENTENNIAL RESOURCE DEVELOPMENT, INC.

CHIMICHANGA ILLEGAL DUMP RELEASE SITE
LEA COUNTY, NEW MEXICO

All concentrations are reported in mg/Kg

SAMPLE LOCATION	SAMPLE DATE	METHODS: SW 846-8021B						METHOD: SW 8015M					E 300.1
		BENZENE	TOLUENE	ETHYL-BENZENE	m, p - XYLENES	o - XYLENE	TOTAL XYLENES	TOTAL BTEX	TPH GRO C_6-C_{12}	TPH DRO C_{12}-C_{28}	TPH ORO C_{28}-C_{35}	TOTAL TPH C_6-C_{35}	CHLORIDE
Limits		10 mg/Kg						50 mg/Kg				100 mg/Kg	600 mg/Kg
AH32 3"	4/16/2020	<0.00913	<0.00473	<0.00622	<0.00689	<0.00689	<0.00689	<0.00913	<49.8	82.2	<49.8	82.2	172
AH33 3"	4/16/2020	<0.00904	<0.00468	<0.00616	<0.00682	<0.00682	<0.00682	<0.00904	<50.0	326	50.9	376.9	166
AH34 3"	4/16/2020	<0.00902	<0.00467	<0.00615	<0.00681	<0.00681	<0.00681	<0.00902	<50.0	<50.0	<50.0	<50.0	126
AH35 3"	4/16/2020	<0.00899	<0.00465	<0.00612	<0.00678	<0.00678	<0.00678	<0.00899	<49.9	<49.9	<49.9	<49.9	24.1
AH36 3"	4/16/2020	<0.00906	<0.00469	<0.00617	<0.00683	<0.00683	<0.00683	<0.00906	<49.8	<49.8	<49.8	<49.8	77.3

CENTENNIAL
RESOURCE DEVELOPMENT, LLC

Appendix D

Well Name: Chimichangas 12 State Com 601H

AFE#: 400716

Code: Signature of Approval 8015.4100

Supervisor: Eric Mills

Route To: Ronny Hise

NATIONAL TANK & EQUIPMENT

CUSTOMER: CENTENNIAL RESOURCE PRODUCTION
ATTN: ACCOUNTS PAYABLE
1401 17TH STREET, SUITE 1000
DENVER, CO 80202

REMIT TO:
NATIONAL TANK & EQUIPMENT, LLC
P.O.BOX 4356 DEPT. # 2225
HOUSTON, TX 77210-4356

INVOICE: 5142200403
INVOICE DATE: 5/4/2020
AFE#: VERBAL
WELL SITE: CHIMICHANGA 12 STATE COM 601H
ORDERED BY: MIKE BROWN
RENTAL PERIOD: 04/01/20 - 04/30/20

TANK #	UNIT DESCRIPTION	START DATE	END DATE	DAILY RATES	DAYS	TOTAL
FRC540057	ROUND BOTTOM FRAC TANK	4/1/2020	4/14/2020	$ 35.00	14	$ 490.00
FRC540117	ROUND BOTTOM FRAC TANK	4/1/2020	4/14/2020	$ 35.00	14	$ 490.00
FRC540237	ROUND BOTTOM FRAC TANK	4/1/2020	4/14/2020	$ 35.00	14	$ 490.00
FRC540257	ROUND BOTTOM FRAC TANK	4/1/2020	4/14/2020	$ 35.00	14	$ 490.00
FRC540267	ROUND BOTTOM FRAC TANK	4/1/2020	4/14/2020	$ 35.00	14	$ 490.00
FRC500317	500BBL "V" BOTTOM FRAC TANK	4/1/2020	4/8/2020	$ 15.00	8	$ 120.00
FRC500377	500BBL "V" BOTTOM FRAC TANK	4/1/2020	4/8/2020	$ 15.00	8	$ 120.00
FRC500817	500BBL "V" BOTTOM FRAC TANK	4/1/2020	4/8/2020	$ 15.00	8	$ 120.00
FRC501257	500BBL "V" BOTTOM FRAC TANK	4/1/2020	4/8/2020	$ 15.00	8	$ 120.00
FRC500707	500BBL "V" BOTTOM FRAC TANK	4/1/2020	4/13/2020	$ 15.00	13	$ 195.00
FRC500437	500BBL "V" BOTTOM FRAC TANK	4/1/2020	4/8/2020	$ 15.00	8	$ 120.00
FRC500507	500BBL "V" BOTTOM FRAC TANK	4/1/2020	4/8/2020	$ 15.00	8	$ 120.00
FRC501317	500BBL "V" BOTTOM FRAC TANK	4/1/2020	4/13/2020	$ 15.00	13	$ 195.00
FRC500367	500BBL "V" BOTTOM FRAC TANK	4/1/2020	4/8/2020	$ 15.00	8	$ 120.00
FRC501427	500BBL "V" BOTTOM FRAC TANK	4/1/2020	4/8/2020	$ 15.00	8	$ 120.00
	8X6 MUDHOG	4/1/2020	4/8/2020	$ 125.00	8	$ 1,000.00
100409021	4" PUMP	4/1/2020	4/15/2020	$ 60.00	15	$ 900.00
10040001	4" PUMP	4/1/2020	4/15/2020	$ 60.00	15	$ 900.00
100409030	4" PUMP	4/1/2020	4/15/2020	$ 60.00	15	$ 900.00
6	4X20 TANK TRUCK HAMMER	4/1/2020	4/15/2020	$ 7.00	15	$ 630.00
					RENTAL SUBTOTAL:	$ 8,130.00
FRTOUT	3RD PARTY PICKUP 8 FRAC TANKS FROM JOB			$ 125.00	36	$ 4,500.00
FRTOUT	3RD PARTY PICKUP 6 FRAC TANKS FROM JOB			$ 125.00	30	$ 3,750.00
FRTOUT	3RD PARTY - DELIVER & PICKUP 10 FRAC TANKS FROM WASH			$ 125.00	8	$ 1,000.00
PKU	PICKUP FRC540267 FROM JOB			$ 125.00	5	$ 625.00
					FREIGHT SUBTOTAL:	$ 9,875.00
OL	OUTSIDE LABOR - 3 TANK TRUCK HAMMERS HOSES NOT RETURNED			$ 1,150.00	1	$ 1,150.00
OL	3RD PARTY PICKUP 4 PUMP HOSES & 1 MUDHOT FROM JOB			$ 1,250.00	1	$ 1,250.00
WASHOUT	WASHOUT 10 FRAC TANKS			$ 250.00	10	$ 2,500.00
					SALES SUBTOTAL:	$ 4,900.00
					TAXES:	$ 1,751.21
					TOTAL DUE:	$ 24,656.21

RM INVOICES: 71039-1,68803-2,68874-2,68877-2,69279-2,70388-1,68874-3,68875-2, 69279-3,68803-3,70628-1,70690-1

Invoice

Duke
Oilfield Services,LLC
PO Box 29647 - Dallas, Texas 75229-9647
Jesus Lopez Cell 575-441-5661
Office (575) 396-0934 Fax (575) 396-0449

Invoice #	30080
Date	4/13/2020
Terms	Net 60

Bill To
Centennial Resource Production, LLC 400 W. IL Midland, TX. 79701

Location	CHIMICHANGAS 12 COM 601H
RIG	PATTERSON 588

Description	Truck	Ticket #	Qty	Rate	Amount
04/11/2020. Loaded and Hauled 520 bbls of Fresh Water to Location. Tickets# 127816,129729,131495,135951.	88,89,100, 105		520	2.65	1,378.00T

Well Name CHIMICHANGAS 12 STATE COM 601H
AFE#: 400716
Date: 4-14-20
Code: 8015 - 3700
Supervisor: MH
Route To: Ronny Hise

All work is completed and Ok for billing.

Signature _____

Date _____

Subtotal	$1,378.00
Sales Tax (5.5%)	$75.79
Total	$1,453.79

Remittance Address & Bank

Duke Oilfield Services, LLC P.O. Box 29647 Dallas,TX 75229-9647	Bank: Wells Fargo Location: San Francisco, CA ABA No: 121000248 Beneficiary: Duke Oilfield, LLC Account No: 4000048876

Thank you for your business!

Duke
Oilfield Services, LLC

PO Box 1253
Lovington, NM 88260
Office (575) 396-0934
Fax (575) 396-0449
Cell (575) 396-6619
Email dukeoilfieldllc@gmail.com

12316 4

Oil _____
Disposal _____
Salt Water _____
Fresh Water _____

DATE: 04/11/20
COMPANY: Centennial
RIG: Patterson 588
LEASE: Chimichanga 12 STATE Com 601H ORDERD BY: _____

Description of Service	Hours
Hauled 130 bbls of Cyty Water	
Sub	383.50
Tax	21.09
total.	404.59

Work done by: Luis Torres Unit #: 105 Accepted: Mike

DASCO FRESH WATER SALES

STATION #3

DASCO CATTLE CO., LLC

(575) 631-9438 P.O. BOX 727 HOBBS, NEW MEXICO 88241

CHARGE TO: _____ DATE: _____

LEASE OR WELL: _____ TIME: _____

TRUCKING CO.: _____ FRESH WATER _____ BBLS.

DRIVER: _____

_____

No. 4464

DASCO retains White and Yellow Copies; Pink Copy to Receiver; Gold Copy to Trucker

3

Duke
Oilfield Services, LLC

PO Box 1253
Lovington, NM 88260
Office (575) 396-0934
Fax (575) 396-0449
Cell (575) 396-6619
Email dukeoilfieldllc@gmail.com

12729

Oil _____
Disposal _____
Salt Water _____
Fresh Water _____

DATE: 4/11/20
COMPANY: Centennial
RIG: Patt - 580
LEASE: Richardson 12 State ORDERD BY: _____

Description of Service	Hours
Tell OW had site	
Hauled 130 bbls of c/w to Location.	
SUBTOTAL 383.50	
TAX. 21.09	
TOTAL. $404.59	

Work done by: Daydel Unit #: 89 Accepted: _____

Duke
Oilfield Services, LLC

PO Box 1253
Lovington, NM 88260
Office (575) 396-0934
Fax (575) 396-0449
Cell (575) 396-6619
Email dukeoilfieldllc@gmail.com

131495

4

Oil ____________
Disposal ____________
Salt Water ____________
Fresh Water ____________

DATE: 4/11/20
COMPANY: Centennial
RIG: PAT 588
LEASE: Chimichangas 12 st. 601H

ORDERD BY: ____________

Description of Service	Hours
* Hauled 130 bbls of C/w to Rig	
Sub: 383.5	
Tax: 21.09	
Total: 404.59	

Work done by: Ellis Jnnzo   Unit #: 100   Accepted: [signature]

Cooper's Fresh Water Sales

PO Box 65
Monument, New Mexico 88265
Manager - Michael Evans (575) 408-0281
Owner - Jimmie Cooper (254) 493-9082

NO 96794

DATE 6/4/20

TRUCKING COMPANY DFC

COMPANY HAULING FOR Enduring

LOCATION HAULED FROM FAT 588

Ticket 76906

Ranch Land LLLP

(575) 393-6964
(575) 369-5266

Box 160
Eunice, NM 88231

Date 4/11/20 Time ____________

Transported By Duke

Transported To Grammell
PRATT → 588

Number of Barrels Transported 130

Truck Number 89

Signed Roydel
Driver

NOTE TO ALL DRIVERS!

White - ORIGINAL • Yellow - INVOICE • **PINK DRIVER**

SUPERIOR PRINTING SERVICE, INC

135951

4

Duke
Oilfield Services, LLC

PO Box 1253
Lovington, NM 88260
Office (575) 396-0934
Fax (575) 396-0449
Cell (575) 396-6619
Email dukeoilfielddllc@gmail.com

Oil _____
Disposal _____
Salt Water _____
Fresh Water _____

DATE: 4-11-20
COMPANY: Centennial
RIG: Patterson 588
LEASE: Chimichanga 12 state com 601H ORDERED BY: _____

Description of Service	Hours
Hauled 130 bbls city water	
subtotal	383.50
tax	21.09
total	404.59

Work done by: Carlos Yanez Unit #: 88 Accepted: MB
Michael Brown

BLE H2O, LLC 3959

1311 S. 13th • Lovington, NM 88260
(575) 441-2531

Date 4-11-20

Oil Company _____

Lease Name _____

Trucking Co. Duke

Billing Address _____

Truck No. 88

BBLS Hauled 130

_____

Carlos Yanez
DRIVER'S SIGNATURE

OMG - #3156 *Office - White & Yellow* *Driver - Pink & Gold*

compass

Date	4/11/2020	Bill to:	
Ticket Number	11407708	Cementer:	
Location	Midland	DOUGLAS MILLER	

Company	Centennial Resource Development, Inc.	Well Name	Chimichangas 12 State Com 601H		
County	Lea	State	New Mexico	Rig	Patterson 588
Job Type	Production	Casing Size	5 1/2	Casing Depth	21315.21

Description	Quantity	Unit Cost	Units	Gross Amount	Net Amount
Pump Charge 21001' to 22000'	1	$40,620.00	each	$40,620.00	$10,561.20
Pump Charge - Additional Hours	3	$1,700.00	hour	$5,100.00	$1,326.00
Reserve Pump Truck	1	$9,640.00	each	$9,640.00	$2,506.40
Reserve Pump Truck after 10 hrs	3	$1,700.00	hour	$5,100.00	$1,326.00
Batch Mixer - First 10 hours	1	$4,920.00	each	$4,920.00	$1,279.20
Batch Mixer - Additional hours	3	$720.00	hour	$2,160.00	$561.60
HV Mileage	300	$11.40	mile	$3,420.00	$888.00
LV Mileage	200	$6.74	mile	$1,348.00	$350.00
Field Storage Bin delivery	300	$11.40	mile	$3,420.00	$888.00
Field Storage Bin - 3 Days	3	$1,700.00	each	$5,100.00	$1,326.00
Cementing Head Rental	1	$2,500.00	each	$2,500.00	$650.00
Top Rubber Plug: 5 1/2"	0	$175.00	each	$0.00	$0.00
Data Acquisition	1	$1,130.00	each	$1,130.00	$293.80
Thickening Time Test, Field Blend	1	$2,180.00	each	$2,180.00	$566.80
Centrifugal Pump	0	$1,130.00	each	$0.00	$0.00
Circulating Equipment	0	$6,000.00	each	$0.00	$0.00
Derrick Charge	0	$1,000.00	each	$0.00	$0.00
Mutual Solvent 4309	140	$64.92	Gal	$9,088.80	$2,363.20
Citric Acid	35	$13.94	lb	$487.90	$126.70
Barite	112	$70.56	sack	$7,902.72	$2,055.20
CSG-1	53	$98.79	lb	$5,235.87	$1,361.57
Plexaid - 803	140	$58.56	gal	$8,198.40	$2,132.20
Plexaid - 840 Surfactant	70	$169.54	gal	$11,867.80	$3,085.60
Subtotal for Pumping & Equipment Charges				$129,419.49	$33,647.47
Class C Premium	525	$35.92	sacks	$18,858.00	$4,903.50
Compass Poz-Mix	263	$20.30	sacks	$5,338.90	$1,388.64
CPO-18	263	$20.75	sacks	$5,457.25	$1,420.20
HSLD 80 Cement	2,040	$28.15	sacks	$57,426.00	$14,932.80
Premium Gel (Bentonite)	8,820	$0.98	lb	$8,643.60	$2,205.00
Gyp Seal	2,100	$1.30	lb	$2,730.00	$714.00
C-503P Defoamer	673	$5.93	lb	$3,990.89	$1,036.42
CFL-1	660	$63.70	lb	$42,042.00	$10,929.60
Citric Acid	327	$13.94	lb	$4,558.38	$1,183.74
STE	11,820	$1.29	lb	$15,247.80	$4,018.80
CSA-1000 - Fluid Loss Additive	322	$60.48	Lb	$19,474.56	$5,061.84
C-45 Econolite	221	$3.34	lb	$738.14	$192.27
Salt	2,105	$0.50	lb	$1,052.50	$273.65
C-503L Defoamer	10	$120.42	gal	$1,204.20	$313.10
Sugar	550	4.20	lb	$2,310.00	$599.50
Materials Handling	3,541	3.75	CF	$13,278.75	$3,452.48
Drayage	331,500	0.09	sacks x miles	$29,835.00	$7,757.10
Subtotal for Materials Charges				$232,185.97	$60,382.64
Gross Price Subtotal					$361,605.46
Discount				74.0%	($267,575.36)
Pre-tax Total					**$94,030.11**

Well Name: CHIMICHANGAS 12 STATE COM 601H
AFE#: 400716
Date: 4-11-20
Code: 8015 - 3000
Supervisor:
Route To : Ronny Hise

Service Receipt: I certify that the materials and services listed were received and all services performed in a workmanlike manner.

Company Rep: _____

Printed: _____

4100 International Plaza, Suite 260, Ft. Worth, TX 76109
Phone: 817.244.2555
Fax: 817.244.6555

10013 West County Road 157, Midland, TX 79706
Phone: 432-561-5970
Fax: 432-561-5974

CEMENTING SUMMARY

Company	Centennial Resource Development, Inc.	Lease and Well Number	Chimichangas 12 State Com 601H		
Type Job	Production	Bid Prepared By	Cesar Acosta	Ticket Number	11407708

JOB TYPE ☐ Intermediate ☐ Liner ☑ Production ☐ PTA ☐ Squeeze ☐ Surface

CASING DATA

Size	Depth	Grade	Weight	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure
5.5	21315	P110	20	0.0221		9888

DRILL PIPE / TUBING DATA

Size	Depth	Grade	Weight	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure

OPEN HOLE DATA

Size	Depth	Excess %	Bbl/Ft Factor	Cuft/Ft Factor

OPEN HOLE ANNULUS DATA

Size	Depth	Excess %	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure
8.75X5.5	11517		0.045		8864
8.5X5.5	21322		0.0408		8864

PREVIOUS CASING ANNULUS DATA

Size	Depth	Grade	Weight	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure
9.625X5.5	5495	J55	40	0.0464		8864

MUD / SPACER / CEMENT DATA

MUD		SPACER		
Type	Density	Type	Density	Volume
OBM	11	BARITE	11.1	70

CEMENT SLURRIES

Type	Sacks	Density	Yield cuft/sk	Gal/Sk	Excess %	Thickening Time
Lead Cement	1050	11.10	3.14	19.14	25.0%	
Tail Cement	2040	13.00	1.51	7.51	25.0%	

JOB WATER REQUIREMENTS

Total Mix Water (Bbls)	844
Total Spacer Water (Bbls)	54
Total Disp Water (Bbls)	471
Total Wash Up Water (Bbls)	20
Total Additional Water (Bbls)	0
Safety Factor - 20%	278
Tank Bottoms	50
Total Water Required	1716.8

CASING / FLOATING EQUIPMENT

Type	Depth	Manufacturer	Type	Quantity	Manufacturer
Float Shoe	21315		Centeralizers	0	
Float Collar	21300		Top Plug	1	
Stage Tool			Bottom Plug	1	
External Casing Packer			Foam Wiper Ball		
Stage Tool					
External Casing Packer					

DISPLACEMENT FLUID AND VOLUME

Disp. Fluid Type	INHIBITED WATER	Volume (Bbls.)	471	Density (PPG)	8.4
Disp. Fluid Type		Volume (Bbls.)		Density (PPG)	
Disp. Fluid Type		Volume (Bbls.)		Density (PPG)	

EQUIPMENT

Pump Truck Unit #	2016	Bulk 660 Unit #	2047	Bulk 1600 Unit #	2074	Other
Pump Truck Unit #	2186	Bulk 660 Unit #	2127	Bulk 1600 Unit #	2036	Other
Batch Mixer Unit #	2185	Bulk 660 Unit #		Bulk 1600 Unit #	2159	Other
Pressurizer Unit #	1067	Bulk 660 Unit #		Bulk 1600 Unit #		Other

Employees

Employee #1	DOUGLAS MILLER	Employee #4	TRENT MARESH	Employee #7	JESUS GARCIA
Employee #2	COLT BERRY	Employee #5	JESUS ARRENDONDO	Employee #8	
Employee #3	TY BERRY	Employee #6	NICK LUEVANO	Employee #9	

Date and Time Requested on Location: 3:00 04/11/20 **Date and Time Arrived on Location:** 23:00 04/10/20

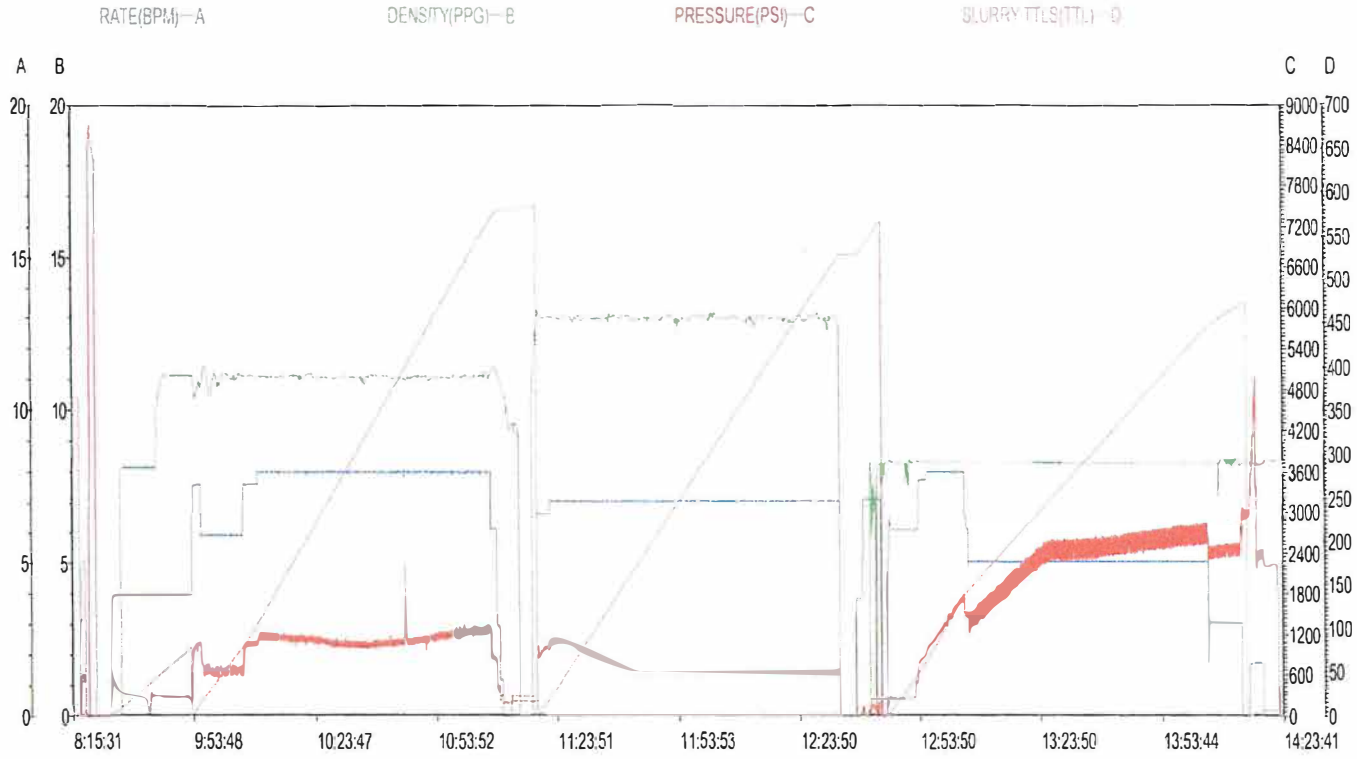
COMPANY REPRESENTATIVE 0 CEMENTER DOUGLAS MILLER

COMPASS JOB LOG

Centennial Resource Development, Inc.	Chimichangas 12 State Com 601H	Production	Ticket Number	11407708

Date	Time	PRESSURES PSI		FLUID PUMPED DATA				RETURNS	REMARKS
		DRILL PIPE/ CASING	ANNULUS	TOTAL STAGE VOLUME	VOLUME PUMPED	RATE (BBLS MIN.)	FLUID TYPE	WELL RETURNS (F, P, NR)	
04/10/20	19:00								CREW CALLED OUT
	21:00								CREW LEAVE YARD
	23:00								CREW ARRIVE ON LOCATION
	23:10								SAFETY MEETING/SPOT EQUIPMENT
	23:30								MEET WITH COMPANY REP.
	23:45								TEST WATER/RIG UP
04/11/20	0:30								WAIT FOR RIG TO RUN CASING/CIRCULATE WELL/RIG CIRCULATED 3 HOURS
	9:15								SAFETY MEETING
	10:00								RIG UP FLOOR
	10:21	650		5	5	5	FW		FILL LINES
	10:24						FW		TEST LINES
	10:29								DROP BOTTOM PLUG W/ 1250 PSI BURST DISK
	10:32	350		70	70	4	BARITE	F	PUMP 70 BBLS BARITE SPACER @ 11.1#
	10:48	1000		587	0	7	CMT	F	PUMP LEAD CMT 1050 SKS/3.14/ YIELD/19.14 G/SK/587 BBLS/ 11.1#
	11:05	1200			100	8	CMT	F	PUMP LEAD CMT 1050 SKS/3.14/ YIELD/19.14 G/SK/587 BBLS/ 11.1#
	11:17	1105			200	8	CMT	F	PUMP LEAD CMT 1050 SKS/3.14/ YIELD/19.14 G/SK/587 BBLS/ 11.1#
	11:29	1040			300	8	CMT	F	PUMP LEAD CMT 1050 SKS/3.14/ YIELD/19.14 G/SK/587 BBLS/ 11.1#
	11:42	1090			398	8	CMT	F	LAND BOTTOM PLUG/1090 PSI - 1500 PSI
	11:42	1090			400	8	CMT	F	PUMP LEAD CMT 1050 SKS/3.14/ YIELD/19.14 G/SK/587 BBLS/ 11.1#
	12:03	1200			587	8	CMT	F	PUMP LEAD CMT 1050 SKS/3.14/ YIELD/19.14 G/SK/587 BBLS/ 11.1#
	12:03	580		548	0	2.5	CMT	F	PUMP TAIL CMT 2040 SKS/1.51 YIELD/7.51 G/SK/548 BBLS/ 13#
	12:30	800			100	7	CMT	F	PUMP TAIL CMT 2040 SKS/1.51 YIELD/7.51 G/SK/548 BBLS/ 13#
	12:42	640			200	7	CMT	F	PUMP TAIL CMT 2040 SKS/1.51 YIELD/7.51 G/SK/548 BBLS/ 13#
	12:57	628			300	7	CMT	F	PUMP TAIL CMT 2040 SKS/1.51 YIELD/7.51 G/SK/548 BBLS/ 13#
	13:11	634			400	7	CMT	F	PUMP TAIL CMT 2040 SKS/1.51 YIELD/7.51 G/SK/548 BBLS/ 13#
	13:31	630			548	7	CMT	F	PUMP TAIL CMT 2040 SKS/1.51 YIELD/7.51 G/SK/548 BBLS/ 13#
	13:31								SHUT DOWN/WASH UP/DROP TOP PLUG W/ 3000 PSI BURST DISK
	13:41	260		471	0	6	SUGAR	F	PUMP DISPLACEMENT/10 BBLS SUGAR WATER/461 BBLS INHIBITED WATER/TOTAL 471
	14:05	1380			100	8	INHIB	F	PUMP DISPLACEMENT/10 BBLS SUGAR WATER/461 BBLS INHIBITED WATER/TOTAL 471
	14:12	2120			200	5	INHIB	F	PUMP DISPLACEMENT/10 BBLS SUGAR WATER/461 BBLS INHIBITED WATER/TOTAL 471
	14:32	2580			300	5	INHIB	F	PUMP DISPLACEMENT/10 BBLS SUGAR WATER/461 BBLS INHIBITED WATER/TOTAL 471
	14:52	2750			400	5	INHIB	F	PUMP DISPLACEMENT/10 BBLS SUGAR WATER/461 BBLS INHIBITED WATER/TOTAL 471
	15:00	2750			440	5	INHIB	F	SLOW RATE LAST 30 BBLS TO 3 BPM
	15:09	3000				3	FW		BUMP PLUG/2500 PSI -3000 PSI
	15:09								SHUT DOWN
	15:12	4900		3	3	3	FW		PRESSURE UP TO BURST 3000 PSI DISK/3000 PSI - 4900 PSI
	15:12	2450		4	4	1.7	FW		PUMP 4 BBLS FOR WET SHOE
	15:14								SHUT DOWN
	15:20								CHECK FLOATS/3.5 BBLS BACK
	15:25								SAFETY MEETING
	15:30								RIG DOWN
	14:00								CREW LEAVE LOCATION
									305 BBLS OF CEMENT CIRCULATED TO SURFACE
									WELL INFO: TD21322/TP 21315.21/SI 15.05/TVD 11271/PC 9.625/40#/J55/5495'/
									OH 8.75 FROM 5495' - 11517'/OH 8.5 11517' - TD/WF 11# OBM/CENT. 0
									FACTORS:C& 8.75 OH/.0450/C& 8.5 OH/.0408/C .0221/C&C .0464.BURST 9888/COL. 8864
									WATER: TEMP. 56/CHLO. 500/SULFATES 200/PH 7/IRON 0
									TC: 465.5 BC: 471.5

Date:04-11-2020 Well Name:CHIMICHANGAS 12 STATE COM 601H Location:LEA Co. NM Country:USA Operator:COLT BERRY Supervisor:DOUGLAS MILLER Type of Job:PRODUCTION Contact Address: Comment:CENTENNIAL RESOURCE DEVELOPMENT, INC.



Chart

Field Test - Water Analysis Report

COMPANY: ntennial Resource Development, I **Date Recorded** 4/10/2020

SUBMITTED BY: DOUGLAS MILLER **SO#** 11407708

LEASE and WELL#: Chimichangas 12 State Com 601H **Job Type** Production

Camp Location Midland

CEMENT MIX WATER REQUIREMENTS

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	7	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	500	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	200	ppm	1500 ppm	Will greatly decrease the strength of cement
Iron	0	ppm	300 mg/L	Can reduce Compressive Strength
Temperature	56	oF	40-100 °F	High temps will accelerate; Low temps may risk freezing in cold weather