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	NAB1912752873
District RP	2RP-5396
Facility ID	fAB1810837464
Application ID	pAB1912752213

Release Notification

Responsible Party

Responsible Party: 3 Bear Delaware Operating – NM, LLC	OGRID: 372603
Contact Name: Stephanie Swanson	Contact Telephone: (303) 862-3967
Contact email: stephanie@3bearllc.com	Incident # *(assigned by OCD)*
Contact mailing address 1512 Larimer St. Suite 540, Denver, CO 80202	

Location of Release Source

Latitude 32.02141 Longitude -104.31707
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: 3Bear Cottonwood Water Treatment and Impound	Site Type: Water Treatment and Impound
Date Release Discovered: 3/26/2019	API# *(if applicable)*:

Unit Letter	Section	Township	Range	County
	20	26S	26E	Eddy

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☒ Private (*Name: 3Bear*)

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) 11	Volume Recovered (bbls) 11
	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)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release: Suspected leak in produced water tank. Leak was contained in a berm. Please see the attached photos.

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Page 2

State of New Mexico
Oil Conservation Division

Incident ID	
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:

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: Stephanie Swanson Title: Manager of Engineering

Signature:  Date: 4/3/2019

email: stephanie@3bearllc.com Telephone: (303) 862-3967

OCD Only

Received by: Date:

Form C-141
Page 3

State of New Mexico
Oil Conservation Division

Incident ID	nAB1912752873
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?	41 (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.

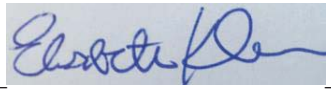
Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	nAB1912752873
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: ____ Liz Klein _____ Title: ____Director, EHS Regulatory Compliance

Signature: _____  _____Date: _12/4/2019_____

email: _____lklein@3bearllc.com_____ Telephone: __(303) 862-3966_____

OCD Only

Received by: _____ Date: _____

Form C-141
Page 5

State of New Mexico
Oil Conservation Division

Incident ID	nAB1912752873
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)
**Spill occurred to lined containment. Liner inspection showed liner integrity intact.

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

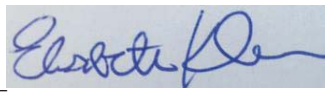
☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.

☐ 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: Elisabeth Klein Title: Director, EHS Regulatory Compliance

Signature:  Date: 12/4/2019

email: lklein@3bearllc.com Telephone: 303-882-4404

OCD Only

Received by: _____ Date: _____

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

Signature: _____ Date: _____

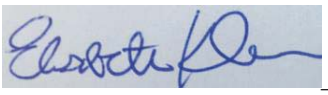
Form C-141
Page 6

State of New Mexico
Oil Conservation Division

Incident ID	nAB1912752873
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. 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: Elisabeth Klein Title: Director, EHS Regulatory Compliance

Signature:  Date: 12/4/2019

email: lklein@3bearllc.com Telephone: (303) 862-3966

OCD Only

Received by: Cristina Eads Date: 02/12/2020

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: Cristina Eads Date: 02/12/2020

Printed Name: Cristina Eads Title: Environmental Specialist

1512 Larimer Street
Suite 540
Denver, CO 80202
PH: 303.626.8290

December 4, 2019

NMOCD District 2
811 S First Street
Artesia, New Mexico 88210

SUBJECT: Remediation Plan for the Cottonwood Water Treatment and Impound Release (NAB1912752873), Eddy County, New Mexico

To Who it May Concern:

This Remediation Closure Report describes remediation of a release of liquids, within a lined secondary containment, related to a produced water recycling facility known as the Cottonwood Water Treatment and Impound site. This report contains the required information that Robert Hamlet outlined in his email dated August 26, 2019. The site is in Section 20, Township 26S, Range 26E, Eddy County, New Mexico, on private land. Figure 1 illustrates the vicinity and site location on a USGS 7.5-minute quadrangle map.

Table 1: Release Information and Closure Criteria

Name	Cottonwood Water Treatment and Impound	Company	3Bear
API Number	NA	Location	32.02141 -104.31707
Incident Number	2RP-5396		
Estimated Date of Release	3/25/2019	Date Reported to NMOCD	4/5/2019
Landowner	Private	Reported To	NMOCD
Source of Release	Produced water tank.		
Released Volume	12 bbls	Released Material	Produced Water
Recovered Volume	12 bbls	Net Release	0 bbls
NMOCD Closure Criteria	< 50 feet to groundwater; CL Limit 600 mg/kg		

1.0 Background

On March 25, 2019, a release was discovered at the Cottonwood Water Treatment and Impound site due to a leak in a "Poseiden" style tank TK-454 located within a lined containment. The release did not get outside of the secondary containment. Response activities were conducted by 3Bear and their contractors, and included emptying the contents of the tank and excavation of the impacted soil within the containment. It is important to note that this tank is placed on soil which is located within a lined containment.

Figures 1 and 2 illustrate the vicinity and site location. The C-141 form is included in Appendix A.

2.0 Site Information and Closure Criteria

The Cottonwood Water Treatment and Impound release area is located approximately 14 miles south southeast of Whites City, New Mexico on private land at an elevation of approximately 3455 feet above mean sea level (amsl).

Based upon New Mexico Office of the State Engineer (NMOSE) online water well database (Figure 3), depth to groundwater in the area is estimated to be an average depth to water at 41 feet below grade surface (bgs). The nearest significant watercourse is Butcher Spring north of Cottonwood. The spring is within a half mile of the release. See figure 4.

Based on the information presented herein, the applicable NMOCD Closure Criteria for this site is for groundwater depth of less than or equal to 50 feet bgs. The closure criteria for the concentration of chloride (CL) for this location is 600 mg/kg. Photographs of the spill can be seen on Figures 5, 6, and 7.

3.0 Release Characterization and Remediation

- On March 25, 2019 a release of 12 bbl produced water release was found within the lined containment.
- Contents of the tanks were emptied to determine leak source
- June 17, 2019 a site characterization and closure report was submitted via email
- July 23, 2019 The NMOCD requested soil samples from two feet below base of tank (one foot above liner)
- August 12, 2019 soil samples were collected as requested
- August 23, 2019 Robert Hamlet requested full delineation vertically and laterally with soil samples. Also, a liner inspection was requested.
- August 26, 2019 Robert Hamlet outlined information to be contained in the remediation plan and closure report.
- August 28, 2019 Mike Solomon submitted sample results to Robert Hamlet via email
- September 6, 2019 additional soil samples were collected and analyzed.

On August 12 soil sampling included a total of four (4) sample locations (1A-4A) were investigated, to depths as shown on the Table of Analytical Results below. A total of four (4) samples were collected for laboratory analysis for total chloride using EPA Method SM4500CL-B; for benzene, toluene, ethylbenzene and total xylenes (BTEX) using EPA Method 8021B; for TPH (GRO, DRO, and EXT DRO) by EPA Method 8015M. The Laboratory Locations for these initial samples are depicted on Figure 9.

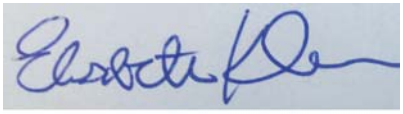
September 5 Soil Sampling included a total of seven (7) sample locations (Blue #1 – Blue #7), to depths as shown on the Table of Analytical Results. A total of seven (7) samples were collected for laboratory analysis for total chloride using EPA Method SM4500CL-B; for benzene, toluene, ethylbenzene and total xylenes (BTEX) using EPA Method 8021B; for TPH (GRO, DRO, and EXT DRO) by EPA Method 8015M. Locations for these initial samples are depicted on Figure 9.

As summarized on the Table of Analytical Results, three of the four samples from the August sampling event exceeded NMOCD Closure Criteria for this site. Soil was excavated and additional sampling conducted on September 6th. These samples indicated that there were no results over the reclamation requirement of 600mg/kg.

Closure criteria has been met in association with this release. A post remediation photograph can be seen on Figure 11. The required Karst Characterization is included as Appendix D. IInformation regarding the liner inspection is in Appendix E.

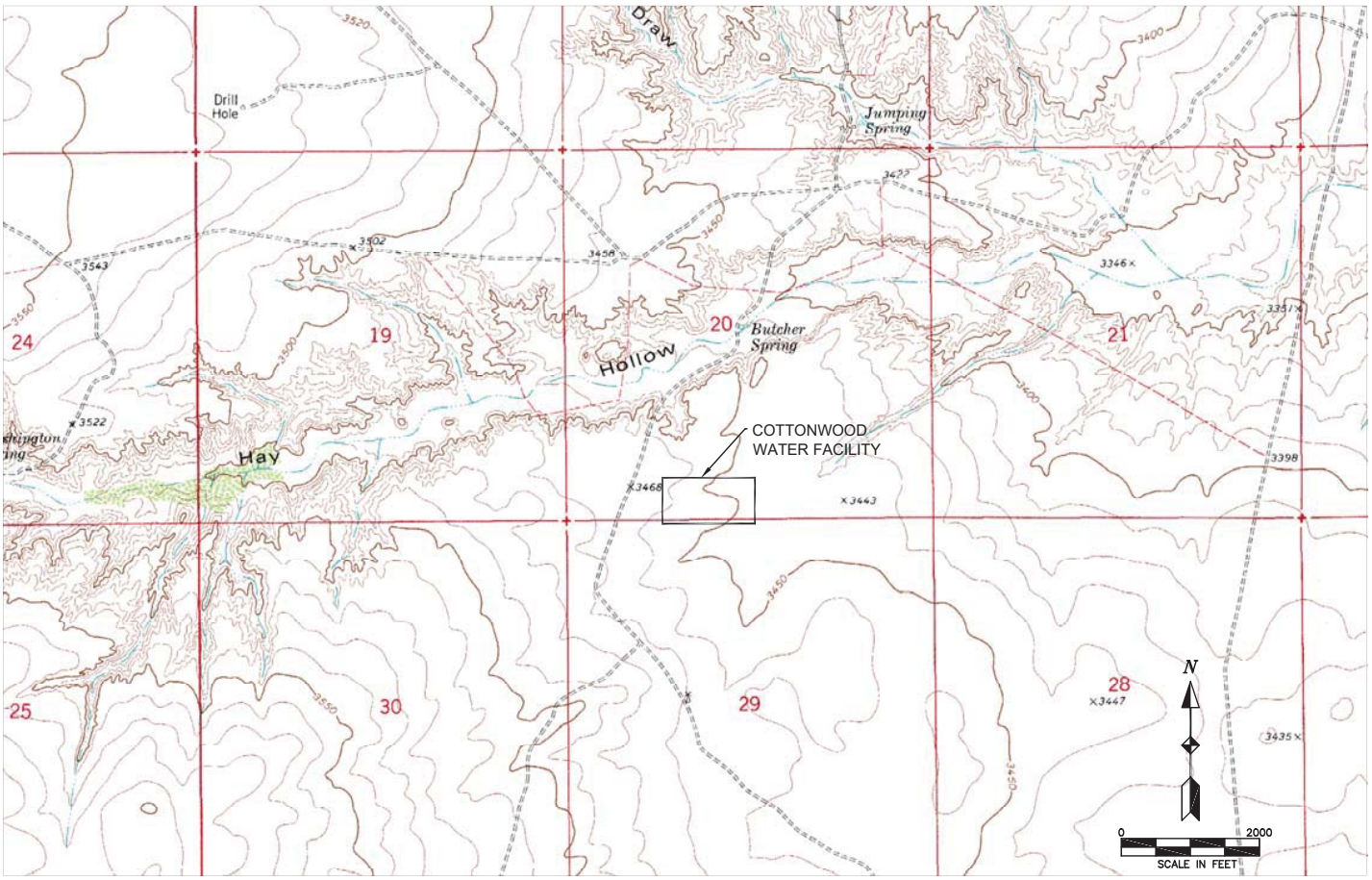
If there are any questions regarding this report, please contact me at 303-882-4404 or by email at LKlein@3BearLLC.com.

Respectfully,



Elisabeth Klein
Director of EHS
3 Bear Delaware Operating – NM, LLC
1512 Larimer St. Suite 540
Denver, CO 80202

FIGURES



SOURCE: USGS JUMPING SPRING, NM 7.5-MINUTE SERIES QUADRANGLE, 1978

PREPARED BY

Marquez Environmental Services, Inc.

Quality ■ Integrity ■ Results

www.MarquezEnvironmental.com

(303) 503-4735 ■ info@ MarquezEnvironmental.com

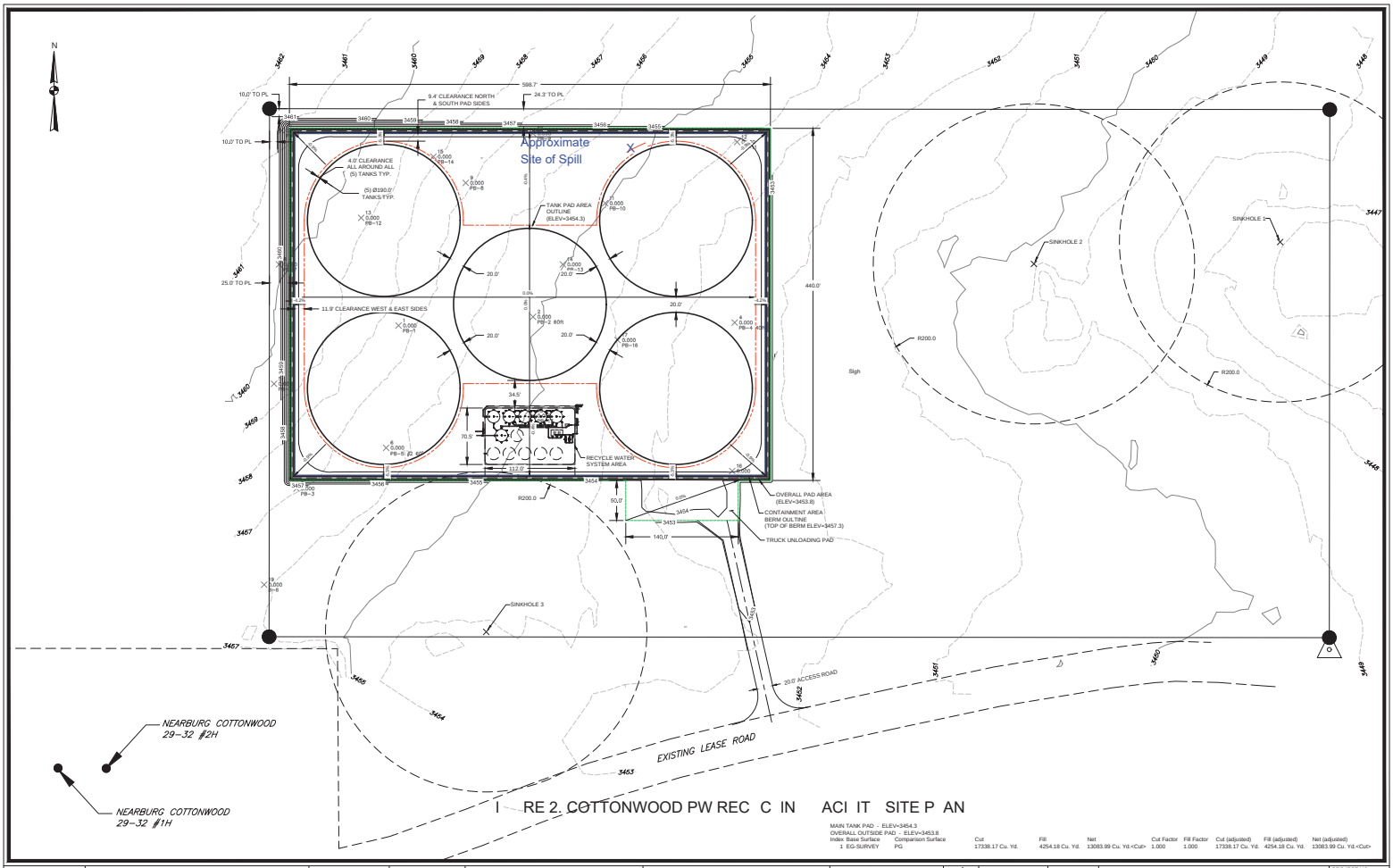
PREPARED FOR

3Bear Field Services, LLC
674 Marathon Rd
Hobbs, NM 88240

TITLE

FIGURE 1
SITE LOCATION MAP
COTTONWOOD PW RECYCLING
EDDY COUNTY, NM

Project: 3Bear	Date: 8-10-2018	Revision
Scale:	Source: JLJ	△



I RE 2. COTTONWOOD PW REC C IN ACI IT SITE P AN

MAIN TANK PAD - ELEV=3454.3
OVERALL OUTSIDE PAD - ELEV=3453.8

Index	Base Surface	Comparison Surface	Cut	Fill	Net	Cut Factor	Fill Factor	Cut (adjusted)	Fill (adjusted)	Net (adjusted)
1	EG-SURVEY	PG	17338.17 Cu. Yd.	4254.18 Cu. Yd.	13083.99 Cu. Yd.<Cut>	1.000	1.000	17338.17 Cu. Yd.	4254.18 Cu. Yd.	13083.99 Cu. Yd.<Cut>

REVISIONS			
NO.	DATE	DESCRIPTION	
A	11/29/2017	ISSUED FOR REVIEW	

DESIGNED NL
DRAWN JNB
CHECKED TM
DATE 11/15/2017

Tetra Tech Inc.
4000 N. BIG SPRING ST., SUITE 401
MIDLAND, TX 79705
(432) 682-4559

3BEAR ENERGY, LLC
EDDY COUNTY, NEW MEXICO
GPS (WGS84): 32.021682°N, -104.318212°W

3Bear Energy

NORTH

VERIFY SCALE
BAR IS ONE (1) INCH ON ORIGINAL DRAWINGS.
IF NOT ONE (1) INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

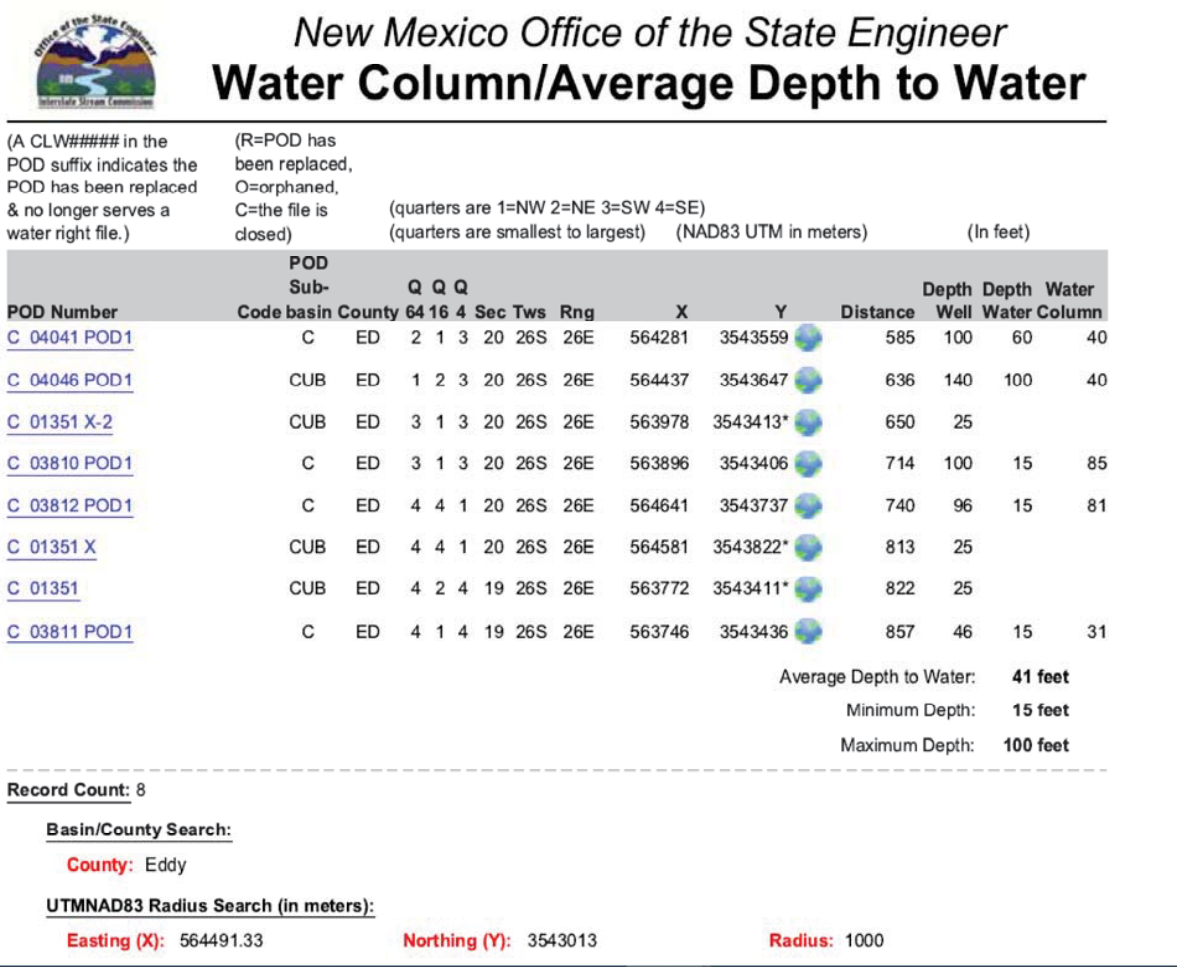
SCALES:
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: NA

COTTONWOOD PRODUCED WATER RECYCLING FACILITY
CONTAINMENT AREA
RECYCLE WATER SYSTEM
GENERAL ARRANGEMENT

PROJECT NO.: 212C-MD-00981
DRAWING NO.:
SHEET NO.: 1 OF 1

Depth to Water Determination

The depth to ground water was determined using the New Mexico Office of the State Engineer website. On the website there is a tool to determine water column/average depth to water based on location. Figure 3 shows water depth at five locations within 1,000 meters of the facility. Based on the information provided for the five wells, it was determined that the average depth of ground water is 41 feet.



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.) (R=POD has been replaced, O=orphaned, C=the file is closed) (quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin Code	County	Q 64	Q 16	Q 4	Sec	Twn	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 04041 POD1	C	ED	2	1	3	20	26S	26E	564281	3543559	585	100	60	40
C 04046 POD1	CUB	ED	1	2	3	20	26S	26E	564437	3543647	636	140	100	40
C 01351 X-2	CUB	ED	3	1	3	20	26S	26E	563978	3543413*	650	25		
C 03810 POD1	C	ED	3	1	3	20	26S	26E	563896	3543406	714	100	15	85
C 03812 POD1	C	ED	4	4	1	20	26S	26E	564641	3543737	740	96	15	81
C 01351 X	CUB	ED	4	4	1	20	26S	26E	564581	3543822*	813	25		
C 01351	CUB	ED	4	2	4	19	26S	26E	563772	3543411*	822	25		
C 03811 POD1	C	ED	4	1	4	19	26S	26E	563746	3543436	857	46	15	31

Average Depth to Water: **41 feet**
Minimum Depth: **15 feet**
Maximum Depth: **100 feet**

Record Count: 8

Basin/County Search:

County: Eddy

UTMNAD83 Radius Search (in meters):

Easting (X): 564491.33 **Northing (Y):** 3543013 **Radius:** 1000

Figure 3

Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release

Butcher Spring is a watercourse north of Cottonwood. The spring is within a half mile of the release. Please see Figure 4.

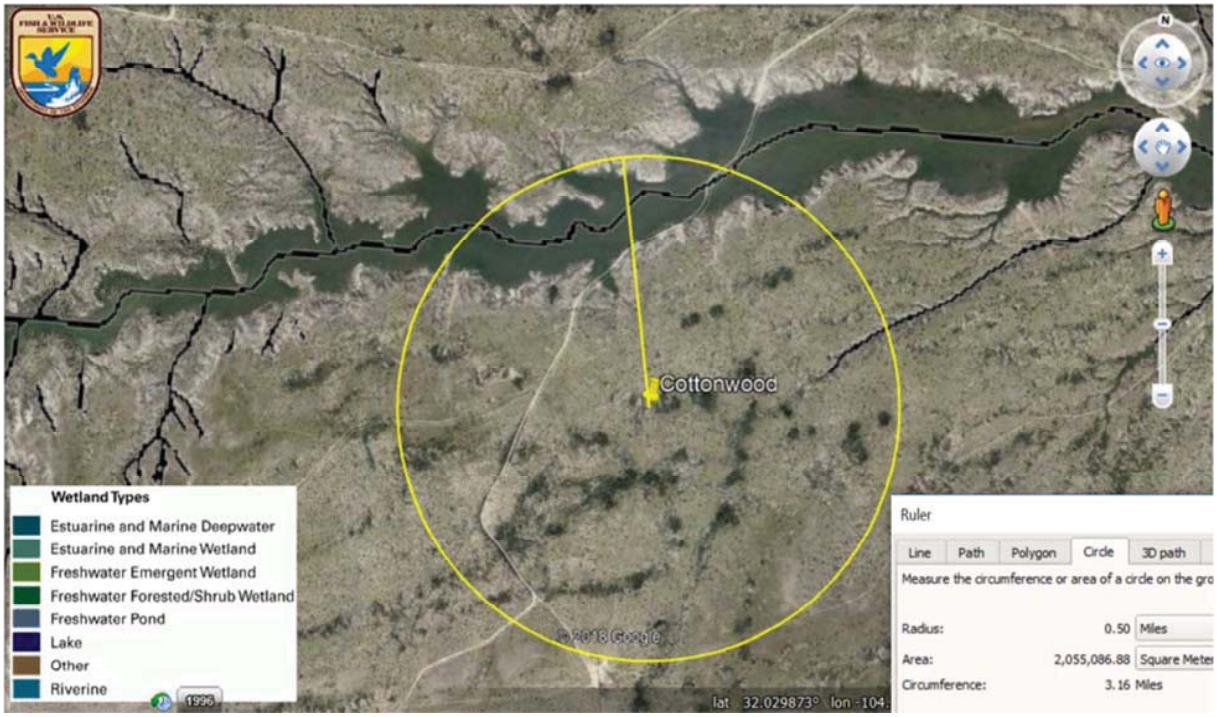
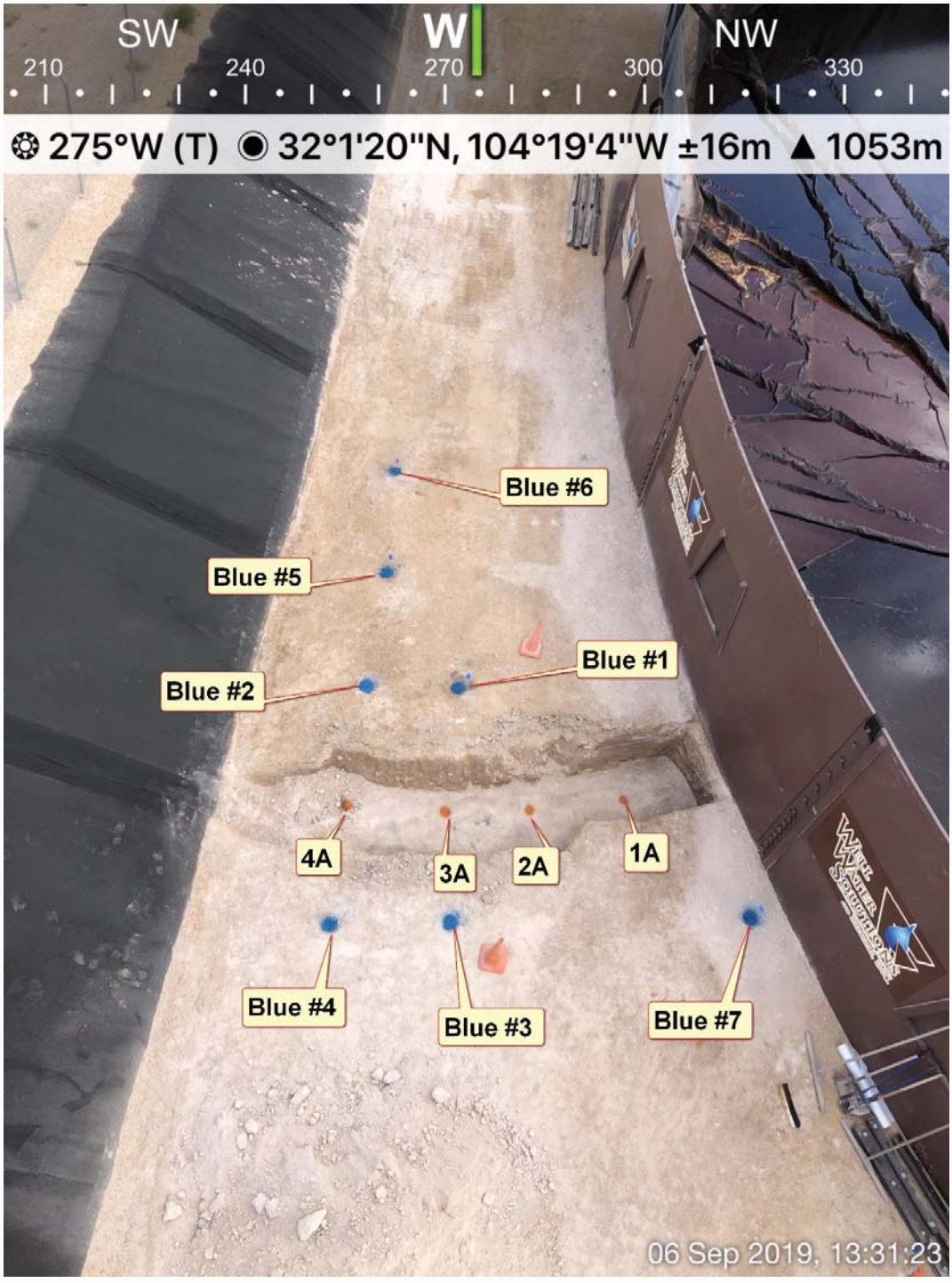


Figure 4


WELL WATER SOLUTIONS
WELL WATER SOLUTIONS



SAMPLE LOCATIONS 3BEAR COTTONWOOD RECYCLING FACILITY 32.02141 -104.31707 EDDY COUNTY, NEW MEXICO	Baber Environmental Assistance & Remediation, LLC	DATE: 11/12/19	DWG BY: RSB
		FILE NO.:	FIGURE NO.: 9

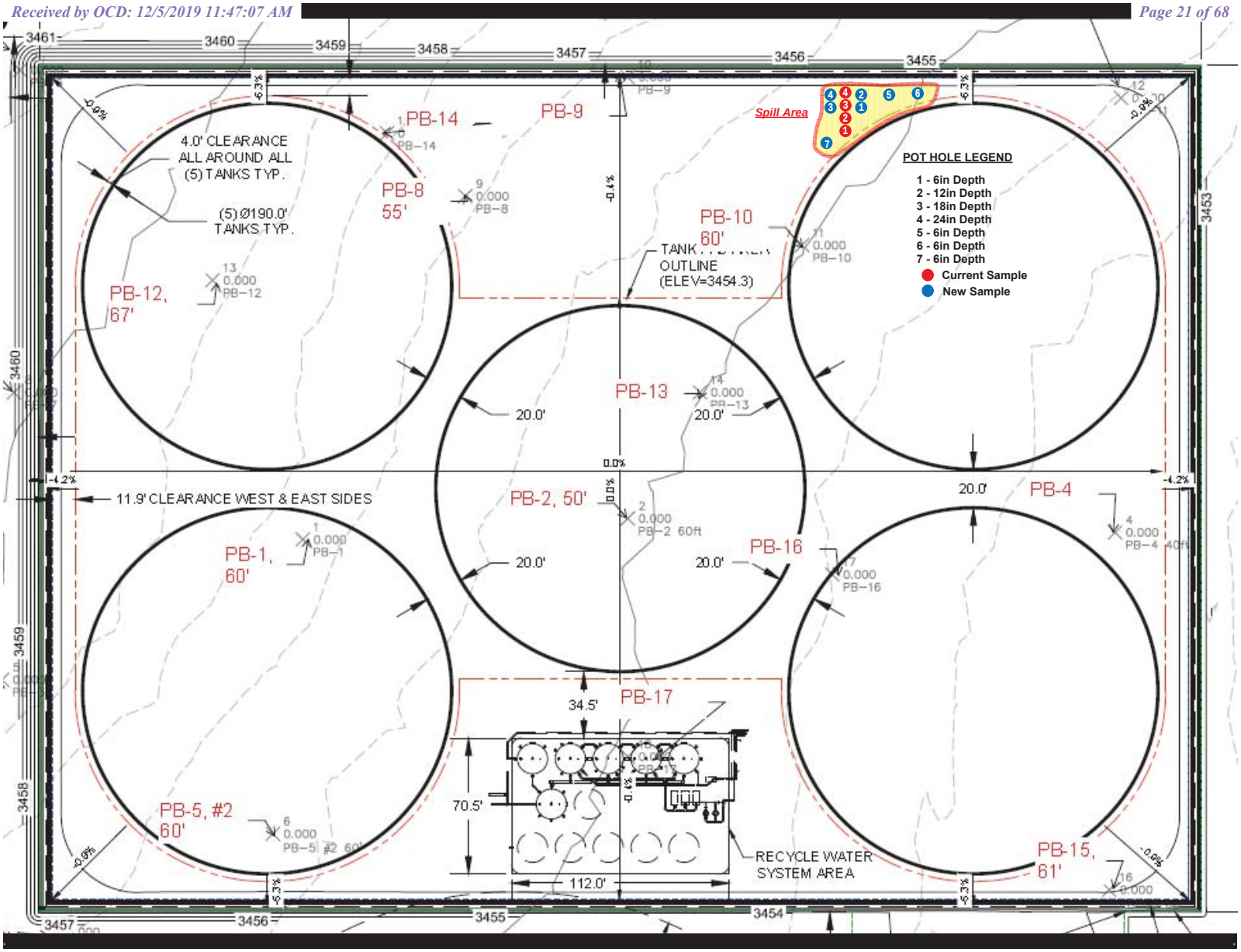

Spill Area
POT HOLE LEGEND
1 - 6in Depth
2 - 12in Depth
3 - 18in Depth
4 - 24in Depth
5 - 6in Depth
6 - 6in Depth
7 - 6in Depth
Current Sample
New Sample
4.0' CLEARANCE ALL AROUND ALL (5) TANKS TYP.
(5) Ø190.0' TANKS TYP.
11.9' CLEARANCE WEST & EAST SIDES
PB-1, 60'
PB-2, 50'
PB-4
PB-5, #2 60'
PB-8 55'
PB-9
PB-10 60'
PB-12, 67'
PB-13
PB-14
PB-15, 61'
PB-16
PB-17
TANK OUTLINE (ELEV=3454.3)
RECYCLE WATER SYSTEM AREA
34.5'
70.5'
112.0'
20.0'
3461
3460
3459
3458
3457
3456
3455
3454
3453

TABLE
Analytical Results

Table 1
3Bear Energy
Cottonwood Produced Water Recycling Facility

Samples collected on 8/12/19

Sample Location	Proposed Depth	Benzene (mg/kg)	Toluene (mg/kg)	EthylBenzene (mg/kg)	Total Xylenes (mg/kg)	Chlorides (mg/kg)	GRO (C6-C10*)	DRO (>C10-C28*)	EXT DRO (C28-C36)
1A	6"	<0.05	<0.05	<0.05	<0.15	12000	<10.0	12.6	<10.0
2A	12"	<0.05	<0.05	<0.05	<0.15	512	<10.0	<10.0	<10.0
3A	18"	<0.05	<0.05	<0.05	<0.15	1300	<10.0	<10.0	<10.0
4A	24"	<0.05	<0.05	<0.05	<0.15	784	<10.0	<10.0	<10.0

Samples Collected on 9/5/19

Sample Location	Proposed Depth	Benzene (mg/kg)	Toluene (mg/kg)	EthylBenzene (mg/kg)	Total Xylenes (mg/kg)	Chlorides (mg/kg)	GRO (C6-C10*)	DRO (>C10-C28*)	EXT DRO (C28-C36)
Blue #1	6"	<0.050	<0.050	<0.050	<0.150	240	<10.0	<10.0	<10.0
Blue #2	12"	<0.050	<0.050	<0.050	<0.150	64	<10.0	<10.0	<10.0
Blue #3	18"	<0.050	<0.050	<0.050	<0.150	112	<10.0	<10.0	<10.0
Blue #4	24"	<0.050	<0.050	<0.050	<0.150	48	<10.0	<10.0	<10.0
Blue #5	6"	<0.050	<0.050	<0.050	<0.150	96	<10.0	<10.0	<10.0
Blue #6	6"	<0.050	<0.050	<0.050	<0.150	160	<10.0	<10.0	<10.0
Blue #7	6"	<0.050	<0.050	<0.050	<0.150	96	<10.0	<10.0	<10.0

APPENDIX A
FORM C-141

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	NAB1912752873
District RP	2RP-5396
Facility ID	fAB1810837464
Application ID	pAB1912752213

Release Notification

Responsible Party

Responsible Party: 3 Bear Delaware Operating –NM, LLC	OGRID: 372603
Contact Name: Stephanie Swanson	Contact Telephone: (720) 272-6791
Contact email: stephanie@3bearllc.com	Incident # *(assigned by OCD)* NAB1912752873
Contact mailing address 1512 Larimer St. Suite 540, Denver, CO 80202	

Location of Release Source

Latitude 32.02141 Longitude -104.31707
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: 3Bear Cottonwood Water Treatment and Impound	Site Type: Water Treatment and Impound
Date Release Discovered: 3/25/2019	API# *(if applicable)*:

Unit Letter	Section	Township	Range	County
N AB	20	26S	26E	Eddy

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☒ Private (*Name: 3Bear Delaware Operating-NM, LLC*)

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) 12	Volume Recovered (bbls) TBD
	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)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)
Cause of Release: Suspected leak in produced water tank. Leak was contained in a lined-berm. Please see the attached photos.		

Form C-141
Page 2

State of New Mexico
Oil Conservation Division

Incident ID	NAB1912752873
District RP	2RP-5396
Facility ID	fAB1810837464
Application ID	pAB1912752213

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:
3 Bear is in the process of emptying the entire contents of the tank which may have leaked. We will hand-dig the affected soil within the lined-berm.

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: Stephanie Swanson Title: Manager of Engineering

Signature:  Date: 4/5/2019

email: stephanie@3bearllc.com Telephone: (720)272-6791

OCD Only

Received by:  Date: 5/7/2019

APPENDIX B
Analytical Report 8/15/19

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

August 15, 2019

KEVIN HEATH

3 BEAR ENERGY

674 MARATHON ROAD

HOBBS, NM 88240

RE: COTTONWOOD SWD

Enclosed are the results of analyses for samples received by the laboratory on 08/13/19 12:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
KEVIN HEATH
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	08/13/2019	Sampling Date:	08/13/2019
Reported:	08/15/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	COTTONWOOD WATER FACILITY		

Sample ID: 0-1 6" (H902770-01)

BTEX 8021B mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/14/2019	ND	1.85	92.4	2.00	1.69	
Toluene*	<0.050	0.050	08/14/2019	ND	1.97	98.6	2.00	4.30	
Ethylbenzene*	<0.050	0.050	08/14/2019	ND	1.97	98.7	2.00	4.93	
Total Xylenes*	<0.150	0.150	08/14/2019	ND	5.99	99.8	6.00	6.80	
Total BTEX	<0.300	0.300	08/14/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *105 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**12000**	16.0	08/14/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	08/14/2019	ND	194	97.1	200	7.24	
DRO >C10-C28*	**12.6**	10.0	08/14/2019	ND	180	90.0	200	9.13	
EXT DRO >C28-C36	<10.0	10.0	08/14/2019	ND					

Surrogate: 1-Chlorooctane *83.3 %* *41-142*

Surrogate: 1-Chlorooctadecane *81.9 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
KEVIN HEATH
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	08/13/2019	Sampling Date:	08/13/2019
Reported:	08/15/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	COTTONWOOD WATER FACILITY		

Sample ID: 0-2 1' (H902770-02)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/14/2019	ND	1.85	92.4	2.00	1.69	
Toluene*	<0.050	0.050	08/14/2019	ND	1.97	98.6	2.00	4.30	
Ethylbenzene*	<0.050	0.050	08/14/2019	ND	1.97	98.7	2.00	4.93	
Total Xylenes*	<0.150	0.150	08/14/2019	ND	5.99	99.8	6.00	6.80	
Total BTEX	<0.300	0.300	08/14/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *105 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**512**	16.0	08/14/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	08/14/2019	ND	194	97.1	200	7.24	
DRO >C10-C28*	<10.0	10.0	08/14/2019	ND	180	90.0	200	9.13	
EXT DRO >C28-C36	<10.0	10.0	08/14/2019	ND					

Surrogate: 1-Chlorooctane *74.8 %* *41-142*

Surrogate: 1-Chlorooctadecane *75.6 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
KEVIN HEATH
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	08/13/2019	Sampling Date:	08/13/2019
Reported:	08/15/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	COTTONWOOD WATER FACILITY		

Sample ID: 0-3 18" (H902770-03)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/14/2019	ND	1.85	92.4	2.00	1.69	
Toluene*	<0.050	0.050	08/14/2019	ND	1.97	98.6	2.00	4.30	
Ethylbenzene*	<0.050	0.050	08/14/2019	ND	1.97	98.7	2.00	4.93	
Total Xylenes*	<0.150	0.150	08/14/2019	ND	5.99	99.8	6.00	6.80	
Total BTEX	<0.300	0.300	08/14/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *108 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1300**	16.0	08/14/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	08/14/2019	ND	207	103	200	1.69	
DRO >C10-C28*	<10.0	10.0	08/14/2019	ND	208	104	200	1.45	
EXT DRO >C28-C36	<10.0	10.0	08/14/2019	ND					

Surrogate: 1-Chlorooctane *90.3 %* *41-142*

Surrogate: 1-Chlorooctadecane *94.2 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
KEVIN HEATH
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	08/13/2019	Sampling Date:	08/13/2019
Reported:	08/15/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	COTTONWOOD WATER FACILITY		

Sample ID: 0-4 24" (H902770-04)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/14/2019	ND	1.85	92.4	2.00	1.69	
Toluene*	<0.050	0.050	08/14/2019	ND	1.97	98.6	2.00	4.30	
Ethylbenzene*	<0.050	0.050	08/14/2019	ND	1.97	98.7	2.00	4.93	
Total Xylenes*	<0.150	0.150	08/14/2019	ND	5.99	99.8	6.00	6.80	
Total BTEX	<0.300	0.300	08/14/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *106 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**784**	16.0	08/14/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	08/14/2019	ND	207	103	200	1.69	
DRO >C10-C28*	<10.0	10.0	08/14/2019	ND	208	104	200	1.45	
EXT DRO >C28-C36	<10.0	10.0	08/14/2019	ND					

Surrogate: 1-Chlorooctane *96.3 %* *41-142*

Surrogate: 1-Chlorooctadecane *99.9 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: 3 BEAR ENERGY		**BILL TO**	
Project Manager: Kevin Heath		P.O. #:	
Address: 674 Marathon Road		Company: 3 Bear Energy	
City: Hobbs	State: NM Zip: 88240	Attn: Stephanie	
Phone #: 575-200-0452	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name: Cottonwood SWD		State: Zip:	
Project Location: Cotton wood		Phone #:	
Sampler Name: Kevin Heath		Fax #:	

FOR LAB USE ONLY					MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST									
Lab I.D.	Sample I.D.		(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chloride	TPH	BTEX	Benzene						
H902770																									
1	0-1	6"					X								8:45 AM	✓	✓	✓	✓						
2	0-2	1'					X								9:00 AM	|	|	|	|						
3	0-3	18"					X								9:15 AM	|	|	|	|						
4	0-4	24"					X								9:30 AM	|	|	|	|						

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequental damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By:	Date: 8-13-19	Received By:	Phone Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 12:15	Tamara Oldaker	Fax Result: ☐ Yes ☐ No Add'l Fax #:
Relinquished By:	Date:	Received By:	REMARKS: Email Kheath@3bearllc.com Email Stephanie@3bearllc.com Stephanie PH# 1-720-272-6791
	Time:		
Delivered By: (Circle One)	3.1° #97	Sample Condition Cool ☑ Yes ☐ No Intact ☑ Yes ☐ No	CHECKED BY: (Initials) T.O.
Sampler - UPS - Bus - Other:	Corrected 3.5°		

APPENDIX C
Analytical Report 9/10/19

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

September 10, 2019

BO BUESCHER

3 BEAR ENERGY

674 MARATHON ROAD

HOBBS, NM 88240

RE: COTTONWOOD SWD SPILL

Enclosed are the results of analyses for samples received by the laboratory on 09/06/19 14:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
BO BUESCHER
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	09/06/2019	Sampling Date:	09/06/2019
Reported:	09/10/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD SPILL	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	MALAGA, NM		

Sample ID: BLUE # 1 (H903090-01)

BTEX 8021B mg/kg Analyzed By: BF HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/09/2019	ND	2.07	103	2.00	8.55	
Toluene*	<0.050	0.050	09/09/2019	ND	2.09	104	2.00	8.06	
Ethylbenzene*	<0.050	0.050	09/09/2019	ND	2.13	107	2.00	9.32	
Total Xylenes*	<0.150	0.150	09/09/2019	ND	6.57	109	6.00	8.52	
Total BTEX	<0.300	0.300	09/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *88.7 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**240**	16.0	09/09/2019	ND	432	108	400	7.69	

TPH 8015M mg/kg Analyzed By: MS HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/07/2019	ND	204	102	200	0.251	
DRO >C10-C28*	<10.0	10.0	09/07/2019	ND	211	106	200	12.4	
EXT DRO >C28-C36	<10.0	10.0	09/07/2019	ND					

Surrogate: 1-Chlorooctane *89.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *95.1 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
BO BUESCHER
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	09/06/2019	Sampling Date:	09/06/2019
Reported:	09/10/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD SPILL	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	MALAGA, NM		

Sample ID: BLUE # 2 (H903090-02)

BTEX 8021B mg/kg Analyzed By: BF HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/09/2019	ND	2.07	103	2.00	8.55	
Toluene*	<0.050	0.050	09/09/2019	ND	2.09	104	2.00	8.06	
Ethylbenzene*	<0.050	0.050	09/09/2019	ND	2.13	107	2.00	9.32	
Total Xylenes*	<0.150	0.150	09/09/2019	ND	6.57	109	6.00	8.52	
Total BTEX	<0.300	0.300	09/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *88.8 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	09/09/2019	ND	432	108	400	7.69	

TPH 8015M mg/kg Analyzed By: MS HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/07/2019	ND	204	102	200	0.251	
DRO >C10-C28*	<10.0	10.0	09/07/2019	ND	211	106	200	12.4	
EXT DRO >C28-C36	<10.0	10.0	09/07/2019	ND					

Surrogate: 1-Chlorooctane *87.3 %* *41-142*

Surrogate: 1-Chlorooctadecane *93.9 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
BO BUESCHER
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	09/06/2019	Sampling Date:	09/06/2019
Reported:	09/10/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD SPILL	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	MALAGA, NM		

Sample ID: BLUE # 3 (H903090-03)

BTEX 8021B mg/kg Analyzed By: BF HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/09/2019	ND	2.07	103	2.00	8.55	
Toluene*	<0.050	0.050	09/09/2019	ND	2.09	104	2.00	8.06	
Ethylbenzene*	<0.050	0.050	09/09/2019	ND	2.13	107	2.00	9.32	
Total Xylenes*	<0.150	0.150	09/09/2019	ND	6.57	109	6.00	8.52	
Total BTEX	<0.300	0.300	09/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *91.2 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**112**	16.0	09/09/2019	ND	432	108	400	7.69	

TPH 8015M mg/kg Analyzed By: MS HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/07/2019	ND	204	102	200	0.251	
DRO >C10-C28*	<10.0	10.0	09/07/2019	ND	211	106	200	12.4	
EXT DRO >C28-C36	<10.0	10.0	09/07/2019	ND					

Surrogate: 1-Chlorooctane *83.9 %* *41-142*

Surrogate: 1-Chlorooctadecane *90.9 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
BO BUESCHER
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	09/06/2019	Sampling Date:	09/06/2019
Reported:	09/10/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD SPILL	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	MALAGA, NM		

Sample ID: BLUE # 4 (H903090-04)

BTEX 8021B mg/kg Analyzed By: BF HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/09/2019	ND	2.07	103	2.00	8.55	
Toluene*	<0.050	0.050	09/09/2019	ND	2.09	104	2.00	8.06	
Ethylbenzene*	<0.050	0.050	09/09/2019	ND	2.13	107	2.00	9.32	
Total Xylenes*	<0.150	0.150	09/09/2019	ND	6.57	109	6.00	8.52	
Total BTEX	<0.300	0.300	09/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *90.0 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	09/09/2019	ND	432	108	400	7.69	

TPH 8015M mg/kg Analyzed By: MS HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/09/2019	ND	200	100	200	0.279	
DRO >C10-C28*	<10.0	10.0	09/09/2019	ND	207	103	200	0.452	
EXT DRO >C28-C36	<10.0	10.0	09/09/2019	ND					

Surrogate: 1-Chlorooctane *73.9 %* *41-142*

Surrogate: 1-Chlorooctadecane *75.1 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
BO BUESCHER
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	09/06/2019	Sampling Date:	09/06/2019
Reported:	09/10/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD SPILL	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	MALAGA, NM		

Sample ID: BLUE # 5 (H903090-05)

BTEX 8021B mg/kg **Analyzed By: BF** **HDSP-1**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/09/2019	ND	2.07	103	2.00	8.55	
Toluene*	<0.050	0.050	09/09/2019	ND	2.09	104	2.00	8.06	
Ethylbenzene*	<0.050	0.050	09/09/2019	ND	2.13	107	2.00	9.32	
Total Xylenes*	<0.150	0.150	09/09/2019	ND	6.57	109	6.00	8.52	
Total BTEX	<0.300	0.300	09/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *89.6 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**96.0**	16.0	09/09/2019	ND	432	108	400	7.69	

TPH 8015M mg/kg **Analyzed By: MS** **HDSP-1**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/09/2019	ND	200	100	200	0.279	
DRO >C10-C28*	<10.0	10.0	09/09/2019	ND	207	103	200	0.452	
EXT DRO >C28-C36	<10.0	10.0	09/09/2019	ND					

Surrogate: 1-Chlorooctane *82.1 %* *41-142*

Surrogate: 1-Chlorooctadecane *84.4 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
BO BUESCHER
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	09/06/2019	Sampling Date:	09/06/2019
Reported:	09/10/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD SPILL	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	MALAGA, NM		

Sample ID: BLUE # 6 (H903090-06)

BTEX 8021B mg/kg Analyzed By: BF HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/09/2019	ND	2.07	103	2.00	8.55	
Toluene*	<0.050	0.050	09/09/2019	ND	2.09	104	2.00	8.06	
Ethylbenzene*	<0.050	0.050	09/09/2019	ND	2.13	107	2.00	9.32	
Total Xylenes*	<0.150	0.150	09/09/2019	ND	6.57	109	6.00	8.52	
Total BTEX	<0.300	0.300	09/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *90.0 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**160**	16.0	09/09/2019	ND	432	108	400	7.69	

TPH 8015M mg/kg Analyzed By: MS HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/09/2019	ND	200	100	200	0.279	
DRO >C10-C28*	<10.0	10.0	09/09/2019	ND	207	103	200	0.452	
EXT DRO >C28-C36	<10.0	10.0	09/09/2019	ND					

Surrogate: 1-Chlorooctane *79.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *82.5 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

3 BEAR ENERGY
BO BUESCHER
674 MARATHON ROAD
HOBBS NM, 88240
Fax To:

Received:	09/06/2019	Sampling Date:	09/06/2019
Reported:	09/10/2019	Sampling Type:	Soil
Project Name:	COTTONWOOD SWD SPILL	Sampling Condition:	Cool & Intact
Project Number:	COTTONWOOD	Sample Received By:	Tamara Oldaker
Project Location:	MALAGA, NM		

Sample ID: BLUE # 7 (H903090-07)

BTEX 8021B mg/kg Analyzed By: BF HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/09/2019	ND	2.07	103	2.00	8.55	
Toluene*	<0.050	0.050	09/09/2019	ND	2.09	104	2.00	8.06	
Ethylbenzene*	<0.050	0.050	09/09/2019	ND	2.13	107	2.00	9.32	
Total Xylenes*	<0.150	0.150	09/09/2019	ND	6.57	109	6.00	8.52	
Total BTEX	<0.300	0.300	09/09/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *90.2 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**96.0**	16.0	09/09/2019	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS HDSP-1

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	09/09/2019	ND	200	100	200	0.279	
DRO >C10-C28*	<10.0	10.0	09/09/2019	ND	207	103	200	0.452	
EXT DRO >C28-C36	<10.0	10.0	09/09/2019	ND					

Surrogate: 1-Chlorooctane *69.7 %* *41-142*

Surrogate: 1-Chlorooctadecane *71.2 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
QR-03	The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
QR-02	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
HDSP-1	Sample container had headspace. Results may be biased low.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: 3 Bear Energy	**BILL TO**
Project Manager: Bo Buescher	P.O. #:
Address: 624 Marathon Rd	Company: 3 Bear Energy
City: Hobbs State: NM Zip: 88240	Attn: Mike Solomon
Phone #: 210-243-7374 Fax #:	Address: 1512 Larimer St Suite 540
Project #: Project Owner:	City: Denver
Project Name: Cottonwood SWD Spill	State: CO Zip: 80202
Project Location: Malaga, NM	Phone #:
Sampler Name: Bo Buescher	Fax #:

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	ANALYSIS REQUEST: CL	BTEX	TPH
H903090																	
1	Blue #1	G	1			✓					✓		9-6-19	10:00	✓	✓	✓
2	#2													10:15			
3	#3													10:30			
4	#4													10:45			
5	#5													11:00			
6	#6													11:15			
7	#7													11:30			

Relinquished By: Bo Buescher	Date: 9-6-19 Time: 14:00	Received By: Tamara Oldaker	Phone Result: ☐ Yes ☐ No Add'l Phone #:
Relinquished By:	Date: Time:	Received By:	Fax Result: ☐ Yes ☐ No Add'l Fax #:
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	2.4°C #97 Corrected 2.8°C	Sample Condition Cool: ☐ Yes ☐ No Intact: ☐ Yes ☐ No	CHECKED BY: (Initials) TO.

REMARKS: bbuescher@3bearllc.com

APPENDIX D
Karst Study 10/27/17

3-Bear Cottonwood Site, Recycled Water Impoundment and SWD, Eddy County, NM 3D Seismic Imaging and Geologic Karst Characterization

#117-0536031
October 27th, 2017

PRESENTED TO

3-Bear Energy, LLC
Mike Soloman, SVP Engineering
1512 Larimer Street, Suite 540
Denver, CO 80202

PRESENTED BY

Tetra Tech
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Golden, CO 80401

(303) 217-5700
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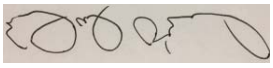
Jamey Turner, WY P.G. #3750 10/26/2017
Sr. Geologist/Geophysicist



Dan O'Connell, Ph.D. 10/26/2017
Sr. Geologist/Geophysicist

Approved by:

Nathan Langford, P.E. 10/27/2017
Project Manager

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LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 PURPOSE

The results presented herein provide results from active-source seismic imaging data collected in October 2017 at the 3-Bear Cottonwood site in Eddy County, New Mexico to identify the best foundation quality areas in the 20-acre property extent. Published geologic data are compiled to characterize the site stratigraphy and surficial geology to provide context for the near surface high-resolution geophysical imaging (Figure 1).

1.2 SCOPE OF WORK

The scope of work (SOW) includes the use of 3D seismic imaging and desktop geologic characterization to provide subsurface imaging of potential karst features to inform the placements of surface infrastructure in support of 3 Bear operations. This report summarizes the data interpretation and recommendations for the Cottonwood site.

2.0 SITE GEOLOGY

The Cottonwood site is located on surficial sand deposits overlying the Permian Castile Formation, (USGS, 1957). The total original thickness of the Castile Formation is approximately 1,825 feet in the vicinity of the McBride No. 1 Well drilled in the Delaware Basin, which reports the following stratigraphy (from the bottom up): 200 feet of interlaminated white anhydrite and gray to brown limestone, above which is a saline section of 515 feet of halite and limestone, an overlying section of 560 feet of anhydrite with limestone laminae, and 305 feet of overlying white anhydrite (USGS, 1957). In the vicinity of the McBride No. 1 well, approximately 125 ft. of gypsum has been eroded from the top of the formation. The thickness of the Castile Formation at the Cottonwood site has not been confirmed at this time, but typically the upper originally anhydrite facies have weathered into gypsum.

In the region around Eddy County, NM, anhydrite facies of the Castile Formation near the ground surface that have been exposed to water and weathering processes have weathered to gypsum. Locally, residual gypsum and clastics of the formerly overlying Solado Halite are intact; The Salado deposits mostly weathered away before the Pleistocene, and where still present are collapsed and typically look like breccia.

Where present at the site, surficial Quaternary (Pleistocene-Holocene) sands should be 70% quartz / 30% carbonate. More recent geologic mapping in nearby 7.5 minute quadrangles (e.g., Otis, Loving) show these sands vary in thickness from a few feet to ~200 feet (Pederson and Dehler, 2004). Regionally, anhydrite is characterized by regular planar bedding, and gypsum bedding is convoluted and irregular.

3.0 SEISMIC IMAGING

3.1 SEISMIC DATA ACQUISITION

Figure 3 shows the source and receiver positions. A total of 756 receiver stations were used across 28 north-south receiver lines of 27 receivers per line. The receiver array spanned 1350 feet east-west and 650 feet north-south. A total of 985 Vibroseis source positions were used at nominal 25 inline (north-south) spacing and 50 foot (east-west) crossline spacing. The Vibroseis source positions extended west, north, and south of the receivers to ensure full coverage of a 1320 foot east-west by 660 foot north-south survey area (Figure 3).

The entire survey had to be moved 75 feet north of the original property southwest corner because the well-pad and piping from the adjacent hydraulic fracturing operation extended nearly 70 feet into the intended survey area. The survey area was moved north to avoid damaging the plastic pipes exposed at the surface with seismic acquisition vehicles, particularly the 64,000-lb Vibroseis truck required to overcome noise from the continuously operating hydraulic fracturing well located less than 200 feet from the southwest corner of the property.

Vibroseis sweep testing was conducted with sweeps from 2 Hz to 96 Hz to 2 Hz to 140 Hz to find the Vibroseis sweep with the best combinations of high signal to noise and high frequency energy content. To eliminate noise

from the adjacent hydraulic fracturing operation and obtain the best resolution of karst structure, a Vibroseis sweep from 2 Hz to 140 Hz over a duration of 28 seconds was selected for production seismic acquisition. A total of > 3 GB of correlated Vibroseis data were acquired for a record length of three seconds per source point.

A RTK GPS survey was conducted to obtain high-accuracy receiver positions (with uncertainties <10 cm in receiver position). A sub-meter accuracy GPS RTK system on the Vibroseis provide source locations.

3.2 SEISMIC DATA PROCESSING

Figure 4 shows the extent of the 3D seismic data volume coverage at the site. The GPS survey was used to assign source and receiver positions and elevations for processing. Several processing methods were used to develop quick screens to identify areas well suited for foundation investigations and to screen off areas that are likely to be unsuitable. These processing approaches included surface wave group velocity and attenuation mapping as a function of frequency, joint total-energy-duration mapping to delineate areas of strong persistent resonance, acoustic-wave (Vp) first-arrival mapping of shallow low- and high-velocity regions, and three-dimensional (3D) Vp tomography using first-arrival time data.

The first-arrival times were picking from > 450,000 receiver ground motion recordings and a total of 342,588 high-quality first-arrival times were used to estimated 3D Vp from the ground surface to > 150 ft. depth using 8.2 foot 3D cells. Finite-frequency 3D wave-equation tomography was used with the first-arrival-time data to estimate 3D Vp.

The 3D Vp model reproduced the first-arrival-time data to within picking uncertainties of 1.5 ms. The 3D Vp model was output as SEGY data to import into the OpendTect 3D visualization and interpretation system to map areas most likely to have suitable foundation properties.

3.3 SEISMIC DATA AND INTERPRETATIONS

Surface-wave attenuation was used as an initial mapping attribute. However, the surface-wave attenuation mapping was potentially overly conservative and could eliminate potential useful foundation areas. Subsequent full 3D Vp tomographic analyses showed Vp attributes provided the best delineation of likely karst regions and larger areas with laterally persistent high-strength properties.

Areal mapping is provided to outline the best areas for positioning boreholes to identify acceptable areas for foundations. As an initial estimate for locating site boreholes, first-arrival time data were used in the 20 m to 65 m source-receiver offset range to estimate areas of anomalous depth-averaged Vp above the nominal water-table depth of 33 feet. This accomplished within one day of receiving the seismic data from the field crew to establish initial drilling target locations and priorities. This initial screening analysis identified areas of slowest Vp which are unlikely to provide acceptable foundation properties which are shown as colored-coded (red and yellow) areas in Figure 5. Based on the initial screening analysis, the areas most likely to provide the best foundation conditions in the property are shown as color-coded (blue and green) areas in Figure 6.

Areas on the surface with large trees and dense vegetation are confined to low-velocity areas outside the higher-velocity yellow-green areas in Figure 7 demonstrating that the 3D Vp model delineates areas of known surface karst features as local laterally lower-velocity regions. We interpret the tree root systems to bioturbate the gypsum bedrock and create pathways for surface water to infiltrate and dissolve bedrock. Thus, the 3D Vp tomography provides the best delineation of karst and best maps areas to focus investigations to identify acceptable foundations areas (Figure 7 and Figure 7 kmz provided as a separate digital file). The yellow areas have the thickest and stiffest foundation properties (i.e., highest seismic velocities that delineate intact bedrock) from the water table elevation to the surface (Figure 7). Only areas of yellow and green in Figure 7 should be considered

for foundation investigations since the rest of the areas in Figure 7 are likely to be impacted by varying degrees of karst development unsuitable for foundations.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the initial shallow Vp maps (Figure 5 and Figure 6) and surface-wave attenuation mapping, 16 drilling targets were defined within the data footprint to characterize subsurface conditions and investigate seismic anomalies. Two drill holes in the yellow-green portion of Figure 7 encountered mostly continuous gypsum in the 17-60 foot depth range (depths < 33 feet are likely above the water table). We recommend confining subsequent drilling to locations within the yellow-green regions of Figure 7 to avoid karst structure and focus drilling investigations in areas most likely to have the best foundation properties.

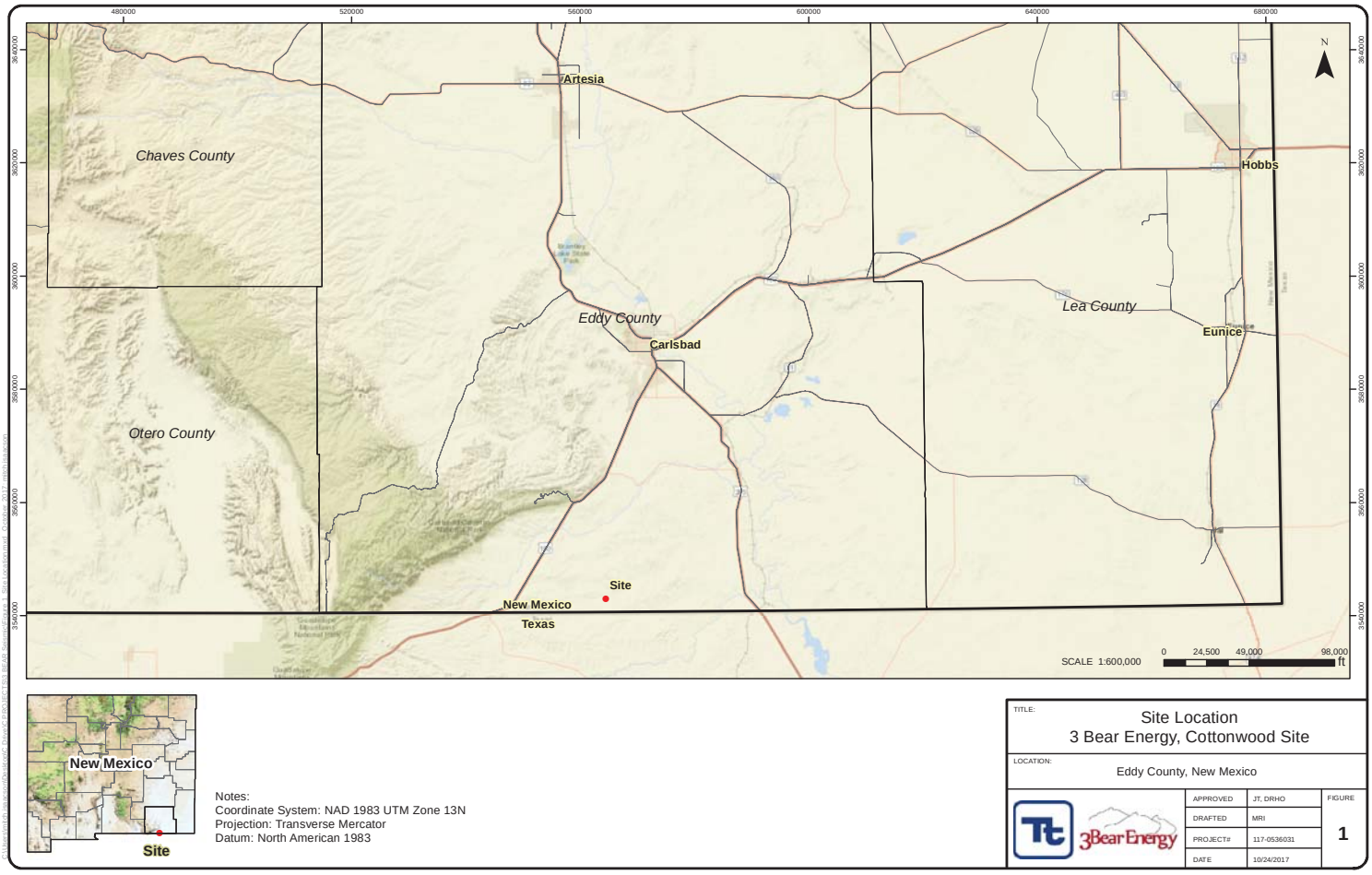
5.0 REFERENCES CITED

Green, G.N., Jones G.E., 1997, The Digital Geologic Map of New Mexico in ARC/INFO Format: USGS Open File Report 97-0052, 9 p.

Pederson, J.L., Dehler, C.M., 1994, Geologic Map of the Otis 7.5-minute Quadrangle, New Mexico Bureau of Geology OF-GM 98.

USGS, 1957, Geology of the Carlsbad Caverns East Quadrangle.

APPENDIX A: VP TOMOGRAPHY

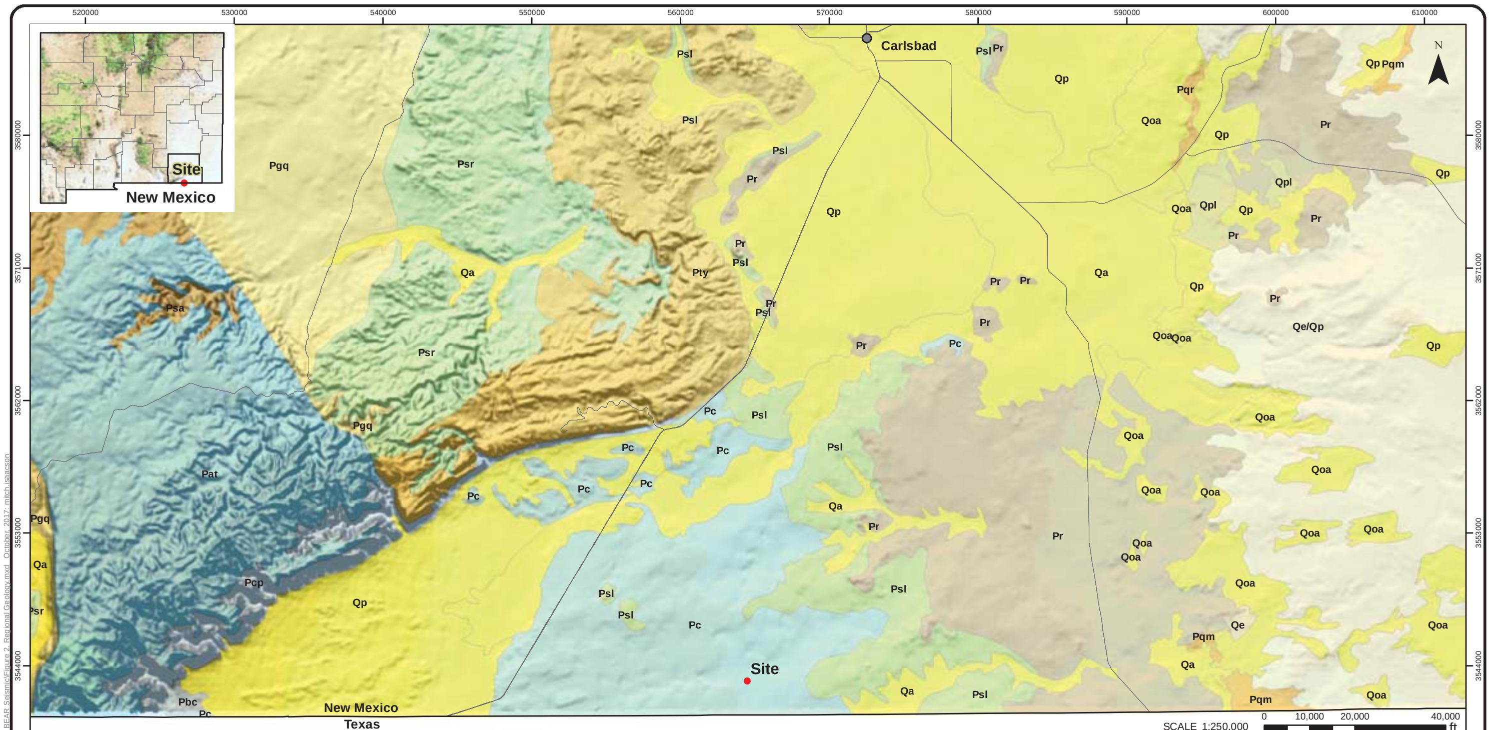


Notes:
Coordinate System: NAD 1983 UTM Zone 13N
Projection: Transverse Mercator
Datum: North American 1983

TITLE:
Site Location
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	1
PROJECT#	117-0536031	
DATE	10/24/2017	



Legend

- Site Location
- State Boundary
- Roads

Permian Deposits

- Pqr, sandstone, mudstone
- Pr, carbonate, fine-grained mixed clastic
- Psa, carbonate, fine-grained mixed clastic
- Psl, evaporite, sandstone
- Psr, evaporite, fine-grained mixed clastic
- Pty, fine-grained mixed clastic, carbonate
- Pat, fine-grained mixed clastic, dolostone (dolomite)
- Pbc, sandstone, limestone
- Pc, evaporite, limestone
- Pcp, carbonate
- Pgq, carbonate, sandstone
- Pqm, sandstone, mudstone

Quaternary Deposits

- Qa, alluvium
- Qe, eolian
- Qe/Qp, eolian
- Qoa, alluvium
- Qp, alluvium
- Qpl, lake or marine deposit (non-glacial), alluvium

Notes:
Geologic map source: Green, G.N., and Jones, G.E., 1997, The Digital Geologic Map of New Mexico in ARC/INFO Format: U.S. Geological Survey Open-File Report 97-0052, 9 p.; http://pubs.usgs.gov/of/1992/ofr-92-0052.
Coordinate System: NAD 1983 UTM Zone 13N, Projection: Transverse Mercator Datum: North American 1983

TITLE:
Regional Geology
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

Tt 3Bear Energy

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	2
PROJECT#	117-0536031	
DATE	10/24/2017	

Legend

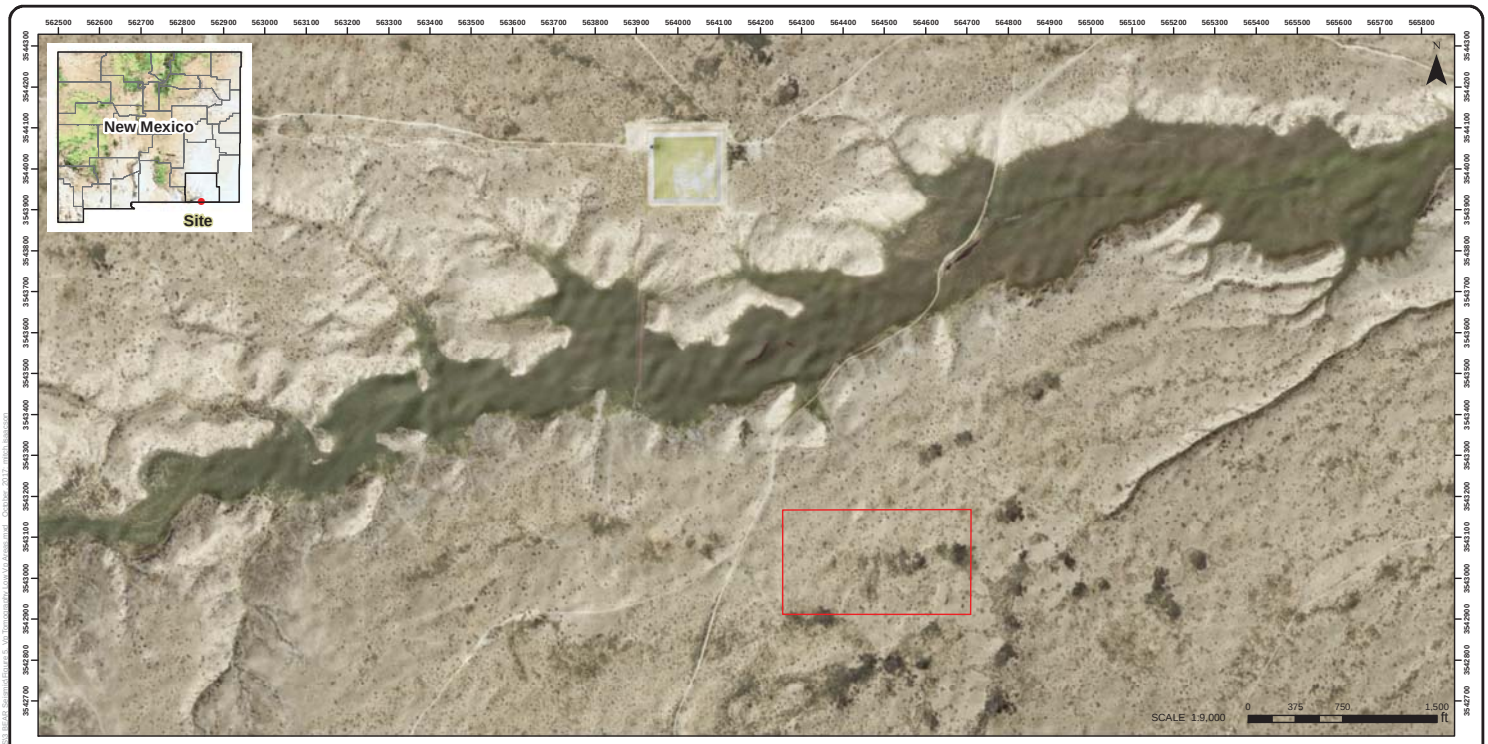
- Seismic Investigation Area
- Vibroseis Source Locations
- Geophone Receiver Locations

Notes:
Coordinate System: NAD 1983 UTM Zone 13N, Projection: Transverse Mercator, Datum: North American 1983

TITLE:
Seismic Aquisition Sources and Receivers
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	3
PROJECT#	117-0536031	
DATE	10/24/2017	



Legend

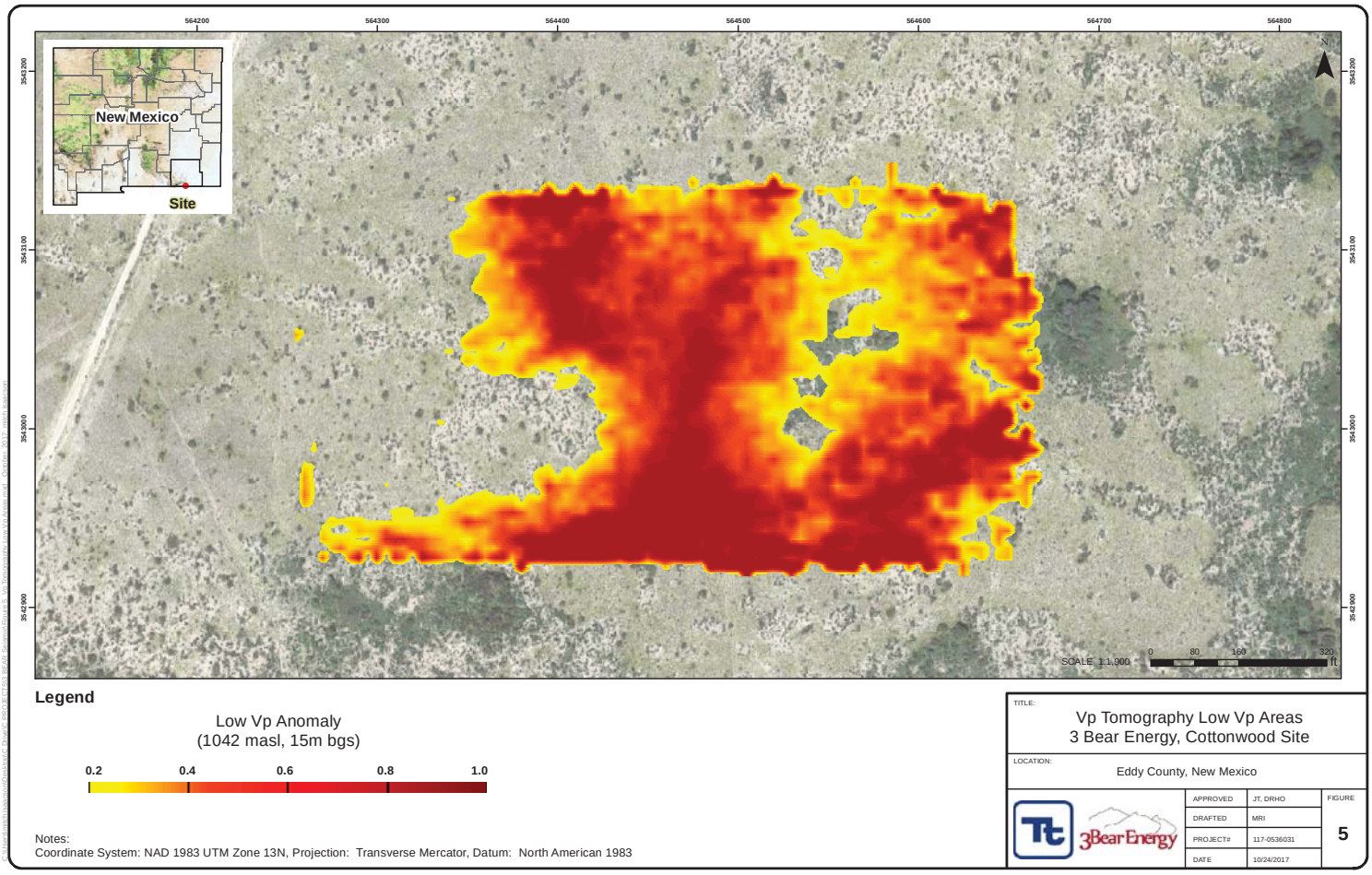
3D Seismic Volume Data Extent

Notes:
Coordinate System: NAD 1983 UTM Zone 13N, Projection: Transverse Mercator, Datum: North American 1983

TITLE:
3D Seismic Volume Data Extent
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	4
PROJECT#	117-0536031	
DATE	10/24/2017	



Legend

Low Vp Anomaly
(1042 masl, 15m bgs)

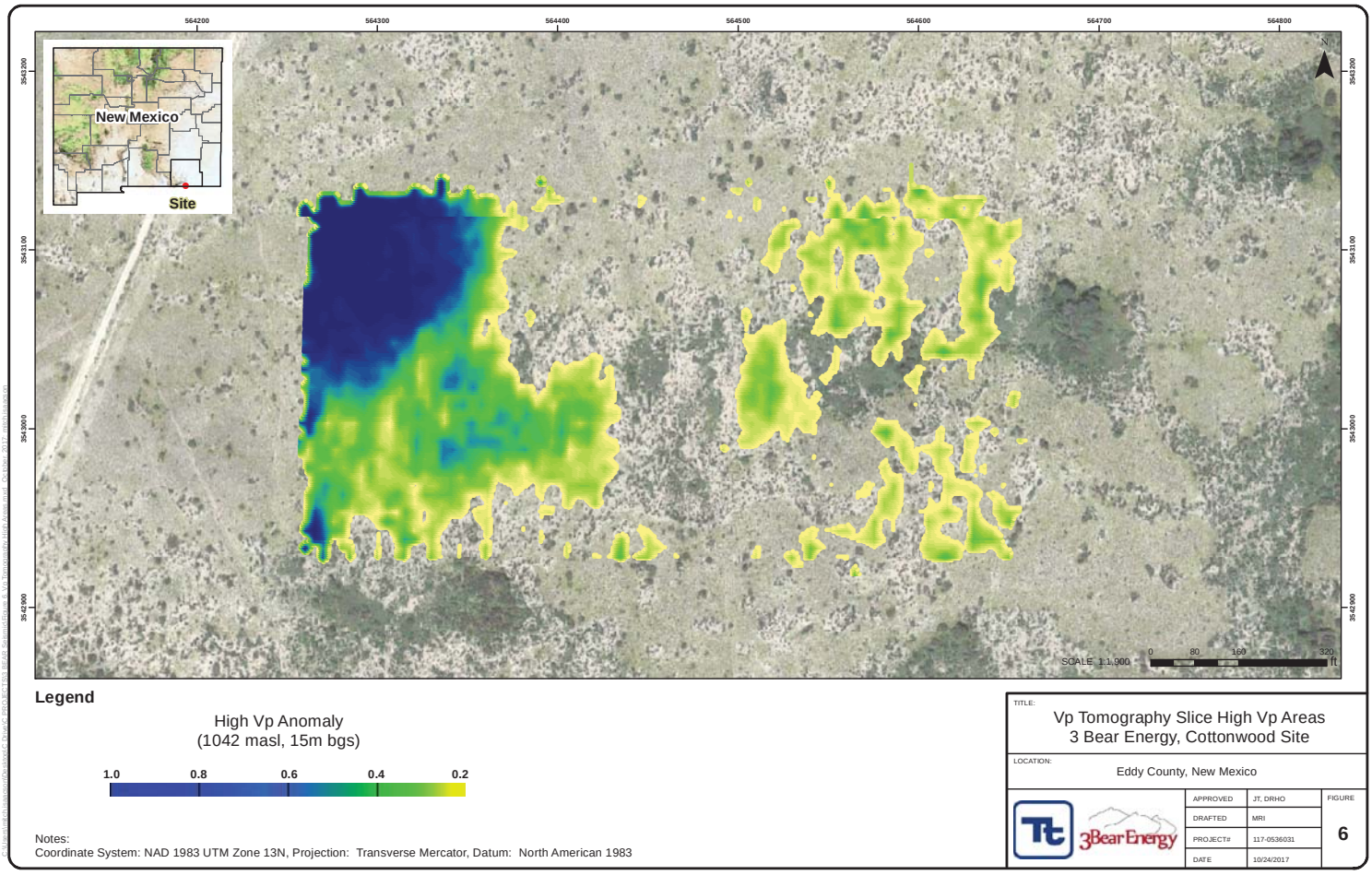
0.2 0.4 0.6 0.8 1.0

Notes:
Coordinate System: NAD 1983 UTM Zone 13N, Projection: Transverse Mercator, Datum: North American 1983

TITLE:
Vp Tomography Low Vp Areas
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	5
PROJECT#	117-0536031	
DATE	10/24/2017	



Legend

High Vp Anomaly
(1042 masl, 15m bgs)

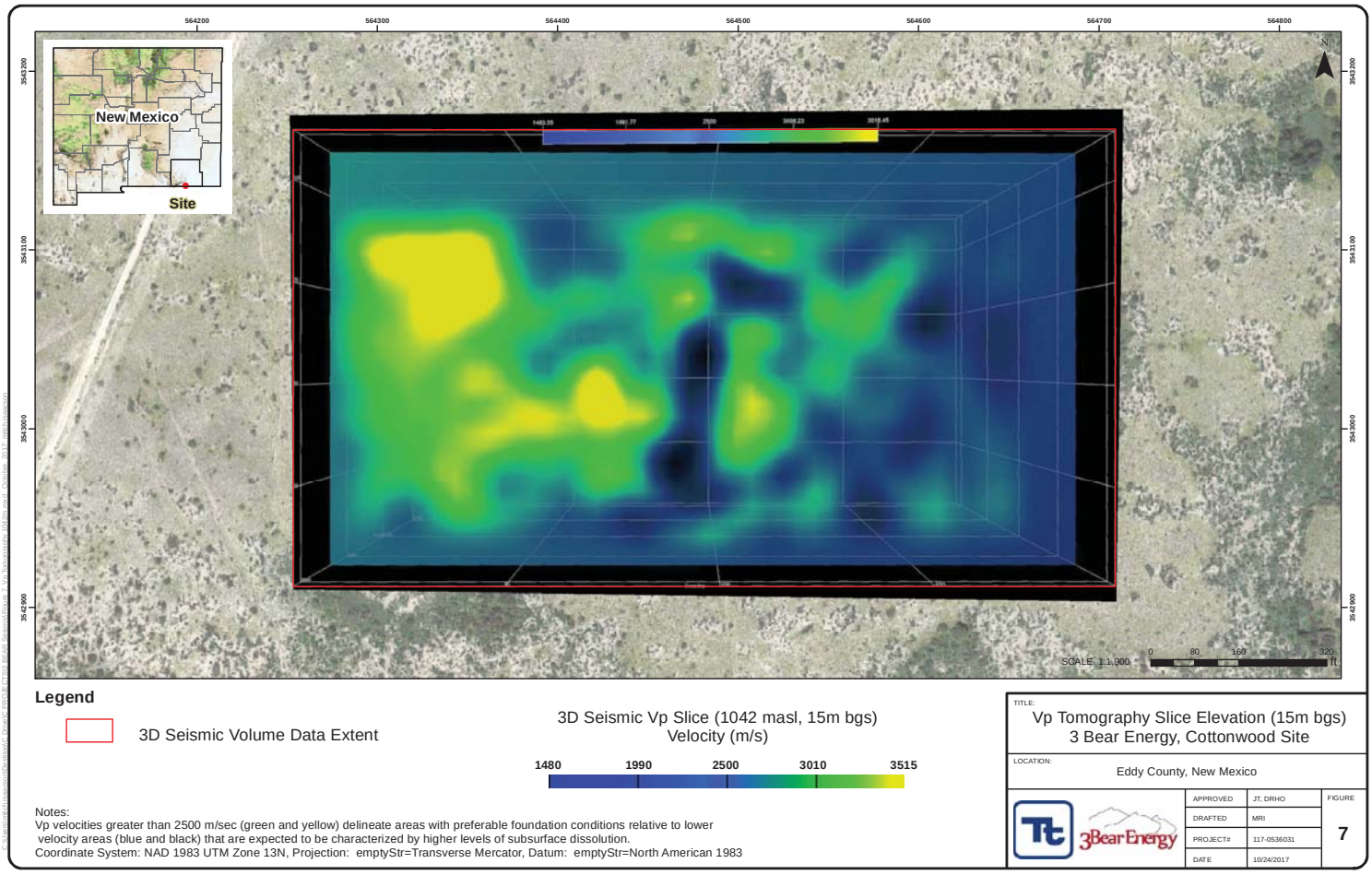
1.0 0.8 0.6 0.4 0.2

Notes:
Coordinate System: NAD 1983 UTM Zone 13N, Projection: Transverse Mercator, Datum: North American 1983

TITLE:
Vp Tomography Slice High Vp Areas
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	6
PROJECT#	117-0536031	
DATE	10/24/2017	



Legend

3D Seismic Volume Data Extent

3D Seismic Vp Slice (1042 masl, 15m bgs)
Velocity (m/s)

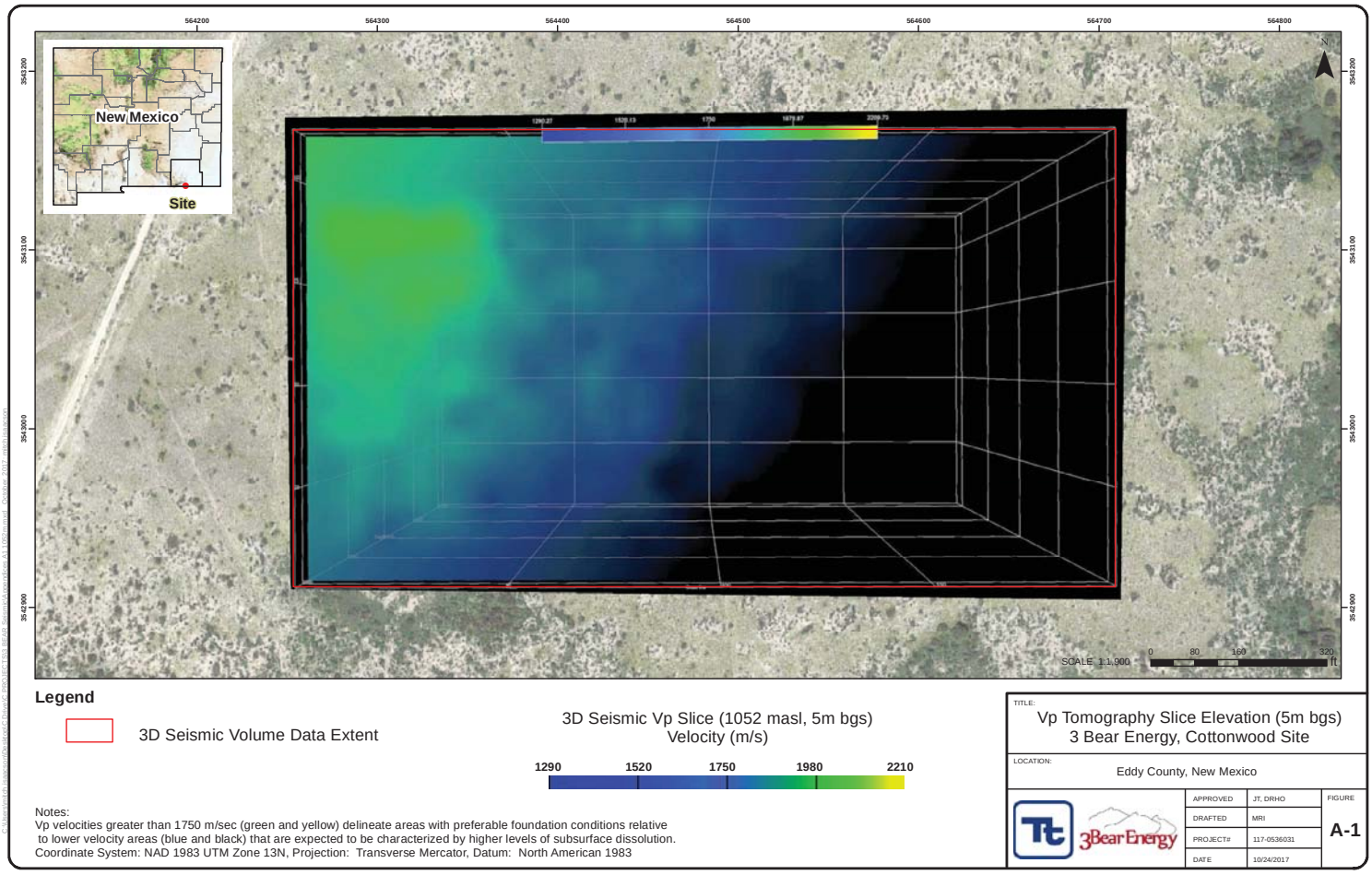
1480 1990 2500 3010 3515

Notes:
Vp velocities greater than 2500 m/sec (green and yellow) delineate areas with preferable foundation conditions relative to lower velocity areas (blue and black) that are expected to be characterized by higher levels of subsurface dissolution.
Coordinate System: NAD 1983 UTM Zone 13N, Projection: emptyStr=Transverse Mercator, Datum: emptyStr=North American 1983

TITLE:
Vp Tomography Slice Elevation (15m bgs)
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	7
PROJECT#	117-0536031	
DATE	10/24/2017	



Legend

3D Seismic Volume Data Extent

3D Seismic Vp Slice (1052 masl, 5m bgs)
Velocity (m/s)

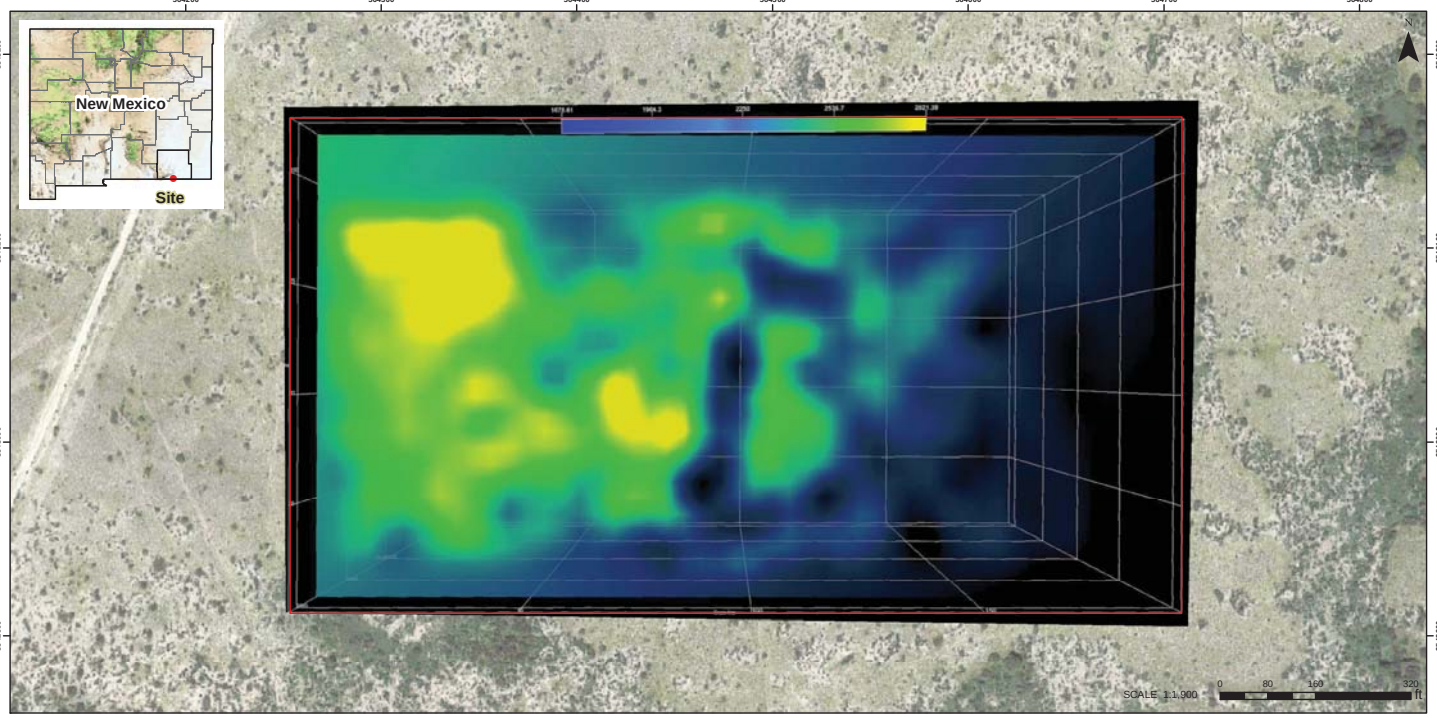
1290 1520 1750 1980 2210

Notes:
Vp velocities greater than 1750 m/sec (green and yellow) delineate areas with preferable foundation conditions relative to lower velocity areas (blue and black) that are expected to be characterized by higher levels of subsurface dissolution.
Coordinate System: NAD 1983 UTM Zone 13N, Projection: Transverse Mercator, Datum: North American 1983

TITLE:
Vp Tomography Slice Elevation (5m bgs)
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	A-1
PROJECT#	117-0536031	
DATE	10/24/2017	



Legend

3D Seismic Volume Data Extent

3D Seismic Vp Slice (1047 masl, 10m bgs)
Velocity (m/s)

1680 1960 2250 2540 2820

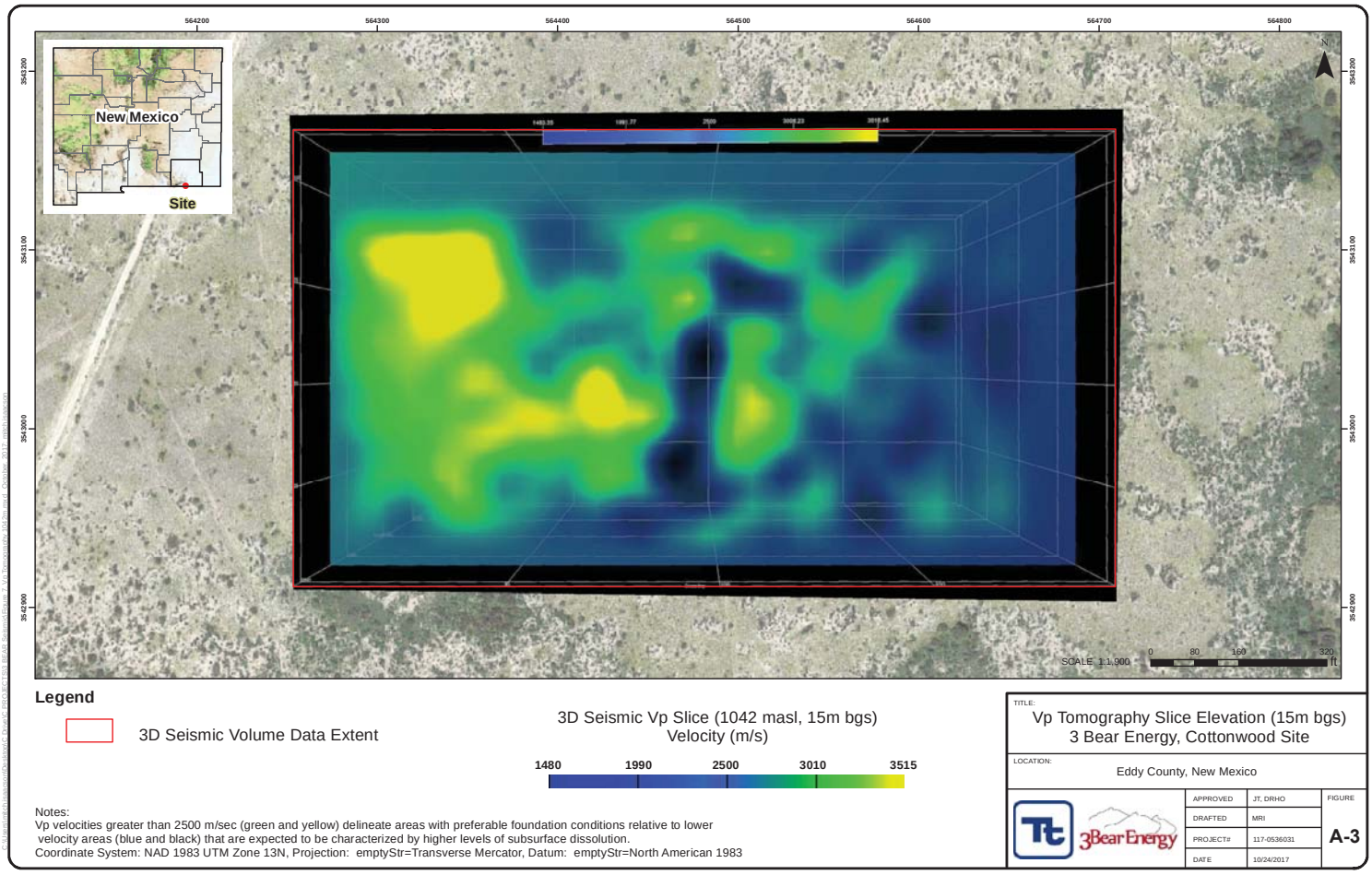
Notes:
Vp velocities greater than 2250 m/sec (green and yellow) delineate areas with preferable foundation conditions relative to lower velocity areas (blue and black) that are expected to be characterized by higher levels of subsurface dissolution.
Coordinate System: NAD 1983 UTM Zone 13N, Projection: Transverse Mercator, Datum: North American 1983

TITLE:
Vp Tomography Slice Elevation (10m bgs)
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	A-2
PROJECT#	117-0536031	
DATE	10/24/2017	

3Bear Energy



Legend

3D Seismic Volume Data Extent

3D Seismic Vp Slice (1042 masl, 15m bgs)
Velocity (m/s)

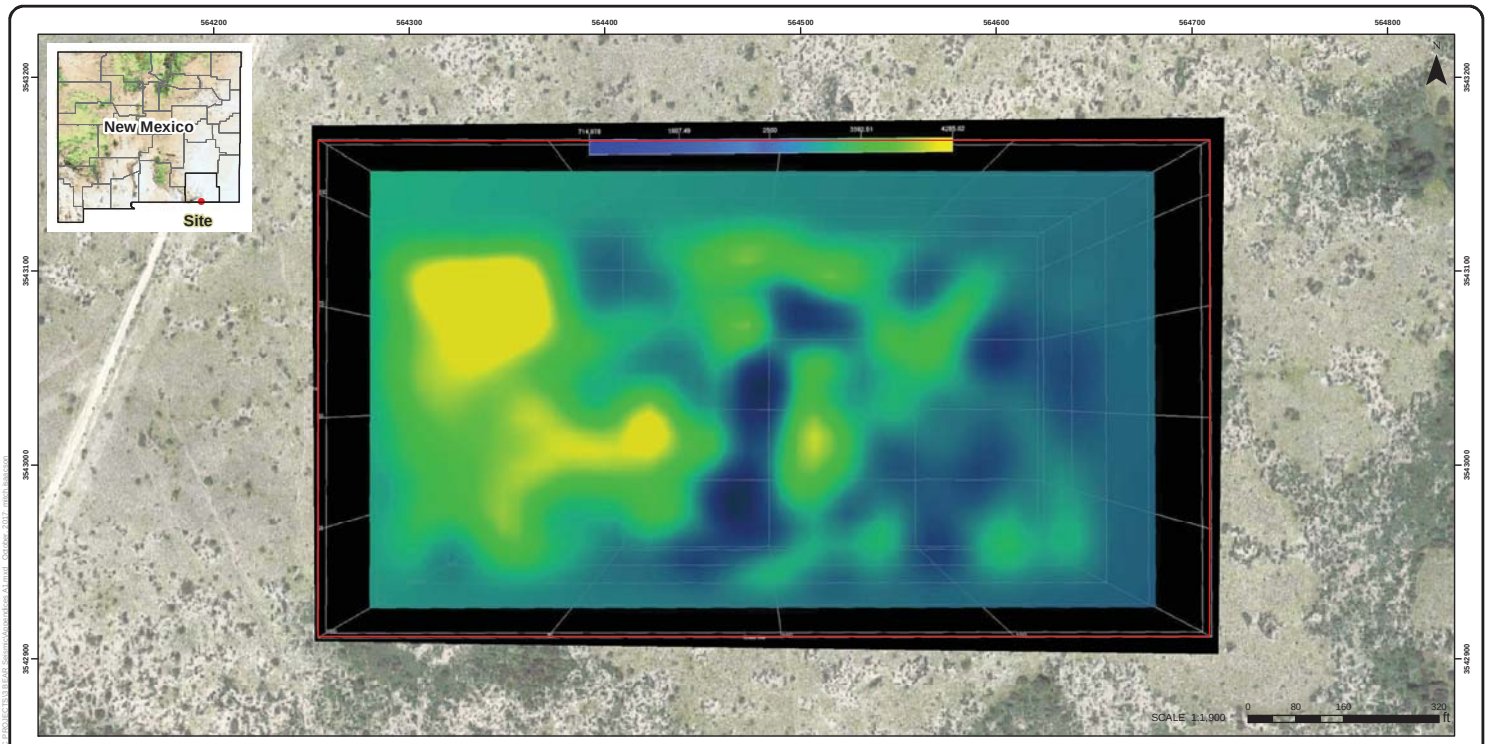
1480 1990 2500 3010 3515

Notes:
Vp velocities greater than 2500 m/sec (green and yellow) delineate areas with preferable foundation conditions relative to lower velocity areas (blue and black) that are expected to be characterized by higher levels of subsurface dissolution.
Coordinate System: NAD 1983 UTM Zone 13N, Projection: emptyStr=Transverse Mercator, Datum: emptyStr=North American 1983

TITLE:
Vp Tomography Slice Elevation (15m bgs)
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	A-3
PROJECT#	117-0536031	
DATE	10/24/2017	



Legend

3D Seismic Volume Data Extent

3D Seismic Vp Slice (1037 masl, 20m bgs)
Velocity (m/s)

710 1610 2500 3390 4290

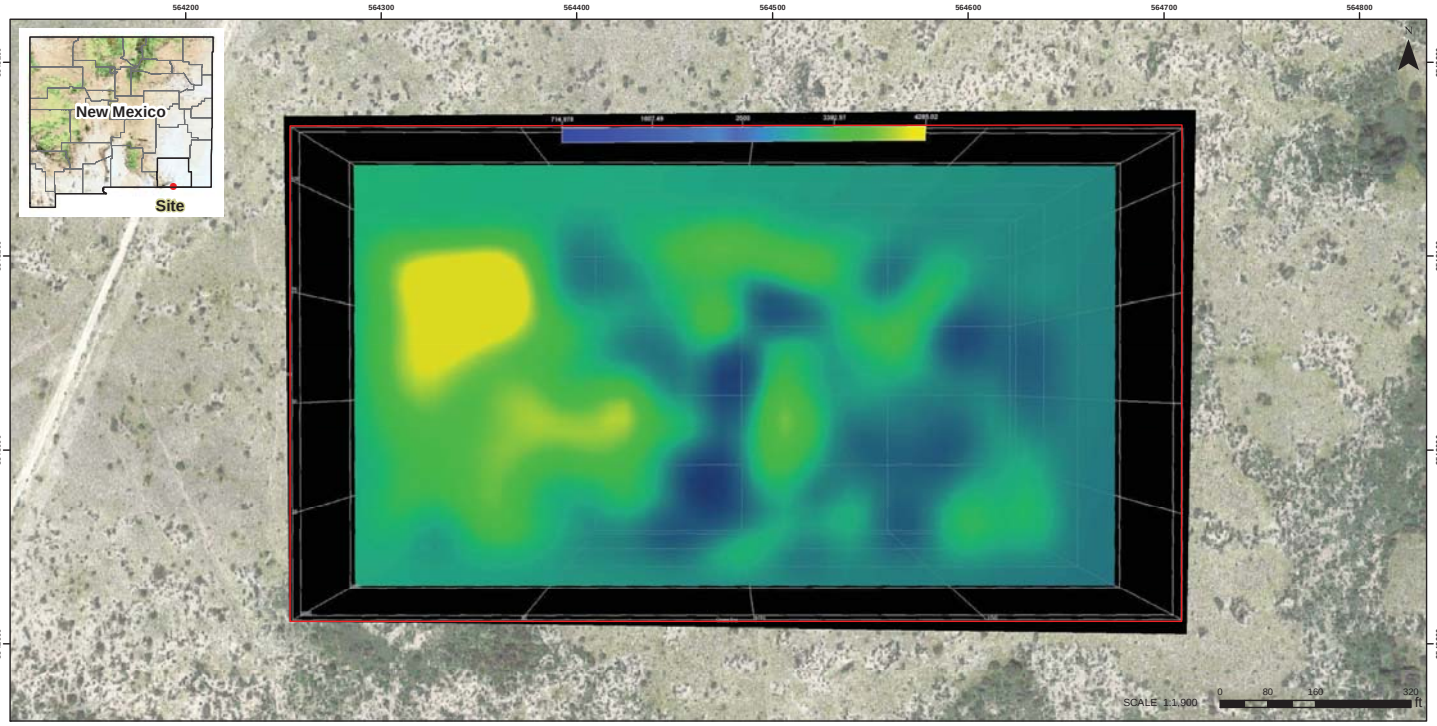
Notes:
Vp velocities greater than 2500 m/sec (green and yellow) delineate areas with preferable foundation conditions relative to lower velocity areas (blue and black) that are expected to be characterized by higher levels of subsurface dissolution.
Coordinate System: NAD 1983 UTM Zone 13N, Projection: Transverse Mercator, Datum: North American 1983

TITLE:
Vp Tomography Slice Elevation (20m bgs)
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	A-4
PROJECT#	117-0536031	
DATE	10/24/2017	

3Bear Energy



Legend

3D Seismic Volume Data Extent

3D Seismic Vp Slice (1032 masl, 25m bgs)
Velocity (m/s)

710 1610 2500 3390 4290

Notes:
Vp velocities greater than 2500 m/sec (green and yellow) delineate areas with preferable foundation conditions relative to lower velocity areas (blue and black) that are expected to be characterized by higher levels of subsurface dissolution.
Coordinate System: NAD 1983 UTM Zone 13N, Projection: Transverse Mercator, Datum: North American 1983

TITLE:
Vp Tomography Slice Elevation (25m bgs)
3 Bear Energy, Cottonwood Site

LOCATION:
Eddy County, New Mexico

APPROVED	JT, DRHO	FIGURE
DRAFTED	MRI	A-5
PROJECT#	117-0536031	
DATE	10/24/2017	

APPENDIX E
Liner Inspection

From: Liz Klein
To: mike.bratcher@state.nm.us
Subject: 48 Hour Notification of Liner Inspection - Cottonwood
Date: Tuesday, September 24, 2019 9:35:00 AM

3Bear Energy LLC will be conducting a liner inspection within the next 48 hours at the Cottonwood facility. This is notification of the inspection. Please let me know if you have any questions.

Thank you.

Liz Klein
EHS Regulatory Compliance
303-882-4404

Liz Klein

From: Liz Klein
Sent: Tuesday, September 24, 2019 10:26 AM
To: Bo Buescher
Cc: Gerald Wyche; Bruno Salazar
Subject: RE: Cottonwood Liner

Thank you I'll take a look at them. We have to leave the liner exposed until Thursday at 9:36 am. Will let everyone know if they contact me to come on site.

Thanks,
Liz

From: Bo Buescher
Sent: Tuesday, September 24, 2019 10:07 AM
To: Liz Klein <lklein@3bearllc.com>
Cc: Gerald Wyche <gerald@3bearllc.com>; Bruno Salazar <bsalazar@3bearllc.com>
Subject: Re: Cottonwood Liner

Liz- I have attached photos of the liner to verify no rips or tears are present. I also attached a picture of the excavation wall to verify no stain is present. Please contact me if you have any other questions or comments.

Bo Buescher
Construction Manager
3Bear Energy, LLC
210-243-7374 (C)
bbuescher@3bearllc.com
1512 Larimer Street, Suite 540
Denver, CO 80202

From: Liz Klein <lklein@3bearllc.com>
Date: Tuesday, September 24, 2019 at 8:28 AM
To: Bo Buescher <bbuescher@3bearllc.com>
Cc: Gerald Wyche <gerald@3bearllc.com>, Bruno Salazar <bsalazar@3bearllc.com>
Subject: Cottonwood Liner

I am sending the email notification to the OCD for the 48 hour notification of liner inspection today. If you can forward me photos of the liner to verify no rips or tears. I will also forward the certification language to put in an email to me confirming it was inspected etc.

Please let me know if you have any questions.

Thanks,
Liz