Incident ID	nMAP1822348621
District RP	2RP-4917
Facility ID	30-015-00255
Application ID	pMAP1822348242

November 12, 2018

Mike Bratcher & Maria Pruett
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division, District 2
811 S. First Street
Artesia, NM 88210

Re: **Site Assessment Report and Deferral Request**
Site Name: Andrew Arnquist Estate Battery
GPS: Latitude: 32.72141 Longitude: -104.4056
Legals: UL "F", Sec. 29, T18S, R26E
Eddy County, New Mexico
NMOCD Ref. No. 2RP-4917

Lowry Environmental & Associates, LLC (LEA), on behalf of Legacy Reserves Operating, LP, has prepared this Site Assessment Report and Deferral Request for the Release Site known as the Andrew Arnquist Estate Battery. Details of the release are summarized on the table below:

Nature and Volume of Release			
Date Release Discovered	7/30/2018	**Source of Release**	Water Tank
Type of Release	Produced Water	**Volume Released (bbls)**	200
		Volume Recovered (bbls)	170
Cause of Release The release was attributed to lightning striking the produced water tank.			
Affected Area The release was confined to within a lined tank battery containment. Heat from the lightning strike is presumed to have melted 2 holes in the liner.			
Was this a major release? Yes	**If YES, for what reasons (s) is this considered a major release?** Volume Greater than 25 bbls, occurred in conjuction with a fire.		
If Yes, was immediate notice given to the OCD? By whom? To whom? When and by what means? Not Available, Not Available, Not Available, Not Available			

A copy of the Release Notification (NMOCD Form C-141) is provided as Attachment #8.

Incident ID	nMAP1822348621
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Site Assessment/Characterization	
What is the shallowest depth to groundwater beneath the area affected by the release?	100-135'
Did this release impact groundwater or surface water?	No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	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)?	No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	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?	No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	No
Are the lateral extents of the release within 300 feet of a wetland?	No
Are the lateral extents of the release overlying a subsurface mine?	No
Are the lateral extents of the release overlying an unstable area such as karst geology?	No
Are the lateral extents of the release within a 100-year floodplain?	No
Did the release impact areas **not** on an exploration, development, production or storage site?	No

A search of groundwater databases maintained by the New Mexico Office of the State Engineer (NMOSE) and United States Geological Survey was conducted in an effort to determine the average depth to groundwater within a 1 Mile radius of the Site and identify any registered water wells within a 1/2 Mile radius of the Site. A search of the NMOSE databases suggested the presence of 1 water well (RA04160) within 1,000 ft. of the site. A field survey indicated available geographic information for RA04160 was outdated and/or incorrect; there was no water well in that vicinity. A search of the USGS and NMOSE databases identified one additional water well (324309104241201) within a 1/2 Mile radius.

Based on the volume and nature of the release, inferred depth to groundwater and NMOCD Siting Criteria, the NMOCD Closure Criteria for the Site is as follows:

Closure Criteria for Soil Impacted by a Release	
Benzene	**10 mg/kg**
Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX)	**50 mg/kg**
Total Petroleum Hydrocarbons	**2500 mg/kg**
Combined GRO and DRO	**1000 mg/kg**
Chloride	**20000 mg/kg**

NMOCD Siting Criteria data was gathered from available resources including Bureau of Land Management (BLM) shapefiles; topographic maps; NMOSE and USGS databases; and aerial imagery. The results are depicted on Figures 1 & 2. Depth to groundwater information is provided as Attachment #4. A Photographic Log is provided as Attachment #7.

Incident ID	nMAP1822348621
District RP	2RP-4917
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INITIAL SITE ASSESSMENT

On **August 17, 2018**, an initial site assessment was conducted at the Site. During the initial site assessment, the liner was inspected in an effort to determine if it had been compromised. During the liner inspection, two (2) holes were discovered. The holes were inferred to have been a result of the subject fire. Upon determining that the liner had been compromised, two (2) soil samples (SP #1 and SP #2) were collected from the soil beneath the areas where the liner had been compromised in an effort to determine if soil had been affected above the NMOCD Closure Criteria. The collected soil samples were submitted to an NMOCD-approved laboratory for analysis of TPH and chloride. Laboratory analytical results indicated concentrations of TPH exceeded the NMOCD Closure Criteria in each of the submitted soil samples; chloride concentrations were below the NMOCD Closure Criteria in each of the submitted soil samples.

On **November 7, 2018,** environmental personnel revisited the Site. During the site visit, a hand-auger was utilized to collect two (2) soil samples (SP #1b @ 2' and SP #2b @ 2') from the affected area represent by soil samples SP #1 and SP #2. The collected soil samples were submitted to the laboratory for analysis of BTEX, TPH and chloride. Laboratory analytical results indicated soil was not affected above the NMOCD Closure Criteria for TPH and chloride beyond 2 ft. bgs in the areas where the liner had been compromised, represented by sample points SP #1 and SP #2.

A table summarizing laboratory analytical results from soil samples collected during the initial site assessment is provided below:

Concentrations of BTEX, TPH and/or Chloride in Soil - Initial Assessment(s)

Sample ID	Date	Depth	Soil Status	SW 846 8021B		SW 846 8015M Ext.					E300/4500Cl
				Benzene (mg/kg)	BTEX (mg/kg)	GRO C_6-C_{10} (mg/kg)	DRO C_{10}-C_{28} (mg/kg)	GRO + DRO C_6-C_{28} (mg/kg)	ORO C_{28}-C_{36} (mg/kg)	TPH C_6-C_{36} (mg/kg)	Chloride (mg/kg)
SP #1	8/17/18	Surf.	In-Situ	-	-	37.6	2,240	**2,277.6**	310	**2,588**	2,040
SP #2	8/17/18	Surf.	In-Situ	-	-	<50.0	2,480	**2,480**	238	**2,718**	16,400
SP #1b @ 2'	11/7/18	2'	In-Situ	<0.050	<0.300	<10.0	18.9	18.9	<10.0	18.9	64.0
SP #2b @ 2'	11/7/18	2'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	5,600
Closure Criteria				**10**	**50**	**-**	**-**	**1,000**	**-**	**2,500**	**20,000**

A "Site & Sample Location Map" is provided as Attachment #3. Field Data, if applicable, is provided as Attachment #9. Soil profile observations are provided on Attachment #5. Laboratory analytical reports are provided as Attachment #6.

Incident ID	nMAP1822348621
District RP	2RP-4917
Facility ID	30-015-00255
Application ID	pMAP1822348242

DEFERRAL REQUEST

The release occurred within a lined tank battery facility. During the initial sites assessment it was determined that portions of the liner had been compromised, presumable from the subject fire that caused the release. Upon determining that the integrity of the liner had been compromised, soil beneath the affected portion of the liner was sampled in an effort to determine if the soil was affected above the NMOCD Closure Criteria and delineated. Laboratory analytical results indicated soil was not affected above the NMOCD Closure Criteria beyond 2 ft. bgs.

Legacy maintains excavation and backfilling of the affected area within the tank battery would require a major facility deconstruction and could result in hazardous conditions and/or property damage. Based on laboratory analytical results, site characteristics and field observations made during the initial site assessment, Legacy requests remediation, restoration and reclamation be deferred until the equipment is removed during other operations and/or at time of abandonment, whichever comes first.

RESTORATION, RECLAMATION AND RE-VEGETATION PLAN

Upon receiving NMOCD permission, the affected liner will be repaired,the tank battery restored and the facility put back into operation. Final remediation and reclamation will be conducted in accordance with 19.15.29.12 and 19.15.29.13 NMAC, once the site is no longer being used for oil and gas operations.

If you have any questions, or need any additional information, please feel free to contact Brian Cunningham or the undersigned by phone or email.

Respectfully,

Joel W. Lowry
Environmental Professional
Lowry Environmental & Associates, LLC

Attachments:
Attachment #1- Figure 1 - Topographic Map
Attachment #2- Figure 2 - Aerial Map
Attachment #3- Figure 3 - Site & Sample Location Map
Attachment #4- Depth to Groundwater Information
Attachment #5- Soil Profile
Attachment #6- Laboratory Analytical Reports
Attachment #7- Photographic Log
Attachment #8- Release Notification (FORM C-141)
Attachment #9- Field Data

Incident ID	nMAP1822348621
District RP	2RP-4917
Facility ID	30-015-00255
Application ID	pMAP1822348242

LIMITATIONS

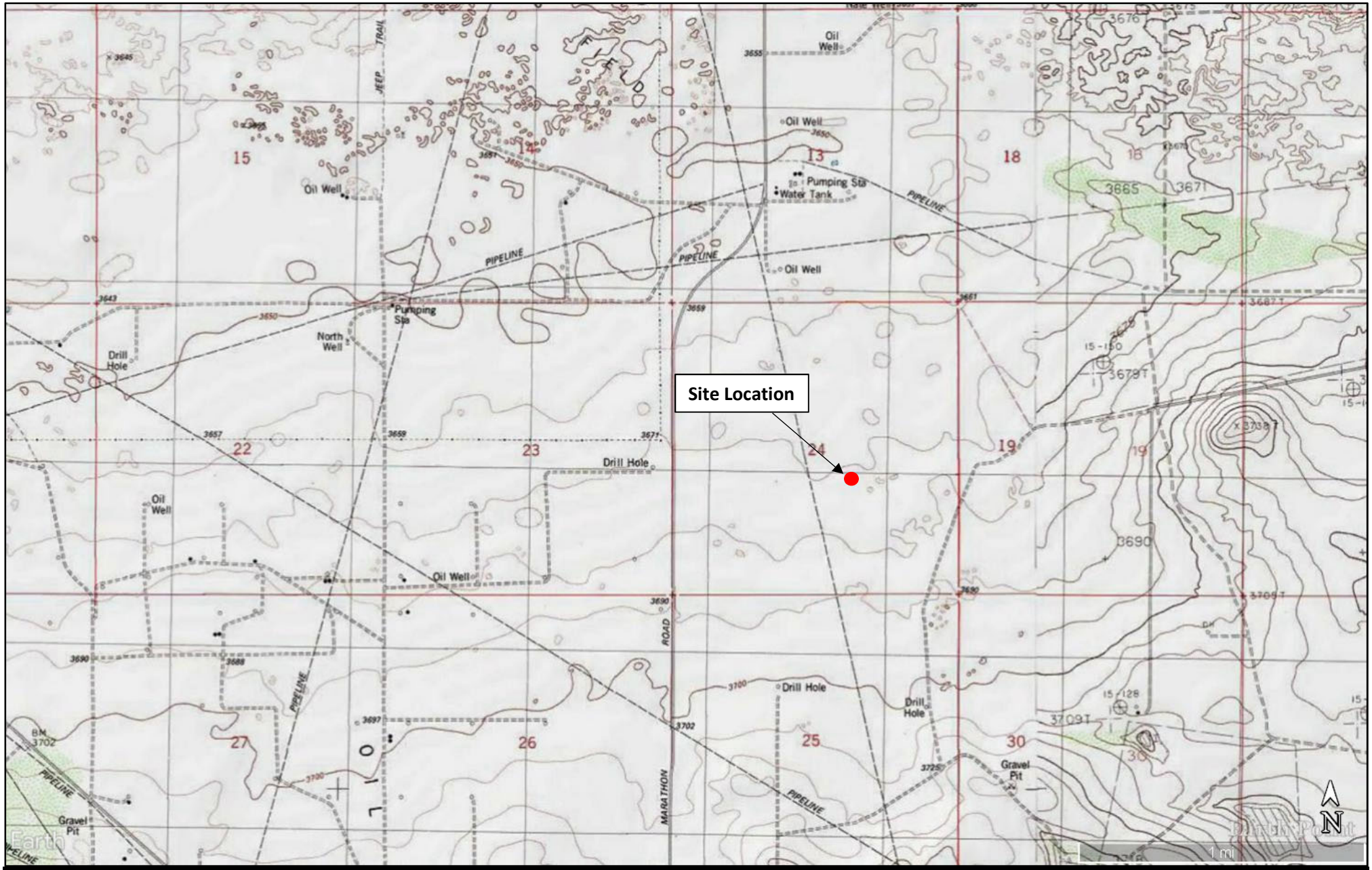
This document has been prepared on behalf of Legacy Reserves Operating, LP. Use of information contained in this report, including exhibits and attachments, by any other party without the consent of LEA and/or Legacy Reserves Operating, LP is prohibited.

This document has been prepared in a professional manner, using the degree of skill and care exercised by similar environmental professionals. LEA notes that the facts and conditions referenced in this document may change over time and that the conclusions and recommendations are only applicable to the facts and conditions as described at the time this document was prepared.

LEA has prepared this report to the best of its ability. No other warranty, expressed or implied, is made or intended.

ATTACHMENT #1

Figure 1 - Topographic Map



LEGEND:

- Site Location

Figure 1

Topographic Map

Legacy Reserves Operating, LP

Andrew Arnquist Estate Battery

GPS: 32.72141, -104.4056

Eddy County, New Mexico

LOWRY environmental

Drafted by: jwl Checked by: client Date: 11/12/2018

ATTACHMENT #2

Figure 2 - Aerial Map

LEGEND:

- Site Location
- Fresh Water Well
- 100-Year Floodplain
- High/Critical Karst
- Non-Inustrial Building
- Subsurface Mine
- 1/2 Mile Radius

Figure 2

Aerial Map

Legacy Reserves Operating, LP

Andrew Arnquist Estate Battery

GPS: 32.72141, -104.4056

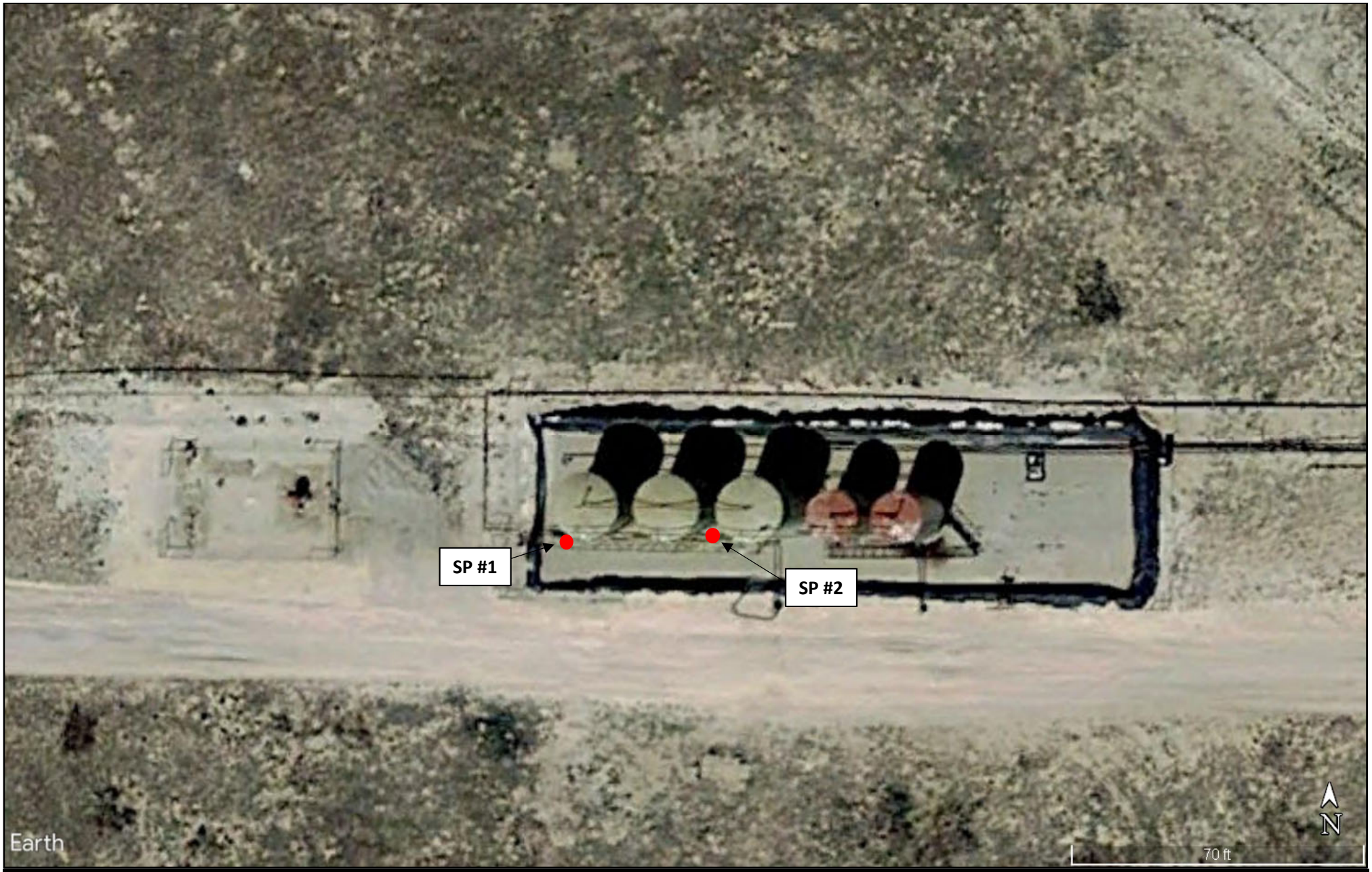
Eddy County, New Mexico

LOWRY environmental

Drafted by: jwl Checked by: client Date: 11/12/2018

ATTACHMENT #3

Figure 3 - Site & Sample Location Map



LEGEND:

- Sample Location

Figure 3

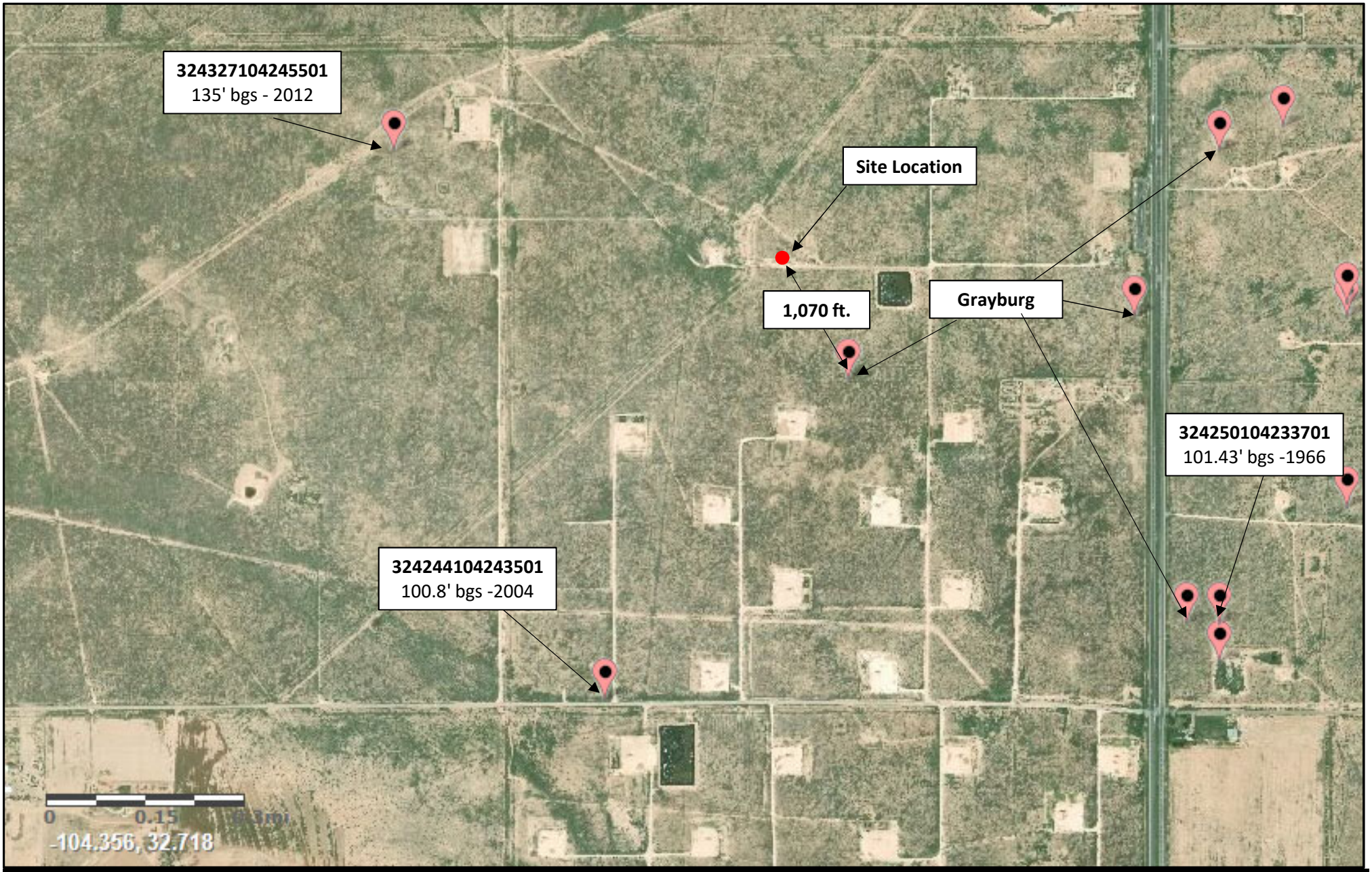
Site & Sample Location Map
Legacy Reserves Operating, LP
Andrew Arnquist Estate Battery
GPS: 32.72141, -104.4056
Eddy County, New Mexico

LOWRY environmental

Drafted by: jwl Checked by: client Date: 11/12/2018

ATTACHMENT #4

Depth to Groundwater Information



LEGEND:

- Site Location

Figure 4

USGS Well Proximity Map
Legacy Reserves Operating, LP
Andrew Arnquist Estate Battery
GPS: 32.72141, -104.4056
Eddy County, New Mexico

LOWRY environmental

Drafted by: jwl Checked by: client Date: 11/12/2018

National Water Information System: Web Interface

Click to hideNews Bulletins

- Please see news on new formats
- **UPDATE, 11/2: The USGS continues to make progress on restoring all of its gages. As of 3 p.m. Friday, November 2, less than 3 percent of USGS streamgages are still not transmitting due to an issue with the telemetry system that records and transmits streamgage data. The USGS will continue to work through the weekend to bring the streamgages back online. Read more**
- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 324309104241201

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

USGS 324309104241201 18S.26E.29.32200

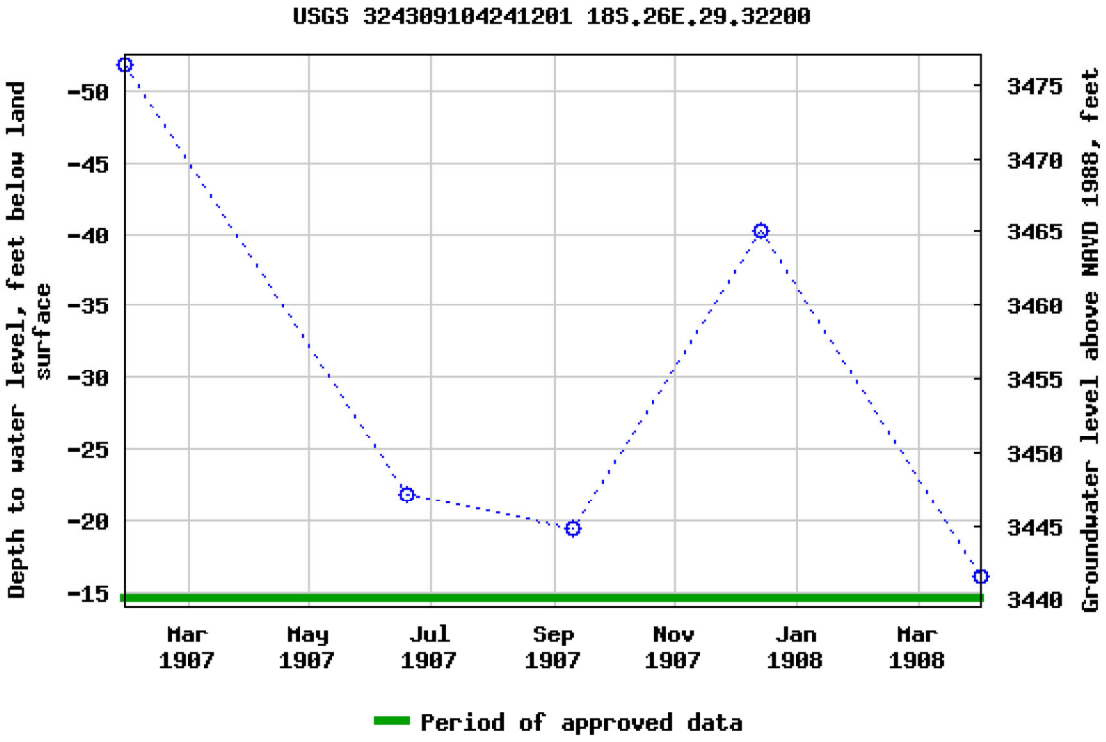
Available data for this site Groundwater: Field measurements | GO

Eddy County, New Mexico
Hydrologic Unit Code --
Latitude 32°43'09", Longitude 104°24'12" NAD27
Land-surface elevation 3,425 feet above NAVD88
This well is completed in the Grayburg Formation (313GRBG) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data

Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
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Help
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- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 324327104245501

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

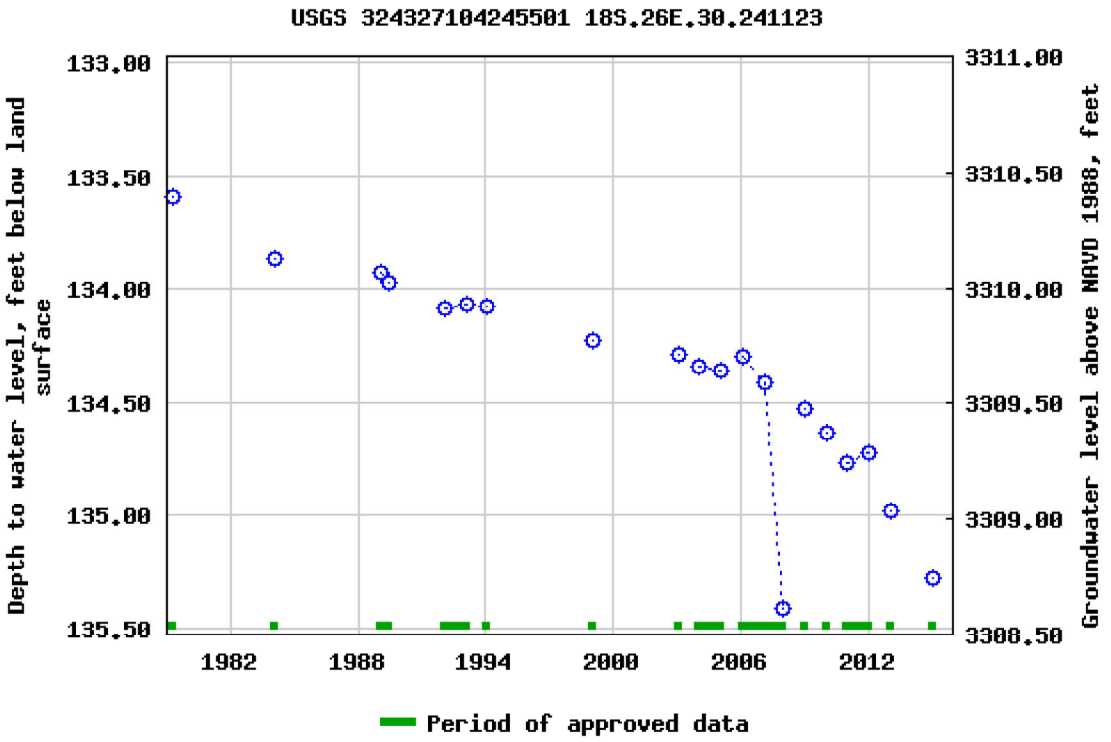
USGS 324327104245501 18S.26E.30.241123

Available data for this site Groundwater: Field measurements | GO

Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°43'27", Longitude 104°24'55" NAD27
Land-surface elevation 3,444 feet above NAVD88
The depth of the well is 205 feet below land surface.
This well is completed in the Roswell Basin aquifer system (S400RSWLBS) national aquifer.
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
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- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 324244104243501

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

USGS 324244104243501 18S.26E.32.11100

Available data for this site Groundwater: Field measurements | GO

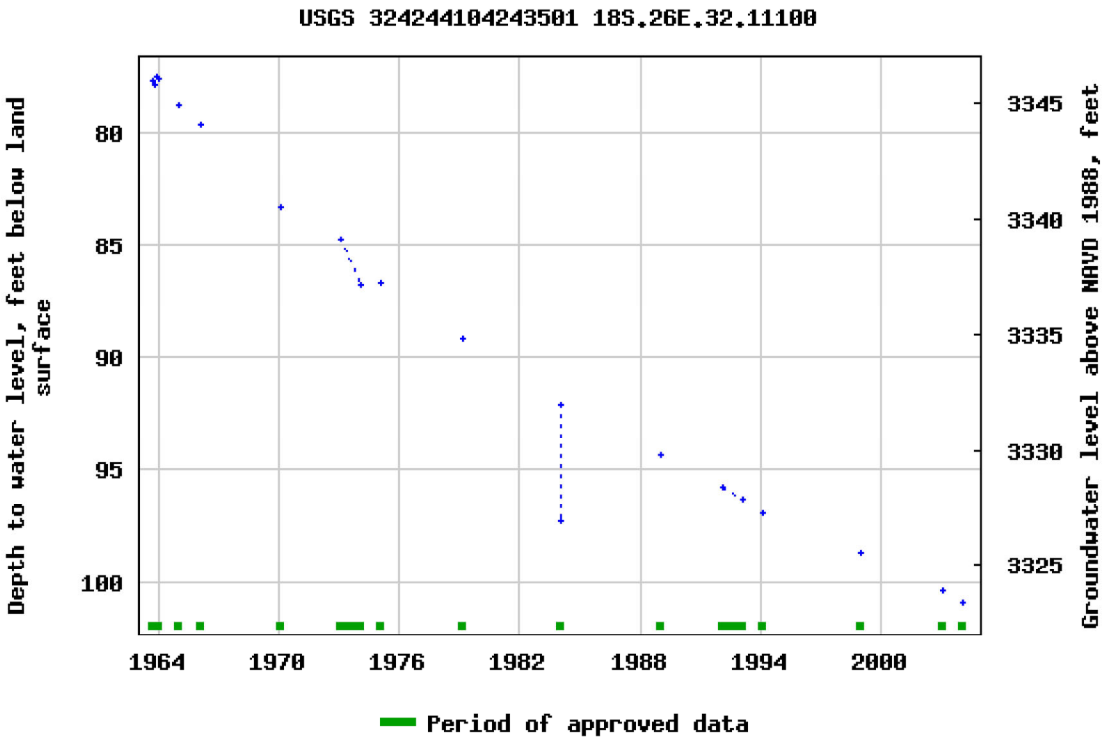
Eddy County, New Mexico
Hydrologic Unit Code --
Latitude 32°42'44", Longitude 104°24'35" NAD27
Land-surface elevation 3,424 feet above NAVD88
The depth of the well is 152 feet below land surface.
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

Output formats

Table of data
Tab-separated data

Graph of data

Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

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- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 324259104232501

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

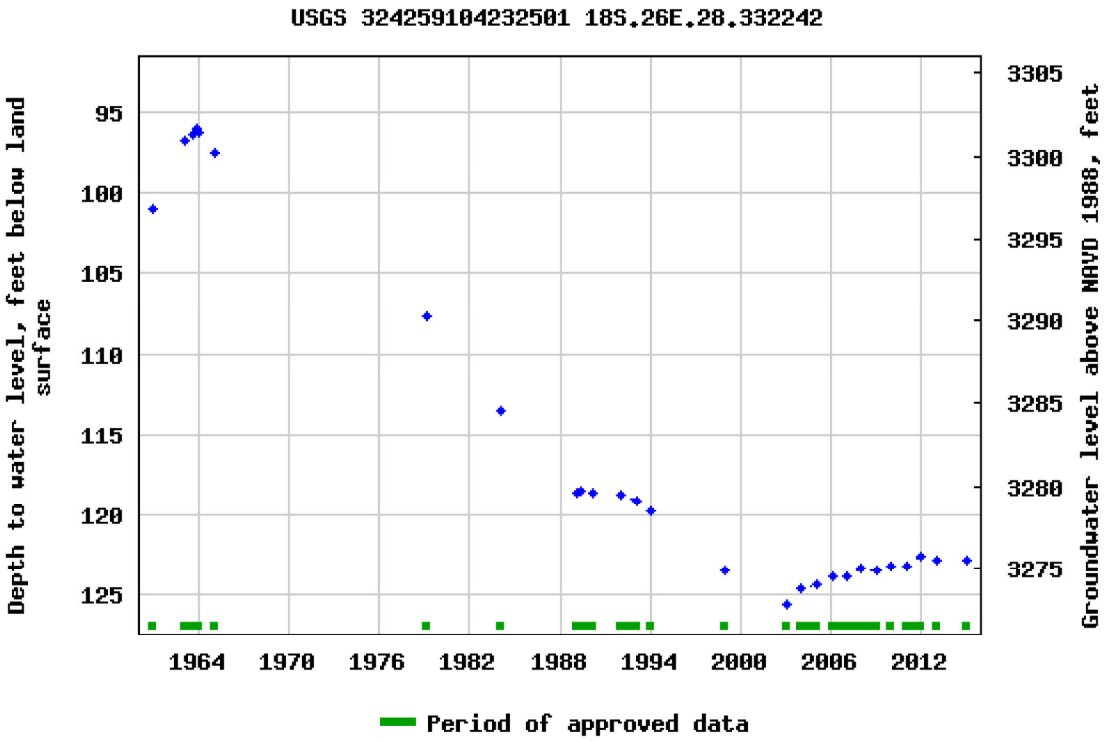
USGS 324259104232501 18S.26E.28.332242

Available data for this site Groundwater: Field measurements | GO

Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°42'59", Longitude 104°23'25" NAD27
Land-surface elevation 3,398 feet above NAVD88
The depth of the well is 170 feet below land surface.
This well is completed in the Roswell Basin aquifer system (S400RSWLBS) national aquifer.
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
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News

Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2018-11-06 14:43:47 EST
1.05 0.91 nadww01

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	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twn	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
RA 04160		RA	ED	1	4	1	29	18S	26E	555542	3620580*	158	160	100	60

Average Depth to Water: **100 feet**

Minimum Depth: **100 feet**

Maximum Depth: **100 feet**

Record Count: 1

UTMNAD83 Radius Search (in meters):

Easting (X): 555699 **Northing (Y):** 3620559 **Radius:** 805

***UTM location was derived from PLSS - see Help**

New Mexico Office of the State Engineer

Point of Diversion Summary

		(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest)						(NAD83 UTM in meters)	
Well Tag	**POD Number**	**Q64**	**Q16**	**Q4**	**Sec**	**Tws**	**Rng**	**X**	**Y**
	RA 04160	1	4	1	29	18S	26E	555542	3620580*

x

Driller License:	62	**Driller Company:**	BEATTY, J.R.		
Driller Name:	WILLIARD BEATTY				
Drill Start Date:	02/12/1960	**Drill Finish Date:**	02/15/1960	**Plug Date:**	
Log File Date:	03/03/1960	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	
Casing Size:	7.00	**Depth Well:**	160 feet	**Depth Water:**	100 feet

x

***UTM location was derived from PLSS - see Help**

ATTACHMENT #5

Soil Profile

SOIL PROFILE

Site Name: A. Arnquist Est.

Date: 11/7/2019

Description	Depth (ft. bgs)
Caliche Pad Material	1
Native Brown Soil w/Clay	2
	3
	4
	5
	6
	7
	8
	9
	0
	1
	2
	3
	4
	5
	6
	7
	8
	9
	0
	1
	2
	3
	4
	5
	6
	7
	8
	9
	0
	1
	2
	3
	4
	5
	6
	7
	8
	9
	0

ATTACHMENT #6

Laboratory Analytical Reports

CARDINAL Laboratories

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

August 24, 2018

STEVE TAYLOR

CAPROCK SERVICES

P.O. BOX 457

LOVINGTON, NM 88260

RE: ANDREW ARNQUIST ESTATE BATTERY

Enclosed are the results of analyses for samples received by the laboratory on 08/20/18 10:50.

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:

CAPROCK SERVICES
STEVE TAYLOR
P.O. BOX 457
LOVINGTON NM, 88260
Fax To:

Received:	08/20/2018	Sampling Date:	08/17/2018
Reported:	08/24/2018	Sampling Type:	Soil
Project Name:	ANDREW ARNQUIST ESTATE BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP #1 (H802318-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2040**	16.0	08/21/2018	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS S-04

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	**37.6**	10.0	08/21/2018	ND	205	103	200	0.866	
DRO >C10-C28*	**2240**	10.0	08/21/2018	ND	208	104	200	3.67	
EXT DRO >C28-C36	**310**	10.0	08/21/2018	ND					

Surrogate: 1-Chlorooctane	*114 %*	*41-142*
Surrogate: 1-Chlorooctadecane	*194 %*	*37.6-147*

Sample ID: SP #2 (H802318-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16400**	16.0	08/21/2018	ND	432	108	400	0.00	

TPH 8015M mg/kg Analyzed By: MS S-06

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<50.0	50.0	08/21/2018	ND	205	103	200	0.866	
DRO >C10-C28*	**2480**	50.0	08/21/2018	ND	208	104	200	3.67	
EXT DRO >C28-C36	**238**	50.0	08/21/2018	ND					

Surrogate: 1-Chlorooctane	*114 %*	*41-142*
Surrogate: 1-Chlorooctadecane	*222 %*	*37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

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.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
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

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:	Caprock Services
Project Manager:	Steve Taylor
Address:	P.O. Box 457
City:	Lovington
State:	NM
Zip:	88260
Phone #:	(575) 704-2718
Fax #:	
Project #:	
Project Owner:	Legacy
Project Name:	Andrew Arnquist Estate Battery
Project Location:	
Sampler Name:	Steve Taylor

BILL TO

P.O. #:	
Company:	Caprock Services
Attn:	Steve Taylor
Address:	P.O. Box 457
City:	Lovington
State:	NM
Zip:	88260
Phone #:	(575) 704-2718
Fax #:	

ANALYSIS REQUEST

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	Chloride	TPH
H802318																
1	SP #1	X				X					X		8/17/18	11:00 Am	X	X
2	SP #2	X				X					X		8/17/18	11:15 Am	X	X

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: 8/20/18	Received By: Jodi Henson	Phone Result: ☐ Yes ☐ No Add'l Phone #:
Relinquished By:	Time: 10:50	Received By:	Fax Result: ☐ Yes ☐ No Add'l Fax #:
	Date:		REMARKS:
	Time:		

Delivered By: (Circle One)
Sampler - UPS - Bus - Other: -4.8°C #54

Sample Condition: Cool ☑ Yes ☐ No; Intact ☑ Yes ☐ No

CHECKED BY: (Initials)

† Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

CARDINAL Laboratories

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

November 09, 2018

STEVE TAYLOR

CAPROCK SERVICES

P.O. BOX 457

LOVINGTON, NM 88260

RE: ANDREW ARNQUIST ESTATE BATTERY

Enclosed are the results of analyses for samples received by the laboratory on 11/08/18 11:18.

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:

CAPROCK SERVICES
STEVE TAYLOR
P.O. BOX 457
LOVINGTON NM, 88260
Fax To:

Received:	11/08/2018	Sampling Date:	11/07/2018
Reported:	11/09/2018	Sampling Type:	Soil
Project Name:	ANDREW ARNQUIST ESTATE BATTERY	Sampling Condition:	** (See Notes)
Project Number:	LEGACY	Sample Received By:	Tamara Oldaker
Project Location:	ARTESIA, NM		

Sample ID: SP #1B @ 2' (H803229-01)

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	11/09/2018	ND	1.63	81.5	2.00	2.61	
Toluene*	<0.050	0.050	11/09/2018	ND	1.76	88.1	2.00	1.24	
Ethylbenzene*	<0.050	0.050	11/09/2018	ND	1.84	92.2	2.00	0.505	
Total Xylenes*	<0.150	0.150	11/09/2018	ND	5.56	92.7	6.00	0.118	
Total BTEX	<0.300	0.300	11/09/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *69.8-142*

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	11/08/2018	ND	416	104	400	0.00	

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	11/09/2018	ND	208	104	200	7.06	
DRO >C10-C28*	**18.9**	10.0	11/09/2018	ND	209	105	200	2.36	
EXT DRO >C28-C36	<10.0	10.0	11/09/2018	ND					

Surrogate: 1-Chlorooctane *93.7 %* *41-142*

Surrogate: 1-Chlorooctadecane *87.3 %* *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:

CAPROCK SERVICES
STEVE TAYLOR
P.O. BOX 457
LOVINGTON NM, 88260
Fax To:

Received:	11/08/2018	Sampling Date:	11/07/2018
Reported:	11/09/2018	Sampling Type:	Soil
Project Name:	ANDREW ARNQUIST ESTATE BATTERY	Sampling Condition:	** (See Notes)
Project Number:	LEGACY	Sample Received By:	Tamara Oldaker
Project Location:	ARTESIA, NM		

Sample ID: SP #2B @ 2' (H803229-02)

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	11/09/2018	ND	1.63	81.5	2.00	2.61	
Toluene*	<0.050	0.050	11/09/2018	ND	1.76	88.1	2.00	1.24	
Ethylbenzene*	<0.050	0.050	11/09/2018	ND	1.84	92.2	2.00	0.505	
Total Xylenes*	<0.150	0.150	11/09/2018	ND	5.56	92.7	6.00	0.118	
Total BTEX	<0.300	0.300	11/09/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *105 %* *69.8-142*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**5600**	16.0	11/08/2018	ND	416	104	400	0.00	

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	11/09/2018	ND	208	104	200	7.06	
DRO >C10-C28*	<10.0	10.0	11/09/2018	ND	209	105	200	2.36	
EXT DRO >C28-C36	<10.0	10.0	11/09/2018	ND					

Surrogate: 1-Chlorooctane *95.1 %* *41-142*

Surrogate: 1-Chlorooctadecane *86.2 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

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

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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	Caprock Services	**BILL TO**	
Project Manager:	Steve Taylor	**P.O. #:**	
Address:		**Company:**	Caprock Services
City:	Lovington **State:** NM **Zip:** 88260	**Attn:**	
Phone #:	(575)704-2718 **Fax #:**	**Address:**	Steve Taylor P.O. Box 457
Project #:	**Project Owner:** Legacy	**City:**	Lovington
Project Name:	Andrew Arnquist Estate Battery	**State:** NM **Zip:** 88260	
Project Location:	Artesia NM	**Phone #:**	(575)704-2718
Sampler Name:	Matt Taylor	**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: BTEX 8021	TPH 8015 M Ext	Cl-
H803229																	
1	SP #1 b @ 2'	G	1			X							11-7-18	1300	X	X	X
2	SP #2 b @ 2'	G	1			X							11-7-18	1310	X	X	X

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: Matt Taylor	**Date:** 11-8-17 **Time:** 11:18 AM	**Received By:** Tamara Oldaker	
Relinquished By:	**Date:** **Time:**	**Received By:**	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	8.2°C #97	**Sample Condition** Cool: ☐ Yes ☑ No Intact: ☑ Yes ☐ No	**CHECKED BY: (Initials)** T.D.

Phone Result: ☐ Yes ☐ No **Add'l Phone #:**
Fax Result: ☐ Yes ☐ No **Add'l Fax #:**
REMARKS:

joel@lowryenvironmental.com
matt.caprockservices@gmail.com
caprockservices56@gmail.com

Rush

FORM-006 R 2.0

† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476

ATTACHMENT #7

Photographic Log

PHOTOGRAPHIC LOG

Figure 1 View of the affected portion of the tank battery facility, facing Northeast.

Figure 2 View of the affected portion of the tank battery facility, facing North.

PHOTOGRAPHIC LOG

Figure 3 View of the affected portion of the tank battery facility, facing North.

Figure 4 View of surface staining from the initial release, facing South.

ATTACHMENT #8

Release Notification (FORM C-141)

OCD Rec'd:08/03/18

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

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

Form C-141
Revised April 3, 2017

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Legacy Reserves OGRID: 240974	Contact Manual Soriano
Address 303 W Wall street, Suite 1800, Midland, TX 79701	Telephone No. (432) 269-8806
Facility Name Andrew Arnquist Estate Battery	Facility Type Oil and gas production facility

Surface Owner Andrew Arnquist Estate	Mineral Owner Andrew Arnquist Estate	API No.3001500255

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	29	18S	26E	1650	FNL	1650	FWL	Eddy

Latitude 32 43' 16.97" **Longitude** 104 24' 19.99" NAD83

NATURE OF RELEASE

Type of Release Produced Water	Volume of Release 200BBL	Volume Recovered 170BBL
Source of Release Water Tank	Date and Hour of Occurrence7/31/18 7:00pm	Date and Hour of Discovery7/30/18 7:00pm
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Lighting strike. Standing fluid inside of the containment was pick up via vacuum truck.

Describe Area Affected and Cleanup Action Taken.*

The area inside the berm was affected and remediation of affected soil will be as soon as possible.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD 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 NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD 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.

Signature: Manuel Soriano	OIL CONSERVATION DIVISION	
Printed Name: Manuel Soriano	Approved by Environmental Specialist: Maria Pruett	
Title: Production Foreman	Approval Date: 08/11/18	Expiration Date: N/A
E-mail Address: JSoriano@legacylp.com	Conditions of Approval:	Attached ☐
Date: 8-2-2018 Phone: 432 269 8806		2RP-4917

* Attach Additional Sheets If Necessary

A#: pMAP1822348242
I#: nMAP1822348621

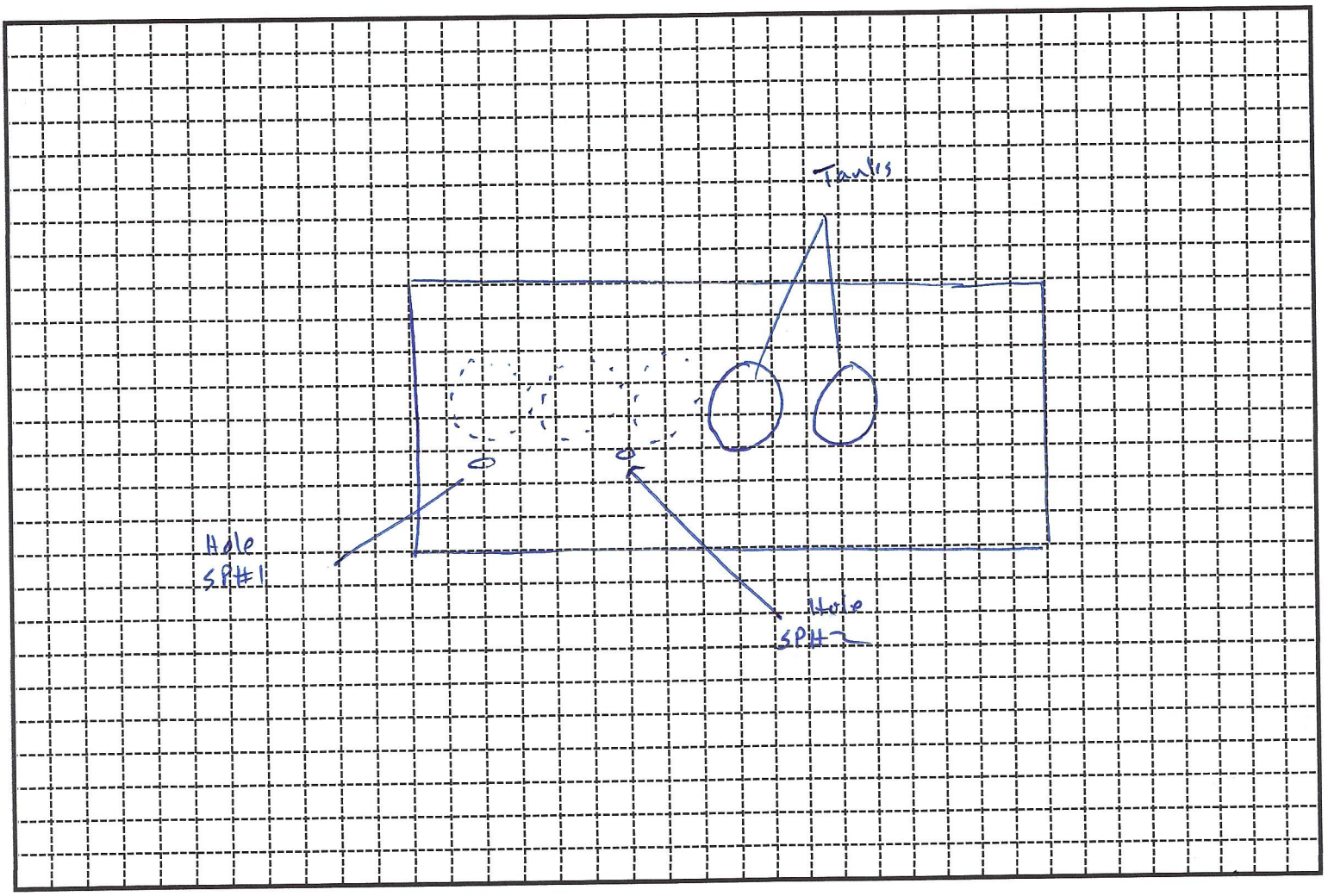
ATTACHMENT #9

Field Data

FIELD NOTES

Site Name: A. Arnquist Estate

Date: 11/7/2018



Cleans up w/ Depth, No odor @ 2' bgs

Field ID	Odor/PID	Chloride
SP#1 b@2'	None	
SP#2 b@2'	None	

Field ID	Odor/PID	Chloride

Field ID	Odor/PID	Chloride

Field ID	Odor/PID	Chloride

Field ID	Odor/PID	Chloride

Field ID	Odor/PID	Chloride