DATE IN 06/14/2013	SUSPENSE	ENGINEER PG	LOGGED IN 06/17/2013	TYPE SWD	APP NO. pAXK1316849 894

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A] 30-025-27964 Manzano LLC State SWD #1

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

[D] Other: Specify _____

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☐ Offset Operators, Leaseholders or Surface Owner

[C] ☐ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Mike Hanagan	See Application	VP of Operations	06/11/2013
Print or Type Name	Signature	Title	Date

mike@manzanoenergy.com
e-mail Address

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

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

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: ________Secondary Recovery ________Pressure Maintenance ____X____Disposal ________Storage
Application qualifies for administrative approval? ____X____Yes ________No

II. OPERATOR: MANZANO, LLC
ADDRESS: P O BOX 2017 ROSWELL, NEW MEXICO 88202
CONTACT PARTY: MIKE HANAGAN 575-623-1996; cell 575-420-8821

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary. ATTACHED

IV. Is this an expansion of an existing project? ________Yes ____X____No
If yes, give the Division order number authorizing the project: ________________

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review. ATTACHED

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail. ATTACHED

VII. Attach data on the proposed operation, including:
ATTACHED
1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval. ATTACHED

IX. Describe the proposed stimulation program, if any. ATTACHED

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted). ATTACHED

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken. ATTACHED

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water. ATTACHED

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form. ATTACHED

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Mike Hanagan TITLE: VP of Operations

SIGNATURE: [signature] DATE: June 11, 2013

E-MAIL ADDRESS: mike@manzanoenergy.com

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: ________________

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate disctrict office.

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Form C-108 Responses

Application For Authorization to Inject

I. The purpose for this application is for salt water disposal. This application should qualify for administrative approval.
II. Operator: Manzano, LLC, P O Box 2107 Roswell, New Mexico 88202, Contact Mike Hanagan, 575-622-5893; cell 575-420-8821.
III. The Injection Well Data Sheet is Attached.
IV. This is not an expansion of an existing project.
V. The Well Radius Map is attached.
VI. There are no plugged or producing wells within the area of review. Data enclosed shows the plugging information on the proposed injection well.
VII. Data on the proposed operation is as follows.
    a. Manzano plans to inject a maximum of 4000 BWPD, an average of 2000 BWPD, and expect to ultimately inject 5 million barrels of salt water.
    b. The system is closed.
    c. The average injection pressure is anticipated to be 500 psi. The maximum injection pressure will be 3000 psi.
    d. An analysis of the produced water to be injected is attached. The production zone and the injection zone are both in the Lower San Andres formation and should be compatible.
    e. The zone to be injected does not produce within one mile of the proposed well, or within the area at all. Logs indicate that at a depth of 6043 feet, resistivity is 3.5 ohm-m, and porosity is 19%. All available data suggests the zone is locally and regionally water bearing. Assuming Sw=100%, the formation water resistivity Rw calculates to be .126 ohm-m at 113 degrees Fahrenheit. This equates to a formation water with 35,000 ppm chlorides, basically the same as seawater.
VIII. The injection zone will be from 5590 to 6050 feet in this existing wellbore. The zone is the basal San Andres formation which includes both limestone and dolomite. There are no known water aquifers below the proposed injection zone. Data on the area shows water aquifers are present at 70 to 287 feet from surface in the Ogallala formation.
IX. Manzano plans to acidize the injection zone with 10,000 gals of 15% HCl.
X. The previous operated filed a compensated neutron density and a dual induction log from surface to 12,561 feet with the NMOCD. These are available on the Go Tech website. Production casing was not run and the well was never produced. However, four drill stem tests were run on this well. Data enclosed shows the plugging information on the proposed injection well, and shows the results of these four tests.
XI. Within a mile of the proposed injection well, Manzano has determined that existing water aquifers are present from 70 to 170 feet beneath the surface, to a total depth of 150 to 287 feet below the surface. All of this water is produced from the Ogallala formation. At their expense,

POD#	Location	S-T-R	Water Depth	TD	Wtr Column	Use
L11623	NESWNE	2-14-38	70	150	80	Stock
L00521 POD 3	NWSE	3-14-38	105	287	182	Irr.
L07066	NWSE	3-14-38	70	150	80	Stock

XII. We have examined all available geologic and engineering evidence and do not see any faulting or other evidence of a hydrologic connection between the injection zone and underground sources of drinking water.

XIII. The State of New Mexico owns the surface. Copies of the Form C-108 with all attachments has been sent to the State of New Mexico, Comissioner of Public Lands, P O Box 1148, Santa Fe, New Mexico. There are not any adjacent leasehold operators. A Lease Map is attached.

Legal Notice has been submitted for publication in the Hobbs News Sun paper of Lea County. A copy is attached. A certified copy will be forwarded as soon as it is received in this office.

Sincerely,

Date: 6/03/13

Mike Hanagan,

Manzano, LLC

Attachments:

1. Injection Well Data Sheet Sides one and two.

2. Well Radius Map showing ½ mile radius of the review area.

3. Plug and abandonment data on the Celeron State #1. ✓

4. Log attachment for proposed injection zone in the Celeron State #1.

5. Drill stem test information for the Celeron State #1.

6. Water analysis is provided for the Manzano LLC What A Melon #1H well located in Section 519, seven miles to the east of the injection well. This water is from the Brahaney field pay. The injection well will be used to dispose water from this zone from wells in New Mexico Manzano plans to drill in this pay zone. Manzano has recently drilled the Broken Spoke 2 State 1H (Sec.2-T14S-R38E) as a horizontal well in this same pay interval, but has not yet completed the well.

7. Water analysis from the irrigation well L 00521 POD 3. ✓

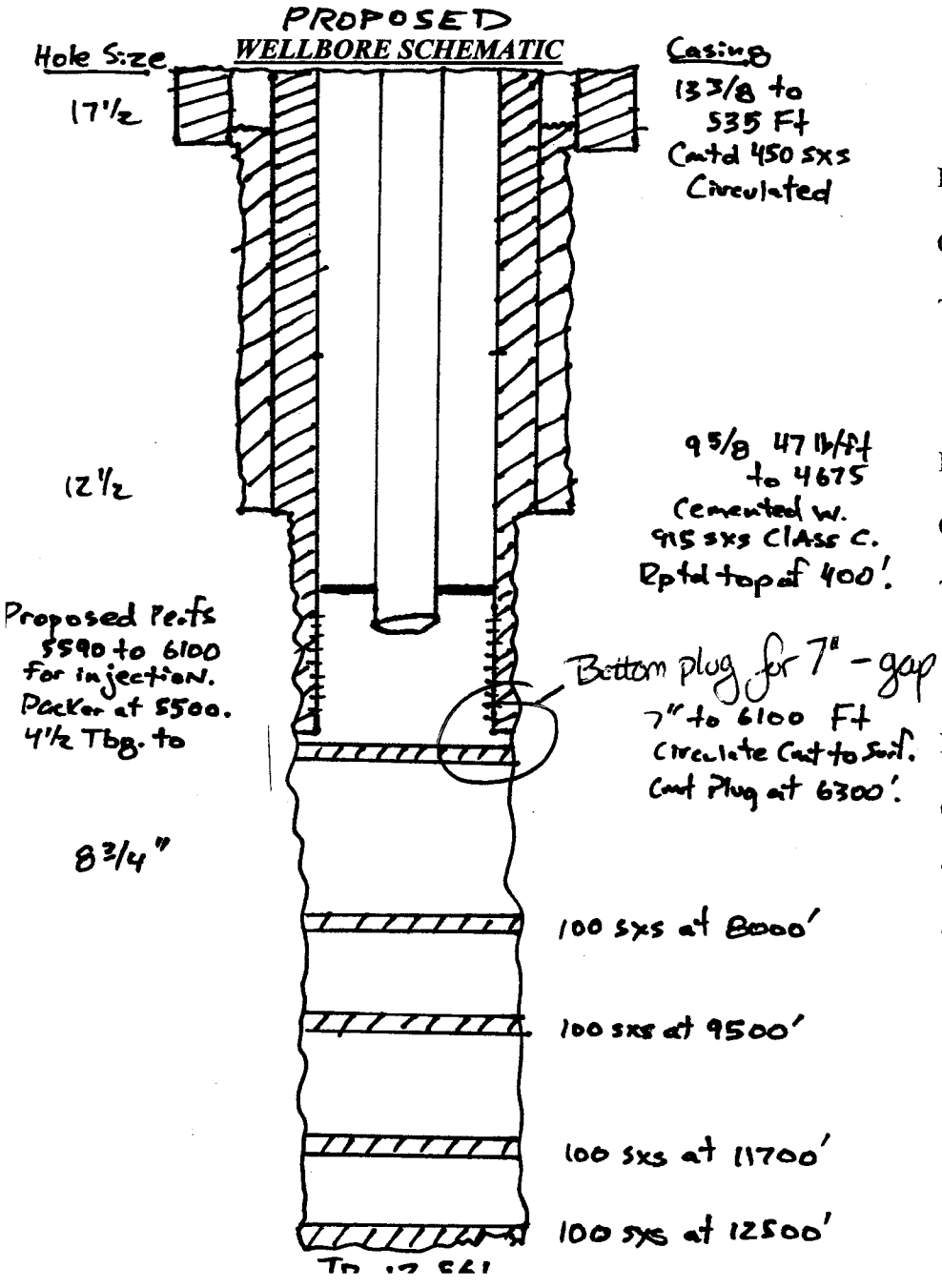
8. Lease Map

9. Copy of Legal Notice published in the Hobbs News Sun.

Side 1

INJECTION WELL DATA SHEET

OPERATOR: Manzano, LLC
WELL NAME & NUMBER: State SWD #1
WELL LOCATION: 1980 Fsl, 660 Fel | I | 33 | T13S | R38E
FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE



WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17 ½" Casing Size: 13 3/8"

Cemented with: 450 sx. *or* _____ ft³

Top of Cement: Surface Method Determined: Circulated.

Intermediate Casing

Hole Size: 12 ½" Casing Size: 9 5/8"

Cemented with: 915 sx. *or* _____ ft³

Top of Cement: 400 feet Method Determined: Reported.

Production Casing

Hole Size: 8 3/4" Casing Size:7"

Cemented with: 800 sx. *or* _____ ft³

Top of Cement: Surface Method Determined: Will Circulate

Total Depth: 6100 Feet

Injection Interval

5590 feet to 6050 feet Perforations in 7" casing.

(Perforated or Open Hole; indicate which)

INJECTION WELL DATA SHEET

Tubing Size: 4 ½" Tubing Lining Material: None

Type of Packer: 7" Nickel Plated Injection Packer

Packer Setting Depth: 5500 Feet

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

1. Is this a new well drilled for injection? _____Yes ___X___No

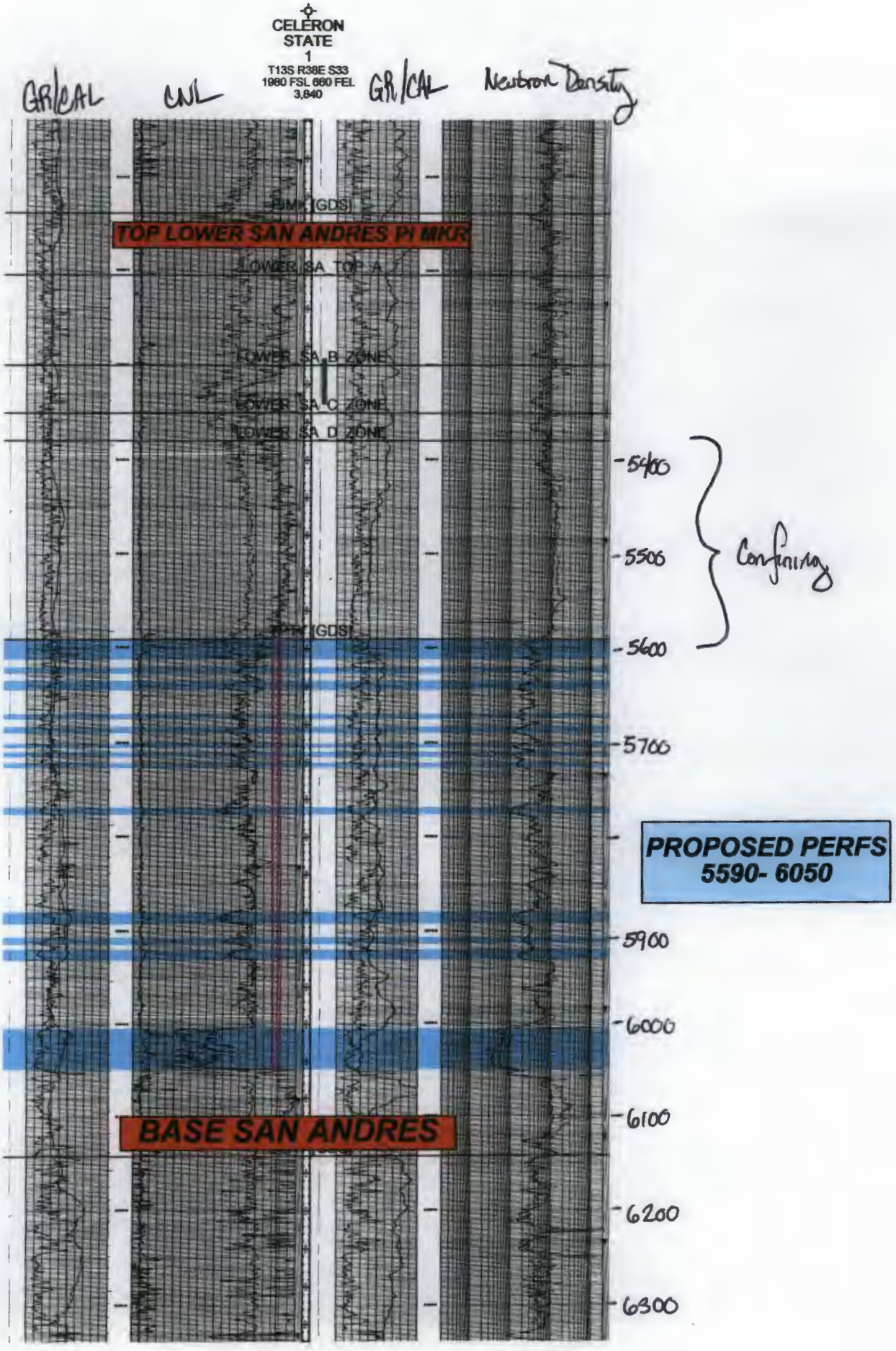
   If no, for what purpose was the well originally drilled? This well was drilled by Celeron in 1982 as an unsuccessful Devonian test of the Devonian formation.

2. Name of the Injection Formation: San Andres Formation

3. Name of Field or Pool (if applicable): None

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. The well was not ever produced. A copy of the plugging information sent by the previous operator to the NMOCD is attached.

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: No zones produce within either the ½ mile or two mile radius. Areally, a shallower San Andres (5200 to 5350 feet) zone produces in Texas. The Wolfcamp (top of 9440 feet) and Devonian (top of 12,506) produce over deep structures.


CELERON
STATE
1
T13S R38E S33
1980 FSL 660 FEL
3,840
GR/CAL
CNL
GR/CAL
Neutron Density
TOP LOWER SAN ANDRES PI MKR
LOWER SA TOP A
LOWER SA B ZONE
LOWER SA C ZONE
LOWER SA D ZONE
BASE SAN ANDRES
5400
5500
5600
5700
5900
6000
6100
6200
6300
Confining
PROPOSED PERFS
5590- 6050

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

Form C-105
Revised 10-1-78

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LAND OFFICE		
OPERATOR		

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5a. Indicate Type of Lease: State [X] Fee [ ]
5. State Oil & Gas Lease No.: E-7169

1a. TYPE OF WELL
b. TYPE OF COMPLETION: OIL WELL [ ] GAS WELL [ ] DRY [X] OTHER ____
NEW WELL [ ] WORK OVER [ ] DEEPEN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] OTHER

7. Unit Agreement Name:
8. Farm or Lease Name: State
9. Well No.: 1
10. Field and Pool, or Wildcat: WC

2. Name of Operator: CELERON OIL AND GAS COMPANY
3. Address of Operator: P.O. Box 52088 Lafayette, La. 70505
4. Location of Well: UNIT LETTER I LOCATED 1980 FEET FROM THE South LINE AND 660 FEET FROM THE East LINE OF SEC. 33 TWP. 13S RGE. 38E NMPM
12. County: Lea

15. Date Spudded	16. Date T.D. Reached	17. Date Compl. (Ready to Prod.)	18. Elevations (DF, RKB, RT, GR, etc.)	19. Elev. Cashinghead
28 Oct. 82	15 Dec. 82	N/A	3818 GR	3814 GR

20. Total Depth	21. Plug Back T.D.	22. If Multiple Compl., How Many	23. Intervals Drilled By	Rotary Tools	Cable Tools
12650	N/A	N/A	→	0-12650	

24. Producing Interval(s), of this completion — Top, Bottom, Name: N/A
25. Was Directional Survey Made: NO

26. Type Electric and Other Logs Run: Dual Induction - SFL, Comp. Neutron-Litho Density
27. Was Well Cored: No

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
13-3/8	54.5	535	17½	450 sx CL "C" w/2% $CaCl_2$	0
9-5/8	47	4675	12½	915 sxs "C"	0

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET

31. Perforation Record (Interval, size and number): N/A

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED

33. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping — Size and type pump)	Well Status (Prod. or Shut-in)
N/A		

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Gas — Oil Ratio

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Oil Gravity — API (Corr.)

34. Disposition of Gas (Sold, used for fuel, vented, etc.)
Test Witnessed By

35. List of Attachments

36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED Clyde A. Adcock, Jr. TITLE Drilling Engineer DATE March 28, 1983

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

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LAND OFFICE		
OPERATOR		

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-103
Revised 10-1-78

5a. Indicate Type of Lease: State [X] Fee [ ]

5. State Oil & Gas Lease No.: E-7169

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT —" (FORM C-101) FOR SUCH PROPOSALS.)

1. OIL WELL [ ] GAS WELL [ ] OTHER- Dry

7. Unit Agreement Name:

2. Name of Operator: CELERON OIL AND GAS COMPANY

8. Farm or Lease Name: State

3. Address of Operator: P.O. Box 52088 Lafayette, La. 70505

9. Well No.: 1

4. Location of Well: UNIT LETTER I, 1980 FEET FROM THE South LINE AND 660 FEET FROM THE East LINE, SECTION 33 TOWNSHIP 13S RANGE 38E NMPM.

10. Field and Pool, or Wildcat: WC

15. Elevation (Show whether DF, RT, GR, etc.): 3818 GR

12. County: Lea

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [ ]	PLUG AND ABANDON [ ]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]		COMMENCE DRILLING OPNS. [ ]	PLUG AND ABANDONMENT [X]
PULL OR ALTER CASING [ ]	CHANGE PLANS [ ]	CASING TEST AND CEMENT JOB [ ]	
OTHER [ ]		OTHER [ ]	

17. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

14 Dec. 82 Set 100 sx plug @ 12500' - Class "H" neat
Set 100 sx plug @ 11700' - Class "H" neat
Set 100 sx plug @ 9500' - Class "H" neat
Set 100 sx plug @ 8000' - Class "H" neat

15 Dec. 82 Set 100 sx plug @ 6000' - Class "H" neat
Set Baker Cmt Retainer @ 4568' - Cmt with 100 sx class "H" neat

16 Dec. 82 Set 10 sx plug @ 10'

18. I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNED Clyde A. Adcock, Jr. TITLE Drilling Engineer DATE March 28, 1983

APPROVED BY David Catanach TITLE OIL & GAS INSPECTOR DATE OCT 28 1983

CONDITIONS OF APPROVAL, IF ANY:

SUMMARY OF DRILL STEM TESTS
ON S/L E-7169
LEA COUNTY, NEW MEXICO

DST #1

5293' - 5340'

C_1 - 21 units
C_2 - 24 units
C_3 - 9 units
C_4 - 14 units
C_5 - 4 units

Open tool for 30 min with very weak blow - slight increase
Close tool for 1 hour
Open tool for 1 hour with very weak blow - no change

Instrument Nos. -	BT #1636	BT #3407
Int. Hyd. -	2416	2453
1st IF -	46	23
FF -	57	35
CIP -	114	92
2nd IF -	57	35
FF -	57	35
CIP -	137	115
Final Hyd -	2439	2476

BHT 110°

Recovery: 5' oil + 30' water

Sampler: 17 psi 50 cc oil + 2350 water

DST #2

12080' - 12413'

C_1 - 140 units
C_2 - 120 units
C_3 - 95 units
C_4 - 50 units
C_5 - 5 units
C_6 - Trace

Open tool for 5 min. Stabilize tool
Close tool for 1 hour
Open tool for 25 min

Instrument Nos.	J1045	J1706
Int. Hyd.		5850
IF		240
FF		248
FSI		5553
Fin. Hyd.		5870

BHT 175°

Recovery: 1035 drilling fluid

Formation failed during final flow. Shut tool in. Did not get final shut in build up. Formation appeared to be very tight due to no build up during flow period.

DST #3

12319' - 12525'

C_1 - 300 units
C_2 - 350 units
C_3 - 70 units
C_4 - 100 units
C_5 - 30 units
C_6 - 15 units

Open tool for 30 min with fair blow decreasing
Closed tool for 1 hour
Open tool for 1 hour
Closed tool for 2 hours

Instrument Nos. J-1045 J-1706

Int. Hyd. - 5859
1st IF - 541
FF - 590
FSI - 1489
2nd IF - 590
FF - 590
FSI - 1140
Fin. Hyd. - 5846

BHT 182°

Recovery: 150' oil and gas cut mud & 1700' mud

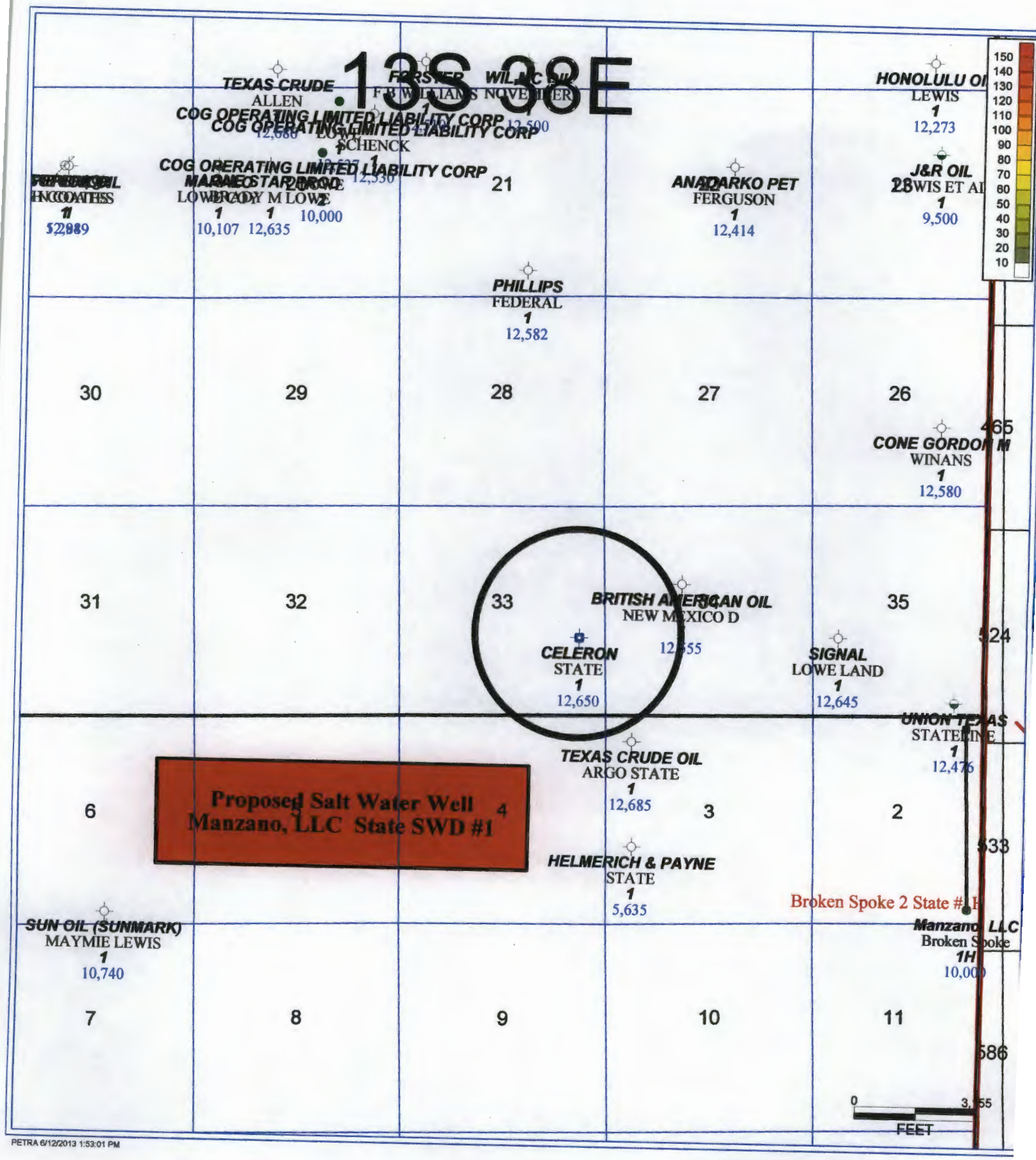
DST #4

12370' - 12568'

Open tool for 15 min with weak blow increasing to fair blow
Closed tool for 1 hour
Open tool for 45 min
Closed tool for 2 hours

Instrument Nos.	J1345	J2154
Int. Hyd.		5850
1st IF		663
FF		829
FSI		4640
2nd IF		842
FF		1377
FSI		4640
Fin. Hyd.		5838

Recovery: 1530' mud cut formation water


13S 38E
TEXAS CRUDE
ALLEN
COG OPERATING LIMITED LIABILITY CORP
12,680
COG OPERATING LIMITED LIABILITY CORP
LOWE
SCHENCK
COG OPERATING LIMITED LIABILITY CORP
MARATHON
LOWE
BRADY M LOWE
1
10,107
1
12,635
2
10,000
21
ANADARKO PET
FERGUSON
1
12,414
HONOLULU OI
LEWIS
1
12,273
J&R OIL
28WIS ET AL
1
9,500
PHILLIPS
FEDERAL
1
12,582
30
29
28
27
26
CONE GORDON M
WINANS
1
12,580
31
32
33
BRITISH AMERICAN OIL
NEW MEXICO D
12,555
CELERON
STATE
1
12,650
35
SIGNAL
LOWE LAND
1
12,645
UNION TEXAS
STATELINE
1
12,476
TEXAS CRUDE OIL
ARGO STATE
1
12,685
Proposed Salt Water Well
Manzano, LLC State SWD #1
6
5
4
3
2
HELMERICH & PAYNE
STATE
1
5,635
Broken Spoke 2 State #1H
Manzano LLC
Broken Spoke
1H
10,000
SUN OIL (SUNMARK)
MAYMIE LEWIS
1
10,740
7
8
9
10
11
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
465
524
533
586
0
3,955
FEET
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HALLIBURTON

PERMAIN BASIN OPERATIONS LABORATORY
WATER ANALYSIS REPORT
HOBBS, NEW MEXICO

COMPANY: Manzano
LEASE: Whatamelon

REPORT W13-021
DATE April 24, 2013
DISTRICT Hobbs

SUBMITTED BY

	TANK SAMPLE				
Sample Temp.	70 °F	°F	°F	°F	°F
RESISTIVITY					
SPECIFIC GR.	1.1				
pH	5.53				
CALCIUM	6500 mpl	mpl	mpl	mpl	mpl
MAGNESIUM	5100 mpl	mpl	mpl	mpl	mpl
CHLORIDE	76000 mpl	mpl	mpl	mpl	mpl
SULFATES	>1600 mpl	mpl	mpl	mpl	mpl
BICARBONATES	800 mpl	mpl	mpl	mpl	mpl
SOLUBLE IRON	0 mpl	mpl	mpl	mpl	mpl
KCL	Neg				
Sodium	mpl	mpl	mpl	mpl	mpl
TDS	~90,000 mpl	mpl	mpl	mpl	mpl
OIL GRAVITY	@ 60 °F	@ 60 °F	@ 60 °F	@ 60 °F	@ 60 °F

REMARKS

MPL = Milligrams per litter
Resitivity measured in: Ohm/m2/m

ANALYST: L. Flores

CARDINAL Laboratories

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

April 09, 2013

CRAIG HANAGAN

MANZANO LLC

PO BOX 2107

ROSWELL, NM 88202

RE: BROKEN SPOKE /Analytical for Irrigation Well (L-00521)

Enclosed are the results of analyses for samples received by the laboratory on 03/19/13 15:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. 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:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BROKEN SPOKE	H300658-01	Water	19-Mar-13 14:30	19-Mar-13 15:30

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

BROKEN SPOKE

H300658-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories									
Inorganic Compounds									
Chloride*	**60.0**	4.00	mg/L	1	3031206	DW	20-Mar-13	4500-Cl-B	
Nitrate as N	**1.48**	0.100	mg/L	1	3032005	AP	20-Mar-13	353.3	
pH*	**8.04**	0.100	pH Units	1	3032201	DW	22-Mar-13	150.1	
Sulfate*	**121**	25.0	mg/L	2.5	3032006	AP	20-Mar-13	375.4	
TDS*	**467**	5.00	mg/L	1	3031407	AP	21-Mar-13	160.1	
Radionuclides									**SUB-SUM**
Radium-226	**0.02 ± 0.07**	0.0	pCi/L	1	3040906	CK	04-Apr-13	903.1/904	
Radium-228	**0.66 ± 0.52**	0.0	pCi/L	1	3040906	CK	03-Apr-13	903.1/904	
PCBs BY GC/ECD									**SUB-SS**
PCB 1016	ND	2.00	ug/L	1	3040907	CK	26-Mar-13	8082	
PCB 1221	ND	2.00	ug/L	1	3040907	CK	26-Mar-13	8082	
PCB 1232	ND	2.00	ug/L	1	3040907	CK	26-Mar-13	8082	
PCB 1242	ND	2.00	ug/L	1	3040907	CK	26-Mar-13	8082	
PCB 1248	ND	2.00	ug/L	1	3040907	CK	26-Mar-13	8082	
PCB 1254	ND	2.00	ug/L	1	3040907	CK	26-Mar-13	8082	
PCB 1260	ND	2.00	ug/L	1	3040907	CK	26-Mar-13	8082	
Surrogate: Tetrachloro-meta-xylene		*40.1 %*	*35-140*		*3040907*	CK	*26-Mar-13*	*8082*	
Volatile Organic Compounds by EPA Method 8260B									
Vinyl chloride*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
1,1-Dichloroethene*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
Methylene chloride*	ND	0.002	mg/L	1	3031506	ms	22-Mar-13	8260	
1,1-Dichloroethane*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
Chloroform*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
Carbon tetrachloride*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
1,1,1-Trichloroethane*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
Benzene*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
1,2-Dichloroethane*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	

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Celey D. Keene, Lab Director/Quality Manager

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

BROKEN SPOKE

H300658-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories									
Volatile Organic Compounds by EPA Method 8260B									
Trichloroethene*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
Toluene*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
Tetrachloroethene*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
1,1,2-Trichloroethane*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
1,2-Dibromoethane*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
Ethylbenzene*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
m-p Xylenes*	ND	0.002	mg/L	1	3031506	ms	22-Mar-13	8260	
o-Xylene*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
Total Xylenes*	ND	0.003	mg/L	1	3031506	ms	22-Mar-13	8260	
1,1,2,2-Tetrachloroethane*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
Naphthalene*	ND	0.001	mg/L	1	3031506	ms	22-Mar-13	8260	
Surrogate: Dibromofluoromethane		*94.0 %*	*70.2-143*		*3031506*	ms	*22-Mar-13*	*8260*	
Surrogate: Toluene-d8		*94.8 %*	*73.8-118*		*3031506*	ms	*22-Mar-13*	*8260*	
Surrogate: 4-Bromofluorobenzene		*97.1 %*	*48-134*		*3031506*	ms	*22-Mar-13*	*8260*	
Semivolatile Organic Compounds by GCMS									
Naphthalene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
2-Methylnaphthalene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
1-Methylnaphthalene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Acenaphthylene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Acenaphthene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Fluorene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Phenanthrene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Anthracene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Carbazole	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Fluoranthene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Pyrene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Benzo[a]anthracene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Chrysene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

BROKEN SPOKE

H300658-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories									
Semivolatile Organic Compounds by GCMS									
Benzo[b]flouranthene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Benzo[k]flouranthene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Benzo[a]pyrene	ND	0.0002	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Indeno[1,2,3-cd]pyrene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Dibenz[a,h]anthracene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Benzo[g,h,i]perylene	ND	0.001	mg/L	1.16	3032208	ms	23-Mar-13	8270C	
Surrogate: Nitrobenzene-d5		*85.6 %*	*35-114*		*3032208*	ms	*23-Mar-13*	*8270C*	
Surrogate: 2-Fluorobiphenyl		*74.4 %*	*43-116*		*3032208*	ms	*23-Mar-13*	*8270C*	
Surrogate: Terphenyl-dl4		*86.7 %*	*33-141*		*3032208*	ms	*23-Mar-13*	*8270C*	
Green Analytical Laboratories									
General Chemistry									
Cyanide, Total*	ND	0.00500	mg/L	1	B304002	KLM	28-Mar-13	EPA335.4	
Fluoride*	**1.60**	0.200	mg/L	1	B304013	ABP	01-Apr-13	4500-F- C	
Phenolics*	ND	0.0100	mg/L	2	B304062	KLM	05-Apr-13	EPA420.1	
Dissolved Metals by ICP									
Aluminum*	**0.057**	0.050	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Arsenic*	ND	0.100	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Barium*	**0.031**	0.010	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Boron	ND	0.200	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Chromium*	ND	0.050	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Cobalt*	ND	0.050	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Copper*	ND	0.020	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Iron*	ND	0.050	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Manganese*	ND	0.005	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Molybdenum*	ND	0.050	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Nickel*	ND	0.050	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

BROKEN SPOKE

H300658-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Green Analytical Laboratories									
Dissolved Metals by ICP									
Silver*	ND	0.050	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Zinc*	ND	0.050	mg/L	1	B303160	JGS	26-Mar-13	EPA200.7	
Dissolved Metals by ICPMS									
Cadmium*	ND	0.0001	mg/L	1	B303176	JGS	28-Mar-13	EPA200.8	
Lead*	ND	0.0005	mg/L	1	B303176	JGS	28-Mar-13	EPA200.8	
Selenium*	**0.0084**	0.0010	mg/L	1	B303176	JGS	28-Mar-13	EPA200.8	
Uranium	**0.0027**	0.0001	mg/L	1	B303176	JGS	28-Mar-13	EPA200.8	
Total Mercury by CVAA									
Mercury*	ND	0.0002	mg/L	1	B303174	JGS	26-Mar-13	245.1	

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3031206 - General Prep - Wet Chem										
Blank (3031206-BLK1)				Prepared & Analyzed: 12-Mar-13						
Chloride	ND	4.00	mg/L							
LCS (3031206-BS1)				Prepared & Analyzed: 12-Mar-13						
Chloride	108	4.00	mg/L	100		108	80-120			
LCS Dup (3031206-BSD1)				Prepared & Analyzed: 12-Mar-13						
Chloride	108	4.00	mg/L	100		108	80-120	0.00	20	
Batch 3031407 - Filtration										
Blank (3031407-BLK1)				Prepared: 14-Mar-13 Analyzed: 15-Mar-13						
TDS	ND	5.00	mg/L							
LCS (3031407-BS1)				Prepared: 14-Mar-13 Analyzed: 15-Mar-13						
TDS	226		mg/L	240		94.2	80-120			
Duplicate (3031407-DUP1)		**Source: H300613-01**		Prepared: 14-Mar-13 Analyzed: 15-Mar-13						
TDS	907	5.00	mg/L		928			2.29	20	
Batch 3032005 - General Prep - Wet Chem										
Blank (3032005-BLK1)				Prepared & Analyzed: 20-Mar-13						
Nitrate as N	ND	0.100	mg/L							
LCS (3032005-BS1)				Prepared & Analyzed: 20-Mar-13						
Nitrate as N	5.10	0.100	mg/L	5.00		102	80-120			

Cardinal Laboratories

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CARDINAL Laboratories

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3032005 - General Prep - Wet Chem										
Duplicate (3032005-DUP1)		**Source: H300658-01**		Prepared & Analyzed: 20-Mar-13						
Nitrate as N	1.18	0.100	mg/L		1.48			22.6	20	
Batch 3032006 - General Prep - Wet Chem										
Blank (3032006-BLK1)				Prepared & Analyzed: 20-Mar-13						
Sulfate	ND	10.0	mg/L							
LCS (3032006-BS1)				Prepared & Analyzed: 20-Mar-13						
Sulfate	21.8	10.0	mg/L	20.0		109	80-120			
LCS Dup (3032006-BSD1)				Prepared & Analyzed: 20-Mar-13						
Sulfate	20.0	10.0	mg/L	20.0		100	80-120	8.28	20	
Batch 3032201 - NO PREP										
LCS (3032201-BS1)				Prepared & Analyzed: 22-Mar-13						
pH	7.40		pH Units	7.00		106	90-110			
Duplicate (3032201-DUP1)		**Source: H300686-01**		Prepared & Analyzed: 22-Mar-13						
pH	7.50	0.100	pH Units		7.43			0.938	20	

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

PCBs BY GC/ECD - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3040907 - EPA 3510C										
Blank (3040907-BLK1)				Prepared: 22-Mar-13 Analyzed: 26-Mar-13						
PCB 1016	ND	1.00	ug/L							
PCB 1221	ND	1.00	ug/L							
PCB 1232	ND	1.00	ug/L							
PCB 1242	ND	1.00	ug/L							
PCB 1248	ND	1.00	ug/L							
PCB 1254	ND	1.00	ug/L							
PCB 1260	ND	1.00	ug/L							
Surrogate: Tetrachloro-meta-xylene	*4.57*		ug/L	*10.0*		*45.7*	*35-140*			
LCS (3040907-BS1)				Prepared: 22-Mar-13 Analyzed: 26-Mar-13						
PCB 1016	67.8		ug/L	100		67.8	70-130			
PCB 1242	ND	1.00	ug/L				70-130			
PCB 1254	ND	1.00	ug/L				70-130			
PCB 1260	72.1		ug/L	100		72.1	70-130			
Surrogate: Tetrachloro-meta-xylene	*4.39*		ug/L	*10.0*		*43.9*	*35-140*			
LCS Dup (3040907-BSD1)				Prepared: 22-Mar-13 Analyzed: 26-Mar-13						
PCB 1016	63.2		ug/L	100		63.2	70-130	7.02	20	
PCB 1242	ND	1.00	ug/L				70-130		20	
PCB 1254	ND	1.00	ug/L				70-130		20	
PCB 1260	54.5		ug/L	100		54.5	70-130	27.8	20	
Surrogate: Tetrachloro-meta-xylene	*4.45*		ug/L	*10.0*		*44.5*	*35-140*			

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3031506 - Volatiles										
Blank (3031506-BLK1)				Prepared: 15-Mar-13 Analyzed: 22-Mar-13						
Vinyl chloride	ND	0.001	mg/L							
1,1-Dichloroethene	ND	0.001	mg/L							
Methylene chloride	0.001	0.001	mg/L							
1,1-Dichloroethane	ND	0.001	mg/L							
Chloroform	ND	0.001	mg/L							
Carbon tetrachloride	ND	0.001	mg/L							
1,1,1-Trichloroethane	ND	0.001	mg/L							
Benzene	ND	0.001	mg/L							
1,2-Dichloroethane	ND	0.001	mg/L							
Trichloroethene	ND	0.001	mg/L							
Toluene	ND	0.001	mg/L							
Tetrachloroethene	ND	0.001	mg/L							
1,1,2-Trichloroethane	ND	0.001	mg/L							
1,2-Dibromoethane	ND	0.001	mg/L							
Ethylbenzene	ND	0.001	mg/L							
m-p Xylenes	ND	0.002	mg/L							
o-Xylene	ND	0.001	mg/L							
Total Xylenes	ND	0.003	mg/L							
1,1,2,2-Tetrachloroethane	ND	0.001	mg/L							
Naphthalene	ND	0.001	mg/L							
Surrogate: Dibromofluoromethane	*0.00952*		mg/L	*0.0100*		*95.2*	*70.2-143*			
Surrogate: Toluene-d8	*0.00957*		mg/L	*0.0100*		*95.7*	*73.8-118*			
Surrogate: 4-Bromofluorobenzene	*0.00967*		mg/L	*0.0100*		*96.7*	*48-134*			
LCS (3031506-BS1)				Prepared: 15-Mar-13 Analyzed: 22-Mar-13						
Vinyl chloride	0.017	0.001	mg/L	0.0200		86.4	63.4-131			
1,1-Dichloroethene	0.019	0.001	mg/L	0.0200		97.1	68.7-131			
Methylene chloride	0.019	0.001	mg/L	0.0200		93.2	63.1-134			
1,1-Dichloroethane	0.016	0.001	mg/L	0.0200		77.8	74.5-121			
Chloroform	0.018	0.001	mg/L	0.0200		90.5	76-115			
Carbon tetrachloride	0.020	0.001	mg/L	0.0200		97.6	66.6-128			
1,1,1-Trichloroethane	0.019	0.001	mg/L	0.0200		96.8	71.1-127			

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3031506 - Volatiles										
LCS (3031506-BS1)				Prepared: 15-Mar-13 Analyzed: 22-Mar-13						
Benzene	0.019	0.001	mg/L	0.0200		93.4	76.5-120			
1,2-Dichloroethane	0.013	0.001	mg/L	0.0200		66.5	75.5-117			BS2
Trichloroethene	0.019	0.001	mg/L	0.0200		95.0	76.3-118			
Toluene	0.018	0.001	mg/L	0.0200		89.7	74.8-121			
Tetrachloroethene	0.021	0.001	mg/L	0.0200		106	52.4-136			
1,1,2-Trichloroethane	0.018	0.001	mg/L	0.0200		90.8	76.6-118			
1,2-Dibromoethane	0.018	0.001	mg/L	0.0200		91.8	77.8-119			
Ethylbenzene	0.019	0.001	mg/L	0.0200		96.8	78.4-121			
m-p Xylenes	0.039	0.002	mg/L	0.0400		96.3	80-120			
o-Xylene	0.020	0.001	mg/L	0.0200		98.3	71-126			
Total Xylenes	0.058	0.003	mg/L	0.0600		97.0	73.6-126			
1,1,2,2-Tetrachloroethane	0.018	0.001	mg/L	0.0200		88.0	74.2-122			
Naphthalene	0.019	0.001	mg/L	0.0200		94.5	68.4-126			
Surrogate: Dibromofluoromethane	*0.00951*		mg/L	*0.0100*		*95.1*	*70.2-143*			
Surrogate: Toluene-d8	*0.00971*		mg/L	*0.0100*		*97.1*	*73.8-118*			
Surrogate: 4-Bromofluorobenzene	*0.00996*		mg/L	*0.0100*		*99.6*	*48-134*			
LCS Dup (3031506-BSD1)				Prepared: 15-Mar-13 Analyzed: 22-Mar-13						
Vinyl chloride	0.017	0.001	mg/L	0.0200		84.6	63.4-131	2.22	12.3	
1,1-Dichloroethene	0.020	0.001	mg/L	0.0200		99.3	68.7-131	2.24	18.3	
Methylene chloride	0.019	0.001	mg/L	0.0200		96.4	63.1-134	3.38	19.8	
1,1-Dichloroethane	0.018	0.001	mg/L	0.0200		89.0	74.5-121	13.4	9.91	
Chloroform	0.018	0.001	mg/L	0.0200		91.6	76-115	1.21	9.44	
Carbon tetrachloride	0.020	0.001	mg/L	0.0200		99.0	66.6-128	1.42	16	
1,1,1-Trichloroethane	0.019	0.001	mg/L	0.0200		96.5	71.1-127	0.259	12.2	
Benzene	0.019	0.001	mg/L	0.0200		95.0	76.5-120	1.75	9.89	
1,2-Dichloroethane	0.016	0.001	mg/L	0.0200		80.4	75.5-117	18.9	9.07	
Trichloroethene	0.020	0.001	mg/L	0.0200		97.6	76.3-118	2.70	12	
Toluene	0.020	0.001	mg/L	0.0200		97.5	74.8-121	8.33	12.3	
Tetrachloroethene	0.022	0.001	mg/L	0.0200		109	52.4-136	2.97	43.6	
1,1,2-Trichloroethane	0.019	0.001	mg/L	0.0200		94.6	76.6-118	3.99	11.1	
1,2-Dibromoethane	0.019	0.001	mg/L	0.0200		96.0	77.8-119	4.47	11.3	

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3031506 - Volatiles										
LCS Dup (3031506-BSD1)				Prepared: 15-Mar-13 Analyzed: 22-Mar-13						
Ethylbenzene	0.020	0.001	mg/L	0.0200		98.6	78.4-121	1.94	13.2	
m-p Xylenes	0.039	0.002	mg/L	0.0400		98.4	80-120	2.23	20	
o-Xylene	0.020	0.001	mg/L	0.0200		98.2	71-126	0.153	11.7	
Total Xylenes	0.059	0.003	mg/L	0.0600		98.4	73.6-126	1.43	13.1	
1,1,2,2-Tetrachloroethane	0.018	0.001	mg/L	0.0200		90.9	74.2-122	3.24	10.6	
Naphthalene	0.019	0.001	mg/L	0.0200		96.8	68.4-126	2.40	10.5	
Surrogate: Dibromofluoromethane	*0.00980*		mg/L	*0.0100*		*98.0*	*70.2-143*			
Surrogate: Toluene-d8	*0.00980*		mg/L	*0.0100*		*98.0*	*73.8-118*			
Surrogate: 4-Bromofluorobenzene	*0.00957*		mg/L	*0.0100*		*95.7*	*48-134*			

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Celey D. Keene, Lab Director/Quality Manager

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Semivolatile Organic Compounds by GCMS - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3032208 - SW846-3510										
Blank (3032208-BLK1)				Prepared & Analyzed: 22-Mar-13						
Naphthalene	ND	0.001	mg/L							
2-Methylnaphthalene	ND	0.001	mg/L							
1-Methylnaphthalene	ND	0.001	mg/L							
Acenaphthylene	ND	0.001	mg/L							
Acenaphthene	ND	0.001	mg/L							
Fluorene	ND	0.001	mg/L							
Phenanthrene	ND	0.001	mg/L							
Anthracene	ND	0.001	mg/L							
Carbazole	ND	0.001	mg/L							
Fluoranthene	ND	0.001	mg/L							
Pyrene	ND	0.001	mg/L							
Benzo[a]anthracene	ND	0.001	mg/L							
Chrysene	ND	0.001	mg/L							
Benzo[b]flouranthene	ND	0.001	mg/L							
Benzo[k]flouranthene	ND	0.001	mg/L							
Benzo[a]pyrene	ND	0.0002	mg/L							
Indeno[1,2,3-cd]pyrene	ND	0.001	mg/L							
Dibenz[a,h]anthracene	ND	0.001	mg/L							
Benzo[g,h,i]perylene	ND	0.001	mg/L							
Surrogate: Nitrobenzene-d5	*0.0372*		mg/L	*0.0500*		*74.4*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*0.0314*		mg/L	*0.0500*		*62.8*	*43-116*			
Surrogate: Terphenyl-d14	*0.0366*		mg/L	*0.0500*		*73.3*	*33-141*			
LCS (3032208-BS1)				Prepared & Analyzed: 22-Mar-13						
Naphthalene	0.007	0.001	mg/L	0.0100		72.1	21-133			
2-Methylnaphthalene	0.007	0.001	mg/L	0.0100		74.1	21-133			
Acenaphthylene	0.007	0.001	mg/L	0.0100		74.6	33-145			
Acenaphthene	0.007	0.001	mg/L	0.0100		73.4	47-145			
Fluorene	0.007	0.001	mg/L	0.0100		70.9	59-121			
Phenanthrene	0.008	0.001	mg/L	0.0100		77.3	54-120			
Anthracene	0.007	0.001	mg/L	0.0100		73.7	27-133			
Carbazole	0.008	0.001	mg/L	0.0100		77.0	70-130			

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Celey D. Keene, Lab Director/Quality Manager

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Semivolatile Organic Compounds by GCMS - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3032208 - SW846-3510										
LCS (3032208-BS1)				Prepared & Analyzed: 22-Mar-13						
Fluoranthene	0.008	0.001	mg/L	0.0100		75.5	26-137			
Pyrene	0.007	0.001	mg/L	0.0100		66.2	52-115			
Benzo[a]anthracene	0.007	0.001	mg/L	0.0100		71.3	33-143			
Chrysene	0.007	0.001	mg/L	0.0100		73.3	17-168			
Benzo[b]flouranthene	0.006	0.001	mg/L	0.0100		64.5	24-159			
Benzo[k]flouranthene	0.007	0.001	mg/L	0.0100		67.1	11-162			
Benzo[a]pyrene	0.006	0.0002	mg/L	0.0100		62.9	17-163			
Indeno[1,2,3-cd]pyrene	0.006	0.001	mg/L	0.0100		60.3	0-171			
Dibenz[a,h]anthracene	0.006	0.001	mg/L	0.0100		62.0	0-227			
Benzo[g,h,i]perylene	0.006	0.001	mg/L	0.0100		56.8	0-219			
Surrogate: Nitrobenzene-d5	*0.0493*		mg/L	*0.0500*		*98.6*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*0.0460*		mg/L	*0.0500*		*92.0*	*43-116*			
Surrogate: Terphenyl-dl4	*0.0504*		mg/L	*0.0500*		*101*	*33-141*			
LCS Dup (3032208-BSD1)				Prepared & Analyzed: 22-Mar-13						
Naphthalene	0.007	0.001	mg/L	0.0100		74.3	21-133	3.01	20	
2-Methylnaphthalene	0.008	0.001	mg/L	0.0100		76.5	21-133	3.19	20	
Acenaphthylene	0.008	0.001	mg/L	0.0100		77.1	33-145	3.30	20	
Acenaphthene	0.007	0.001	mg/L	0.0100		72.2	47-145	1.65	20	
Fluorene	0.007	0.001	mg/L	0.0100		70.7	59-121	0.282	20	
Phenanthrene	0.008	0.001	mg/L	0.0100		76.9	54-120	0.519	20	
Anthracene	0.008	0.001	mg/L	0.0100		80.1	27-133	8.32	20	
Carbazole	0.008	0.001	mg/L	0.0100		76.1	70-130	1.18	20	
Fluoranthene	0.008	0.001	mg/L	0.0100		75.9	26-137	0.528	20	
Pyrene	0.007	0.001	mg/L	0.0100		68.5	52-115	3.41	20	
Benzo[a]anthracene	0.007	0.001	mg/L	0.0100		72.0	33-143	0.977	20	
Chrysene	0.007	0.001	mg/L	0.0100		72.1	17-168	1.65	20	
Benzo[b]flouranthene	0.006	0.001	mg/L	0.0100		58.9	24-159	9.08	20	
Benzo[k]flouranthene	0.006	0.001	mg/L	0.0100		62.0	11-162	7.90	20	
Benzo[a]pyrene	0.006	0.0002	mg/L	0.0100		60.7	17-163	3.56	20	
Indeno[1,2,3-cd]pyrene	0.006	0.001	mg/L	0.0100		58.8	0-171	2.52	20	
Dibenz[a,h]anthracene	0.006	0.001	mg/L	0.0100		60.7	0-227	2.12	20	

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Semivolatile Organic Compounds by GCMS - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3032208 - SW846-3510										
LCS Dup (3032208-BSD1)				Prepared & Analyzed: 22-Mar-13						
Benzo[g,h,i]perylene	0.006	0.001	mg/L	0.0100		55.2	0-219	2.86	20	
Surrogate: Nitrobenzene-d5	*0.0519*		mg/L	*0.0500*		*104*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*0.0475*		mg/L	*0.0500*		*95.0*	*43-116*			
Surrogate: Terphenyl-dl4	*0.0510*		mg/L	*0.0500*		*102*	*33-141*			

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

General Chemistry - Quality Control

Green Analytical Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B304002 - General Prep - Wet Chem										
Blank (B304002-BLK1)				Prepared: 26-Mar-13 Analyzed: 28-Mar-13						
Cyanide, Total	ND	0.00500	mg/L							
LCS (B304002-BS1)				Prepared: 26-Mar-13 Analyzed: 28-Mar-13						
Cyanide, Total	0.0451	0.00500	mg/L	0.0500		90.2	85-115			
LCS Dup (B304002-BSD1)				Prepared: 26-Mar-13 Analyzed: 28-Mar-13						
Cyanide, Total	0.0464	0.00500	mg/L	0.0500		92.8	85-115	2.84	20	
Batch B304013 - General Prep - Wet Chem										
Blank (B304013-BLK1)				Prepared & Analyzed: 01-Apr-13						
Fluoride	ND	0.200	mg/L							
LCS (B304013-BS1)				Prepared & Analyzed: 01-Apr-13						
Fluoride	0.991	0.200	mg/L	1.00		99.1	85-115			
LCS Dup (B304013-BSD1)				Prepared & Analyzed: 01-Apr-13						
Fluoride	1.05	0.200	mg/L	1.00		105	85-115	5.95	20	
Batch B304062 - General Prep - Wet Chem										
Blank (B304062-BLK1)				Prepared: 04-Apr-13 Analyzed: 05-Apr-13						
Phenolics	ND	0.00500	mg/L							
LCS (B304062-BS1)				Prepared: 04-Apr-13 Analyzed: 05-Apr-13						
Phenolics	0.0530	0.00500	mg/L	0.0500		106	85-115			

Cardinal Laboratories

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

General Chemistry - Quality Control

Green Analytical Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B304062 - General Prep - Wet Chem										
LCS Dup (B304062-BSD1)				Prepared: 04-Apr-13 Analyzed: 05-Apr-13						
Phenolics	0.0520	0.00500	mg/L	0.0500		104	85-115	1.90	20	

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Dissolved Metals by ICP - Quality Control

Green Analytical Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B303160 - Dissolved Metals, E200.7/E200.8										
Blank (B303160-BLK1)				Prepared & Analyzed: 26-Mar-13						
Nickel	ND	0.050	mg/L							
Iron	ND	0.050	mg/L							
Copper	ND	0.020	mg/L							
Silver	ND	0.050	mg/L							
Molybdenum	ND	0.050	mg/L							
Manganese	ND	0.005	mg/L							
Cobalt	ND	0.050	mg/L							
Boron	ND	0.200	mg/L							
Aluminum	ND	0.050	mg/L							
Barium	ND	0.010	mg/L							
Arsenic	ND	0.100	mg/L							
Zinc	ND	0.050	mg/L							
Chromium	ND	0.050	mg/L							
LCS (B303160-BS1)				Prepared & Analyzed: 26-Mar-13						
Zinc	2.63	0.050	mg/L	2.50		105	85-115			
Nickel	2.44	0.050	mg/L	2.50		97.8	85-115			
Molybdenum	4.99	0.050	mg/L	5.00		99.8	85-115			
Iron	5.22	0.050	mg/L	5.00		104	85-115			
Aluminum	5.16	0.050	mg/L	5.00		103	85-115			
Arsenic	5.24	0.100	mg/L	5.00		105	85-115			
Barium	2.51	0.010	mg/L	2.50		101	85-115			
Boron	5.01	0.200	mg/L	5.00		100	85-115			
Chromium	2.61	0.050	mg/L	2.50		104	85-115			
Silver	0.132	0.050	mg/L	0.125		106	85-115			
Cobalt	2.52	0.050	mg/L	2.50		101	85-115			
Manganese	2.51	0.005	mg/L	2.50		101	85-115			
Copper	5.09	0.020	mg/L	5.00		102	85-115			

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Dissolved Metals by ICP - Quality Control

Green Analytical Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B303160 - Dissolved Metals, E200.7/E200.8										
LCS Dup (B303160-BSD1)				Prepared & Analyzed: 26-Mar-13						
Aluminum	5.14	0.050	mg/L	5.00		103	85-115	0.349	20	
Barium	2.49	0.010	mg/L	2.50		99.5	85-115	1.01	20	
Boron	5.03	0.200	mg/L	5.00		101	85-115	0.319	20	
Cobalt	2.50	0.050	mg/L	2.50		100	85-115	0.714	20	
Chromium	2.59	0.050	mg/L	2.50		103	85-115	0.837	20	
Arsenic	5.17	0.100	mg/L	5.00		103	85-115	1.36	20	
Copper	5.08	0.020	mg/L	5.00		102	85-115	0.229	20	
Silver	0.129	0.050	mg/L	0.125		103	85-115	2.56	20	
Manganese	2.51	0.005	mg/L	2.50		100	85-115	0.200	20	
Nickel	2.42	0.050	mg/L	2.50		96.7	85-115	1.07	20	
Molybdenum	4.96	0.050	mg/L	5.00		99.2	85-115	0.594	20	
Iron	5.20	0.050	mg/L	5.00		104	85-115	0.310	20	
Zinc	2.62	0.050	mg/L	2.50		105	85-115	0.298	20	

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Dissolved Metals by ICPMS - Quality Control

Green Analytical Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B303176 - Dissolved Metals, E200.7/E200.8										
Blank (B303176-BLK1)				Prepared: 25-Mar-13 Analyzed: 27-Mar-13						
Selenium	ND	0.0010	mg/L							
Uranium	ND	0.0001	mg/L							
Lead	ND	0.0005	mg/L							
Cadmium	ND	0.0001	mg/L							
LCS (B303176-BS1)				Prepared: 25-Mar-13 Analyzed: 27-Mar-13						
Uranium	0.0446	0.0001	mg/L	0.0500		89.1	85-115			
Cadmium	0.0464	0.0001	mg/L	0.0500		92.8	85-115			
Lead	0.0449	0.0005	mg/L	0.0500		89.8	85-115			
Selenium	0.227	0.0010	mg/L	0.250		90.6	85-115			
LCS Dup (B303176-BSD1)				Prepared: 25-Mar-13 Analyzed: 27-Mar-13						
Selenium	0.231	0.0010	mg/L	0.250		92.4	85-115	1.97	20	
Uranium	0.0431	0.0001	mg/L	0.0500		86.3	85-115	3.23	20	
Lead	0.0450	0.0005	mg/L	0.0500		90.1	85-115	0.232	20	
Cadmium	0.0463	0.0001	mg/L	0.0500		92.7	85-115	0.142	20	

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Analytical Results For:

MANZANO LLC PO BOX 2107 ROSWELL NM, 88202	Project: BROKEN SPOKE Project Number: NOT GIVEN Project Manager: CRAIG HANAGAN Fax To: NOT GIVEN	Reported: 09-Apr-13 10:55

Total Mercury by CVAA - Quality Control

Green Analytical Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B303174 - EPA 245.1/7470										
Blank (B303174-BLK1)				Prepared & Analyzed: 26-Mar-13						
Mercury	ND	0.0002	mg/L							
LCS (B303174-BS1)				Prepared & Analyzed: 26-Mar-13						
Mercury	0.0021	0.0002	mg/L	0.00200		105	85-115			
LCS Dup (B303174-BSD1)				Prepared & Analyzed: 26-Mar-13						
Mercury	0.0021	0.0002	mg/L	0.00200		103	85-115	1.30	20	

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

Z-01a	0.66 ± 0.52
Z-01	0.02 ± 0.07
SUB-SUM	Analysis subcontracted to Summit Environmental Technologies, Inc..
SUB-SS	Analysis subcontracted to SunStar Laboratories, Inc.
BS2	Blank spike recovery below laboratory acceptance criteria. Results for analyte potentially 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

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:	Manzano LLC	BILL TO	
Project Manager:	Craig Hanagan	P.O. #:	
Address:	PO Box 2107	Company:	
City:	Roswell State: NM Zip: 88202	Attn:	
Phone #:	575-910-6154 Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:	Broken Spoke	State: Zip:	
Project Location:	Lea County New Mexico	Phone #:	
Sampler Name:	Craig Hanagan	Fax #:	

ANALYSIS REQUEST: LW QCC ABC

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
H300658 -1	Broken Spoke												3/19/13	2:30

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 consequential 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: 3/19/13 Time: 3:30	Received By: Jodi Henson	
Relinquished By:	Date: Time:	Received By:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	3° C	Sample Condition: Cool: Yes / No; Intact: Yes / No	CHECKED BY: (Initials)

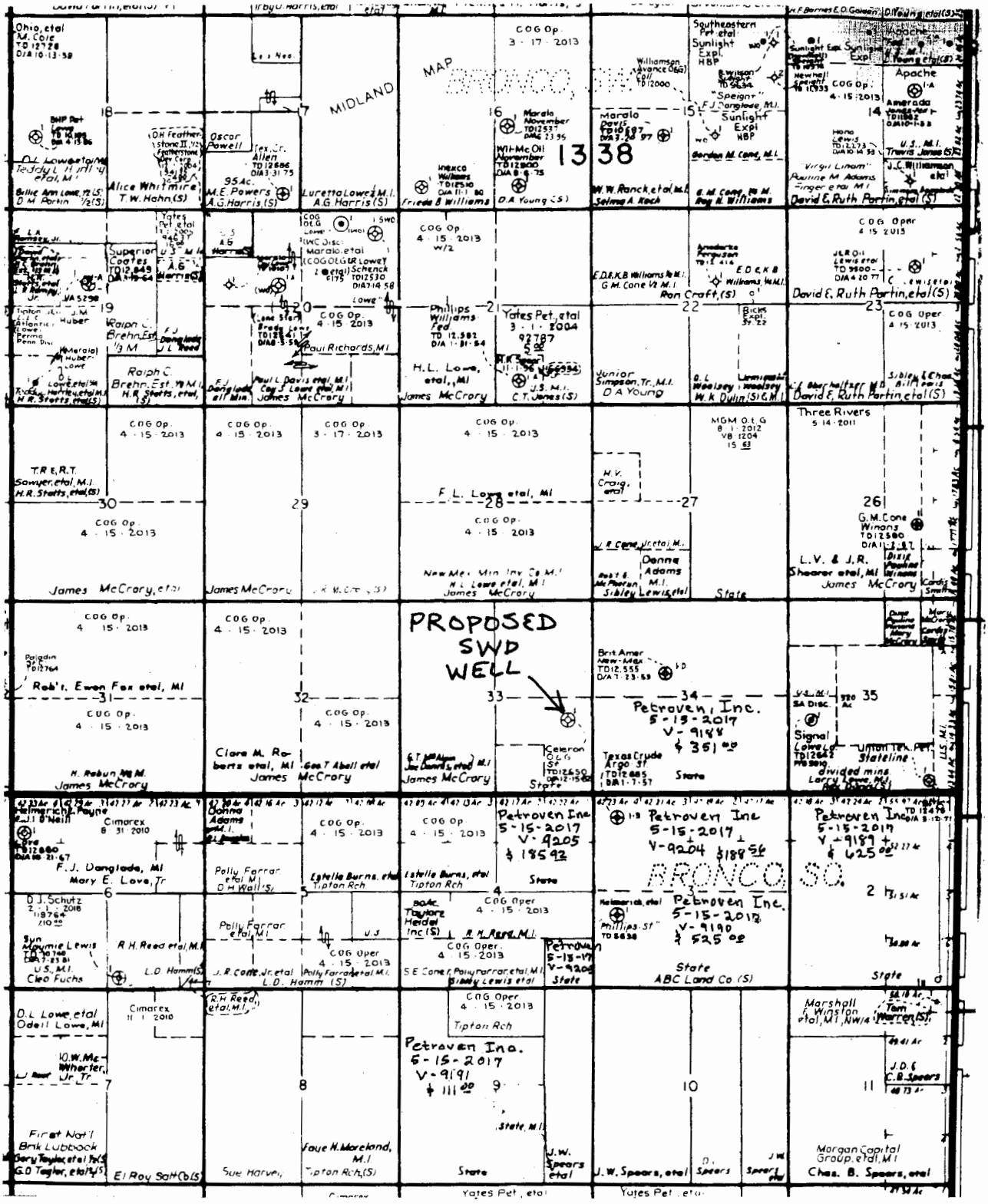
Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☐ Yes ☐ No Add'l Fax #:
REMARKS:
craig@manzanoenergy.com
mike@manzanoenergy.com

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

#26

LEASE MAP

Note: Manzano, LLC has drilled but not yet completed the horizontal well along the E2E2 of Section 2-T14S-R38E. All acreage shown as Petroven, Inc. has been assigned to Manzano, LLC.



LEGAL NOTICE

June 13, 2013

Notice is hereby given of the application of Manzano, LLC, P O Box 2107, Roswell, New Mexico to the Oil Conservation Division, and the Commissioner of Public Lands, State of New Mexico, for approval to reenter and convert the State #1 well to a Salt Water Disposal Well in the San Andres formation. The surface is owned by the State of New Mexico.

The Manzano, LLC State SWD #1, API # 3002527964, is located 1980 Fsl, 660 Fel, Unit Letter I, Sec. 33, T13S, R38E, Lea County, New Mexico.

The injection interval is the basal San Andres formation from 5590 to 6050 feet. The Maximum injection pressure is 3000# and maximum injection rate will be 4000 BWPD.

Interested parties should file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Drive, Santa Fe, NM 87505 within fifteen days.

Inquiries regarding this application should be directed to Manzano LLC, Attention: Mike Hanagan, P O Box 2017, Roswell, NM 88202.

Advertising Receipt

Hobbs Daily News-Sun
201 N Thorp
P. O. Box 936
Hobbs, NM 88241

Phone: 575-393-2123
Fax: 575-397-0610

MANZANO OIL CORPORATION
KEN BARBIE
P.O. BOX 2107
ROSWELL , NM 88202-2107

Cust #: 01101555
Ad #: 00116515
Phone: (575)623-1996
Date: 06/13/2013
Ad taker: C2 **Salesperson:** 06

Sort Line: 28210 **Classification** 672

Description	Start	Stop	Ins.	Cost/Day	Total
07 07 Daily News-Sun	06/14/2013	06/20/2013	6	34.51	207.06

RECEIVED
JUN 2 1 2013

Ad Text: **Payment Reference:**

LEGAL NOTICE
June 14, 15, 16, 18, 19, 20, 2013

Notice is hereby given of the application of Manzano, LLC, P O Box 2107, Roswell, New Mexico to the Oil Conservation Division, and the Commissioner of Public Lands, State of New Mexico, for approval to reenter and convert the State #1 well to a Salt Water Disposal Well in the San Andres formation. The surface is owned by the State of New Mexico.

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Total:	207.06
Tax:	14.11
Net:	221.17
Prepaid:	0.00
Total Due:	221.17

Affidavit of Publication

State of New Mexico,
County of Lea.

I, DANIEL RUSSELL
PUBLISHER
of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period

of 6 issue(s).
Beginning with the issue dated
June 14, 2013
and ending with the issue dated
June 20, 2013

PUBLISHER
Sworn and subscribed to before me
this 20th day of
June, 2013

Notary Public

My commission expires
January 29, 2015
(Seal)

OFFICIAL SEAL
GUSSIE BLACK
Notary Public
State of New Mexico
My Commission Expires 1-29-15

This newspaper is duly qualified to publish legal notices or advertisments within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said publication has been made.

LEGAL LEGAL

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#28210

01101555 00116515

KEN BARBIE
MANZANO OIL CORPORATION
ATTN: ACCOUNTS PAYABLE
P.O. BOX 2107
ROSWELL, NM 88202-2107

Manzano, LLC

P.O. Box 2107
Roswell, New Mexico 88202-2107
(575) 623-1996
FAX (575) 625-2620

June 12, 2013

New Mexico Oil Conservation Division
1220 South Francis Drive
Santa Fe, New Mexico 87505

New Mexico Oil Conservation Division
1625 N. French Drive
Hobbs, New Mexico 88240

Manzano, LLC hereby submits an application to convert the plugged and abandoned Celeron State #1 to a salt water disposal well to be renamed the Manzano, LLC State SWD #1. Accordingly please find enclosed an original and one copy of our application Form C-108 with attachments. A third copy has been sent to the Division Office in Hobbs. The state of New Mexico is the surface owner, so a fourth copy has been sent to the New Mexico State Land Office. A Legal Notice of our application has been filed with the Hobbs News-Sun.

Should you have questions regarding our application, I can be reached at 575-623-1996 or 575-420-8821 cell. Thank you for your assistance in handling our application.

Sincerely,

Mike Hanagan
On Behalf of Manzano, LLC

Injection Permit Checklist: Received 06/17/13 First Email Date: — Final Reply Date: — Suspended?: —

Issued Permit: Type: WFX / PMX / SWD Number: 1433 Permit Date: 07/29/13 Legacy Permits or Orders: NA

Well No. 1 Well Name(s): State SWD (former Celeron State 1 - Pre Ongard)

API : 30-0 25-27964 Spud Date: 10/28/1982 New/Old: N (UIC Cl II Primacy March 7, 1982)

Footages 1980 FSL/660 FEL Lot — Unit I Sec 33 Tsp 13S Rge 38E County Lea

General Location: Near Tx border - 13 mi SE of Eatum Pool: SWD; San Andres originally - WC/Dev/Miss Pool No.: 96124

Operator: Manzano LLC OGRID: 231429 Contact: Mike Hanagan

COMPLIANCE RULE 5.9: Inactive Wells: 1 TotalWells: 39 Fincl Assur: Yes Compl. Order? No **IS 5.9 OK?** Yes

Well File Reviewed: ✓ Current Status: P&A - 4 DSTs - 3 in lower Miss/Dev - one for 5293/5340 (Upper SA)

Planned Rehab Work to Well: Re-entry - drill out plugs incl. 6000 cmt plug / install 7" casing to 6100 - cmt to surface - install tubing/packer

Well Diagrams: Proposed ____ Before Conversion ____ After Conversion X Are Elogs in Imaging?: Yes - GR/CA/Navory Density Porosity

Well Construction Details:	Sizes (in) Borehole / Pipe	Setting Depths (ft)	Stage Tool	Cement Sx or Cf	Cement Top and Determination Method
Planned __or Existing __ Cond	—	—	—	—	—
Planned __or Existing ✓ Surface	17 1/2 / 13 3/8	0 to 535	None	450	Circulate to Surf.
Planned __or Existing ✓ Interm	12 1/2 / 9 5/8	0 to 4675	None	915	Toc 400' - calc.
Planned ✓ or Existing __ LongSt	8 3/4 / 7	0 to 6100	None	800	Circulate to surf.
Planned __or Existing __ Liner	—	—	—	—	—
Planned ✓ or Existing __ OH / PERF	8 3/4 / 7	5590 to 6050			

See attached Log

Injection Strat Column:	Depths (ft)	Injection or Confining Formations	Tops?
Above Top of Inject Formation		Grayburg / Artesian Carb	—
Above Top of Inject Formation		Upper San Andres	4711
Proposed Interval TOP:	5590	Lower San Andres	5590
Proposed Interval BOTTOM:	6050	(Limestone)	— Perfs
Below Bottom of Inject Formation	—	— Glorieta	—
Below Bottom of Inject Formation	—	— Yeso	—

200' of low porosity above 5600

Completion/Ops Details: 6300

Drilled TD 12561 PBTD — P&A cmt plug

Open Hole ___ or Perfs X

Tubing Size 4 1/2 Inter Coated? ~~Yes~~ No

Proposed Packer Depth 5500 ft

Min Packer Depth 5490 (100-ft limit)

Proposed Max. Surface Press 3000

Calc. Injt Press 1118 (0.2 psi per ft)

Calc. FPP — (0.65 psi per ft)

AOR: Hydrologic and Geologic Information

POTASH: R-111-P No Noticed? NA **BLM Sec Ord** No **WIPP** No Noticed? NA **SALADO:** T: — B: — **CLIFF HOUSE** NA

Fresh Water: Max Depth: 300 FW Formation Ogallala Wells? 3 Analysis? Yes HydrologicAffirmStatement Yes

Disposal Fluid: Formation Source(s) San Andres - analysis incl. Stock & Irrigation On Lease ___ Only from Operator X or Commercial ___

Disposal Interval: Injection Rate (AVE/MAX): 2000/4000 BWPD Protectable Waters: No CAPITAN REEF: thru No adjacent No

H/C Potential: Producing Interval? Yes Formerly Producing? No Method: E Log /Mudlog/DST/Depleted/Other DST#1 5293-5340 (Upper San Andres)

AOR Wells: 1/2-M Radius Map? Yes Well List? NA Total No. Wells Penetrating Interval: 0

Penetrating Wells: No. Active Wells 0 Num Repairs? 0 on which well(s)? ___ Diagrams? NA

Penetrating Wells: No. P&A Wells 0 Num Repairs? 0 on which well(s)? ___ Diagrams? NA

NOTICE: Newspaper Date 6/14/2013 Mineral Owner State Surface Owner State/SLO N. Date ___

RULE 26.7(A): Identified Tracts? Yes Affected Persons: No leases/operator / lease map - all acreage (offset) N. Date NA

Permit Conditions: ① No inert liner for tubing assigned to Manzano

Issues: ② Bottom - plug/openhole 6100 to 6300 - needs plug for 7"