

DATE IN 2/9/07	SUSPENSE 2/21/07	ENGINEER WJS	LOGGED IN Swd	TYPE 1062-A	APP NO. JWNJ070307188
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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]

[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.

Martha Howard		Regulatory Analyst	2/08/2007
Print or Type Name	Signature	Title	Date
		martha_howard@swn.com	
		e-mail Address	

2007 FEB 9 AM 9 04

**APPLICATION FOR AUTHORIZATION TO INJECT**

- I. PURPOSE: Secondary Recovery Pressure Maintenance XX Disposal Storage  
Application qualifies for administrative approval? XX Yes No
- II. OPERATOR: Southwestern Energy Production Company  
ADDRESS: 2350 N. Sam Houston Parkway East, Suite 190 Houston, Texas 77032  
CONTACT PARTY: Martha Howard PHONE: (281) 618-4887
- 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.
- IV. Is this an expansion of an existing project? Yes XX 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.
- 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.
- VII. Attach data on the proposed operation, including:
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.
- IX. Describe the proposed stimulation program, if any.
- \*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).
- \*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.
- 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.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- 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: Martha Howard TITLE: Regulatory Analyst  
SIGNATURE: Martha C. Howard DATE: 2/8/2007  
E-MAIL ADDRESS: martha\_howard@swn.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: \_\_\_\_\_

### 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.

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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.

**C-108 Application for Authority to Inject  
Southwestern Energy Production Company  
Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Eddy County, New Mexico**

- I. The purpose is to drill and complete a salt water disposal well for produced Delaware, Bone Springs, and other source water into the Delaware Sand formation.

Southwestern Energy Production Company plans to drill a new well into the Delaware Sand for the purpose of water disposal.

- II. Operator: Southwestern Energy Production Company  
2350 N. Sam Houston Parkway East  
Suite 190  
Houston, Texas 77032  
Attn: Martha Howard (281-618-4887)

- III. Well Data: See Attachment A

- IV. This is not an expansion of an existing project

- V. There are no active wells within the ½ mile area of review that penetrate the proposed injection zone.  
(See Attachment B)

Southwestern Energy Production Company operates three (3) horizontal wells that are producing from the Cherry Canyon 4 Sand of the Delaware Formation Series. The horizontal laterals produce at depth of 5,300' TVD.

- VI. Attachment C is a tabulation of well data and wellbore schematics for all wells that fall within the ½ mile area of review.

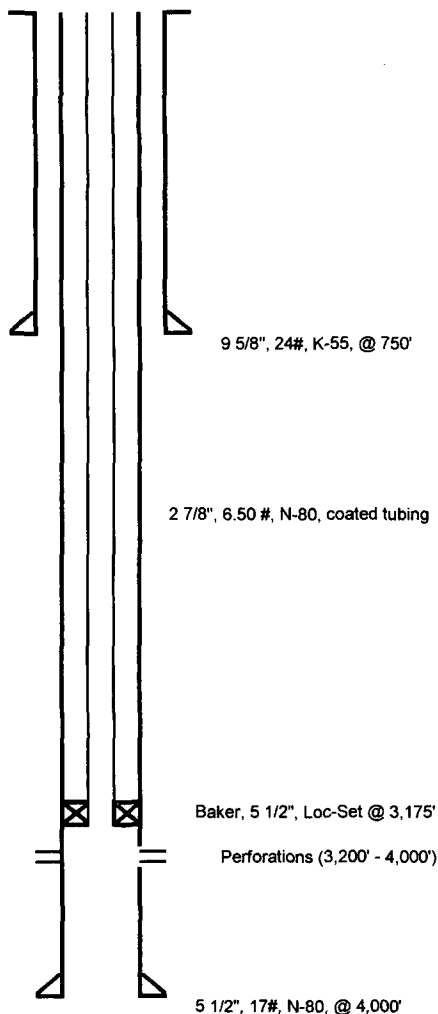
- VII. 1. Proposed average daily injection volume is approximately 2,000 BWPD.  
Maximum daily injection volume is approximately 5,000 BWPD
2. This will be a closed system
3. Proposed Average Injection Pressure – unknown  
Proposed maximum injection pressure – 1526 psig
4. Sources of injected water would be produced water from the Delaware, Bone Springs, and other sources (Attachment D)
5. There are no productive oil or gas wells in the Bell Canyon formation within 1 mile of the proposed injection well.

- VIII. The proposed injection interval is the portion of the Delaware Sand formation consisting of porous sandstone from estimated depths of 3,200' – 4,000' (TD of proposed new well).
- IX. The proposed disposal interval may be acidized with 10% HCL acid or proppant fracture.
- X. Logs will be filed after the well is drilled.
- XI. There are no windmills within a one mile radius of the well location.
- XII. Southwestern Energy Production Company has examined geological and engineering data and has found no evidence of faulting in the proposed interval. (Attachment E).
- XIII. Proof of notice
  - A. Certified letters sent to the surface owner and offset operators attached (Attachment F)
  - B. Copy of legal advertisement attached (Attachment G)
- XIV. Certification is signed

## Attachment A

Side 1

## INJECTION WELL DATA SHEET

OPERATOR: Southwestern Energy Production CompanyWELL NAME & NUMBER: Karlsbad Corral SWD No. 1WELL LOCATION: 2,222' FSL & 2,640' FEL 11 25S 29E  
FOOTAGE LOCATION UNIT LETTER SECTION TOWNSHIP RANGEWELLBORE SCHEMATICSouthwestern Energy Production Company  
Proposed Wellbore Diagram  
Karlsbad Corral SWD No. 1, Eddy County, New MexicoWELL CONSTRUCTION DATASurface CasingHole Size: 12-1/4" Casing Size: 9-5/8"Cemented with: 305 sx. or 412 ftTop of Cement: Surface Method Determined: CirculationIntermediate Casing

Hole Size: \_\_\_\_\_ Casing Size: \_\_\_\_\_

Cemented with: \_\_\_\_\_ sx. or \_\_\_\_\_ ft

Top of Cement: \_\_\_\_\_ Method Determined: \_\_\_\_\_

Production CasingHole Size: 7-7/8" Casing Size: 5-1/2"Cemented with: 641 sx. or 1134 ftTop of Cement: Surface Method Determined: CirculationDepth: 4000'Injection Interval3,200' feet to 4,000'**(Perforated)**

**INJECTION WELL DATA SHEET**Tubing Size: 2-7/8" Lining Material: Plastic CoatedType of Packer: Baker 5-1/2" Loc-Set, internally plastic coatedPacker Setting Depth: 3,175' MD

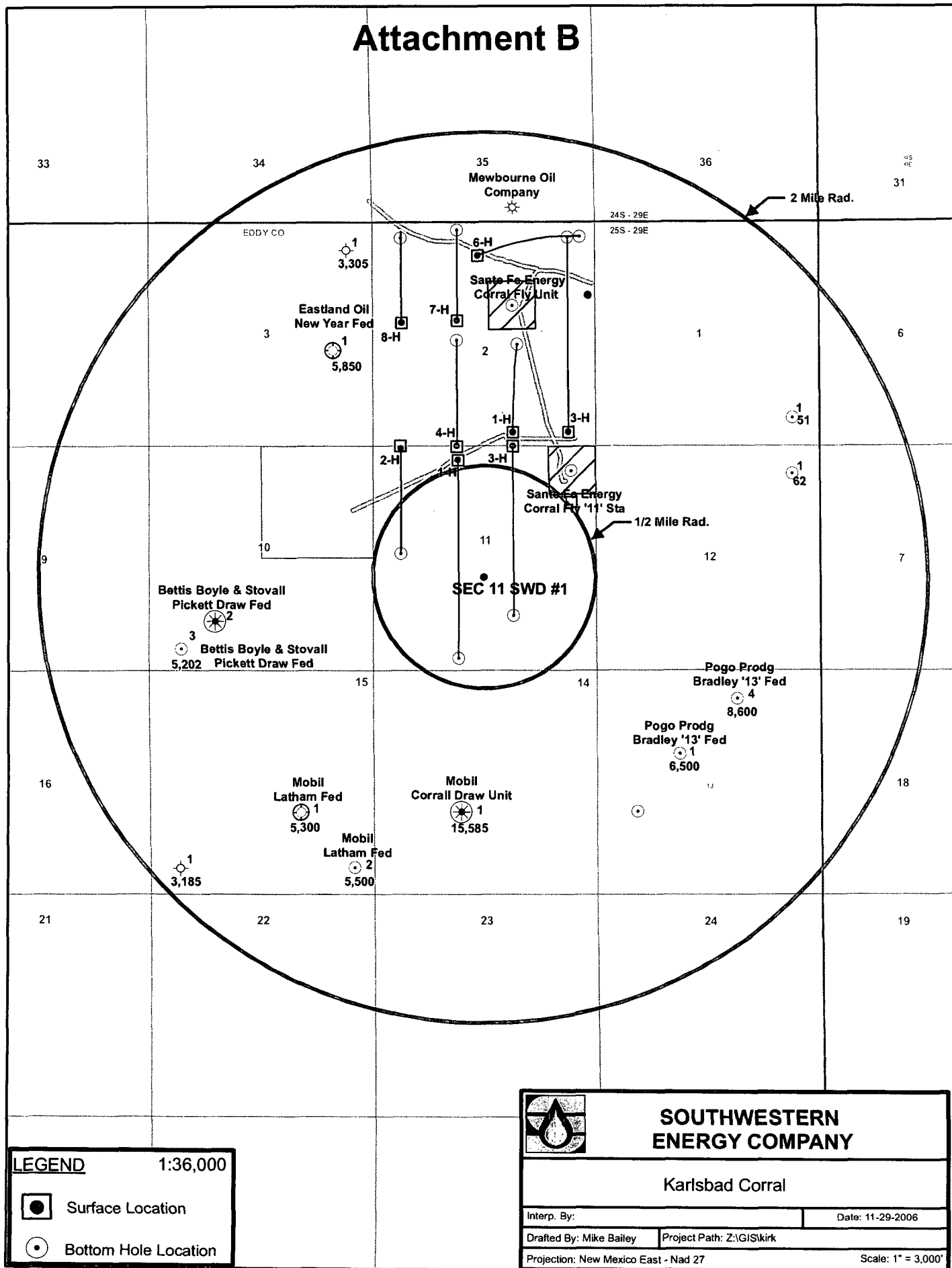
Other Type of Tubing/Casing Seal (if applicable): \_\_\_\_\_

Additional Data

1. Is this a new well drilled for injection? XX Yes        No  
 If no, for what purpose was the well originally drilled? \_\_\_\_\_  
 \_\_\_\_\_
2. Name of the Injection Formation: Delaware (Bell Canyon)
3. Name of Field or Pool (if applicable): \_\_\_\_\_
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. New Drill  
No other perforated intervals
5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: \_\_\_\_\_  
Higher: Delaware (Lamar)  
Lower: Delaware (Cherry Canyon)  
 \_\_\_\_\_
6. The proposed well is not located in either a Potash area or WIPP site area.
7. Estimated Formation Tops:

Rustler	553'
Salado	1,683'
Base of Salado	2,903'
Lamar	3,183'
Bell Canyon	3,208'
8. Production casing will be cemented to surface to isolate the salt section of the well from the injection interval. A cement bond log will be run to verify cement placement..

# Attachment B





## Attachment C

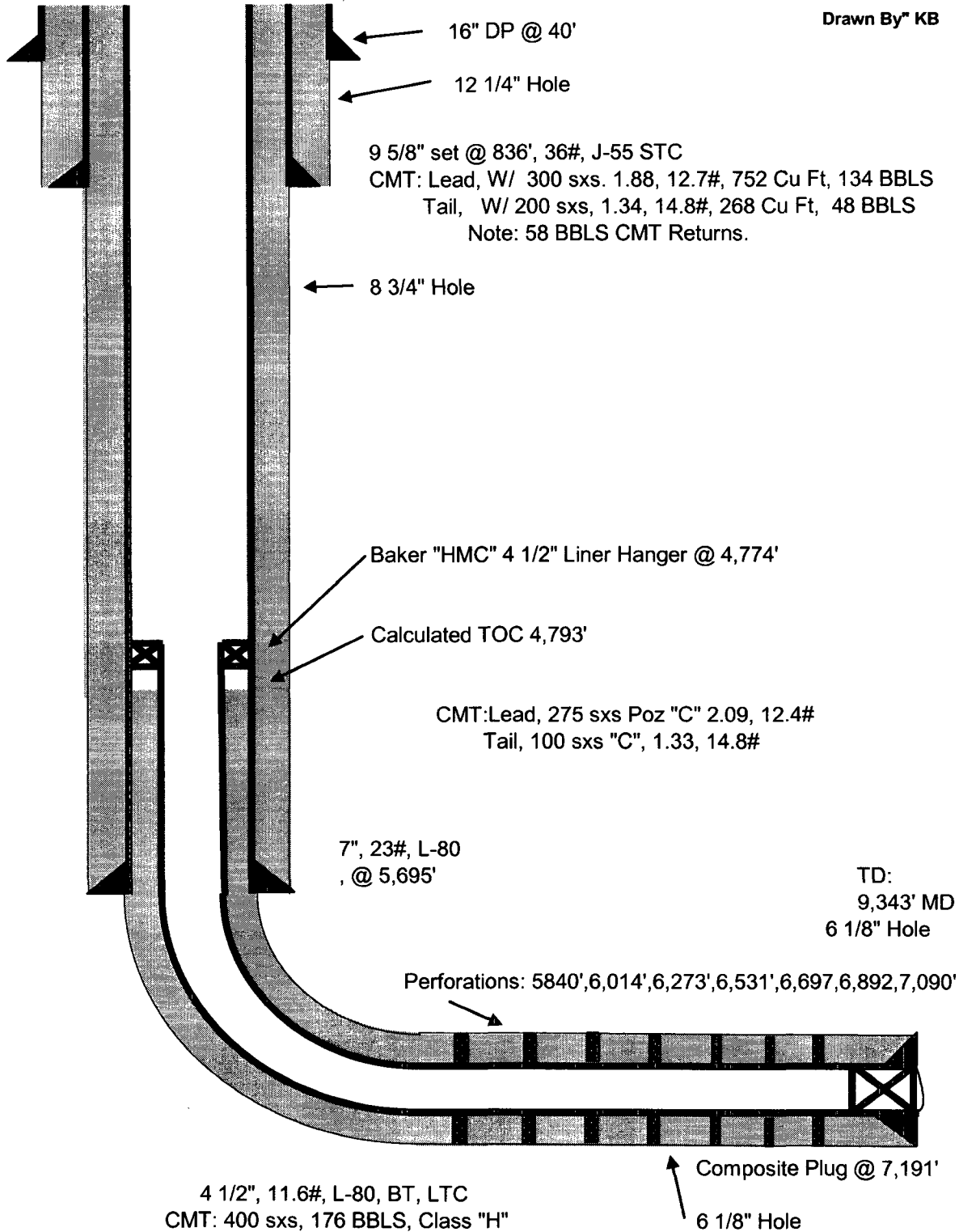
The following is a tabulation on all wells of public record within the area of review. **None of these wells penetrate the proposed injection formation within the area of review.**

Well Name	Operator	API #	Type Well / Location	Date Drilled	Completion Date	Schematic Attached
Karlsbad Corral 11 State 1-H	Southwestern Energy Production Company	30-015-33983	<b>Horizontal Well</b> <b>Surface Location:</b> 330' FNL & 1980' FWL  <b>Bottom Hole Location:</b>	5/6/2005 (TD Reached)	5/15/2005	Yes
Karlsbad Corral 11 State 2-H	Southwestern Energy Production Company	30-015-34942	<b>Horizontal Well</b> <b>Surface Location:</b> 65' FNL & 660' FWL  <b>Bottom Hole Location:</b> 2563' FNL & 660' FWL	9/8/2006 (TD Reached)	10/3/2006	Yes
Karlsbad Corral 11 State 3-H	Southwestern Energy Production Company	30-015-34449	<b>Horizontal Well</b> <b>Surface Location:</b> 10' FNL & 1980' FEL  <b>Bottom Hole Location:</b> 3,598' FNL & 1,968' FEL	3/9/2006 (TD Reached)	4/11/2006	Yes

# Attachment C

**Southwestern Energy Production Company**  
**Karlsbad Corral 11 # 1-H, Eddy County, N. M.**  
**Wellbore Diagram**  
**API #: 30-015-33983**

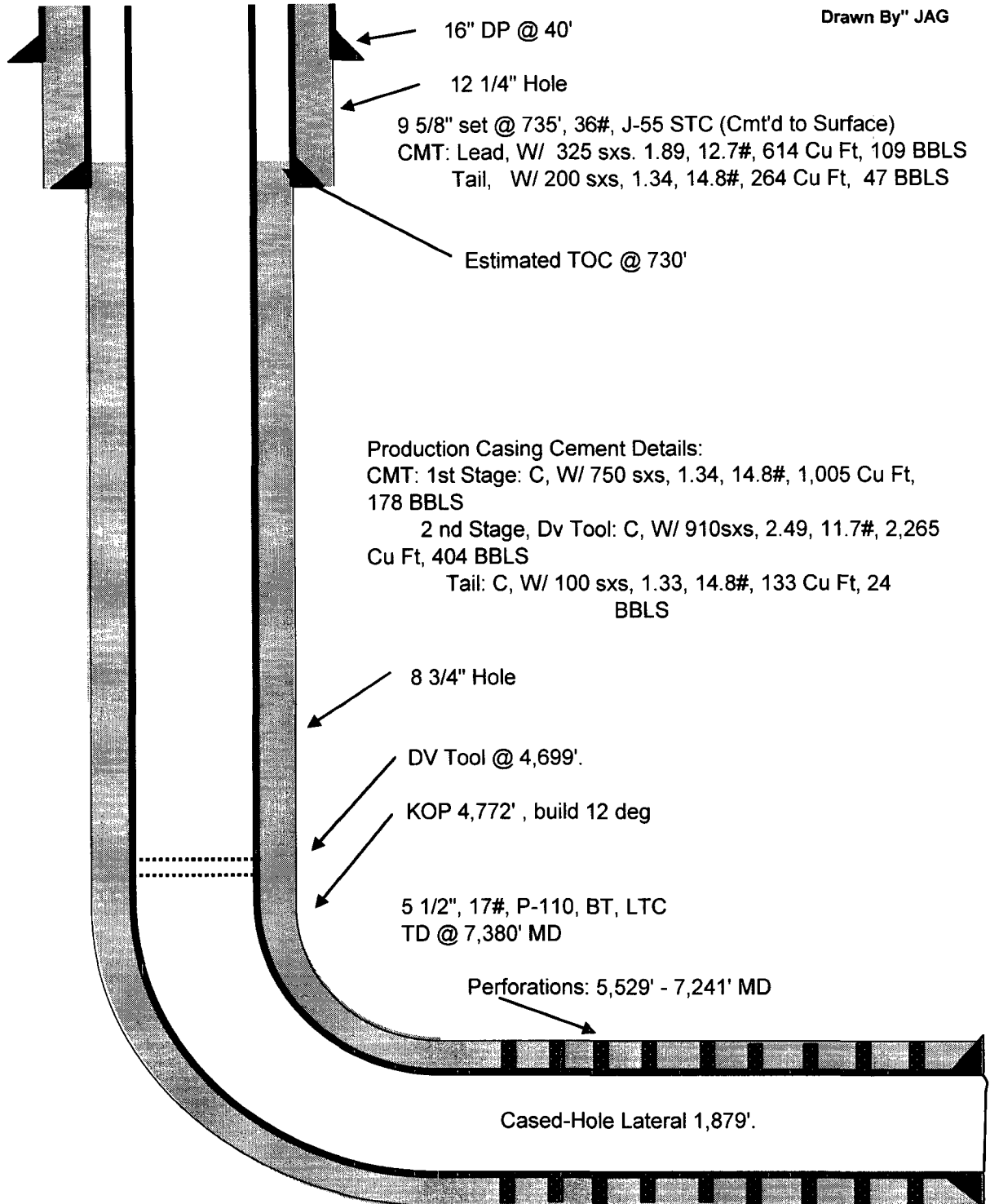
Drawn By" KB



# Attachment C

**Southwestern Energy Production Company**  
**Karlsbad Corral 11 # 2-H, Eddy County, N. M.**  
**Wellbore Diagram**  
**API #: 30-015-34942**

Drawn By" JAG



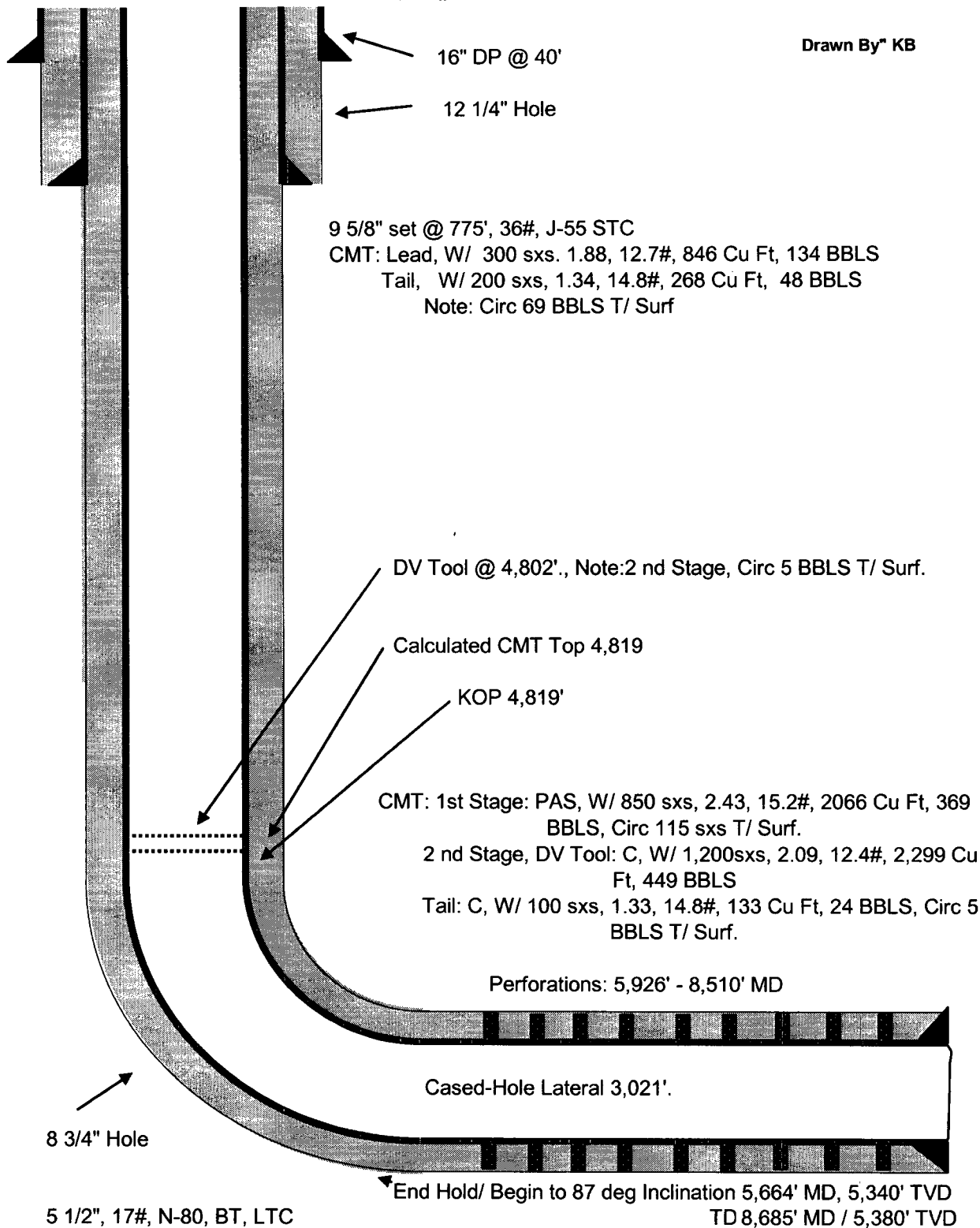
End Hold/ Begin to 90 deg Inclination 5,518' MD, 5,259' TVD

TD: 7,400' MD / 5,301' TVD

# Attachment C

**Southwestern Energy Production Company**  
**Karlsbad Corral 11 # 3-H, Eddy County, N. M.**  
**Wellbore Diagram**  
**API #: 30-015-34449**

Drawn By" KB



# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : Southwestern Energy Co.  
Lease : Karlsbad Corral 11-ST.  
Well No.: 1-H  
Location: *Cherry Canyon 4*  
Attention:

Date Sampled : 30-November-2006  
Date Analyzed: 01-December-2006  
Lab ID Number: Dec0106.001- 2  
Salesperson :  
Requested By : Pro-Kem, Inc.\*  
File Name : Dec0106.001

### ANALYSIS

1. Ph 6.170
2. Specific Gravity 60/60 F. 1.208
3. CACO3 Saturation Index @ 80F 3.205 Severe

@140F 3.205 Severe

### Dissolved Gasses

4. Hydrogen Sulfide
5. Carbon Dioxide
6. Dissolved Oxygen

Not Determined  
Not Determined

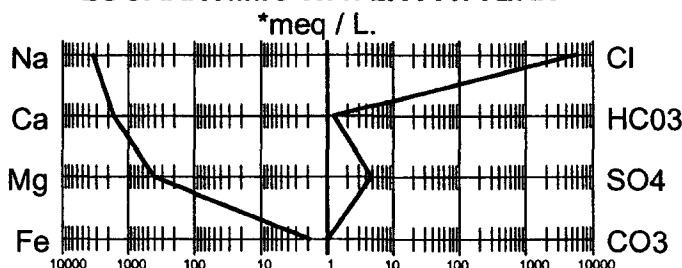
### Cations

7. Calcium (Ca++)	32,064	/ 20.1 =	1,595.22
8. Magnesium (Mg++)	4,741	/ 12.2 =	388.61
9. Sodium (Na+) (Calculated)	74,969	/ 23.0 =	3,259.52
10. Barium (Ba++)	20	/ 68.7 =	0.29

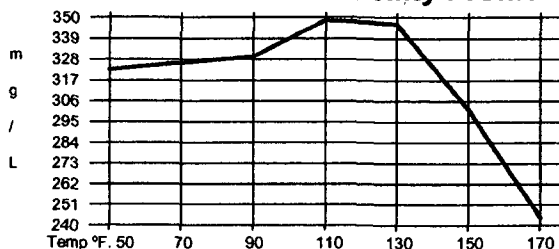
### Anions

11. Hydroxyl (OH+)	0	/ 17.0 =	0.00
12. Carbonate (CO3=)	0	/ 30.0 =	0.00
13. Bicarbonate (HCO3-)	73	/ 61.1 =	1.19
14. Sulfate (SO4=)	220	/ 48.8 =	4.51
15. Chloride (Cl-)	185,958	/ 35.5 =	5,238.25
16. Total Dissolved Solids	298,045		
17. Total Iron (Fe)	33.00	/ 18.2 =	1.81
18. Manganese (Mn++)	Not Determined		
19. Total Hardness as CaCO3	99,589		
20. Resistivity @ 75 F. (Calculated)	0.001 Ohm · meters		

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/l
Ca(HCO3)2	1.19		81.04	97
CaSO4	4.22		68.07	287
CaCl2	1,589.81		55.50	88,235
Mg(HCO3)2	0.00		73.17	0
MgSO4	0.00		60.19	0
MgCl2	388.61		47.62	18,505
NaHCO3	0.00		84.00	0
NaSO4	0.00		71.03	0
NaCl	3,259.83		58.46	190,570

\* milliequivalents per Liter

*Rebecca Rodriguez*  
Rebecca Rodriguez, Analyst

# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : **Southwestern Energy Co.**  
 Lease : **Karlsbad Corral 11-ST.**  
 Well No.: **2-H**  
 Location: *Cherry Canyon 4*  
 Attention:

Date Sampled : **30-November-2006**  
 Date Analyzed: **01-December-2006**  
 Lab ID Number: **Dec0106.001- 3**  
 Salesperson :  
 Requested By : **Pro-Kem, Inc.\***  
 File Name : **Dec0106.001**

### ANALYSIS

1. Ph **6.320**
2. Specific Gravity 60/60 F. **1.206**
3. CACO3 Saturation Index

@ 80F  
 @ 140F

**3.353** Severe  
**3.353** Severe

### Dissolved Gasses

4. Hydrogen Sulfide
5. Carbon Dioxide
6. Dissolved Oxygen

Not Determined  
 Not Determined

**MG/L.** **EQ. WT.** **\*MEQ/L**

**0**

### Cations

7. Calcium (Ca++)
8. Magnesium (Mg++)
9. Sodium (Na+) (Calculated)
10. Barium (Ba++)

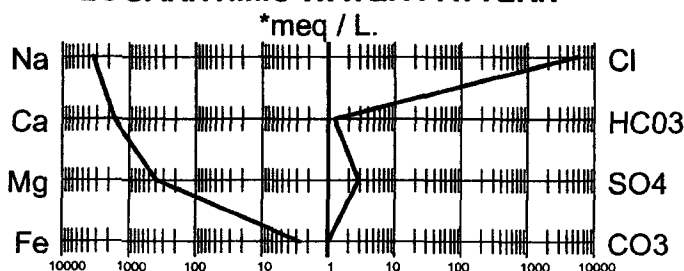
**31,864** / 20.1 = **1,585.27**  
**4,559** / 12.2 = **373.69**  
**74,853** / 23.0 = **3,254.48**  
**Below 10**

### Anions

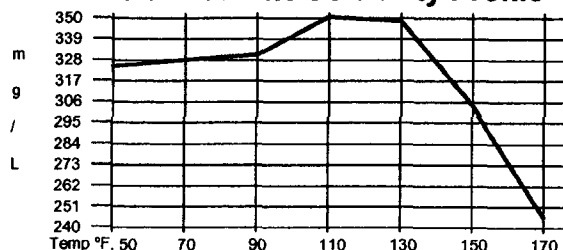
11. Hydroxyl (OH+)
12. Carbonate (CO3=)
13. Bicarbonate (HCO3-)
14. Sulfate (SO4=)
15. Chloride (Cl-)
16. Total Dissolved Solids
17. Total Iron (Fe)
18. Manganese (Mn++)
19. Total Hardness as CaCO3
20. Resistivity @ 75 F. (Calculated)

**0** / 17.0 = **0.00**  
**0** / 30.0 = **0.00**  
**73** / 61.1 = **1.19**  
**135** / 48.8 = **2.77**  
**184,958** / 35.5 = **5,210.08**  
**296,442**  
**46.00** / 18.2 = **2.53**  
 Not Determined  
**98,338**  
**0.001** Ohm · meters

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/L
Ca(HCO3)2	<b>1.19</b>		81.04	<b>97</b>
CaSO4	<b>2.77</b>		68.07	<b>188</b>
CaCl2	<b>1,581.31</b>		55.50	<b>87,763</b>
Mg(HCO3)2	<b>0.00</b>		73.17	<b>0</b>
MgSO4	<b>0.00</b>		60.19	<b>0</b>
MgCl2	<b>373.69</b>		47.62	<b>17,795</b>
NaHCO3	<b>0.00</b>		84.00	<b>0</b>
NaSO4	<b>0.00</b>		71.03	<b>0</b>
NaCl	<b>3,255.08</b>		58.46	<b>190,292</b>

\* milliequivalents per Liter

*Rebecca A. Rodriguez*  
 Rebecca Rodriguez, Analyst

# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : Southwestern Energy Co.  
Lease : Karlsbad Corral 11  
Well No.: 3-H  
Location: *Cherry Canyon 4*  
Attention:

Date Sampled : 30-November-2006  
Date Analyzed: 01-December-2006  
Lab ID Number: Dec0106.001- 1  
Salesperson :  
Requested By : Pro-Kem, Inc.\*  
File Name : Dec0106.001

### ANALYSIS

1. Ph 6.190
2. Specific Gravity 60/60 F. 1.213
3. CACO3 Saturation Index @ 80F 3.297 Severe  
@140F 3.298 Severe

### Dissolved Gasses

4. Hydrogen Sulfide 0
5. Carbon Dioxide Not Determined
6. Dissolved Oxygen Not Determined

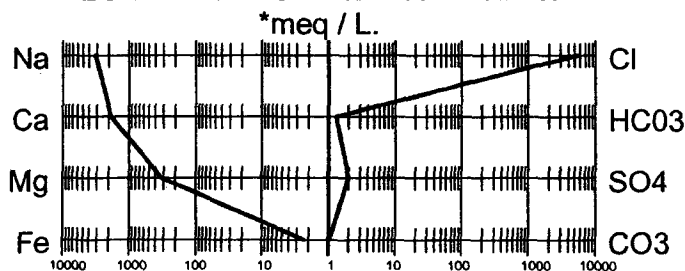
### Cations

- |                              |          |          |          |
|------------------------------|----------|----------|----------|
| 7. Calcium (Ca++)            | 35,471   | / 20.1 = | 1,764.73 |
| 8. Magnesium (Mg++)          | 3,890    | / 12.2 = | 318.85   |
| 9. Sodium (Na+) (Calculated) | 70,019   | / 23.0 = | 3,044.30 |
| 10. Barium (Ba++)            | Below 10 |          |          |

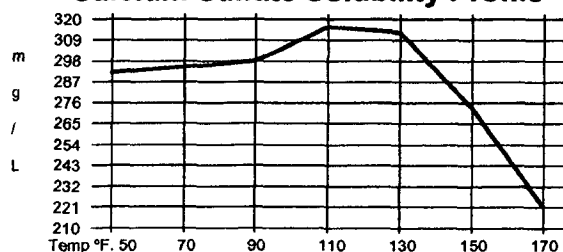
### Anions

- |                                      |                    |          |          |
|--------------------------------------|--------------------|----------|----------|
| 11. Hydroxyl (OH+)                   | 0                  | / 17.0 = | 0.00     |
| 12. Carbonate (CO3=)                 | 0                  | / 30.0 = | 0.00     |
| 13. Bicarbonate (HCO3-)              | 78                 | / 61.1 = | 1.28     |
| 14. Sulfate (SO4=)                   | 95                 | / 48.8 = | 1.95     |
| 15. Chloride (Cl-)                   | 181,959            | / 35.5 = | 5,125.61 |
| 16. Total Dissolved Solids           | 291,512            |          |          |
| 17. Total Iron (Fe)                  | 39.50              | / 18.2 = | 2.17     |
| 18. Manganese (Mn++)                 | Not Determined     |          |          |
| 19. Total Hardness as CaCO3          | 104,593            |          |          |
| 20. Resistivity @ 75 F. (Calculated) | 0.001 Ohm · meters |          |          |

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/l
Ca(HCO3)2	1.28		81.04	103
CaSO4	1.95		68.07	133
CaCl2	1,761.50		55.50	97,763
Mg(HCO3)2	0.00		73.17	0
MgSO4	0.00		60.19	0
MgCl2	318.85		47.62	15,184
NaHCO3	0.00		84.00	0
NaSO4	0.00		71.03	0
NaCl	3,045.25		58.46	178,025

\* milliequivalents per Liter

*Rebecca A. Rodriguez*  
Rebecca Rodriguez, Analyst

# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : Southwestern Energy

Lease : Karlsbad Corral "2"

Well No.: # 1-H

Location: Cherry Canyon 4

Attention:

Date Sampled : 22-July-2004

Date Analyzed: 02-August-2004

Lab ID Number: AUG0204.001- 4

Salesperson :

Requested By : Pro-Kem, Inc.\*

File Name : AUG0204.001

### ANALYSIS

1. Ph 6.500
2. Specific Gravity 60/60 F. 1.128
3. CACO3 Saturation Index @ 80F 0.868 Moderate  
@ 140F 2.288 Severe

### Dissolved Gasses

4. Hydrogen Sulfide 0
5. Carbon Dioxide Not Determined
6. Dissolved Oxygen Not Determined

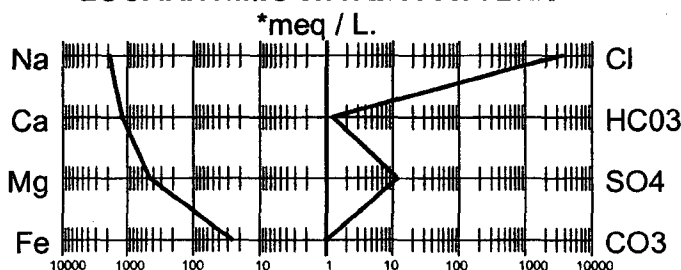
### Cations

- |                              |                |          |          |
|------------------------------|----------------|----------|----------|
| 7. Calcium (Ca++)            | 22,846         | / 20.1 = | 1,136.62 |
| 8. Magnesium (Mg++)          | 5,349          | / 12.2 = | 438.44   |
| 9. Sodium (Na+) (Calculated) | 41,763         | / 23.0 = | 1,815.78 |
| 10. Barium (Ba++)            | Not Determined |          |          |

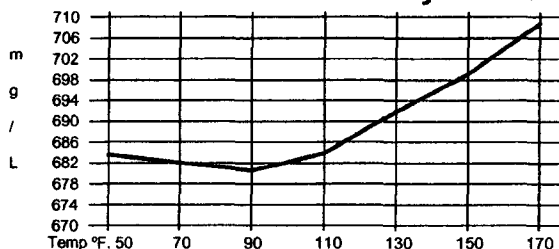
### Anions

- |                                      |                    |          |          |
|--------------------------------------|--------------------|----------|----------|
| 11. Hydroxyl (OH+)                   | 0                  | / 17.0 = | 0.00     |
| 12. Carbonate (CO3=)                 | 0                  | / 30.0 = | 0.00     |
| 13. Bicarbonate (HCO3-)              | 73                 | / 61.1 = | 1.19     |
| 14. Sulfate (SO4=)                   | 550                | / 48.8 = | 11.27    |
| 15. Chloride (Cl-)                   | 119,973            | / 35.5 = | 3,379.52 |
| 16. Total Dissolved Solids           | 190,554            |          |          |
| 17. Total Iron (Fe)                  | 450.00             | / 18.2 = | 24.73    |
| 18. Manganese (Mn++)                 | Not Determined     |          |          |
| 19. Total Hardness as CaCO3          | 79,071             |          |          |
| 20. Resistivity @ 75 F. (Calculated) | 0.003 Ohm · meters |          |          |

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/l
Ca(HCO3)2	1.19		81.04	97
CaSO4	11.27		68.07	767
CaCl2	1,124.15		55.50	62,390
Mg(HCO3)2	0.00		73.17	0
MgSO4	0.00		60.19	0
MgCl2	438.44		47.62	20,879
NaHCO3	0.00		84.00	0
NaSO4	0.00		71.03	0
NaCl	1,816.93		58.46	106,218

\* milliequivalents per Liter

*Jose L. Enriquez*  
Jose L. Enriquez, Analyst



# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : **Southwestern Energy Co.**  
 Lease : **Karlsbad Corral 2-ST.**  
 Well No.: **3-H**  
 Location: *Chenay Canyon 4*  
 Attention:

Date Sampled : **30-November-2006**  
 Date Analyzed: **01-December-2006**  
 Lab ID Number: **Dec0106.001- 4**  
 Salesperson :  
 Requested By : **Pro-Kem, Inc.\***  
 File Name : **Dec0106.001**

### ANALYSIS

1. Ph **6.200**
2. Specific Gravity 60/60 F. **1.206**
3. CACO3 Saturation Index

@ 80F  
 @140F

**2.628** Severe  
**3.068** Severe

### Dissolved Gasses

4. Hydrogen Sulfide
5. Carbon Dioxide
6. Dissolved Oxygen

Not Determined  
 Not Determined

**MG/L.** **EQ. WT.** **\*MEQ/L**

0

### Cations

7. Calcium (Ca++)
8. Magnesium (Mg++)
9. Sodium (Na+) (Calculated)
10. Barium (Ba++)

**32,264** / 20.1 = **1,605.17**  
**4,984** / 12.2 = **408.52**  
**67,737** / 23.0 = **2,945.09**  
**Below 10**

### Anions

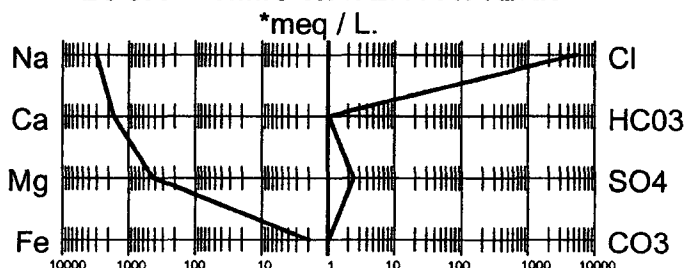
11. Hydroxyl (OH+)
12. Carbonate (CO3=)
13. Bicarbonate (HCO3-)
14. Sulfate (SO4=)
15. Chloride (Cl-)
16. Total Dissolved Solids
17. Total Iron (Fe)
18. Manganese (Mn++)
19. Total Hardness as CaCO3
20. Resistivity @ 75 F. (Calculated)

0 / 17.0 = **0.00**  
 0 / 30.0 = **0.00**  
**49** / 61.1 = **0.80**  
**115** / 48.8 = **2.36**  
**175,960** / 35.5 = **4,956.62**  
**281,109**  
**33.00** / 18.2 = **1.81**

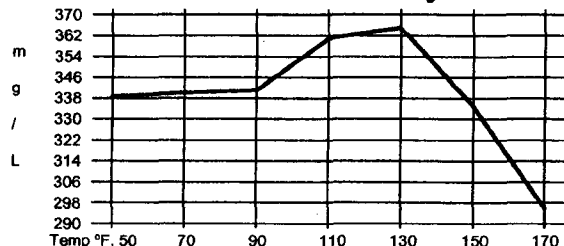
Not Determined  
**101,090**

**0.001** Ohm · meters

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/L
Ca(HCO3)2	0.80		81.04	65
CaSO4	2.36		68.07	160
CaCl2	1,602.02		55.50	88,912
Mg(HCO3)2	0.00		73.17	0
MgSO4	0.00		60.19	0
MgCl2	408.52		47.62	19,454
NaHCO3	0.00		84.00	0
NaSO4	0.00		71.03	0
NaCl	2,946.08		58.46	172,228

\* milliequivalents per Liter

*Rebecca A. Rodriguez*  
 Rebecca Rodriguez, Analyst

# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : Southwestern Energy Co.

Lease : Karlsbad Corral 2

Well No.: 4-H

Location: Cherry Canyon 4

Attention:

Date Sampled : 30-November-2006

Date Analyzed: 01-December-2006

Lab ID Number: Dec0106.002- 2

Salesperson :

Requested By : Pro-Kem, Inc.\*

File Name : Dec0106.002

### ANALYSIS

1. Ph 6.300
2. Specific Gravity 60/60 F. 1.205
3. CACO3 Saturation Index @ 80F 2.187 Severe

@ 140F  
3.107 Severe

#### Dissolved Gasses

4. Hydrogen Sulfide
5. Carbon Dioxide
6. Dissolved Oxygen

MG/L.	EQ. WT.	*MEQ/L
0		
Not Determined		
Not Determined		

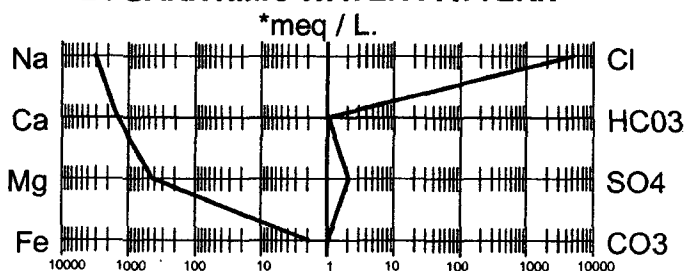
#### Cations

- |                              |        |          |          |
|------------------------------|--------|----------|----------|
| 7. Calcium (Ca++)            | 28,056 | / 20.1 = | 1,395.82 |
| 8. Magnesium (Mg++)          | 5,166  | / 12.2 = | 423.44   |
| 9. Sodium (Na+) (Calculated) | 68,324 | / 23.0 = | 2,970.61 |
| 10. Barium (Ba++)            | 16     | / 68.7 = | 0.23     |

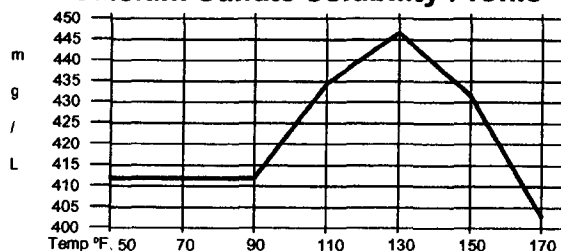
#### Anions

- |                                      |                    |          |          |
|--------------------------------------|--------------------|----------|----------|
| 11. Hydroxyl (OH+)                   | 0                  | / 17.0 = | 0.00     |
| 12. Carbonate (CO3=)                 | 0                  | / 30.0 = | 0.00     |
| 13. Bicarbonate (HCO3-)              | 49                 | / 61.1 = | 0.80     |
| 14. Sulfate (SO4=)                   | 100                | / 48.8 = | 2.05     |
| 15. Chloride (Cl-)                   | 169,962            | / 35.5 = | 4,787.66 |
| 16. Total Dissolved Solids           | 271,673            |          |          |
| 17. Total Iron (Fe)                  | 33.00              | / 18.2 = | 1.81     |
| 18. Manganese (Mn++)                 | Not Determined     |          |          |
| 19. Total Hardness as CaCO3          | 91,331             |          |          |
| 20. Resistivity @ 75 F. (Calculated) | 0.001 Ohm · meters |          |          |

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/L
Ca(HCO3)2	0.80		81.04	65
CaSO4	1.82		68.07	124
CaCl2	1,393.20		55.50	77,323
Mg(HCO3)2	0.00		73.17	0
MgSO4	0.00		60.19	0
MgCl2	423.44		47.62	20,164
NaHCO3	0.00		84.00	0
NaSO4	0.00		71.03	0
NaCl	2,971.02		58.46	173,686
* milliequivalents per Liter				

*Rebecca A. Rodriguez*  
Rebecca Rodriguez, Analyst

# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : Southwestern Energy Co.  
Lease : Karlsbad Corral 2  
Well No.: 6-H  
Location: *Cherry Canyon 4*  
Attention:

Date Sampled : 30-November-2006  
Date Analyzed: 01-December-2006  
Lab ID Number: Dec0106.002- 3  
Salesperson :  
Requested By : Pro-Kem, Inc.\*  
File Name : Dec0106.002

### ANALYSIS

1. Ph 6.110
2. Specific Gravity 60/60 F. 1.212
3. CACO3 Saturation Index @ 80F 2.905 Severe

@ 140F  
3.005 Severe

#### Dissolved Gasses

4. Hydrogen Sulfide 0
5. Carbon Dioxide Not Determined
6. Dissolved Oxygen Not Determined

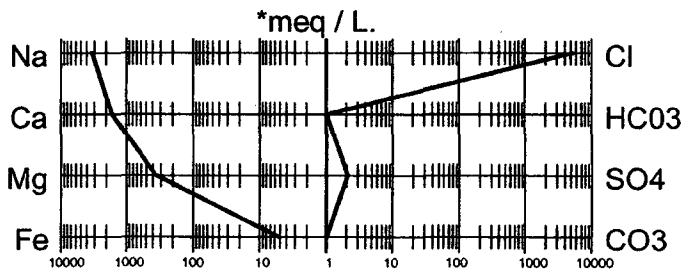
#### Cations

- |                              |          |          |          |
|------------------------------|----------|----------|----------|
| 7. Calcium (Ca++)            | 31,262   | / 20.1 = | 1,555.32 |
| 8. Magnesium (Mg++)          | 4,255    | / 12.2 = | 348.77   |
| 9. Sodium (Na+) (Calculated) | 72,852   | / 23.0 = | 3,167.48 |
| 10. Barium (Ba++)            | Below 10 |          |          |

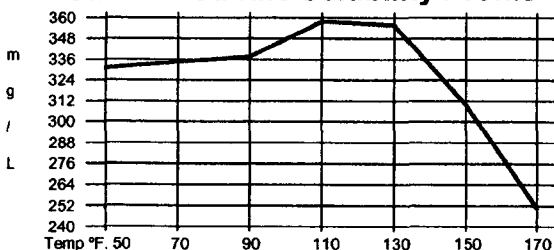
#### Anions

- |                                      |                    |          |          |
|--------------------------------------|--------------------|----------|----------|
| 11. Hydroxyl (OH+)                   | 0                  | / 17.0 = | 0.00     |
| 12. Carbonate (CO3=)                 | 0                  | / 30.0 = | 0.00     |
| 13. Bicarbonate (HCO3-)              | 54                 | / 61.1 = | 0.88     |
| 14. Sulfate (SO4=)                   | 98                 | / 48.8 = | 2.01     |
| 15. Chloride (Cl-)                   | 179,959            | / 35.5 = | 5,069.27 |
| 16. Total Dissolved Solids           | 288,480            |          |          |
| 17. Total Iron (Fe)                  | 89.50              | / 18.2 = | 4.92     |
| 18. Manganese (Mn++)                 | Not Determined     |          |          |
| 19. Total Hardness as CaCO3          | 95,585             |          |          |
| 20. Resistivity @ 75 F. (Calculated) | 0.001 Ohm · meters |          |          |

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/L
Ca(HCO3)2	0.88		81.04	72
CaSO4	2.01		68.07	137
CaCl2	1,552.43		55.50	86,160
Mg(HCO3)2	0.00		73.17	0
MgSO4	0.00		60.19	0
MgCl2	348.77		47.62	16,608
NaHCO3	0.00		84.00	0
NaSO4	0.00		71.03	0
NaCl	3,168.07		58.46	185,205
* milliequivalents per Liter				

*Rebecca A. Rodriguez*  
Rebecca Rodriguez, Analyst

# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : Southwestern Energy Co.

Lease : Karlsbad Corral 2

Well No.: 7-H

Location: Cherry Canyon 4

Attention:

Date Sampled : 30-November-2006

Date Analyzed: 01-December-2006

Lab ID Number: Dec0106.002- 4

Salesperson :

Requested By : Pro-Kem, Inc.\*

File Name : Dec0106.002

### ANALYSIS

1. Ph 6.050
2. Specific Gravity 60/60 F. 1.208
3. CACO3 Saturation Index @ 80F 2.304 Severe

@ 140F 3.004 Severe

### Dissolved Gasses

4. Hydrogen Sulfide 0
5. Carbon Dioxide Not Determined
6. Dissolved Oxygen Not Determined

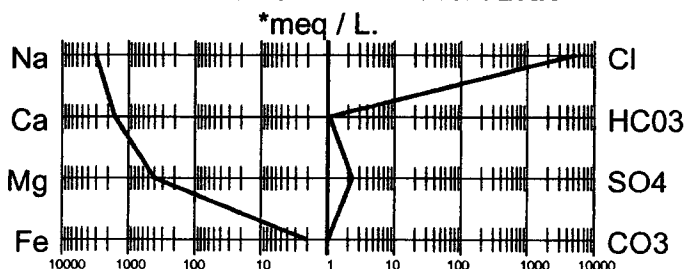
### Cations

- |                              |          |          |          |
|------------------------------|----------|----------|----------|
| 7. Calcium (Ca++)            | 30,761   | / 20.1 = | 1,530.40 |
| 8. Magnesium (Mg++)          | 4,741    | / 12.2 = | 388.61   |
| 9. Sodium (Na+) (Calculated) | 67,331   | / 23.0 = | 2,927.44 |
| 10. Barium (Ba++)            | Below 10 |          |          |

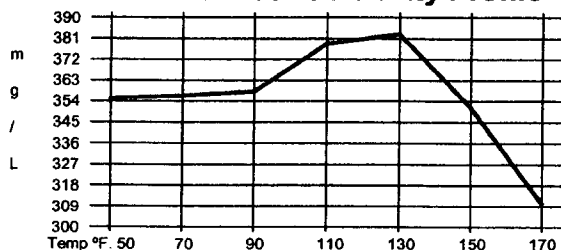
### Anions

- |                                      |                    |          |          |
|--------------------------------------|--------------------|----------|----------|
| 11. Hydroxyl (OH+)                   | 0                  | / 17.0 = | 0.00     |
| 12. Carbonate (CO3=)                 | 0                  | / 30.0 = | 0.00     |
| 13. Bicarbonate (HCO3-)              | 63                 | / 61.1 = | 1.03     |
| 14. Sulfate (SO4=)                   | 110                | / 48.8 = | 2.25     |
| 15. Chloride (Cl-)                   | 171,961            | / 35.5 = | 4,843.97 |
| 16. Total Dissolved Solids           | 274,967            |          |          |
| 17. Total Iron (Fe)                  | 35.50              | / 18.2 = | 1.95     |
| 18. Manganese (Mn++)                 | Not Determined     |          |          |
| 19. Total Hardness as CaCO3          | 96,336             |          |          |
| 20. Resistivity @ 75 F. (Calculated) | 0.001 Ohm · meters |          |          |

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/L
Ca(HCO3)2	1.03		81.04	84
CaSO4	2.25		68.07	153
CaCl2	1,527.11		55.50	84,755
Mg(HCO3)2	0.00		73.17	0
MgSO4	0.00		60.19	0
MgCl2	388.61		47.62	18,505
NaHCO3	0.00		84.00	0
NaSO4	0.00		71.03	0
NaCl	2,928.25		58.46	171,186

\* milliequivalents per Liter

Rebecca Rodriguez, Analyst

# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : Southwestern Energy Co.  
Lease : Karlsbad Corral 2  
Well No.: 8-H  
Location: Cheney Canyon 4  
Attention:

Date Sampled : 30-November-2006  
Date Analyzed: 01-December-2006  
Lab ID Number: Dec0106.002- 5  
Salesperson :  
Requested By : Pro-Kem, Inc.\*  
File Name : Dec0106.002

### ANALYSIS

1. Ph 6.020
2. Specific Gravity 60/60 F. 1.194
3. CACO3 Saturation Index @ 80F 2.229 Severe  
@ 140F 3.149 Severe

### Dissolved Gasses

4. Hydrogen Sulfide 0
5. Carbon Dioxide Not Determined
6. Dissolved Oxygen Not Determined

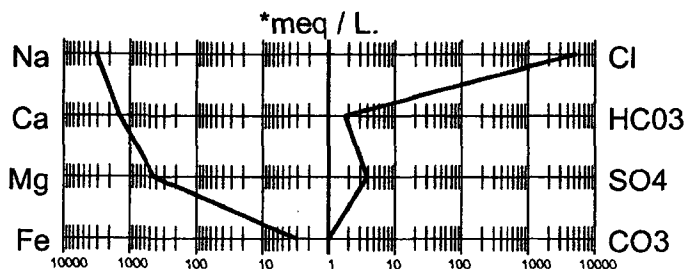
### Cations

- |                              |          |          |          |
|------------------------------|----------|----------|----------|
| 7. Calcium (Ca++)            | 27,254   | / 20.1 = | 1,355.92 |
| 8. Magnesium (Mg++)          | 5,166    | / 12.2 = | 423.44   |
| 9. Sodium (Na+) (Calculated) | 70,600   | / 23.0 = | 3,069.57 |
| 10. Barium (Ba++)            | Below 10 |          |          |

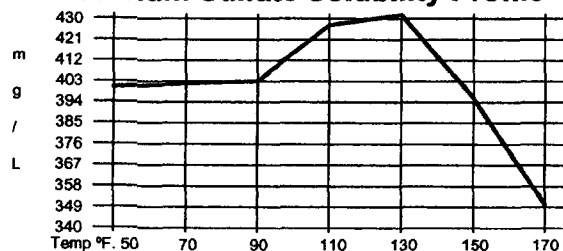
### Anions

- |                                      |                    |          |          |
|--------------------------------------|--------------------|----------|----------|
| 11. Hydroxyl (OH+)                   | 0                  | / 17.0 = | 0.00     |
| 12. Carbonate (CO3=)                 | 0                  | / 30.0 = | 0.00     |
| 13. Bicarbonate (HCO3-)              | 107                | / 61.1 = | 1.75     |
| 14. Sulfate (SO4=)                   | 180                | / 48.8 = | 3.69     |
| 15. Chloride (Cl-)                   | 171,961            | / 35.5 = | 4,843.97 |
| 16. Total Dissolved Solids           | 275,268            |          |          |
| 17. Total Iron (Fe)                  | 54.00              | / 18.2 = | 2.97     |
| 18. Manganese (Mn++)                 | Not Determined     |          |          |
| 19. Total Hardness as CaCO3          | 89,330             |          |          |
| 20. Resistivity @ 75 F. (Calculated) | 0.001 Ohm · meters |          |          |

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/L
Ca(HCO3)2	1.75		81.04	142
CaSO4	3.69		68.07	251
CaCl2	1,350.48		55.50	74,952
Mg(HCO3)2	0.00		73.17	0
MgSO4	0.00		60.19	0
MgCl2	423.44		47.62	20,164
NaHCO3	0.00		84.00	0
NaSO4	0.00		71.03	0
NaCl	3,070.05		58.46	179,475

\* milliequivalents per Liter

*Rebecca A. Rodriguez*  
Rebecca Rodriguez, Analyst

# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : Southwestern Energy Co.  
Lease : Karlsbad Corral Section 2  
Well No.: Heater  
Location: TANK BATTERY Sample  
Attention: (All Cherry Canyon 4)

Date Sampled : 30-November-2006  
Date Analyzed: 01-December-2006  
Lab ID Number: Dec0106.001- 5  
Salesperson :  
Requested By : Pro-Kem, Inc.\*  
File Name : Dec0106.001

### ANALYSIS

1. Ph 6.160
2. Specific Gravity 60/60 F. 1.203
3. CACO3 Saturation Index @ 80F 3.237 Severe  
@140F 3.238 Severe

### Dissolved Gasses

4. Hydrogen Sulfide 0
5. Carbon Dioxide Not Determined
6. Dissolved Oxygen Not Determined

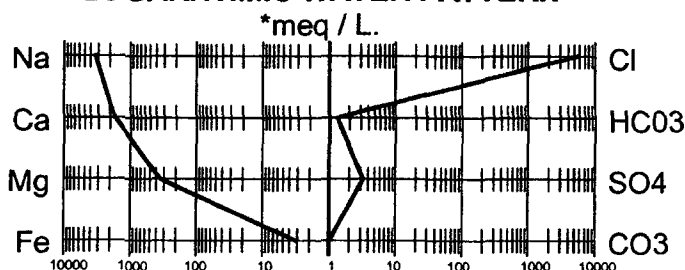
### Cations

- |              |                    |          |          |          |
|--------------|--------------------|----------|----------|----------|
| 7. Calcium   | (Ca++)             | 33,166   | / 20.1 = | 1,650.05 |
| 8. Magnesium | (Mg++)             | 4,133    | / 12.2 = | 338.77   |
| 9. Sodium    | (Na+) (Calculated) | 73,529   | / 23.0 = | 3,196.91 |
| 10. Barium   | (Ba++)             | Below 10 |          |          |

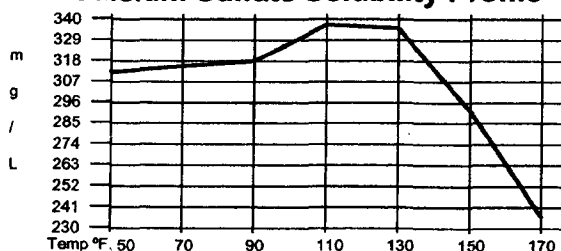
### Anions

- |                                      |         |                    |          |          |
|--------------------------------------|---------|--------------------|----------|----------|
| 11. Hydroxyl                         | (OH+)   | 0                  | / 17.0 = | 0.00     |
| 12. Carbonate                        | (CO3=)  | 0                  | / 30.0 = | 0.00     |
| 13. Bicarbonate                      | (HCO3-) | 78                 | / 61.1 = | 1.28     |
| 14. Sulfate                          | (SO4=)  | 155                | / 48.8 = | 3.18     |
| 15. Chloride                         | (Cl-)   | 183,959            | / 35.5 = | 5,181.94 |
| 16. Total Dissolved Solids           |         | 295,020            |          |          |
| 17. Total Iron                       | (Fe)    | 54.50              | / 18.2 = | 2.99     |
| 18. Manganese                        | (Mn++)  | Not Determined     |          |          |
| 19. Total Hardness as CaCO3          |         | 99,839             |          |          |
| 20. Resistivity @ 75 F. (Calculated) |         | 0.001 Ohm · meters |          |          |

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/L
Ca(HCO3)2	1.28		81.04	103
CaSO4	3.18		68.07	216
CaCl2	1,645.60		55.50	91,331
Mg(HCO3)2	0.00		73.17	0
MgSO4	0.00		60.19	0
MgCl2	338.77		47.62	16,132
NaHCO3	0.00		84.00	0
NaSO4	0.00		71.03	0
NaCl	3,197.58		58.46	186,930

\* milliequivalents per Liter

*Rebecca A. Rodriguez*  
Rebecca Rodriguez, Analyst

# Pro-Kem, Inc.

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co. : Southwestern Energy Co.  
Lease : Karlsbad Corral Section 11  
Well No.: Heater  
Location: TANK BATTERY Sample  
Attention: (Am Chemist Canyon 4)

Date Sampled : 30-November-2006  
Date Analyzed: 01-December-2006  
Lab ID Number: Dec0106.002- 1  
Salesperson :  
Requested By : Pro-Kem, Inc.\*  
File Name : Dec0106.002

### ANALYSIS

1. Ph 6.130
2. Specific Gravity 60/60 F. 1.203
3. CACO3 Saturation Index @ 80F 2.245 Severe  
@140F 2.945 Severe

#### Dissolved Gasses

4. Hydrogen Sulfide 0
5. Carbon Dioxide Not Determined
6. Dissolved Oxygen Not Determined

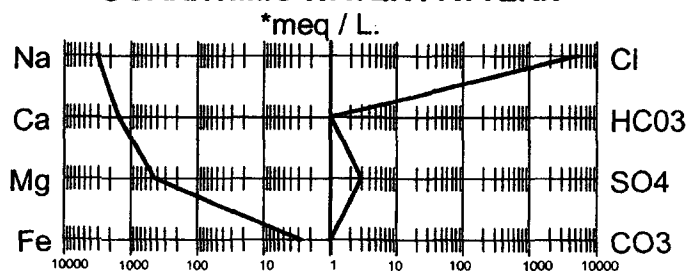
#### Cations

- |                              |          |          |          |
|------------------------------|----------|----------|----------|
| 7. Calcium (Ca++)            | 28,557   | / 20.1 = | 1,420.75 |
| 8. Magnesium (Mg++)          | 5,227    | / 12.2 = | 428.44   |
| 9. Sodium (Na+) (Calculated) | 70,245   | / 23.0 = | 3,054.13 |
| 10. Barium (Ba++)            | Below 10 |          |          |

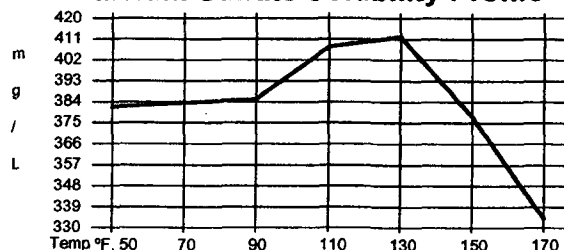
#### Anions

- |                                      |                    |          |          |
|--------------------------------------|--------------------|----------|----------|
| 11. Hydroxyl (OH+)                   | 0                  | / 17.0 = | 0.00     |
| 12. Carbonate (CO3=)                 | 0                  | / 30.0 = | 0.00     |
| 13. Bicarbonate (HCO3-)              | 49                 | / 61.1 = | 0.80     |
| 14. Sulfate (SO4=)                   | 138                | / 48.8 = | 2.83     |
| 15. Chloride (Cl-)                   | 173,961            | / 35.5 = | 4,900.31 |
| 16. Total Dissolved Solids           | 278,177            |          |          |
| 17. Total Iron (Fe)                  | 47.00              | / 18.2 = | 2.58     |
| 18. Manganese (Mn++)                 | Not Determined     |          |          |
| 19. Total Hardness as CaCO3          | 92,833             |          |          |
| 20. Resistivity @ 75 F. (Calculated) | 0.001 Ohm · meters |          |          |

### LOGARITHMIC WATER PATTERN



### Calcium Sulfate Solubility Profile



### PROBABLE MINERAL COMPOSITION

COMPOUND	*meq/L	X	EQ. WT. =	mg/L
Ca(HCO3)2	0.80		81.04	65
CaSO4	2.83		68.07	192
CaCl2	1,417.12		55.50	78,650
Mg(HCO3)2	0.00		73.17	0
MgSO4	0.00		60.19	0
MgCl2	428.44		47.62	20,402
NaHCO3	0.00		84.00	0
NaSO4	0.00		71.03	0
NaCl	3,054.75		58.46	178,581

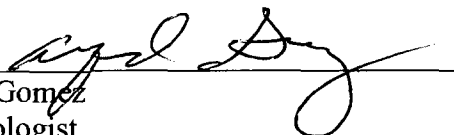
\* milliequivalents per Liter

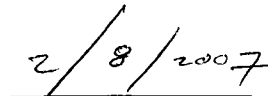
*Rebecca A. Rodriguez*  
Rebecca Rodriguez, Analyst


## Attachment E


Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Section 11, T25S R29E  
2,222' FSL & 2,640' FEL  
Eddy County, New Mexico

Available engineering and geological data have been examined and no evidence of open faults of hydrologic connection between the disposal zone and underground sources of drinking water have been found.

  
Al Gomez  
Geologist  
Southwestern Energy Production Company

  
Date

  
Toni Showan  
Engineer  
Southwestern Energy Production Company

  
Date



## **Attachment F**

Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Section 11, T25S R29E  
2222' FSL & 2,640' FEL  
Eddy County, New Mexico

### **Offset Operators**

EOG Resources  
P.O. Box 2267  
Midland, Texas 79702

OXY USA WTP Limited Partnership  
P.O. Box 50250  
Midland, Texas 79710

Yates Petroleum Corporation  
105 South 4<sup>th</sup> Street  
Artesia, New Mexico 88210

### **Surface/Mineral Owner and Lessees**

New Mexico State Land Office  
Oil, Gas and Minerals Division  
P.O. Box 1148  
Santa Fe, NM 87504-1148

Bureau of Land Management  
Carlsbad Field Office  
620 E. Greene Street  
Carlsbad, NM 88220

Russler Breaks Ranch  
Attn: Mr. Tran King  
64 North 5050 East  
Ririe, Idaho 83443

JR Engineering and Construction Co.  
P.O. Box 487  
Carlsbad, New Mexico 88220



**Southwestern Energy  
Company**

2350 N. Sam Houston Parkway East  
Suite 300  
Houston, Texas 77032  
(281) 618-4700 FAX: (281) 618-4818

February 8, 2007

EOG Resources  
P. O. Box 2267  
Midland, Texas 79702

via Certified Mail  
Receipt # 7006 2150 0002 1398 0534

Re: Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Section 11, T25S R29E  
2,222' FSL & 2,640' FEL

Dear Sir:

Southwestern Energy Production Company is making an application to amend the perforation interval approved by Administrative Order SWD-1062 for the Karlsbad Corral SWD No. 1 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

If you have no objections to this operation, kindly execute the attached waiver of protest and return to Southwestern Energy in the enclosed stamped and addressed envelope.

Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887.

Very truly yours,

*Martha C. Howard*

Martha Howard  
Regulatory Analyst

Attachments

7006 2150 0002 1398 0534

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT  
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City, State, ZIP+4 <b>Midland, TX 79702</b>	



**Southwestern Energy  
Company**

2350 N. Sam Houston Parkway East  
Suite 300  
Houston, Texas 77032  
(281) 618-4700 FAX: (281) 618-4818

February 8, 2007

Bureau of Land Management  
Carlsbad Field Office  
620 E. Greene Street  
Carlsbad, New Mexico 88220

via Certified Mail

Receipt # 7006 2150 0002 1398 0541

Re: Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Section 11, T25S R29E  
2,222' FSL & 2,640' FEL

Dear Sir:

Southwestern Energy Production Company is making an application to amend the perforation interval approved by Administrative Order SWD-1062 for the Karlsbad Corral SWD No. 1 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

If you have no objections to this operation, kindly execute the attached waiver of protest and return to Southwestern Energy in the enclosed stamped and addressed envelope.

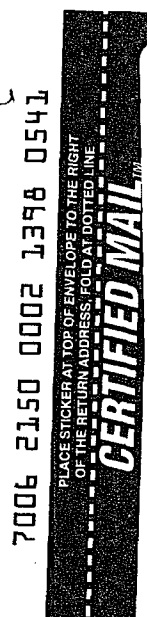
Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887.

Very truly yours,

*Martha C. Howard*

Martha Howard  
Regulatory Analyst

Attachments



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or PO Box No. 620 E. Green St.	
City, State, ZIP+4	
Carlsbad, NM 8820	
PS Form 3800, August 2006	
See Reverse for Instructions	



**Southwestern Energy  
Company**

2350 N. Sam Houston Parkway East  
Suite 300  
Houston, Texas 77032  
(281) 618-4700 FAX: (281) 618-4818

February 8, 2007

Mr. Robert H. Bullock  
Yates Petroleum Corporation  
105 South 4<sup>th</sup> Street  
Artesia, New Mexico 88210-2177

via Certified Mail

Receipt # 7006 2150 0002 1398 0558

Re: Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Section 11, T25S R29E  
2,222' FSL & 2,640' FEL

Dear Mr. Bullock:

Southwestern Energy Production Company is making an application to amend the perforation interval approved by Administrative Order SWD-1062 for the Karlsbad Corral SWD No. 1 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

If you have no objections to this operation, kindly execute the attached waiver of protest and return to Southwestern Energy in the enclosed stamped and addressed envelope.

Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887.

Very truly yours,

*Martha C. Howard*

Martha Howard  
Regulatory Analyst

Attachments

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Street, Apt. No.,  
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City, State, ZIP+4<sup>®</sup> Artesia, NM 88210-2177



**Southwestern Energy  
Company**

2350 N. Sam Houston Parkway East  
Suite 300  
Houston, Texas 77032  
(281) 618-4700 FAX: (281) 618-4818

February 8, 2007

Mr. David Evans  
OXY USA WTP Limited Partnership  
P.O. Box 50250  
Midland, Texas 79710

via Certified Mail

Receipt # 7006 2150 0002 1398 0565

Re: Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Section 11, T25S R29E  
2,222' FSL & 2,640' FEL

Dear Mr. Evans:

Southwestern Energy Production Company is making an application to amend the perforation interval approved by Administrative Order SWD-1062 for the Karlsbad Corral SWD No. 1 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

If you have no objections to this operation, kindly execute the attached waiver of protest and return to Southwestern Energy in the enclosed stamped and addressed envelope.

Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887.

Very truly yours,

Martha Howard  
Regulatory Analyst

Attachments

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City, State, ZIP+4 **Midland, TX 79710**

PS Form 3800, August 2006

See Reverse for Instructions



**Southwestern Energy  
Company**

2350 N. Sam Houston Parkway East  
Suite 300  
Houston, Texas 77032  
(281) 618-4700 FAX: (281) 618-4818

February 8, 2007

New Mexico State Land Office  
Oil, Gas, and Mineral Division  
P.O. Box 1148  
Santa Fe, New Mexico 87504-1148

via Certified Mail  
Receipt # 7006 2150 0002 1398 0572

Re: Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Section 11, T25S R29E  
2,222' FSL & 2,640' FEL

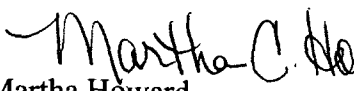
Dear Sir:

Southwestern Energy Production Company is making an application to amend the perforation interval approved by Administrative Order SWD-1062 for the Karlsbad Corral SWD No. 1 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

If you have no objections to this operation, kindly execute the attached waiver of protest and return to Southwestern Energy in the enclosed stamped and addressed envelope.

Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887.

Very truly yours,

  
Martha Howard  
Regulatory Analyst

Attachments

7006 2150 0002 1398 0572

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**Southwestern Energy  
Company**

2350 N. Sam Houston Parkway East  
Suite 300  
Houston, Texas 77032  
(281) 618-4700 FAX: (281) 618-4818

February 8, 2007

Jim Richardson  
JR Engineering and Construction Co.  
P.O. Box 487.  
Carlsbad, New Mexico 88220

via Certified Mail  
Receipt # 7006 2150 0002 1398 0589

Re: Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Section 11, T25S R29E  
2,222' FSL & 2,640' FEL

Dear Mr. Richardson:

Southwestern Energy Production Company is making an application to amend the perforation interval approved by Administrative Order SWD-1062 for the Karlsbad Corral SWD No. 1 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

If you have no objections to this operation, kindly execute the attached waiver of protest and return to Southwestern Energy in the enclosed stamped and addressed envelope.

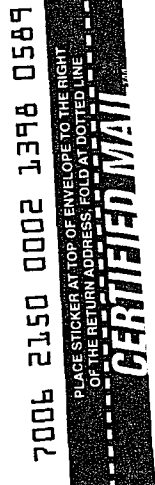
Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887.

Very truly yours,

*Martha C Howard*

Martha Howard  
Regulatory Analyst

Attachments



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**Southwestern Energy  
Company**

2350 N. Sam Houston Parkway East  
Suite 300  
Houston, Texas 77032  
(281) 618-4700 FAX: (281) 618-4818

February 8, 2007

Mr. Tran King  
Russler Breaks Ranch  
64 North 5050 East.  
Ririe, Idaho 83443

via Certified Mail

Receipt # 7006 2150 0002 1398 0596

Re: Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Section 11, T25S R29E  
2,222' FSL & 2,640' FEL

Dear Mr. King:

Southwestern Energy Production Company is making an application to amend the perforation interval approved by Administrative Order SWD-1062 for the Karlsbad Corral SWD No. 1 well for disposal of produced Delaware Formation water from our Karlsbad Corral lease. In accordance with regulation 701.B (2), as an offset operator, a copy of the disposal application is being furnished to you.

If you have no objections to this operation, kindly execute the attached waiver of protest and return to Southwestern Energy in the enclosed stamped and addressed envelope.

Thank you for your cooperation of this application. If you have any questions, I can be reached at 281-618-4887.

Very truly yours,

Martha Howard  
Regulatory Analyst

Attachments



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Street, Apt. No., or PO Box No. <u>64 North 5050 East</u>	
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**Southwestern Energy  
Company**

2350 N. Sam Houston Parkway East  
Suite 300  
Houston, Texas 77032  
(281) 618-4700 FAX: (281) 618-4818

February 8, 2007

2007 FEB 9 AM 9 04

Mr. William Jones  
Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Re: Karlsbad Corral SWD No. 1  
API # 30-015-35341  
Section 11, T25S R29E  
2,222' FSL & 2,640' FEL

Dear Mr. Jones:

Southwestern Energy Production Company is requesting to amend the perforation interval approved by Administrative Order SWD-1062 for the Karlsbad Corral SWD No. 1 well. Enclosed please find the following information in support of this application:

1. Form C-108
2. Map identifying all wells within two (2) miles with a one-half ( $\frac{1}{2}$ ) radius circle around proposed injection well
3. Table of wells within a one-half ( $\frac{1}{2}$ ) mile radius of subject well.
4. Injection well data sheet
5. Wellbore diagrams for all wells within a one-half ( $\frac{1}{2}$ ) mile radius
6. Water Analysis Report
7. Affidavit of publication and newspaper clipping – to be emailed upon receipt – Published 2-8-07
8. Administrative Application Checklist
9. Letter attesting to the notification of the affected parties.

Thank you for your timely approval of this application. If you have any questions, I can be reached at 281-618-4887.

Very truly yours,

Martha Howard  
Regulatory Analyst

Attachments  
CC: District 2

**Jones, William V., EMNRD**

---

**From:** Martha Howard [Martha\_Howard@SWN.COM]  
**Sent:** Monday, February 12, 2007 11:01 AM  
**To:** Jones, William V., EMNRD  
**Subject:** Southwestern - Karlsbad Corral SWD 1  
**Attachments:** Affidavit of Publication - TD to 4000'.pdf

Will,

The attached is the Affidavit of Publication for the second request to amend the approved Administrative Order SWD-1062 that was mailed to you on February 8, 2007. The engineers assure me that they will not be changing their plans again.

On behalf of Southwestern, I apologize for all of the additional work that Southwestern has generated due to these numerous requests to amend the existing approved order.

Martha C. Howard  
Staff Regulatory Analyst  
281-618-4887 direct  
281-618-4758 fax  
Martha\_Howard@SWN.com

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2/12/2007

**Affidavit of Publication**

State of New Mexico,  
County of Eddy, ss.

April Hernandez, being first duly sworn,  
on oath says:

That she is HR/Administrative Assistant of the Carlsbad Current-Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

February 8

2007

That the cost of publication is \$60.35 and that Payment Thereof has been made and will be assessed as court costs.

*April Hernandez*

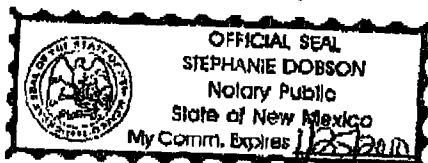
Subscribed and sworn to before me this

8 day of February, 2007

*Stephanie Dobson*

My commission Expires on 1/25/2010

Notary Public



February 8, 2007

Southwestern Energy Production Company, 2350 N. Sam Houston Parkway East, Suite 125, Houston, Texas, 77032, has filed form C-108 (Application for Authorization to Inject), with the New Mexico Oil Conservation Division, seeking administrative approval for

an injection well. This application was approved by Administrative Order SWD-1062 on December 23, 2006. Southwestern is amending the perforation interval and the total depth of the Produced Water Disposal permit. The proposed well, the Carlsbad Corral SWD No. 1, located 2222' FSL & 2640' FEL, Section 11, Township 25 South, Range 29 East of Eddy County, New Mexico, will be used for a saltwater disposal. Disposal waters from the Delaware formation, Cherry Canyon sand, will be re-injected into the Delaware formation, Bell Canyon sand, at a depth of 3,200' - 4,000', with a maximum injection pressure of 1,500 psi maximum, at a rate of 5,000 BWPD.

All interested parties opposing the afore mentioned must file objections of requests for a hearing with the Oil Conservation Division, 1220 South Saint Francis Drive, Santa Fe, New Mexico, 87505-5472, within 15 days. Additional information can be obtained by contacting Martha C. Howard at (281) -

618-4887.

Published by the Carlsbad Current Argus, Carlsbad, N.M., February 8, 2007.

Legal Notice Number

**Affidavit of Publication**

State of New Mexico,  
County of Eddy, ss.

April Hernandez, being first duly sworn,  
on oath says:

That she is HR/Administrative Assistant of the Carlsbad Current-Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

January 26 2007

That the cost of publication is \$59.69 and that Payment Thereof has been made and will be assessed as court costs.

April Hernandez

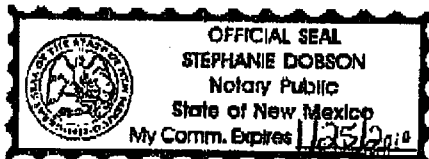
Subscribed and sworn to before me this

26 day of January, 2007

Stephanie Dobson

My commission Expires on 1/25/2010

Notary Public



January 26, 2007

Southwestern Energy Production Company, 2350 N. Sam Houston Parkway East, Suite 125, Houston, Texas, 77032, has filed form C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division, seeking administrative approval for an injection well. This application was approved by Administrative Order SWD-1062 on December 23, 2006. Southwestern is amending the perforation interval of the Produced Water Disposal permit. The proposed well, the Carlsbad Comp SWD No. 1, located 2222' PSL & 2640' FEL, Section 11, Township 25 South, Range 29 East of Eddy County, New Mexico, will be used for a saltwater disposal. Disposal waters from the Dakota were formation, Cherry Canyon sand, will be re-injected into the Dakota formation, Ball Canyon sand, at a depth of 3,200' - 3,600', with a maximum injection pressure of 1,500 psi maximum, at a rate of 5,000 BWPD.

All interested parties opposing the aforementioned must file objections of requests for a hearing with the Oil Conservation Division, 1220 South Saint Francis Drive, Santa Fe, New Mexico, 87505-8472, within 15 days. Additional information can be obtained by contacting Martha C. Howard at (281) 618-4887.

Published by the Carlsbad Current Argus, Carlsbad, N.M., January 26, 2007.

Legal Notice Number