DATE 9/3/02	SUSPENSE 9/18/02	ENGINEER WJ	LOGGED IN MW	TYPE SWD	APP NO. 224831650

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

SEP - 3

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.

Donald R. Lankford	DR Lankford	Petroleum Engineer	8/29/02
Print or Type Name	Signature	Title	Date

Don.Lankford@ElPaso.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 4-1-98

AMENDED APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____ Secondary Recovery _____ Pressure Maintenance ___X___ Disposal _____ Storage
Application qualifies for administrative approval? ___X___ Yes _____ No

II. OPERATOR: El Paso Energy Raton, L.L.C.

ADDRESS: PO BOX 190

CONTACT PARTY: Donald R. Lankford PHONE: 505-445-6721 445-6788 Fax

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? ___X___ Yes _____ No
If yes, give the Division order number authorizing the project: 826 - A

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.

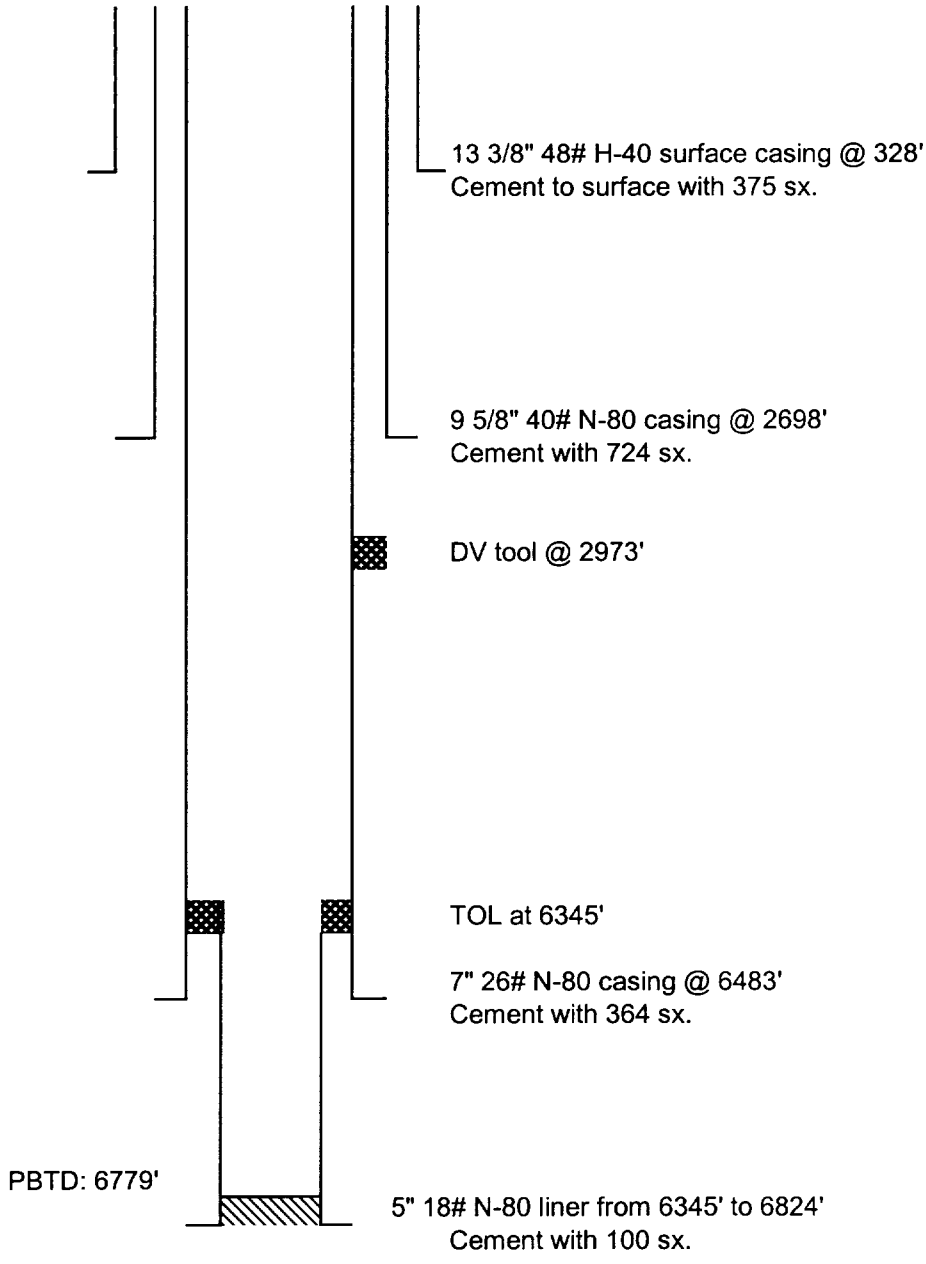
XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Donald R. Lankford TITLE: Petroleum Engineer

SIGNATURE: DR Lankford DATE: 08/29/02

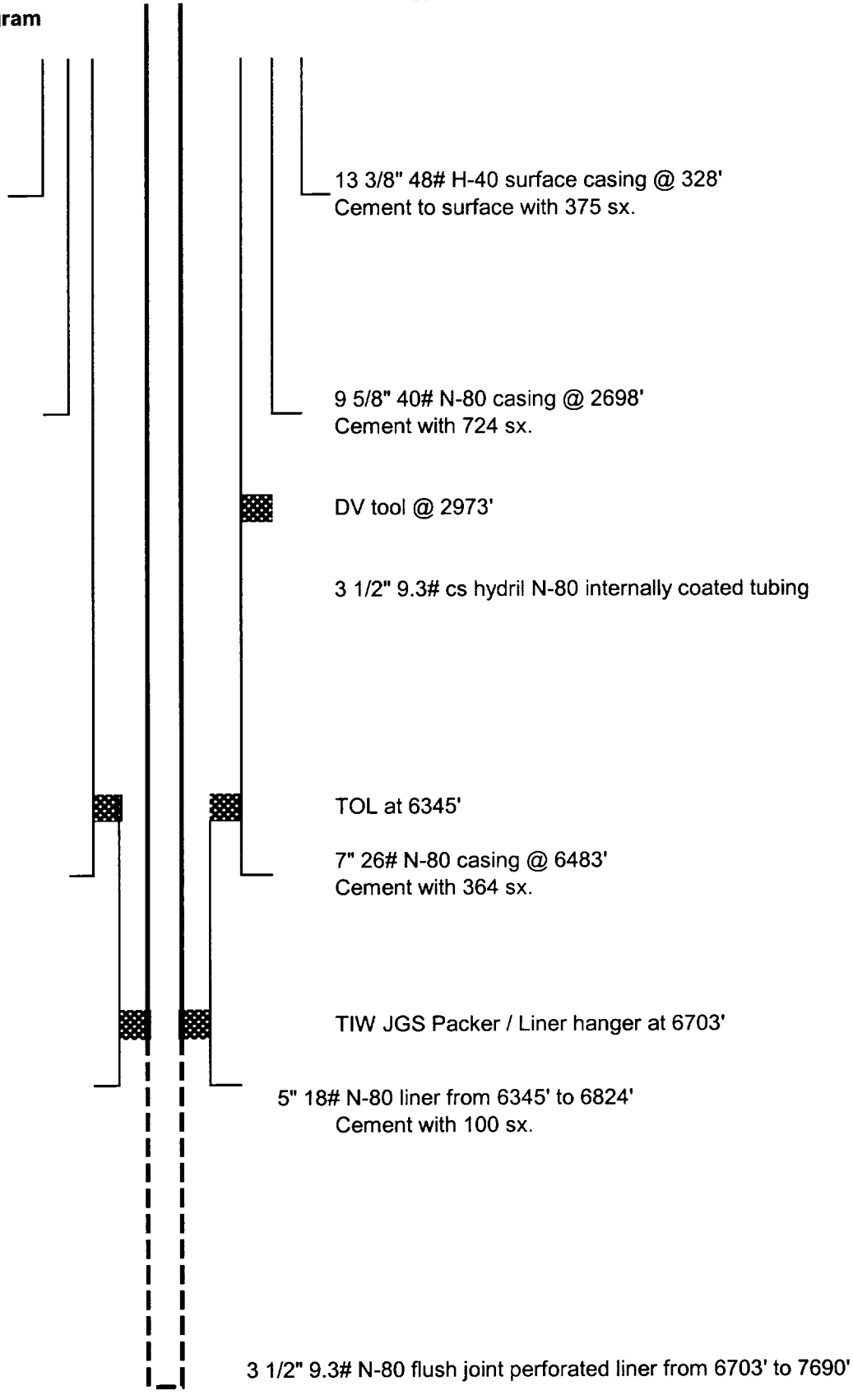
* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office


13 3/8" 48# H-40 surface casing @ 328'
Cement to surface with 375 sx.
9 5/8" 40# N-80 casing @ 2698'
Cement with 724 sx.
DV tool @ 2973'
TOL at 6345'
7" 26# N-80 casing @ 6483'
Cement with 364 sx.
PBTD: 6779'
5" 18# N-80 liner from 6345' to 6824'
Cement with 100 sx.

VPRE 99 Gas Well
Proposed Well Diagram

El Paso Energy Raton



El Paso Energy Raton, L.L.C.
Vermejo Park Ranch "E", Well #99 Water Disposal
1391.9' FNL & 885.1' FEL
Section 5, T31N, 19E
Colfax County, New Mexico

AMENDED Attachment A

III. WELL DATA

Section A:

1. Lease Name: Vermejo Park Ranch "E" Well #99 (Water Disposal) (30-007-20378)

   Location: 1391.9' FNL & 885.1' FEL, Sec 05, T31N, R19E, Colfax County, NM

2. Casing & Cementing (Drilling Procedure and Wellbore/Well Location Schematic Attached)

   Proposed:

Casing Size	Setting Depth	Sacks Cement	Hole Size	Top of Cement
13 3/8"	328'	375 sx	17 1/2"	Surface
9 5/8"	2,698'	724 sx	12 3/8"	Surface
7"	6,483'	364 sx	8 ¾"	Into 9 5/8" Casing Annulus
5"	6,345'- 6,824'	100 sx	6 1/8"	To top of liner at 6,345'
3 ½"	6,750'- 7,735'	N/A	4 1/8"	N/A

3. Tubing: 3 ½". 9.3 ppf, N-80, Butt IPC, 2.867" Drift/4.5" OD @ +/- 6,800'.

4. Packer: 5 " x 3 ½" nickel plated Loc Set w/ carbide slips @ =/- 6,800'

Section B:

1. Injection Formation: The Entrada, Glorieta Sandstone and possibly Sangre de Cristo.

   Field Name: Vermejo Park Ranch

2. Injection Interval: Entrada Sandstone 7,095'- 7,195'; Glorieta Sandstone 7,470'- 7,550'

3. Original Purpose of Well: Exploratory gas well.

4. No other perforated intervals.

5. Next Higher gas/oil zone: Vermejo Coal
   Next Lower gas/oil zone: None

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

V. Map Attached - "Attachment B", two mile & ½ mile radius area of review.

VI. Area of Review: "Attachment C" is the well data of the VPR E-34 mentioned below.

There is one well within one half mile of the proposed disposal well that penetrates the target formation. The VPR E -34 WDW is located approximately 500' east. Also, the VPRE 11 completed in the Raton and Vermejo Coals is located 130' west.

VII. Operation Data:

1. Proposed average daily injection volume: 18,000 BWPD
   Proposed maximum daily injection volume: 18,000 BWPD

2. This well will be a closed system.

3. Proposed average daily injection pressure: 2,000 psi
   Proposed maximum daily injection pressure: 2,000 psi

4. Sources of injection/disposal water will be from the Vermejo and Raton Formation CBM wells that have been drilled or are scheduled to be drilled on the Vermejo Park Ranch.

5. Chemical analysis of water zones will be obtained by Baker Petrolite Laboratories and Roy Johnson, District 4, Oil Conservation Division, Santa Fe, NM.

VIII. Geological Data (Geologic Well Prognosis Report – Attachment D)

Information pertaining to the lithological details and thickness have been estimated based on correlation with VPR E-34, located 500' to the east.

IX. Stimulation Program

Anticipated frac job will be 250,000 # 16/30 sand.

X. Logs and Test Data

Logs and test data will be submitted to: The Oil & Gas Conservation Division,
Att: Roy Johnson, Santa Fe, NM 87501

XI. Fresh Water "Attachment E"

Roy Johnson, OGCD, will take fresh water samples during drilling.

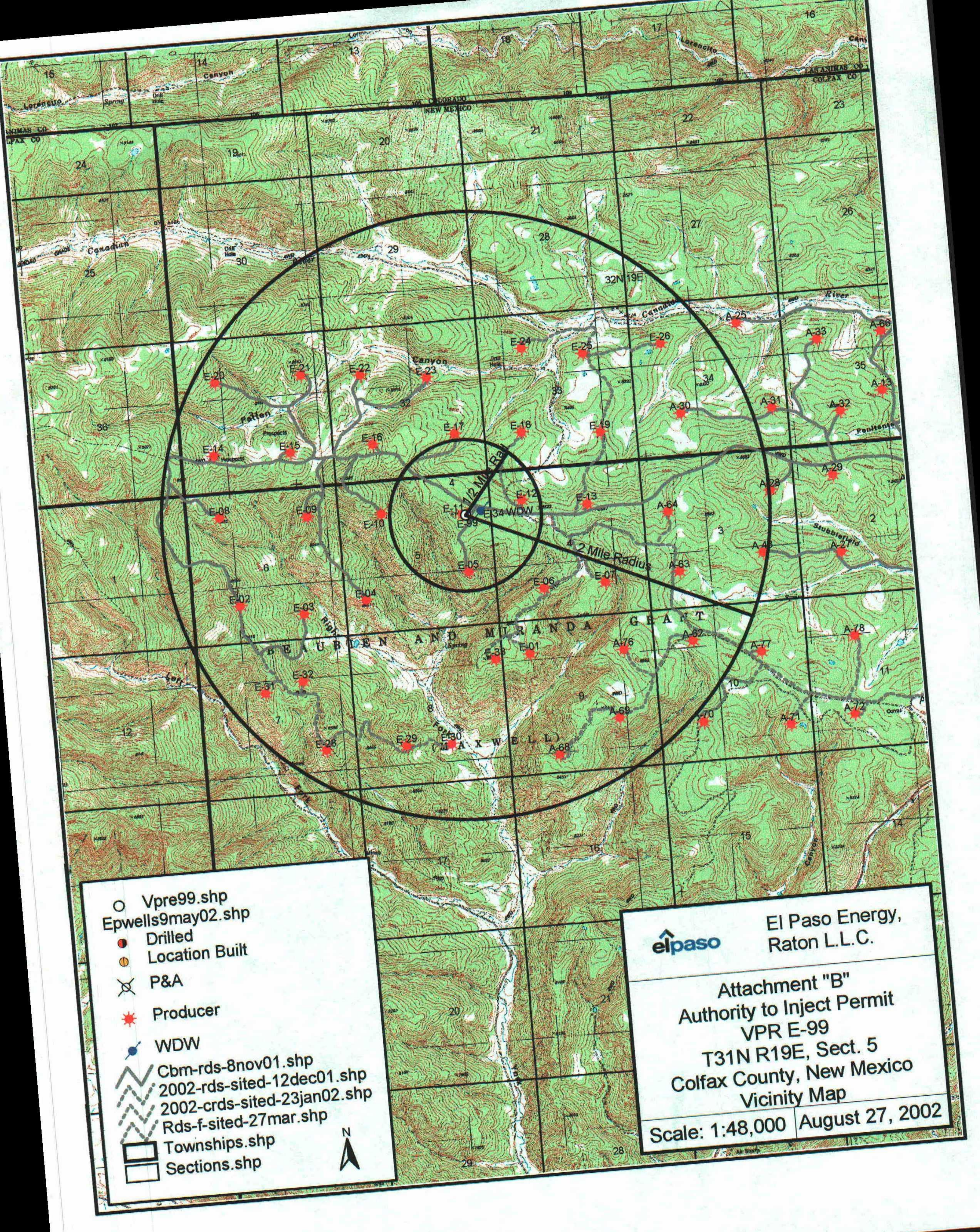
XII. Statement

To the best of our current knowledge of the area, there is no evidence of open faults or other hydrologic connection between and disposal zone and underground sources of drinking water.

XIII. Proof of Notice attached as "Attachment F"

El Paso Energy Raton, L.L.C. offsets Section 1 on all sides.

XIV. Certification: Form C-108 "Application for Authorization to Inject".


Vpre99.shp
Epwells9may02.shp
Drilled
Location Built
P&A
Producer
WDW
Cbm-rds-8nov01.shp
2002-rds-sited-12dec01.shp
2002-crds-sited-23jan02.shp
Rds-f-sited-27mar.shp
Townships.shp
Sections.shp
N
El Paso Energy,
Raton L.L.C.
Attachment "B"
Authority to Inject Permit
VPR E-99
T31N R19E, Sect. 5
Colfax County, New Mexico
Vicinity Map
Scale: 1:48,000
August 27, 2002
1/2 Mile Radius
2 Mile Radius
E-34 WDW
E-99
32N19E
BEAUBIEN AND MIRANDA GRANT
COLORADO
NEW MEXICO

El Paso Energy Raton, L.L.C.
Vermejo Park Ranch "E", Well #34 Water Disposal
1268.5' FNL & 368.2' FEL
Section 5, T31N, 19E
Colfax County, New Mexico

Attachment C: Data of Well Within Area of Review

WELL DATA:

1. Well Name: Vermejo Park Ranch "E" Well #34 (Water Disposal)

   Location: 1268.5' FNL & 368.2' FEL, Sec 05, T31N, R19E, Colfax County, NM

2. Operator: El Paso Energy Raton, L.L.C. (Same as Applicant)

3. Casing & Cementing (Drilling Procedure and Wellbore/Well Location Schematic Attached)

   Existing:

Casing Size	Setting Depth	Sacks Cement	Hole Size	Top of Cement
16"	330' KB	223 sx	18"	Surface
10 3/4"	2,675' KB	833 sx	13 ½"	Surface
7 5/8"	6038' KB	812 sx	9 7/8"	Into 10 ¾" Casing Annulus
5 ½"	7,133' KB	160 sx	6 ¾"	Into 7 5/8" Casing Annulus
3 ½"	7,110'- 7,614'	Not cemented	4 ¾"	Not cemented

4. Tubing: 3 ½". 9.3 ppf, L-80, JMLS, RTS 8, 2.867" Drift/ 4.5" OD @ +/- 6,706'

5. Packer: 5 ½" x 3 ½" nickel plated Loc Set w/ carbide slips @ =/- 6,706'

6. Open Formation: The Entrada and Glorieta Sandstone

7. Injection Interval: Entrada Sandstone 6,730'- 6,830'; Glorieta Sandstone 7,090'- 7,160'

8. Original Purpose of Well: Drilled for the purpose of disposing of produced formation water.

9. No other perforated intervals.

Attachment "D"

El Paso Energy Raton, LLC

GEOLOGIC WELL PROGNOSIS REPORT (ENTRADA/GLORIETTA DEPTHS)

DATE: 8/21/02
RIG: KEY
SUPV: Olmstead / Roper
REPORT BY: Mike Korte/Paul Basinski

WELL NAME: VPR E - 99 API number: 3000720378

FIELD	RATON BASIN CBM PROJECT	SEC.	5	TW.	31N	RANGE	19E
FEET FNL:	1,392	FEET FEL:	882	POD	E	AREA	YORK CANYON
ELEV. KB.:	8,608	SPUD:	7/30/02	Dak Test TD	6824 (8/19)	LOG:	6662 (8/20)
MUD LOGGERS:	Pikes Peak	SITE GEOLOGIST:	M. Korte (Shallow);T. Doupe (Deep)			OP. HOLE LOGGERS:	Schlumberger

COUNTY: COLFAX STATE: NM
PROJECT SPECIFIC: Pierre/Nio/Dak test

3rd Revision: 8/21/02 prog due to deepening VprE99 well to a depth 150 feet below Glorietta ss

Intermediate 9 5/8"...12 1/4" HOLE

DRILLERS DEPTH: 2,742 — 12 1/4"bit 3 1/2 days drilling
LOGGERS DEPTH: — no open hole log...CBL run

Surface Csg.: 13 3/8" Set @: 328 ft.
Intermediate Csg.: 9 5/8" Set @: 2690 ft.
Cement Inter. Csg.: 8/7/02 Circ. Cmt.: to surface

First significant gas:		subsea:		ft.
RATON FM. TOP:	320	subsea:	8288	ft.
VERMEJO FM. TOP:	2,221	subsea:	6387	ft.
TRINIDAD FM. TOP:	2,522	subsea:	6086	ft.
PIERRE FM. TOP:	2,657	subsea:	5951	ft.

Raton fm. CBM (ft.)
Vermejo fm. CBM (ft.)

Tops based on E11 CBM well offset to the nw, E99 sample tops, E99 GR curve on 8/11/02 Schl. Log

Intermediate 7" Pierre - Graneros Section 8 3/4" HOLE

DRILLERS DEPTH: 6,485 — 8/13/02 drlg nearer DK top after log
LOGGERS DEPTH: 6,388 — 8/11/02

Intermediate Csg.: 7" Set @: 6478 ft. (log csg @ 6,458'
Cement Inter. Csg.: 8/14/02 Circ. Cmt.: poor bond per 8/16 CBL

First significant gas:	3,876	subsea:	4732	ft.	correlates as a different zone than found at E34 Pierre gas shows
PIERRE FM. TOP:	2,657	subsea:	5951	ft.	SHALE dark gr./bl. firm mod calc, carb. minor sandy sh tr. bent and pyr...gas @ 3,876 behind open pipe
Lower Pierre member:	4,896	subsea:	3712	ft.	SHALE AS ABOVE with silty shale ...no significant gas shows while drilling
NIOBRARA FM. TOP:	5,218	subsea:	3390	ft.	
Smokey Hill Member:	5,218	subsea:	3390	ft.	dark gray firm hard calcareous shale with minor gray arg ls and sdy sh, tr. bent and pyr
Timpas Member:	5,820	subsea:	2788	ft.	SHALE dark gray calc. firm mica pyr becoming silty to vfg sd in lower parts, minor arg ls
Fort Hayes Member:	6,064	subsea:	2544	ft.	LS tan microcrystalline to chalky limestone and gray calcareous shale
BENTON FM TOP:	6,084	subsea:	2524	ft.	
Codell Member:	6,084	subsea:	2524	ft.	SH & SS dark gray carb shale, minor fine grained sandstone with thin beds of black limestone
Carlile Sh. Member:	6,150	subsea:	2458	ft.	SHALE chalky to limy dark gray calc soft smooth shale with minor ls and calcareous sandy shale
Greenhorn Ls. Member:	6,283	subsea:	2325	ft.	SHALE dark gray abnt pyr limy, minor hard crystalline dark gray ls, minor gray calc shale-arg. Ls
Graneros Sh. Member:	6,326	subsea:	2282	ft.	SHALE dk gray to bl slicalc.&silty, minor bent, limestone and silt-fg sd...washout @ 6,458'-6,488'
DAKOTA FM TOP:	6,513	subsea:	2095	ft.	thin beds of siltstone, brown hard mica carb arg siltstone, minor fg ss

Tops based on Schlumberger Logging

Intermediate (Liner) 6 1/8" HOLE

DRILLERS DEPTH: 6,875 — 8/21...Prepare for drlg depth 7,650'
LOGGERS DEPTH: 6,662

Production Liner: Set @: ft.
Cement Liner in place:

DAKOTA FM TOP:	6,513	subsea:	2095	ft.	E34 wdw offset showed gas (3,500+ Mcfd) Dakota expected but failed to show similar results
Dakota SS A member:	6,513	subsea:	2095	ft.	Silt & SS fine to medium grained sli calc, silica cement w/minor carb shale, clays, trace of coal
Dakota SS B member:	6,578	subsea:	2030	ft.	SS as above A member, mostly medium grained, minor chert conglomeratic ss and carb shale
Purgatoire SS member:	6,612	subsea:	1996	ft.	SS poorly sorted med- conglomeratic quartz grained friable, sli calc.
MORRISON FM TOP:	6,675	subsea:	1933	ft.	Jurassic Age: SH & SS Variegated shales, red green, gray maroon, minor tan hard ls, wh f-m gr ss
8/21/02 Depth	6,824	subsea:	1784	ft.	*TD 8/19/02 @ 8:00 MST; 271 ft above Entrada SS & 911 ft above projected TD*
Wanakah member:	7,055	subsea:	1553	ft.	SS f gr wh to orange mod cmt sli calc glauconitic fspr, minor gypsum, fxn oolitic ls
ENTRADA FM TOP:	7,095	subsea:	1513	ft.	SS wh -lt gn f-m gr calc. well rd and sorted frsted grains minor uncons SS
DOCKUM FM TOP:	7,195	subsea:	1413	ft.	Triassic Age: SHALE Variegated (red) mica calc, minor thin beds of f gr limy gray SS
Glorieta ss member:	7,470	subsea:	1138	ft.	Permian: SS orng, pink, white med grained silica cmt; deeper dolo. cmt, may become coarse arkosic ss
SANGRE DE CRISTO FM:	7,585	subsea:	1023	ft.	SHALE AND ARKOSIC SS (WASH) dominantly red shale, siltstone and red arkosic crs sediments
Est. TD	7,735	subsea:	873	ft.	

TD DEPTH SUFFICIENT FOR COMPLETION IN GLORIETA (150' below Glorieta SS base)

MUD LOG/GEOLOGIC DRILLING NOTES

NOTES: Key offset well: E34 WDW.....Above tops are logged through the Morrison 8/21/02 tops picked by Korte
Regional mapping indicates the Dakota fm can be expected approximately 4,000 feet below the top of the Trinidad SS....In fact 3,991 ft.
Lower Pierre member (from Raton basin top picks) is on a few occasions referred to as the top of Niobrara fm
"hot" shale of Pierre fm is expected to be found from 4,465'-4,505'.....in fact 4,444'-4,490'
E34 wdw drilled (below Trinidad SS) dry through Dakota SS, expect some water in Purgatoire SS.....in fact found water (minor) in Dak ss A member @ 6,534' sd
Dakota/Purgatoire SS: 6,513' - 6,675' is is considered tight with very minor fracturing in evidence.
Entrada fm SS: 7,095' - 7,195' has an estimated 100 feet net sand. Possible fracture enhanced porosity, probable water as in E34 offset.
Best Glorieta SS: 7,470' - 7,500' with an estimated 30 feet net sand....drill 150 feet below the base of member for "rat hole".

"Attachment E: Water Analyses of Sources Water to be injected down VPR E – 99"

Rocky Mountain Regior
1675 Broadway, Suite 15(
Denver, CO 8020(
(303) 573-277(
Lab Team Leader - Sheila Hernande
(915) 495-724(

Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	20103
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	2		
Formation:	UNKNOWN		
Sample Point:	BLEEDER		

Summary	
Sampling Date:	7/6/01
Analysis Date:	7/17/01
Analyst:	MARILYN BRANNON
TDS (mg/l or g/m3):	2330.5
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	0.9999998
Carbon Dioxide:	45 PPM
Oxygen:	
Comments:	

Analysis of Sample 185016 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**365.0**	**10.3**	**Sodium:**	**655.0**	**28.49**
Bicarbonate:	**1249.0**	**20.47**	**Magnesium:**	**3.5**	**0.29**
Carbonate:	**0.0**	**0.**	**Calcium:**	**16.0**	**0.8**
Sulfate:	**3.0**	**0.06**	**Strontium:**	**2.0**	**0.05**
Phosphate:			**Barium:**	**2.5**	**0.04**
Borate:			**Iron:**	**27.0**	**0.98**
Silicate:			Potassium:	7.5	0.19
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.2	Lead:		
pH used in Calculation:		**8.2**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.81	10.49	-3.97	0.00	-4.04	0.00	-3.12	0.00	0.07	0.00	0.11
100	0	0.86	11.19	-3.99	0.00	-3.99	0.00	-3.10	0.00	-0.07	0.00	0.17
120	0	0.92	11.54	-3.99	0.00	-3.91	0.00	-3.06	0.00	-0.18	0.00	0.25
140	0	0.99	11.89	-3.98	0.00	-3.81	0.00	-3.02	0.00	-0.26	0.00	0.36

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

Rocky Mountain Regior
1675 Broadway, Suite 15(
Denver, CO 80202
(303) 573-277
Lab Team Leader - Sheila Hernande
(915) 495-724(

Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	20105
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	3		
Formation:	UNKNOWN		
Sample Point:	BLEEDER		

Summary	
Sampling Date:	7/6/01
Analysis Date:	7/17/01
Analyst:	MARILYN BRANNON
TDS (mg/l or g/m3):	2351.2
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	0.9999999
Carbon Dioxide:	40 PPM
Oxygen:	
Comments:	

Analysis of Sample 185012 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**168.0**	**4.74**	**Sodium:**	**642.2**	**27.93**
Bicarbonate:	**1500.0**	**24.58**	**Magnesium:**	**2.5**	**0.21**
Carbonate:	**0.0**	**0.**	**Calcium:**	**13.0**	**0.65**
Sulfate:	**4.0**	**0.08**	**Strontium:**	**1.5**	**0.03**
Phosphate:			**Barium:**	**2.0**	**0.03**
Borate:			**Iron:**	**9.0**	**0.33**
Silicate:			Potassium:	9.0	0.23
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.42	Lead:		
pH used in Calculation:		**8.42**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.98	9.79	-3.96	0.00	-4.03	0.00	-3.13	0.00	0.10	0.35	0.08
100	0	1.02	9.79	-3.97	0.00	-3.98	0.00	-3.11	0.00	-0.04	0.00	0.13
120	0	1.06	10.14	-3.97	0.00	-3.90	0.00	-3.07	0.00	-0.15	0.00	0.2
140	0	1.10	10.14	-3.97	0.00	-3.80	0.00	-3.02	0.00	-0.23	0.00	0.3

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure

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Lab Team Leader - Sheila Hernande
(915) 495-724(

Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	23054
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	5		
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	11/28/01
Analysis Date:	12/7/01
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	1799.3
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	0.9999995
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 195611 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**85.0**	**2.4**	**Sodium:**	**515.0**	**22.4**
Bicarbonate:	**1148.0**	**18.81**	**Magnesium:**	**0.1**	**0.**
Carbonate:	**40.0**	**1.33**	**Calcium:**	**0.1**	**0.**
Sulfate:	**3.0**	**0.06**	**Strontium:**	**0.0**	**0.**
Phosphate:			**Barium:**	**1.0**	**0.01**
Borate:			**Iron:**	**0.1**	**0.**
Silicate:			Potassium:	7.0	0.18
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.52	Lead:		
pH used in Calculation:		**8.52**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-1.09	0.00	-6.12	0.00	-6.20	0.00	0.00	0.00	-0.26	0.00	0.05
100	0	-1.05	0.00	-6.14	0.00	-6.14	0.00	0.00	0.00	-0.39	0.00	0.08
120	0	-1.01	0.00	-6.14	0.00	-6.06	0.00	0.00	0.00	-0.50	0.00	0.13
140	0	-0.97	0.00	-6.12	0.00	-5.96	0.00	0.00	0.00	-0.58	0.00	0.19

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	20351
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	8		
Formation:	UNKNOWN		
Sample Point:	BLEEDER		

Summary	
Sampling Date:	7/17/01
Analysis Date:	7/31/01
Analyst:	MARILYN BRANNON
TDS (mg/l or g/m3):	2319.1
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	0.9999996
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 185029 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**660.0**	**18.62**	**Sodium:**	**723.6**	**31.48**
Bicarbonate:	**839.0**	**13.75**	**Magnesium:**	**1.5**	**0.12**
Carbonate:	**31.0**	**1.03**	**Calcium:**	**9.5**	**0.47**
Sulfate:	**10.0**	**0.21**	**Strontium:**	**0.6**	**0.01**
Phosphate:			**Barium:**	**0.4**	**0.01**
Borate:			**Iron:**	**38.0**	**1.37**
Silicate:			Potassium:	5.5	0.14
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.49	Lead:		
pH used in Calculation:		**8.49**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.69	5.94	-3.70	0.00	-3.77	0.00	-3.14	0.00	-0.22	0.00	0.04
100	0	0.71	6.29	-3.70	0.00	-3.71	0.00	-3.12	0.00	-0.36	0.00	0.07
120	0	0.74	6.29	-3.70	0.00	-3.62	0.00	-3.08	0.00	-0.47	0.00	0.11
140	0	0.77	6.64	-3.68	0.00	-3.52	0.00	-3.03	0.00	-0.55	0.00	0.17

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (505) 447-0621
Area:	RATON, NM	Sample #:	196049
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis ID #:	27726
Entity (or well #):	9	Analysis Cost	$40.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	7/29/02
Analysis Date:	8/7/02
Analyst:	SHEILA HERNANDEZ
TDS (mg/l or g/m3):	2217.6
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	0.999999
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 196049 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**272.0**	**7.67**	**Sodium:**	**651.0**	**28.32**
Bicarbonate:	**1281.0**	**20.99**	**Magnesium:**	**1.0**	**0.08**
Carbonate:	**0.0**	**0.**	**Calcium:**	**3.5**	**0.17**
Sulfate	**3.0**	**0.06**	**Strontium:**	**0.8**	**0.02**
Phosphate:			**Barium:**	**0.8**	**0.01**
Borate:			**Iron:**	**1.0**	**0.04**
Silicate:			Potassium:	3.5	0.09
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:		8.7	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		**8.7**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.58	2.10	-4.67	0.00	-4.74	0.00	-3.54	0.00	-0.43	0.00	0.04
100	0	0.61	2.10	-4.68	0.00	-4.69	0.00	-3.51	0.00	-0.56	0.00	0.06
120	0	0.63	2.45	-4.68	0.00	-4.60	0.00	-3.47	0.00	-0.67	0.00	0.1
140	0	0.66	2.45	-4.66	0.00	-4.50	0.00	-3.42	0.00	-0.75	0.00	0.15

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	23055
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	10		
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	11/28/01
Analysis Date:	12/7/01
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	3720
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1.0000001
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 182109 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**165.0**	**4.65**	**Sodium:**	**1047.2**	**45.55**
Bicarbonate:	**2481.0**	**40.66**	**Magnesium:**	**0.1**	**0.**
Carbonate:	**13.0**	**0.43**	**Calcium:**	**0.1**	**0.**
Sulfate:	**3.0**	**0.06**	**Strontium:**	**0.5**	**0.01**
Phosphate:			**Barium:**	**2.0**	**0.03**
Borate:			**Iron:**	**0.1**	**0.**
Silicate:			Potassium:	8.0	0.2
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.33	Lead:		
pH used in Calculation:		**8.33**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-1.09	0.00	-6.31	0.00	-6.38	0.00	-3.84	0.00	-0.13	0.00	0.16
100	0	-1.06	0.00	-6.34	0.00	-6.34	0.00	-3.82	0.00	-0.27	0.00	0.26
120	0	-1.04	0.00	-6.35	0.00	-6.27	0.00	-3.78	0.00	-0.38	0.00	0.4
140	0	-1.00	0.00	-6.35	0.00	-6.18	0.00	-3.74	0.00	-0.46	0.00	0.61

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	23056
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	11		
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	11/28/01
Analysis Date:	12/7/01
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	4133.5
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	0.9999999
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 182107 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**252.0**	**7.11**	**Sodium:**	**1167.3**	**50.78**
Bicarbonate:	**2693.0**	**44.14**	**Magnesium:**	**0.1**	**0.**
Carbonate:	**0.0**	**0.**	**Calcium:**	**0.5**	**0.02**
Sulfate:	**3.0**	**0.06**	**Strontium:**	**0.6**	**0.01**
Phosphate:			**Barium:**	**2.0**	**0.03**
Borate:			**Iron:**	**7.0**	**0.25**
Silicate:			Potassium:	8.0	0.2
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.29	Lead:		
pH used in Calculation:		**8.29**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-0.41	0.00	-5.64	0.00	-5.71	0.00	-3.79	0.00	-0.16	0.00	0.19
100	0	-0.39	0.00	-5.67	0.00	-5.67	0.00	-3.77	0.00	-0.30	0.00	0.3
120	0	-0.36	0.00	-5.68	0.00	-5.60	0.00	-3.73	0.00	-0.41	0.00	0.47
140	0	-0.33	0.00	-5.68	0.00	-5.52	0.00	-3.69	0.00	-0.49	0.00	0.71

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	20353
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	14		
Formation:	UNKNOWN		
Sample Point:	BLEEDER		

Summary	
Sampling Date:	7/17/01
Analysis Date:	7/31/01
Analyst:	MARILYN BRANNON
TDS (mg/l or g/m3):	1970.3
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	1.0000001
Carbon Dioxide:	22
Oxygen:	
Comments:	

Analysis of Sample 185031 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**236.0**	**6.66**	**Sodium:**	**583.7**	**25.39**
Bicarbonate:	**990.0**	**16.22**	**Magnesium:**	**1.0**	**0.08**
Carbonate:	**29.0**	**0.97**	**Calcium:**	**5.0**	**0.25**
Sulfate:	**111.0**	**2.31**	**Strontium:**	**0.5**	**0.01**
Phosphate:			**Barium:**	**0.1**	**0.**
Borate:			**Iron:**	**6.5**	**0.23**
Silicate:			Potassium:	7.5	0.19
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.47	Lead:		
pH used in Calculation:		**8.47**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.46	2.80	-2.90	0.00	-2.97	0.00	-2.16	0.00	0.25	0.00	0.05
100	0	0.50	2.80	-2.91	0.00	-2.92	0.00	-2.14	0.00	0.11	0.00	0.08
120	0	0.54	3.15	-2.91	0.00	-2.83	0.00	-2.10	0.00	0.00	0.00	0.12
140	0	0.59	3.15	-2.90	0.00	-2.73	0.00	-2.06	0.00	-0.08	0.00	0.19

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	20352
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	15		
Formation:	UNKNOWN		
Sample Point:	BLEEDER		

Summary	
Sampling Date:	7/17/01
Analysis Date:	7/31/01
Analyst:	MARILYN BRANNON
TDS (mg/l or g/m3):	2116.5
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	1.0000002
Carbon Dioxide:	25
Oxygen:	
Comments:	

Analysis of Sample 185028 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**207.0**	**5.84**	**Sodium:**	**623.9**	**27.14**
Bicarbonate:	**1122.0**	**18.39**	**Magnesium:**	**0.9**	**0.07**
Carbonate:	**49.0**	**1.63**	**Calcium:**	**5.5**	**0.27**
Sulfate:	**96.0**	**2.**	**Strontium:**	**0.6**	**0.01**
Phosphate:			**Barium:**	**0.1**	**0.**
Borate:			**Iron:**	**6.0**	**0.22**
Silicate:			Potassium:	5.5	0.14
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.54	Lead:		
pH used in Calculation:		**8.54**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.61	3.50	-2.95	0.00	-3.02	0.00	-2.16	0.00	0.17	0.00	0.05
100	0	0.64	3.50	-2.96	0.00	-2.96	0.00	-2.14	0.00	0.04	0.00	0.08
120	0	0.67	3.85	-2.96	0.00	-2.88	0.00	-2.10	0.00	-0.07	0.00	0.12
140	0	0.71	3.85	-2.95	0.00	-2.78	0.00	-2.06	0.00	-0.16	0.00	0.19

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	20106
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	16		
Formation:	UNKNOWN		
Sample Point:	BLEEDER		

Summary	
Sampling Date:	7/6/01
Analysis Date:	7/17/01
Analyst:	MARILYN BRANNON
TDS (mg/l or g/m3):	1781.9
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1.0000008
Carbon Dioxide:	60 PPM
Oxygen:	
Comments:	

Analysis of Sample 185017 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**326.0**	**9.2**	**Sodium:**	**535.4**	**23.29**
Bicarbonate:	**859.0**	**14.08**	**Magnesium:**	**2.0**	**0.16**
Carbonate:	**32.0**	**1.07**	**Calcium:**	**11.0**	**0.55**
Sulfate:	**2.5**	**0.05**	**Strontium:**	**1.5**	**0.03**
Phosphate:			**Barium:**	**1.5**	**0.02**
Borate:			**Iron:**	**5.0**	**0.18**
Silicate:			Potassium:	6.0	0.15
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.54	Lead:		
pH used in Calculation:		**8.54**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.85	7.70	-4.17	0.00	-4.24	0.00	-3.28	0.00	-0.18	0.00	0.04
100	0	0.89	7.70	-4.17	0.00	-4.18	0.00	-3.25	0.00	-0.31	0.00	0.06
120	0	0.93	8.05	-4.17	0.00	-4.09	0.00	-3.21	0.00	-0.42	0.00	0.09
140	0	0.97	8.40	-4.16	0.00	-3.99	0.00	-3.16	0.00	-0.50	0.00	0.14

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

Rocky Mountain Regior
1675 Broadway, Suite 15(
Denver, CO 8020(
(303) 573-277(
Lab Team Leader - Sheila Hernande
(915) 495-724(

Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	23057
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	17		
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	11/28/01
Analysis Date:	12/7/01
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	2258.1
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	0.9999998
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 195614 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**130.0**	**3.67**	**Sodium:**	**633.7**	**27.56**
Bicarbonate:	**1478.0**	**24.22**	**Magnesium:**	**0.1**	**0.**
Carbonate:	**0.0**	**0.**	**Calcium:**	**0.1**	**0.**
Sulfate:	**3.0**	**0.06**	**Strontium:**	**0.2**	**0.**
Phosphate:			**Barium:**	**1.0**	**0.01**
Borate:			**Iron:**	**5.0**	**0.18**
Silicate:			Potassium:	7.0	0.18
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.21	Lead:		
pH used in Calculation:		**8.21**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-1.30	0.00	-6.15	0.00	-6.22	0.00	-4.09	0.00	-0.29	0.00	0.13
100	0	-1.25	0.00	-6.16	0.00	-6.17	0.00	-4.07	0.00	-0.43	0.00	0.19
120	0	-1.19	0.00	-6.17	0.00	-6.09	0.00	-4.03	0.00	-0.54	0.00	0.28
140	0	-1.12	0.00	-6.17	0.00	-6.00	0.00	-3.99	0.00	-0.63	0.00	0.41

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

Rocky Mountain Regior
1675 Broadway, Suite 15(
Denver, CO 80202
(303) 573-277:
Lab Team Leader - Sheila Hernande
(915) 495-724(

Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	23058
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	20		
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	11/28/01
Analysis Date:	12/7/01
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	1702.8
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	1.0000005
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 176415 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**66.0**	**1.86**	**Sodium:**	**477.4**	**20.77**
Bicarbonate:	**1134.0**	**18.58**	**Magnesium:**	**0.1**	**0.**
Carbonate:	**14.0**	**0.47**	**Calcium:**	**0.1**	**0.**
Sulfate:	**3.0**	**0.06**	**Strontium:**	**0.1**	**0.**
Phosphate:			**Barium:**	**1.0**	**0.01**
Borate:			**Iron:**	**0.1**	**0.**
Silicate:			Potassium:	7.0	0.18
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.39	Lead:		
pH used in Calculation:		**8.39**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-1.21	0.00	-6.09	0.00	-6.16	0.00	-4.34	0.00	-0.24	0.00	0.07
100	0	-1.15	0.00	-6.10	0.00	-6.11	0.00	-4.31	0.00	-0.37	0.00	0.1
120	0	-1.10	0.00	-6.10	0.00	-6.03	0.00	-4.27	0.00	-0.48	0.00	0.16
140	0	-1.04	0.00	-6.09	0.00	-5.93	0.00	-4.22	0.00	-0.56	0.00	0.23

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

Rocky Mountain Regior
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Denver, CO 80202
(303) 573-277:
Lab Team Leader - Sheila Hernande
(915) 495-724(

Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	20104
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	21		
Formation:	UNKNOWN		
Sample Point:	BLEEDER		

Summary	
Sampling Date:	7/6/01
Analysis Date:	7/17/01
Analyst:	MARILYN BRANNON
TDS (mg/l or g/m3):	1344.3
Density (g/cm3, tonne/m3):	1.001
Anion/Cation Ratio:	1.0000007
Carbon Dioxide:	55 PPM
Oxygen:	
Comments:	

Analysis of Sample 185013 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**84.0**	**2.37**	**Sodium:**	**374.3**	**16.28**
Bicarbonate:	**826.0**	**13.54**	**Magnesium:**	**0.7**	**0.06**
Carbonate:	**33.0**	**1.1**	**Calcium:**	**7.0**	**0.35**
Sulfate:	**5.0**	**0.1**	**Strontium:**	**0.8**	**0.02**
Phosphate:			**Barium:**	**1.5**	**0.02**
Borate:			**Iron:**	**7.0**	**0.25**
Silicate:			Potassium:	5.0	0.13
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.54	Lead:		
pH used in Calculation:		**8.54**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO3		Gypsum CaSO4*2H20		Anhydrite CaSO4		Celestite SrSO4		Barite BaSO4		CO2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	0.68	4.55	-3.99	0.00	-4.06	0.00	-3.18	0.00	0.19	0.35	0.04
100	0	0.73	4.55	-4.00	0.00	-4.01	0.00	-3.15	0.00	0.06	0.00	0.06
120	0	0.77	4.90	-4.00	0.00	-3.92	0.00	-3.11	0.00	-0.05	0.00	0.09
140	0	0.83	4.90	-3.98	0.00	-3.81	0.00	-3.06	0.00	-0.13	0.00	0.13

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

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Lab Team Leader - Sheila Hernande
(915) 495-724(

Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	23059
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	22		
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	11/28/01
Analysis Date:	12/7/01
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	3564.9
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1.0000003
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 195609 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**156.0**	**4.4**	**Sodium:**	**1000.0**	**43.5**
Bicarbonate:	**2396.0**	**39.27**	**Magnesium:**	**0.1**	**0.**
Carbonate:	**0.0**	**0.**	**Calcium:**	**0.1**	**0.**
Sulfate:	**3.0**	**0.06**	**Strontium:**	**0.6**	**0.01**
Phosphate:			**Barium:**	**2.0**	**0.03**
Borate:			**Iron:**	**0.1**	**0.**
Silicate:			Potassium:	7.0	0.18
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.33	Lead:		
pH used in Calculation:		**8.33**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	**Calcite CaCO3**		**Gypsum CaSO4*2H20**		**Anhydrite CaSO4**		**Celestite SrSO4**		**Barite BaSO4**		**CO2 Press**
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-1.10	0.00	-6.30	0.00	-6.37	0.00	-3.75	0.00	-0.12	0.00	0.15
100	0	-1.07	0.00	-6.32	0.00	-6.33	0.00	-3.73	0.00	-0.25	0.00	0.25
120	0	-1.04	0.00	-6.33	0.00	-6.26	0.00	-3.69	0.00	-0.36	0.00	0.38
140	0	-1.00	0.00	-6.33	0.00	-6.17	0.00	-3.65	0.00	-0.45	0.00	0.58

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

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Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

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(303) 573-277
Lab Team Leader - Sheila Hernande
(915) 495-724(

Water Analysis Report by Baker Petrolite

Company:	EL PASO ENERGY RATON LLC	Sales RDT:	44625
Region:	ROCKY MOUNTAINS	Account Manager:	BOB WILLIAMS (970) 749-7375
Area:	RATON, NM	ID #:	23060
Lease/Platform:	VERMEJO PARK RANCH 'E'	Analysis Cost:	$40.00
Entity (or well #):	23		
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	11/28/01
Analysis Date:	12/7/01
Analyst:	JAMES AHRLETT
TDS (mg/l or g/m3):	3526.8
Density (g/cm3, tonne/m3):	1.002
Anion/Cation Ratio:	1
Carbon Dioxide:	
Oxygen:	
Comments:	

Analysis of Sample 176413 @ 75 °F

Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	**159.0**	**4.48**	**Sodium:**	**994.3**	**43.25**
Bicarbonate:	**2313.0**	**37.91**	**Magnesium:**	**0.1**	**0.**
Carbonate:	**39.0**	**1.3**	**Calcium:**	**0.1**	**0.**
Sulfate:	**4.0**	**0.08**	**Strontium:**	**0.3**	**0.01**
Phosphate:			**Barium:**	**2.0**	**0.03**
Borate:			**Iron:**	**9.0**	**0.33**
Silicate:			Potassium:	6.0	0.15
			Aluminum:		
Hydrogen Sulfide:			Chromium:		
pH at time of sampling:			Copper:		
pH at time of analysis:		8.41	Lead:		
pH used in Calculation:		**8.41**	Manganese:		
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	**Gauge Press.**	**Calcite CaCO3**		**Gypsum CaSO4*2H20**		**Anhydrite CaSO4**		**Celestite SrSO4**		**Barite BaSO4**		**CO2 Press**
°F	**psi**	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-1.04	0.00	-6.19	0.00	-6.26	0.00	-3.93	0.00	0.00	0.00	0.13
100	0	-1.02	0.00	-6.21	0.00	-6.21	0.00	-3.91	0.00	-0.13	0.00	0.2
120	0	-1.00	0.00	-6.22	0.00	-6.14	0.00	-3.87	0.00	-0.24	0.00	0.33
140	0	-0.97	0.00	-6.21	0.00	-6.05	0.00	-3.83	0.00	-0.33	0.00	0.51

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

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"Attachment F"

XIII. Proof of Notice

Surface Owner:

Vermejo Park, L.L.C.
PO Drawer E
Raton, NM 87740

Working/Offset & Royalty Owner:

Vermejo Mineral Corporation
Nine Greenway Plaza
Houston, TX 77046
Attn: Paul Dowden

A copy of the Oil Conservation Division, Form C-108 has been sent to the above stated parties by Certified Mail on this 30th day of August, 2002.

DR Lankford

Donald R. Lankford, Petroleum Engineer
El Paso Energy Raton, L.L.C.
PO Box 190
Raton, NM 87740

elpaso

EL PASO ENERGY RATON, L.L.C.
P.O. BOX 190
RATON, N.M. 87740

July 28, 2002

Vermejo Park Ranch
P. O. Drawer E
Raton, New Mexico 87740

Attn: Mr. David Vackar

Subject: Landowner Notice of Conversion of VPRE-99 to an Injection Well

Dear David:

This correspondence is to serve notice that El Paso Energy Raton, L.L.C., plans to convert the VPRE-99 exploratory test well, API no. 30-007-20378, to a produced water disposal well in the SE1/4 of the NE1/4 of Section 5, T31N, R19E in Colfax, County, New Mexico.

The well will be deepened to the Entrada and Glorieta formations at approximate depth 7735 ft. Produced water from coalbed methane wells will be injected into the Entrada and Glorieta Formations and possibly the Sangre de Cristo formation.

Respectfully,

Carl Lakey
Production Director

UNITED STATES POSTAL SERVICE®

Receipt

Amount *(Written Out)*	Amount *(In Numbers)*
Cert. Fee $1 /100 Dollars	$ 1.42

Purpose 7001 1940 0000 6056 1323

+ Rtn. Rec pt

Is any Portion of this Sale a Charitable Tax Deduction?

☐ Yes ☐ No

If "Yes," the fair market value of the postage portion of the foregoing stamps equals the First-Class postage rate.

By *(Signature and Title)*	Date

elpaso

EL PASO ENERGY RATON, L.L.C.
P.O. BOX 190
RATON, N.M. 87740

July 28, 2002

Vermejo Minerals Corp.
Nine Greenway Plaza
Houston, Texas 77046

Attn: Mr. Paul Dowden

Subject: Partner Notice of Conversion of VPRE-99 to an Injection Well

Dear Paul:

This correspondence is to serve notice that El Paso Energy Raton, L.L.C., plans to convert the VPRE-99 exploratory test well, API no. 30-007-20378, to a produced water disposal well in the SE1/4 of the NE1/4 of Section 5, T31N, R19E in Colfax, County, New Mexico.

The well will be deepened to the Entrada and Glorieta formations at approximate depth 7735 ft. Produced water from coalbed methane wells will be injected into the Entrada and Glorieta Formations and possibly the Sangre de Cristo formation.

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only: No Insurance Coverage Provided)

HOUSTON, TX 77046

Postage	$ 0.37	UNIT ID: 0880
Certified Fee	2.30	
Return Receipt Fee (Endorsement Required)	1.75	Postmark Here
Restricted Delivery Fee (Endorsement Required)		Clerk: KN9NJR
Total Postage & Fees	$ 4.42	08/28/02

Sent To: Vermejo Minerals Corp.
Mr. Paul Dowden
Street, Apt. No.; or PO Box No.: Nine Greenway Plaza
City, State, ZIP+ 4: Houston, TX 77046

PS Form 3800, January 2001 See Reverse for Instructions

7001 1940 0000 6056 1330

Respectfully,

DR Lankford

Don Lankford
Petroleum Engineer

Affidavit of Publication

STATE OF NEW MEXICO)
) ss.
COUNTY OF COLFAX)

The undersigned, being first duly sworn according to law, on his/her oath deposes and says that he/she is the business manager of the newspaper named "The Raton Range" and that he/she has personal knowledge of the facts stated herein; that the said "The Raton Range" is a twice-weekly newspaper of general paid circulation printed and published in the County of Colfax and State of New Mexico and entered under the Second class postal privilege in said County, and having been uninterruptedly and continuously printed and published in said County during the period of more than six months to the date of publishing of the first issue of the publication next prior or notice concerning which this affidavit is made and a copy of which is hereto attached; that said newspaper is duly qualified for that purpose under the laws of the state of New Mexico; that the publication, a printed copy of which is hereunto attached and made a part of this affidavit, was published in said newspaper once each week for 1 successive weeks, said paid publication having been made on the following dates, to-wit:

First publication: The 30 day of August, 2002

Second publication: The ____ day of _____, 2002

Third publication: The ____ day of _____, 2002

Fourth publication: The ____ day of _____, 2002

Fifth publication: The ____ day of _____, 2002

Sixth publication: The ____ day of _____, 2002

Cynthia N Marshall
Business Manager

Subscribed and sworn to before me this 30 day of August, 2002.

Kimberly D. Davis
Notary Public

Notice of Application for Fluid Injection Well Permit

El Paso Energy Raton, L.L.C., Nine Greenway Plaza, Houston, Texas, is seeking administrative approval from the New Mexico Oil Conservation Division to complete their Vermejo Park Ranch "E", #99, as a water disposal well. The well is located in Section 05,T31N, R19E, Colfax County, New Mexico. The proposed disposal interval is the Entrada Sandstone 7095' - 7175' and Glorieta Sandstone 7470' - 7580', and possibly the Sangre De Cristo 7585' - 7620'. El Paso Energy Raton, L.L.C. intends to inject a maximum of 18,000 bbls. of produced formation water per day at a maximum injection pressure of 2,000 psi. Interested parties must file objections or request for hearing with the Oil Conservation Division, 1220 S. St. Francis, Santa Fe, New Mexico 87505 within 15 days of this notice.

Donald R. Lankford, PE

El Paso Energy Raton, L.L.C.

P.O. Box 190

Raton, NM 87740

(505) 445-6721

(505) 445-6788 Fax

Legal No. 401102

Published in The Raton Range: August 30 and September 3, 2002.

OFFICIAL SEAL
KIMBERLY D. DAVIS
NOTARY PUBLIC
STATE OF NEW MEXICO
MY COMMISSION EXPIRES: 3/11/06

PUBLISHER'S BILL

1 inserts 1 Times, 36.24

101 lines ____ Times, ____

____ col. Inches ____ Times, ____

Affidavit of Publication

Legal 4011