7-27-05 DATE IN	SUSPENSE	Catanach ENGINEER	7-28-05 LOGGED IN	TYPE WFX	pSEM0521933703 APP NO.

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.

MARCIE ST. GERMAIN	Marcie St Germain	Production Tech	7-25-05
Print or Type Name	Signature	Title	Date

mstgermain@stmaryland.com
e-mail Address

580 WESTLAKE PARK BLVD., SUITE 600

HOUSTON, TEXAS 77079

281/677-2800

FAX 281/677-2810

ST. MARY LAND & EXPLORATION COMPANY

July 18. 2005

State of New Mexico
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505
Attn: David Catanach

Re: Form C-108 Application for Authorization to Inject
East Shugart Delaware Unit #25

Dear Mr. Catanach:

In January 1999, St. Mary Land & Exploration Company submitted an Application for Authorization to Inject for the East Shugart Delaware Unit. The application was approved and included wells #1, #17, #18, #19, #20, #21, #22, #23, and #24 (Division Order No. R-11254; Case #12208). The ESDU #25 was inadvertently omitted from the original application.

Enclosed is Form C-108 for the ESDU #25 and what I believe are the necessary attachments as follows:

- Administrative Application Checklist
- Application for Authorization to Inject
- Map of Area with ESDU #25 Marked in Red (Item V)
- Well Data
- Map of Fresh Water Wells in Shugart Area with ESDU #25 Marked in Red
- Latest Water Analysis Report by Baker Petrolite

If additional information is required, please contact me at (281) 677-2772.

Sincerely,

Marcie St. Germain

Marcie St. Germain
Production Technician

cc: Bureau of Land Management
1301 W. Grand Avenue
Artesia, NM 88210

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

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

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: ____X___Secondary Recovery _____Pressure Maintenance _____Disposal _____Storage
Application qualifies for administrative approval? ___X___Yes _____No

II. OPERATOR: St. Mary Land & Exploration Company

ADDRESS: 580 Westlake Park Blvd., Suite 600, Houston, TX 77079

CONTACT PARTY: Marcie St. Germain PHONE: 281/677-2772

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: R-11254

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: MARCIE ST. GERMAIN TITLE: Production Technician

SIGNATURE: Marcie St. Germain DATE: 7-25-05

E-MAIL ADDRESS: mstgermain@stmaryland.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: January 1999, Division Order # R-11254, Case # 12208.

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

Side 2

III. WELL DATA

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

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

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

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

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

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

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

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

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

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

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

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

XIV. PROOF OF NOTICE

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

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

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

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

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

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

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

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

Side 1

INJECTION WELL DATA SHEET

OPERATOR: _St. Mary Land & Exploration Company _____

WELL NAME & NUMBER: East Shugart Delaware Unit #25 _____

WELL LOCATION: ___250' FNL, 1125' FEL_____I_____24_____ 18S_____31E____
FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC

30-015-34212

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: _____12 ¼"_____ Casing Size:_____8 5/8"_____

Cemented with: 225 + sx PP sufficient to circ *or* _____ ft^3

Top of Cement: ___surface_____ Method Determined: _____

Intermediate Casing

Hole Size: _____7 7/8"_____ Casing Size:_____5 ½"_____

Cemented with: 695 sx Cl C & H *or* _____ ft^3

Top of Cement: _____ Method Determined: _____

Production Casing

Hole Size: _____ Casing Size:_____

Cemented with: _____ sx. *or* _____ ft^3

Top of Cement: _____ Method Determined: _____

Total Depth: _____

Injection Interval

_____Proposed 5030_____feet to___5310_____

(Perforated or Open Hole; indicate which)

INJECTION WELL DATA SHEET

Tubing Size: 2 3/8" 4.7# Lining Material: J-55 Duo-lined

Type of Packer: Baker Lot-set injection packer

Packer Setting Depth: @ +/- 5000'

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

Additional Data

1. Is this a new well drilled for injection? X Yes _____ No

   If no, for what purpose was the well originally drilled? _____

   _____

2. Name of the Injection Formation: Delaware

3. Name of Field or Pool (if applicable): East Shugart ; Pool 56419

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. No, new WIW.

   _____

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: _____

   Grayburg @ 4300' _____

   Bone Spring @ 7800' _____

   _____

Nine Point Drilling Plan

(Supplement to BLM 3160-3)

St. Mary Land and Exploration Co.

ESDU #25

250 FNL, 1125' FEL; Sec 24, TI8S, R31E

East Shugart Delaware Unit – Property Code 25743

Shugart (Delaware) East Field

Eddy Co., NM

NM-106715

1. The geologic surface formation is quaternary.
2. Name and estimated tops of geologic horizons

Yates	2400'
Queen	3500'
Grayburg	4020'
San Andres	4420'
Delaware	4575'

3. Protection of possible useable water will be achieved by setting 8.625" surface casing @ ~~350'+/-~~ and cementing it to surface. The Queen-Grayburg are oil and gas productive in this area in addition to the targeted Delaware-Brushy Canyon. Isolation will be achieved by setting 5.5" casing @ 5500' +/-, and cementing back to surface.
4. **Specifically the casing string referenced in #3 above will consist of the following:**

Surface: 8.625" OD, 24#/ft, J55, STC, new pipe @ 850'+/- in 12.25" hole.

Production: 5.50" OD, 15.5#/ft, J55, LTC, new pipe @5550'+/- in 7.875" hole

Cementing programs for the above casing strings are:

Surface: 225 sx Premium Plus w/ 2% CaC12, .25#/sk celloflake mixed at 14.8 ppg, and having a yield of 1.34 cu ft/sk

The above volume represents 100% excess over calculated hole volume, and will be adjusted to actual setting depth of casing. The slurries will be preceded by a fresh water spacer, and displaced with brine water.

Production: (a) 365 sx Interfill C cement mixes @ 11.9 ppg and having a yield of 2.45 cuft/sk

(b) 330 sx Super H cement w/2.5lbm salt, 0.3% CFR-3, 00.3% Lap-1, 5 lbm Gilsonite mixed at 13.2 ppg and having a yield of 1.63 cuft/sk

The above are Schlumberger products with 50% excess volume - actual volumes will be adjusted to the open hole caliper of this wellbore. The cement slurries will be preceded by 12 bbls cement wash for mud removal and displaced with fresh water. Equivalent products from another vendor may be substituted for Schlumberger depending on price/availability.

5. *The well control equipment to be employed during the drilling of this well is as illustrated on **EXHIBIT A**. This equipment includes a pipe and blind rams, an annular preventer and a choke manifold of comparable pressure rating. Equipment will be rated for a minimum of 3000 psi, and will be tested to 80% of that pressure rating prior to drilling out of the 8.625" surface casing.*

6. It is anticipated that this well will be drilled to TD utilizing the fluids shown below:

0-850': Gel/Lime "spud mud" 8.6-9.0 PPG. Utilize native solids to maintain sufficient viscosity to clean hole. Mix paper as required to control seepage loss.

850-5000': Brine 9.9 - 10.0 PPG. Circulate thru reserve pit for gravitational solids solids removal. Add paper as required to control seepage loss. Maintain pH using Lime.

5000-5550': Salt gel 10-10.01 PPG Confine circulation to steel pits. Discontinue Lime, and mix starch for filtration control. Maintain water loss @ 10-15 cc. Sweep hole with Loloss at TD to clean hole for logging operations.

7. Auxiliary equipment will include an upper kelly cock valve, safety valve to fit drill pipe and pressure gauges.

8. No drill stem testing is planned for this wellbore. Coring the Brushy Canyon is being considered and may be proposed if economically feasible.

A one-man mud logging unit will be utilized from 3000' to TD to record geological tops, collect samples, and monitor drilling fluids for hydrocarbons. GR/Caliper , Density Neutron and Dual Induction Laterologs will be run at TD to evaluate porosity and saturations. A cased hole GR/CB/CVL will be run during the completion for correlation and to evaluate cement quality.

CONDITIONS OF APPROVAL - DRILLING

Operator's Name:	**St. Mary Exploration & Land Co.**
Well Name & No.	**East Shugart Delaware Unit #25**
Location:	**250' FNL, 1125' FEL, Section 24, T. 18 S., R. 31 E., Lea County, New Mexico**
Lease:	**NM-106714**

I. DRILLING OPERATIONS REQUIREMENTS:

1. The Bureau of Land Management (BLM) is to be notified at the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (505) 361-2822 for wells in Eddy County in sufficient time for a representative to witness:

   A. Well spud

   B. Cementing casing: **8-5/8** inch **5-1/2** inch

   C. BOP tests

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

3. Submit a Sundry Notice (Form 3160-5, one original and five copies) for each casing string, describing the casing and cementing operations. Include pertinent information such as; spud date, hole size, casing (size, weight, grade and thread type), cement (type, quantity and top), water zones and problems or hazards encountered. The Sundry shall be submitted within 15 days of completion of each casing string. The reports may be combined into the same Sundry if they fall within the same 15-day time frame.

4. The API No. assigned to the well by NMOCD shall be included on the subsequent report of setting the first casing string.

II. CASING:

1. The **8-5/8** inch surface casing shall be set at **approximately 850 feet** and cement circulated to the surface. If cement does not circulate to the surface the appropriate BLM office shall be notified and a temperature survey or cement bond log shall be run to verify the top of the cement. Remedial cementing shall be completed prior to drilling out that string.

2. The minimum required fill of cement behind the **5-1/2** inch production casing is **to reach at least 500 feet above the top of the uppermost hydrocarbon productive interval.**

III. PRESSURE CONTROL:

1. All BOP systems and related equipment shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2. The BOP and related equipment shall be installed and operational before drilling below the **8-5/8** inch casing shoe and shall be tested as described in Onshore Order No. 2. Any equipment failing to test satisfactorily shall be repaired or replaced.

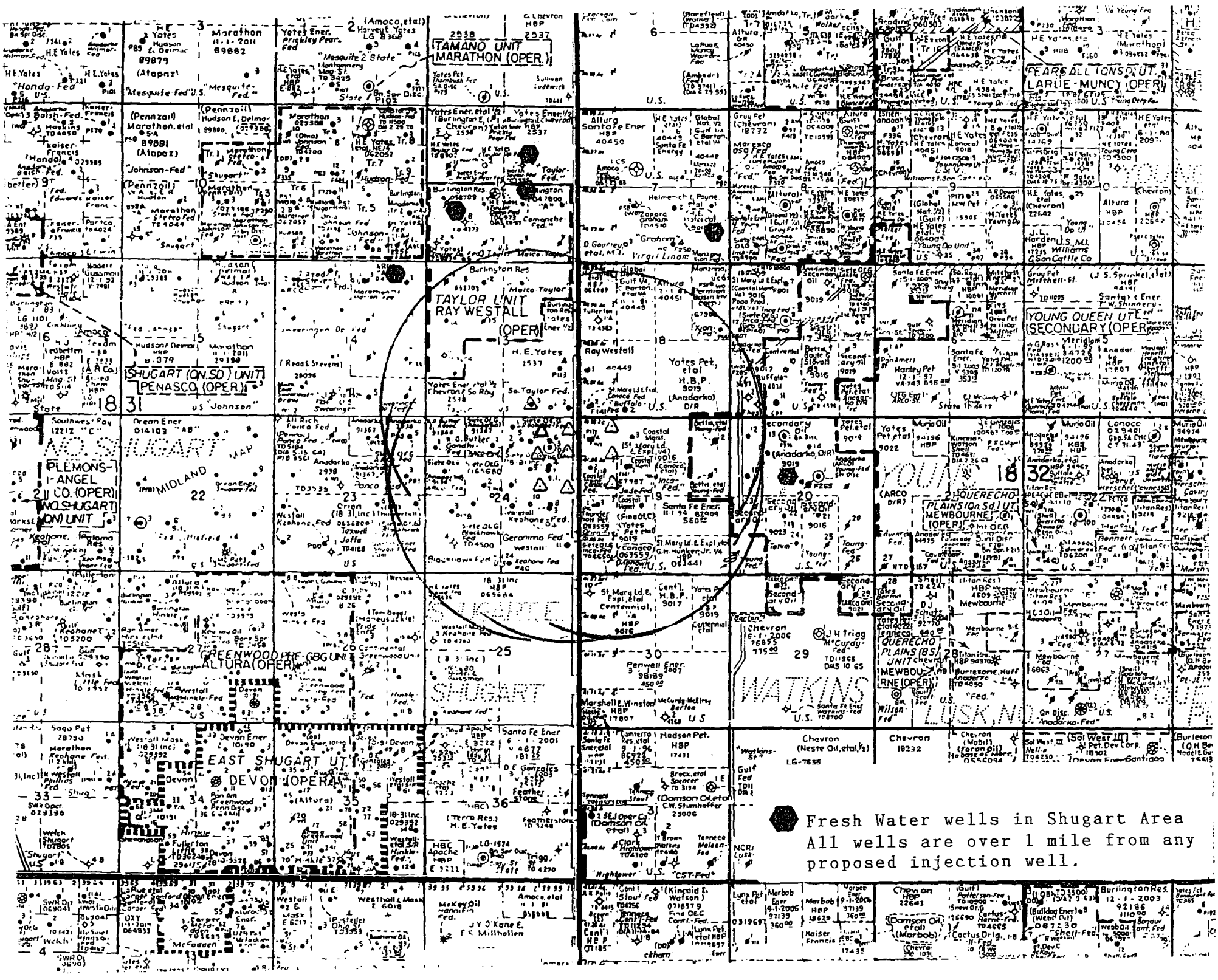
2. Minimum working pressure of the blowout preventer and related equipment (BOPE) shall be **2000** psi.

3. The appropriate BLM office shall be notified in sufficient time for a representative to witness the tests.

- The tests shall be done by an independent service company.
- The results of the test shall be reported to the appropriate BLM office.
- Testing fluid must be water or an appropriate clear liquid suitable for sub-freezing temperatures. Use of drilling mud for testing is not permitted since it can mask small leaks.
- Testing must be done in a safe workman-like manner. Hard line connections shall be required.

6/29/05
acs

Shugart C-108
Item V.


TAMANO UNIT
MARATHON (OPER.)
TAYLOR UNIT
RAY WESTALL
(OPER.)
SHUGART (N.SD.) UNIT
PENASCO (OPER.)
NO. SHUGART
PLEMONS-ANGEL CO. (OPER.)
NO. SHUGART (N.SD.) UNIT
MIDLAND
SHUGART
GREENWOOD-PENN GAS UNIT
ALTURA (OPER.)
EAST SHUGART UT.
DEVON (OPER.)
YOUNG QUEEN UT.
SECONDARY (OPER.)
QUERECHO PLAINS (N.SD.) UT.
MEWBOURNE (OPER.)
QUERECHO PLAINS (BS) UNIT
MEWBOURNE (OPER.)
WATKINS
LUSK
Fresh Water wells in Shugart Area
All wells are over 1 mile from any
proposed injection well.

THE FOLLOWING WELLS ARE WITHIN THE AREA OF REVIEW BUT DID NOT PENETRATE THE DELAWARE.

OPERATOR	CURRENT WELL NAME	API #	S-T-R	LOCATION	STATUS	SPUD DATE	COMP. DATE	TD	PBTD
ST. MARY	ARCO #2	30-15-25624	24-T18S-R31E	950' FNL 2310' FWL	PROD	6/2/86	6/21/86	4500'	4487'
ST. MARY	GERONIMO #2	30-15-25244	24-T18S-R31E	950' FNL 2310' FEL	INJ.	4/3/86	4/26/85	4702'	4691'
ST. MARY	GERONIMO #6	30-15-25597	24-T18S-R31E	790' FNL 940' FEL	PROD	4/10/86	4/26/86	4450'	4407'
ST. MARY	GERONIMO #7	30-15-25598	24-T18S-R31E	1750' FNL 990' FEL	INJ	4/21/86	5/6/86	4500'	4489'
ST. MARY	JADE #2	30-25-30038	19-T18S-R32E	1650' FNL 1750' FWL	PROD	12/15/87	1/25/88	4525'	4320'
ST. MARY	INCA #4	30-25-30039	19-T18S-R32E	760' FNL 430' FWL	INJ	1/7/88	2/5/88	4500'	4244'
THUNDERBOL PETROLEUM	ORION #1	30-25-33140	19-T18S-R32E	2310' FSL 500' FWL	PROD	11/12/95	2/2/96	4500'	4454'
WESTALL	KEOHANE FED #2	30-15-25441	24-T18S-R31E	2310' FSL 2200' FEL	PROD	10/18/85	12/11/85	4500'	
WESTALL	KEOHANE FED #3	30-15-25814	24-T18S-R31E	2200' FSL 990' FEL	PROD	10/30/87	11/25/87	4500'	
ST. MARY	BLACKHAWK #1	30-15-25235	24-T18S-R31E	2310' FSL 1650' FWL	SHUT IN PROD	3/24/85	4/18/85	4527'	4485'
ST. MARY	BLACKHAWK #2	30-15-25360	24-T18S-R31E	2310 FNL 1980' FWL	SHUT IN PROD	8/4/85	9/5/85	4500'	4490'
ST. MARY	BLACKHAWK #7	30-15-26500	24-T18S-R31E	2630' FNL 2310' FWL	INJ	11/23/90	11/23/90	4500'	4455'
ST. MARY	CONOCO #2	30-25-29803	18-T18S-R32E	400' FSL 400' FWL	PROD	12/13/86	1/12/87	4500'	4487'
ST. MARY	KEOHANE FED #1	30-15-NA	24-T18S-R31E	330' FNL 2260' FEL	P & A	3/12/61	5/3/61	4232'	

Operator	Current Well Name	Former Well Name	API #	S-T-R	Location	Status	Spud Date	Com. Date	TD	PBTD	Casing Program	Top of Cement	Formation	Completion Interval	Treatment	IP
ST. MARY	ARCO #1		30-15-25218	24-T18S-R31E	1830' FNL 660' FWL	Prod. Oil	03/12/85	04/01/85	5256'	5235'	13 3/8" 48#/FT, J-55 SET @ 350' w/370 SX 4 1/2" 10.5#/FT, J-55 SET @ 5255' w/2300 SX	SURFACE SURFACE	QN-PENR-GBG	3740-4316'	Acidize w/3150 gal Frac w/48M gal & 81M#	50 BOPD 145 BWPD 21 MCFPD
ST. MARY	GERONIMO #1		30-15-24927	24-T18S-R31E	2310' FNL 2310' FEL	Prod. Oil	11/07/84	02/17/85	6417'	4748'	8 5/8" 24#/FT, J-55 SET @ 350' w/370 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5367' w/900 SX	SURFACE 2108'	QN-PENR-GBG	4258-4284'	Acidize w/1500 gal Frac w/35M gal & 70M#	105 BOPD 16 BWPD 44 MCFPD
ST. MARY	ESDU #6	GERONIMO #3	30-15-25385	24-T18S-R31E	890' FNL 990' FEL	Prod. Oil	09/01/85	10/05/85	6470'	6459'	8 5/8" 24#/FT, J-55 SET @ 311' w/400 SX 5 1/2" 15.5 #/FT, J-55 SET @ 6470' w/2830 SX	SURFACE SURFACE	DELAWARE	5012-5069' 5221-5237' 5302-5320'	Acidize w/3000 gal Frac w/75M gal & 131.5M#	166 BOPD 100 BWPD 100 MCFPD
ST. MARY	ESDU #10	GERONIMO #4	30-15-25457	24-T18S-R31E	1650' FNL 990' FEL	Prod. Oil	11/30/85	12/20/85	6550'	5321'	13 3/8" 54#/FT, J-55 SET @ 357' w/400 SX 8 5/8" 24#/FT, J-55 SET @ 2247' w/830 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5365' w/840 SX	SURFACE SURFACE 2286'	DELAWARE	5016-5074'	Acidize w/1000 gal Frac w/32M gal & 62M#	135 BOPD 345 BWPD 100 MCFPD
ST. MARY	ESDU #4	GERONIMO #5	30-15-25546	24-T18S-R31E	765' FNL 1980' FEL	Prod. Oil	02/16/86	03/18/96	10,200'	5250'	13 3/8" 54 #/FT, J-55 SET @ 372' w/385 SX 8 5/8" 32 & 24 #/FT, J-55 SET @ 5350' w/2050 SX	SURFACE SURFACE	DELAWARE	5013-5088' 5114-5121'	Acidize w/2000 gal Frac w/60M gal & 110M#	70 BOPD 105 BWPD 75 MCFPD
ST. MARY	ESDU #14	GERONIMO #8	30-15-25652	24-T18S-R31E	2310' FSL 990' FEL	Prod. Oil	09/08/86	10/02/86	5500'	5441'	8 5/8" 24#/FT, J-55 SET @ 337' w/250 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5497' w/910 SX	SURFACE SURFACE	DELAWARE	5042-5094'	Acidize w/1000 gal Frac w/22M gal & 39M#	99 BOPD 68 BWPD 150 MCFPD
ST. MARY	ESDU #9	GERONIMO #9	30-15-25723	24-T18S-R31E	1730' FNL 1650' FEL	Prod. Oil	12/01/86	02/02/87	5400'	5360'	8 5/8" 24#/FT, J-55 SET @ 345' w/200 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5400' w/935 SX	SURFACE SURFACE	DELAWARE	5022-5072' 5136-5166' 5258-5273'	Acidize w/2750 gal Frac w/82M gal & 141.1M#	146 BOPD 70 BWPD 183 MCFPD
ST. MARY	ESDU #13	GERONIMO #10	30-15-25735	24-T18S-R31E	2310' FSL 1650' FEL	Prod. Oil	03/02/87	03/23/87	5500'	5471'	8 5/8" 24#/FT, J-55 SET @ 350' w/230 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5496' w/1300 SX	SURFACE SURFACE	DELAWARE	5033-5079	Acidize w/1000 gal Frac w/32M gal & 64M#	116 BOPD 65 BWPD 125 MCFPD
ST. MARY	GERONIMO #11		30-15-25803	24-T18S-R31E	990' FSL 330' FEL	T&A OIL	09/03/87	09/30/87	5500'	5489'	8 5/8" 24#/FT, J-55 SET @ 364' w/230 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5489' w/1330 SX	SURFACE SURFACE	DELAWARE	4636-4651'	Acidize w/1000 gal Frac w/21M gal & 43M#	50 BOPD 115 BWPD 30 MCFPD
ST. MARY	ESDU #5	GERONIMO #12	30-15-26022	24-T18S-R31E	990' FNL 1650' FEL	Prod. Oil	12/21/88	02/03/89	5600'	5400'	8 5/8" 24#/FT, J-55 SET @ 372' w/240 SX 5 1/2" 17 & 15.5 #/FT, J-55 SET @ 5622' w/1170 SX	SURFACE SURFACE	DELAWARE	5255-5270' 5311-5329' 5135-5156' 5021-5069'	Acidize w/3500 gal Frac w/98.75M gal & 215.3M#	68 BOPD 195 BWPD 75 MCFPD
K O BUTLER	GHANDI #1		30-15-26243	24-T18S-R31E	990' FNL 330' FWL	Prod. Oil	12/15/89	05/23/89	10,000'	9180'	13 3/8" 54#/FT, J-55 SET @ 467' w/500 SX 8 5/8" 24#/FT, J-55 SET @ 2419' w/1000 SX 5 1/2" 15.5 #/FT, J-55 SET @ 10000' w/2030 SX	SURFACE SURFACE SURFACE	BONE SPRING	7871-8141' 8264-8340' 8452-8995' 9224-9350'	Acidize w/25,000 gal Frac w/395M gal & 791.5M#	71 BOPD 139 BWPD 49 MCFPD
HEYCO	SO. TAYLOR 13 #1		30-15-25594	13-T18S-R31E	330' FSL 990' FEL	Prod. Oil	07/24/86	09/25/86	5410'	5083'	8 5/8" 24#/FT, J-55 SET @ 352' w/250 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5410' w/2325 SX	SURFACE SURFACE	DELAWARE GRAYBURG	5063 5180-5220' 4310-4410'	Acidize w/6,000 gal Frac w/60M gal & 102M# Acidize w/1200 gal Frac w/40M gal & 60M#	98 BOPD 120 BWPD 105 MCFPD 181 BOPD 0 BWPD 73 MCFPD
HEYCO	ESDU #2	SO. TAYLOR 13 #2	30-15-25847	13-T18S-R31E	330' FSL 330' FEL	Prod. Oil	12/30/87	03/09/88	5448'	5410'	8 5/8" 24#/FT, J-55 SET @ 350' w/230 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5448' w/1350 SX	SURFACE SURFACE	DELAWARE	5310-5390'	Acidize w/5500 gal Frac w/35M gal & 71.5M#	27 BOPD 21 BWPD 25 MCFPD
HEYCO	ESDU #1	SO. TAYLOR 13 #3	30-15-25741	13-T18S-R31E	430' FSL 1650' FEL	Injector	07/22/88	08/01/88	5450'	4781'	8 5/8" 24#/FT, J-55 SET @ 366' w/230 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5450' w/1950 SX	SURFACE SURFACE	DELAWARE QN-PENR-GBG	4848-70' 4330-4428'	Acidize w/2100 gal Frac w/20M gal & 42.5M# Acidize w/1200 gal Frac w/40M gal & 63M#	55 BOPD 39 BWPD NR MCFPD 34 BOPD 150 BWPD 39 MCFPD
HEYCO	SO. TAYLOR 13 #4		30-15-26150	13-T18S-R31E	1650' FSL 660' FEL	Prod. Oil	07/19/89	08/29/89	5500'	4650'	9 5/8" 40#/FT, J-55 SET @ 350' w/400 SX 5 1/2" 15.5 #/FT, J-55 SET @ 4895' w/1775 SX	SURFACE SURFACE	QN-PENR-GBG	4278-4614'	Acidize w/3000 gal Frac w/65M gal & 60M#	113 BOPD 107 BWPD 60 MCFPD
WESTWALL	BUFFALO #1		30-25-29985	18-T18S-R32E	1650' FSL 330' FWL	T&A OIL	09/09/87	11/24/87	6519'	6469'	8 5/8" 24#/FT, J-55 SET @ 950' w/570 SX 5 1/2" 15.5 #/FT, J-55 SET @ 6519' w/2775 SX	SURFACE SURFACE	DELAWARE QN-PENR-GBG	6279-6329' 4795-4820'	Acidize w/2500 gal Frac w/44M gal & 70M#	33 BOPD 81 BWPD NR MCFPD
WESTWALL	BUFFALO #2		30-025-30013	18-T18S-R32E	330' FSL 1650' FWL	T&A OIL	10/02/87	12/09/87	6500'	5064'	8 5/8" 24#/FT, J-55 SET @ 900' w/570 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5110' w/2025 SX	SURFACE SURFACE	QN-PENR-GBG	4826-4958'	Not Reported	10 BOPD 11 BWPD NR MCFPD
ST. MARY	ESDU #3	CONOCO #1	30-25-29694	18-T18S-R32E	330' FSL 330' FWL	Prod. Oil	06/21/86	07/15/86	5500'	5457'	8 5/8" 24#/FT, J-55 SET @ 362' w/250 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5470' w/600 SX	SURFACE SURFACE	DELAWARE	5190-5221' 5267-5295'	Acidize w/2500 gal Frac w/60M gal & 116M#	141 BOPD 21 BWPD 150 MCFPD

Operator	Current Well Name	Former Well Name	API #	S-T-R	Location	Status	Spud Date	Com. Date	TD	PBTD	Casing Program	Top of Cement	Formation	Completion Interval	Treatment	IP
ST. MARY	ESDU #12	JADE #1	30-25-29939	19-T18S-R32E	1650' FNL 1650' FWL	Prod. Oil	06/20/87	07/13/87	5500'	5488'	8 5/8" 24#/FT, J-55 SET @ 372' w/230 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5500' w/1160 SX	SURFACE SURFACE	DELAWARE	5274-5289' 5166-5190'	Acidize w/2000 gal Frac w/73M gal & 111.28M#	142 BOPD 101 BWPD 150 MCFPD
ST. MARY	ESDU #7	INCA #1	30-25-29887	19-T18S-R32E	760' FNL 440' FWL	Prod. Oil	04/10/87	05/04/87	5500'	5450'	8 5/8" 24#/FT, J-55 SET @ 350' w/200 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5500' w/1250 SX	SURFACE SURFACE	DELAWARE	5292-5307' 5220-5267'	Acidize w/2000 gal Frac w/75M gal & 133.8M#	171 BOPD 148 BWPD 200 MCFPD
ST. MARY	ESDU #11	INCA #2	30-25-29940	19-T18S-R32E	1770' FNL 330' FWL	Prod. Oil	06/08/87	06/28/87	5500'	5460'	8 5/8" 24#/FT, J-55 SET @ 372' w/200 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5460' w/1170 SX	SURFACE SURFACE	DELAWARE	5259-5274' 5158-5173'	Acidize w/1000 gal Frac w/23M gal & 46M#	178 BOPD 201 BWPD 190 MCFPD
ST. MARY	ESDU #8	INCA #3	30-25-29978	19-T18S-R32E	660' FNL 1650' FWL	Prod. Oil	07/12/87	08/06/87	5500'	5255'	8 5/8" 24#/FT, J-55 SET @ 374' w/230 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5500' w/1360 SX	SURFACE SURFACE	DELAWARE	5188-5200' 5293-5307'	Acidize w/1500 gal Frac w/38M gal & 78M#	134 BOPD 146 BWPD 90 MCFPD
ST. MARY	ESDU #15	CONOCO #3	30-25-30187	19-T18S-R32E	2310' FSL 660' FWL	Prod. Oil	12/27/87	02/12/88	5650'	5596'	8 5/8" 24#/FT, J-55 SET @ 374' w/230 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5636' w/1425 SX	SURFACE SURFACE	DELAWARE	5054-5212'	Acidize w/2000 gal Frac w/47M gal & 98M#	98 BOPD 154 BWPD 55 MCFPD
ST. MARY	ESDU #16	MOHAWK #1	30-25-30111	19-T18S-R32E	2310' FSL 1650' FWL	Prod. Oil	10/24/87	11/28/87	6550'	6510'	8 5/8" 24#/FT, J-55 SET @ 351' w/230 SX 5 1/2" 15.5 #/FT, J-55 SET @ 6550' w/1635 SX	SURFACE SURFACE	DELAWARE	5048-5072' 5211-5226'	Acidize w/2000 gal Frac w/31M gal & 59.4M#	60 BOPD 89 BWPD 50 MCFPD
ST. MARY	ESDU #17		30-15-33841	24-T18S-R31E	248' FNL 302' FEL	Injector	02/21/05	04/04/05	5537'	5507'	8 5/8" 24#/FT, J-55 SET @866' w/677 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5532' w/1202 SX	SURFACE SURFACE	DELAWARE	5082-5242'	Acidize w/2500 gal 1st Frac w/23M gal & 36.7# 2nd Frac 26M gal & 42#	N/A
ST. MARY	ESDU #18			19-T18S-R32E	190' FNL 1045' FWL	Not Drilled						SURFACE SURFACE	DELAWARE			N/A
ST. MARY	ESDU #19		30-15-33842	24-T18S-R31E	1288' FNL 1361' FEL	Drilling	06/30/05		5540'			SURFACE SURFACE	DELAWARE			N/A
ST. MARY	ESDU #20		30-15-31350	24-T18S-R31E	1250' FNL 303' FEL	Injector	10/30/00	01/18/01	5550'	5494'	8 5/8" 24#/FT, J-55 SET @ 882' w/540 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5500' w/1240 SX	SURFACE SURFACE	DELAWARE	5230-5240'	Acidize w/1500 gal Frac w/11.2M gal & 34M#	N/A
ST. MARY	ESDU #21		30-25-37036	19-T18S-R32E	1193' FNL 1018' FWL	Injector	03/08/05	04/04/05	5517'	5479'	8 5/8" 24#/FT, J-55 SET @ 954' w/590 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5517' w/1214 SX	SURFACE SURFACE	DELAWARE	5252-5346'	Acidize w/2500 gal Frac w/32.4 gal & 60.3#	N/A
ST. MARY	ESDU #22			24-T18S-R31E	2330' FNL 1320' FEL	Not Drilled						SURFACE SURFACE	DELAWARE			N/A
ST. MARY	ESDU #23		30-15-33843	24-T18S-R31E	2322' FNL 248' FEL	Injector	02/03/05	03/16/05	5550'	5507'	8 5/8" 24#/FT, J-55 SET @ 875' w/525 SX 5 1/2" 15.5 #/FT, J-55 SET @ 5555' w/1080 SX	SURFACE SURFACE	DELAWARE	5056-5090'	Acidize w/2500 gal Frac w/29.6 gal & 47.7#	N/A
ST. MARY	ESDU #24			19-T18S-R32E	2322' FNL 1073' FWL	Not Drilled						SURFACE SURFACE	DELAWARE			N/A
ST. MARY	ESDU #25			24-T18S-R31E	250' FNL 1125' FEL	Not Drilled						SURFACE SURFACE	DELAWARE			N/A

BAKER PETROLITE
A Baker Hughes company

Water Analysis Report by Baker Petrolite

COASTAL
GERONIMO
WATER PLANT
TANK

Account Manager
WAYNE PETERSON

Summary	
Sampling Date	1/6/99
Analysis Date	1/13/99
Analyst	SHEILA HERNANDEZ
TDS (mg/l or g/m³)	250813
Density (g/cm³ or tonne/m³)	1.163
Anion/Cation Ratio	1.00
Carbon Dioxide	210 PPM
Oxygen	

Analysis of Sample 106238 @ 75°F					
Anions	**mg/l**	**meq/l**	**Cations**	**mg/l**	**meq/l**
Chloride	153487	4329	**Sodium**	79884	3475
Bicarbonate	82.6	1.02	**Magnesium**	2070	344
Carbonate	0.00	0.00	**Calcium**	12651	631
Sulfate	900	18.7	**Strontium**	339	7.74
Phosphate	N/A	N/A	**Barium**	0.30	0.00
Borate	N/A	N/A	**Iron**	5.50	0.20
Silicate	N/A	N/A	Potassium	919	23.5
			Aluminum	N/A	N/A
Hydrogen Sulfide		2 PPM	Chromium	N/A	N/A
			Copper	N/A	N/A
pH at time of sampling		6.90	Lead	N/A	N/A
pH at time of analysis			Manganese	N/A	N/A
pH used in Calculations		6.90	Nickel	N/A	N/A

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000bbl									
Temp.	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		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.	0.60	2.87	-0.05		0.00	3.20	-0.00		-0.01		0.05
100	0.	0.62	3.06	-0.13		-0.01		-0.08		-0.21		0.06
120	0.	0.63	3.49	-0.20		-0.01		-0.10		-0.39		0.08
140	0.	0.64	3.97	-0.26		0.02	19.1	-0.10		-0.54		0.11

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 CO_2 pressure is actually the calculated CO_2 fugacity. It is usually nearly the same as the CO_2 partial pressure.

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BAKER PETROLITE
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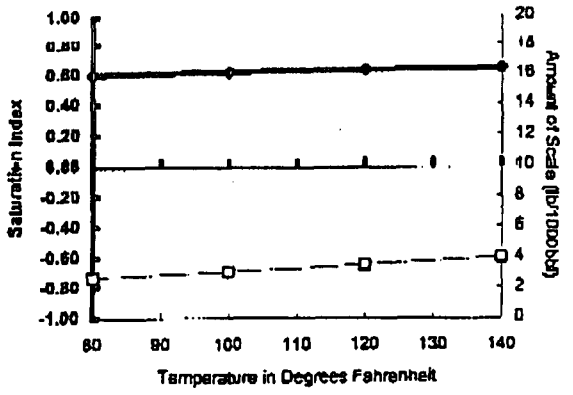
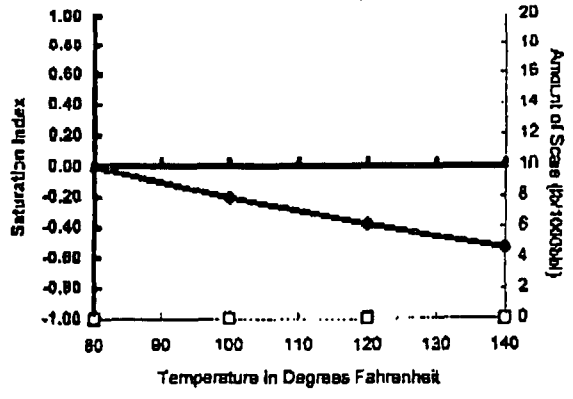
Scale Predictions from Baker Petrolite

Analysis of Sample 106236 @ 75°F for COASTAL , Jan/13/99

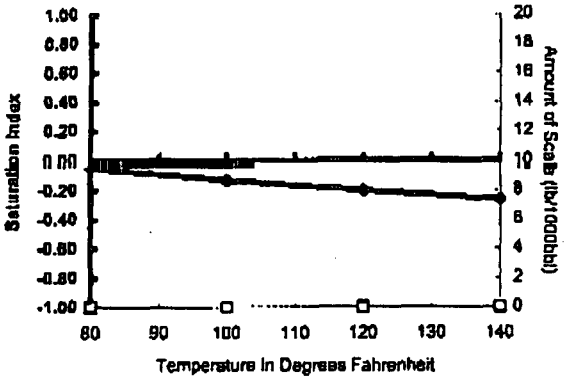
Calcite - $CaCO_3$



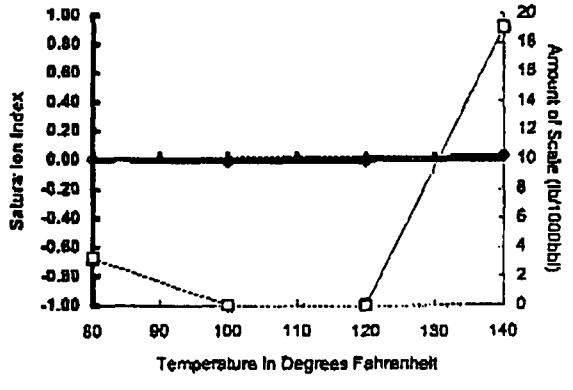
Barite - $BaSO_4$



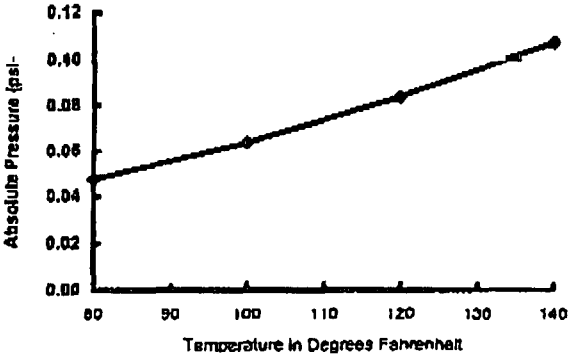
Gypsum - $CaSO_4 \cdot 2H_2O$



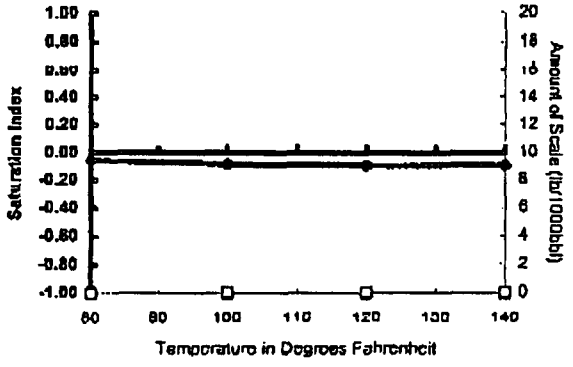
Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



Celestite - $SrSO_4$



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BAKER PETROLITE
A Baker Hughes company

Water Analysis Report by Baker Petrolite

MARATHON
TORANO
WATER PLANT
TANK

Account Manager
WAYNE PETERSON

Summary	
Sampling Date	1/6/99
Analysis Date	1/13/99
Analyst	SHEILA HERNANDEZ
TDS (mg/l or g/m³)	150848
Density (g/cm³ or tonne/m³)	1.096
Anion/Cation Ratio	1.00
Carbon Dioxide	135 PPM
Oxygen	

Analysis of Sample 106237 @ 75°F					
Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride	89691	2530	Sodium	51718	2250
Bicarbonate	187	3.06	Magnesium	1340	110
Carbonate	0.00	0.00	Calcium	4395	219
Sulfate	2929	61.0	Strontium	122	2.78
Phosphate	N/A	N/A	Barium	0.10	0.00
Borate	N/A	N/A	Iron	4.50	0.16
Silicate	N/A	N/A	Potassium	462	11.8
			Aluminum	N/A	N/A
Hydrogen Sulfide		9 PPM	Chromium	N/A	N/A
			Copper	N/A	N/A
pH at time of sampling		7.10	Lead	N/A	N/A
pH at time of analysis			Manganese	N/A	N/A
pH used in Calculations		7.10	Nickel	N/A	N/A

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000bbl										
Temp.	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		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.	0.70	11.1	0.07	216	0.08	177	0.24	33.5	0.26	0.02	0.11
100	0.	0.73	13.0	0.01	27.4	0.08	181	0.21	30.9	0.06	0.01	0.16
120	0.	0.76	15.0	-0.04		0.10	240	0.20	29.5	-0.11		0.21
140	0.	0.79	17.2	-0.09		0.15	338	0.20	29.2	-0.25		0.29

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 CO_2 pressure is actually the calculated CO_2 fugacity. It is usually nearly the same as the CO_2 partial pressure.

BAKER PETROLITE
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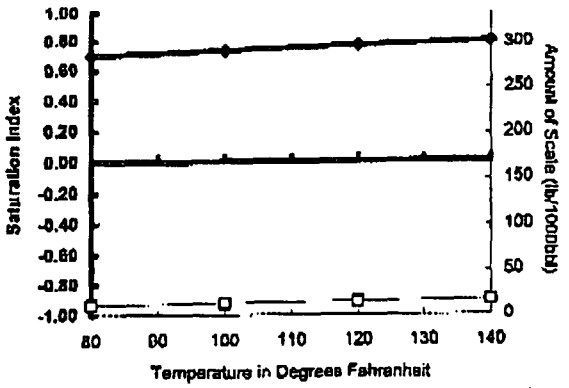
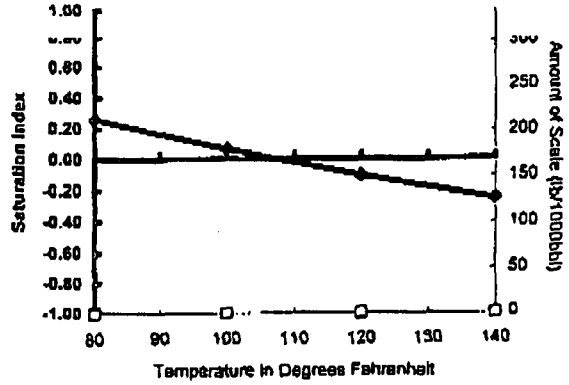
Scale Predictions from Baker Petrolite

Analysis of Sample 108237 @ 75°F for MARATHON , Jan/13/99

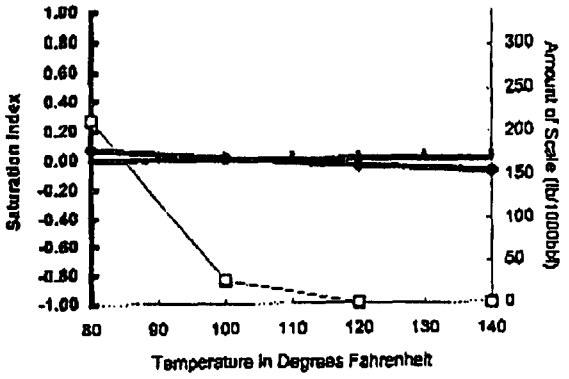
Calcite - $CaCO_3$



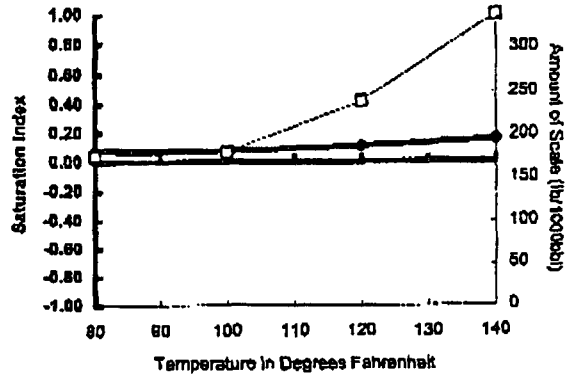
Barite - $BaSO_4$



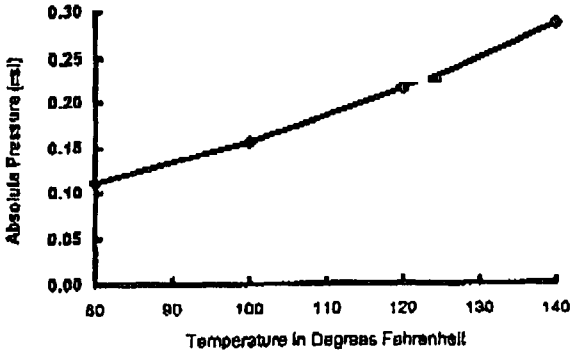
Gypsum - $CaSO_4 \cdot 2H_2O$



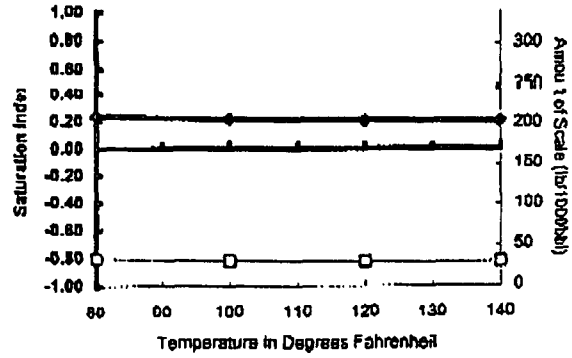
Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



Celestite - $SrSO_4$



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BAKER PETROLITE
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Analysis: 22546

Water Analysis Report from Baker Petrolite

Summary of Mixing Waters			
Sample Number	**106238**	**106237**	**106640**
Company	COASTAL	MARATHON	HEYCO
Lease	GERONIMO	TORANO	YOUNG DEEP
Well	WATER PLANT	WATER PLANT	
Sample Location	TANK	TANK	I.P.D.
Anions (mg/L)			
Chloride	153,482	89,691	106,932
Bicarbonate	62.0	187	354
Carbonate	0.00	0.00	0.00
Sulfate	900	2,929	1,416
Phosphate	0.00	0.00	0.00
Borate	0.00	0.00	0.00
Silicate	0.00	0.00	0.00
Cations (mg/L)			
Sodium	79,884	51,718	54,936
Magnesium	2,570	1,340	1,975
Calcium	12,651	4,395	8,961
Strontium	339	122	188
Barium	0.30	0.10	0.20
Iron	5.50	4.50	4.00
Potassium	919	462	1,869
Aluminum	0.00	0.00	0.00
Chromium	0.00	0.00	0.00
Copper	0.00	0.00	0.00
Lead	0.00	0.00	0.00
Manganese	0.00	0.00	0.00
Nickel	0.00	0.00	0.00
Anion/Cation Ratio	*1.00*	*1.00*	*1.00*
TDS (mg/L)	250,813	150,848	176,635
Density (g/cm)	1.16	1.10	1.12
Sampling Date	1/6/99	1/6/99	8/3/98
Account Manager	WAYNE PETERSON	WAYNE PETERSON	FRANK WONER
Analyst	SHEILA HERNANDEZ	SHEILA HERNANDEZ	SHEILA DEARMAN
Analysis Date	1/13/99	1/13/99	8/6/98
pH at time of sampling	6.90	7.10	6.45
pH at time of analysis			
pH used in Calculations	6.90	7.10	6.45

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BAKER PETROLITE
A Baker Hughes company

Analysis: 22546

Water Analysis Report from Baker Petrolite

Mixes at 80°F and 0 psi with 106237

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl												
Mix Waters		CO_2	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$	
106238	106640	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
20%	40%	0.39	0.57	15.4	0.10	200	0.11	182	0.16	36.9	0.24	0.04

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: CO_2 Pressure is absolute pressure. Total Pressure is gauge pressure.

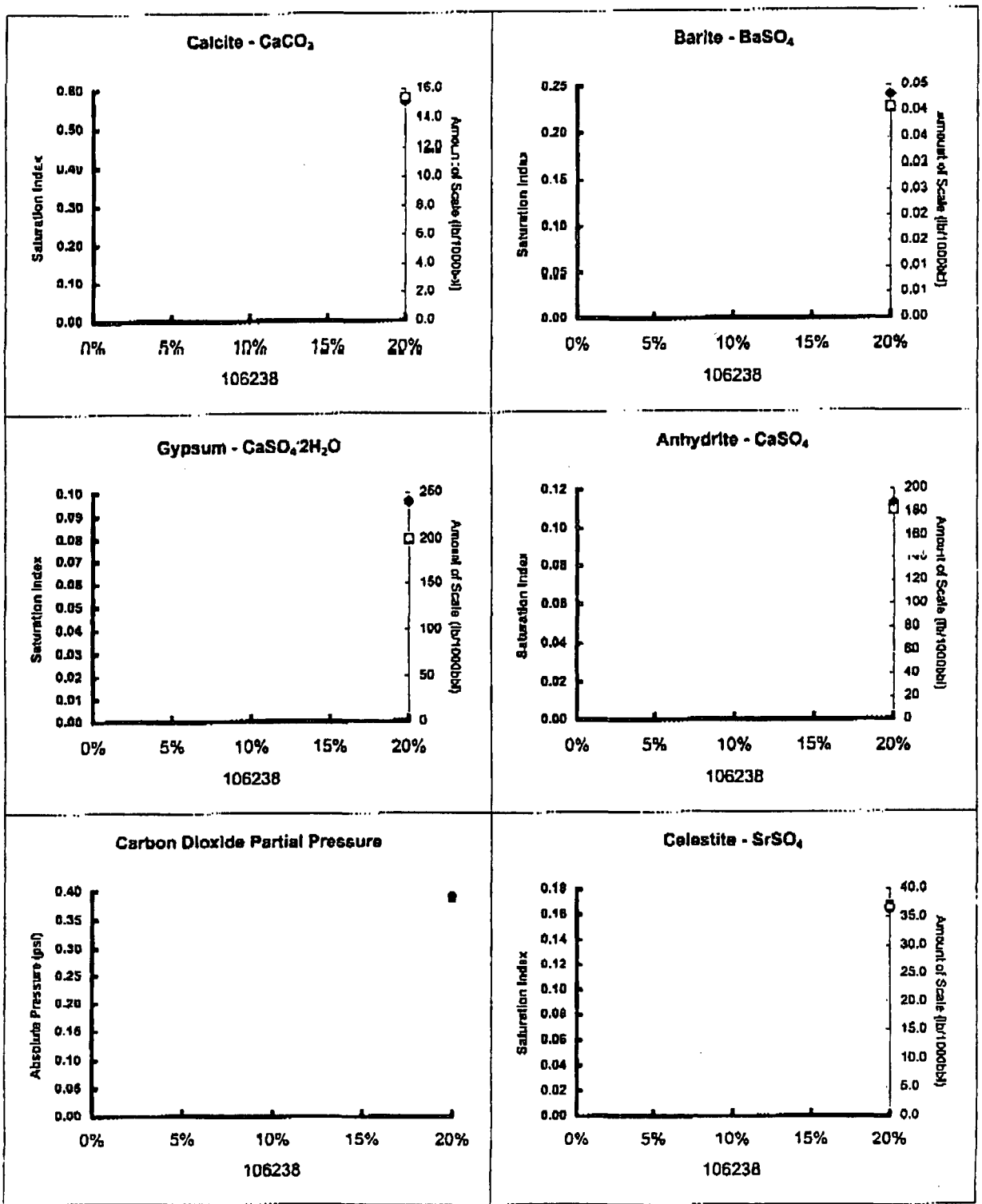
Compositions of the Mixed Waters used for the Calculations		
106238	106237	106640
20.0%	40.0%	40.0%

BAKER PETROLITE
A Baker Hughes company

Analysis: 22546

Mixture Predictions from Baker-Petrolite

106238 with 106237 and with 106640 at 80°F and 0 psi



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BAKER PETROLITE
A Baker Hughes company

Analysis: 22546

Water Analysis Report from Baker Petrolite

Mixes at 100°F and 0 psi with 106237

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl												
Mix Waters		CO_2	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$	
106238	106640	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
20%	40%	0.49	0.64	17.9	0.03	61.4	0.11	178	0.14	32.3	0.04	0.01

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: CO_2 Pressure is absolute pressure. Total Pressure is gauge pressure.

Compositions of the Mixed Waters used for the Calculations		
106238	106237	106640
20.0%	40.0%	40.0%

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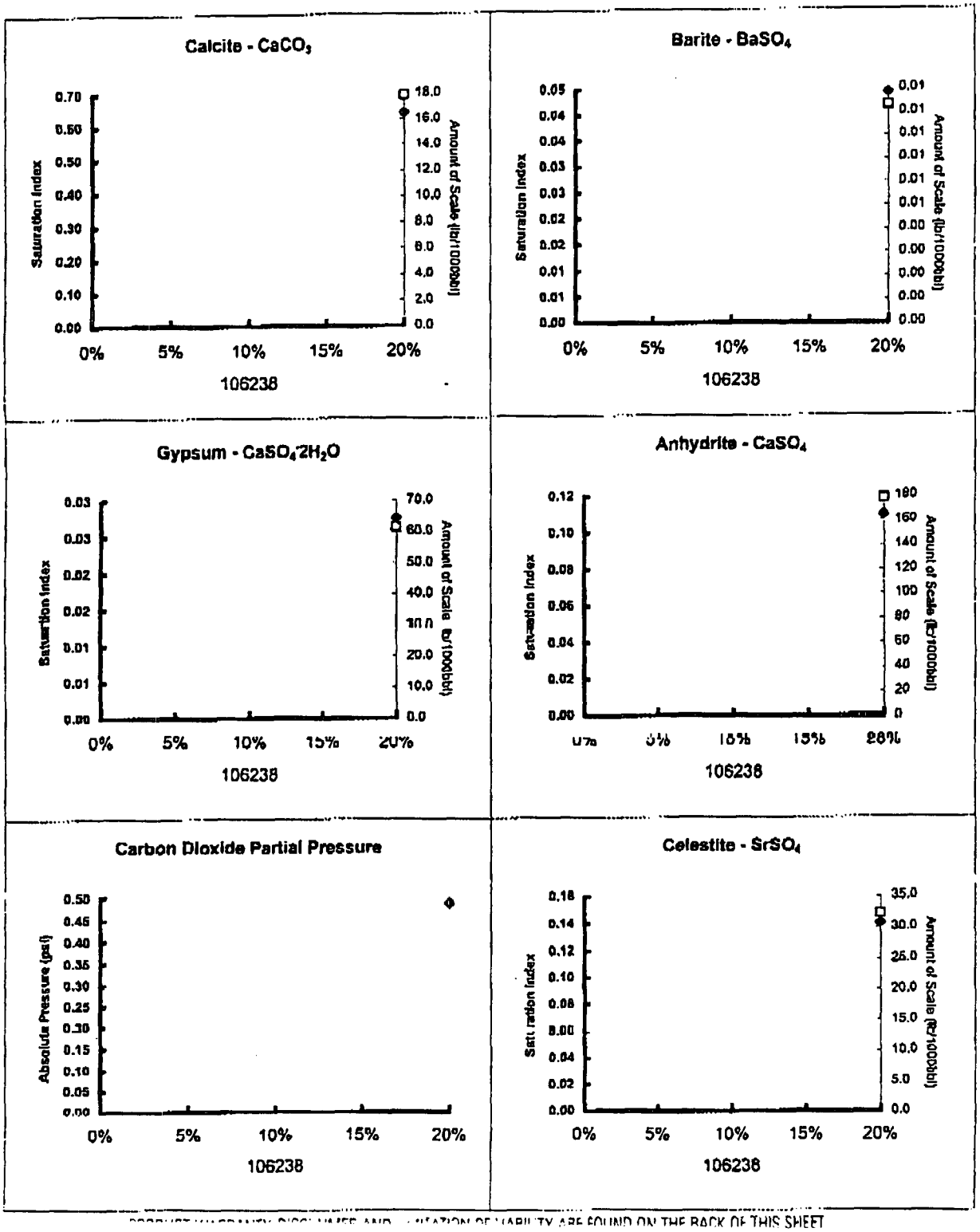
BAKER PETROLITE
A Baker Hughes company

Analysis: 22546

Mixture Predictions from Baker-Petrolite

106238 with 106237 and with 106640 at 100°F and 0 psi



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BAKER PETROLITE
A Baker Hughes company

Analysis: 22546

Water Analysis Report from Baker Petrolite

Mixes at 120°F and 0 psi with 106237

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO_2	Calcite $CaCO_3$		Gypsum $CaSO_4 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$	
106238	106640	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
20%	40%	0.59	0.71	20.5	-0.03		0.13	210	0.13	30.1	-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: CO_2 Pressure is absolute pressure. Total Pressure is gauge pressure.

Compositions of the Mixed Waters used for the Calculations		
106238	106237	106640
20.0%	40.0%	40.0%

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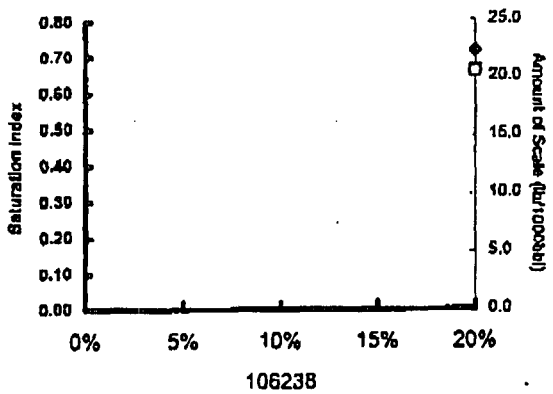
BAKER PETROLITE
A Baker Hughes company

Analysis: 22546

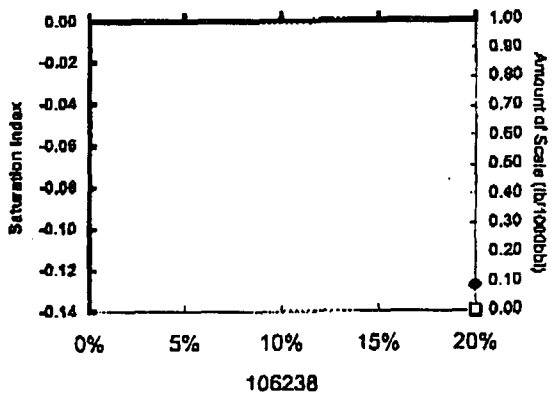
Mixture Predictions from Baker-Petrolite

10C230 with 106237 and with 106640 at 120°F and 0 psi

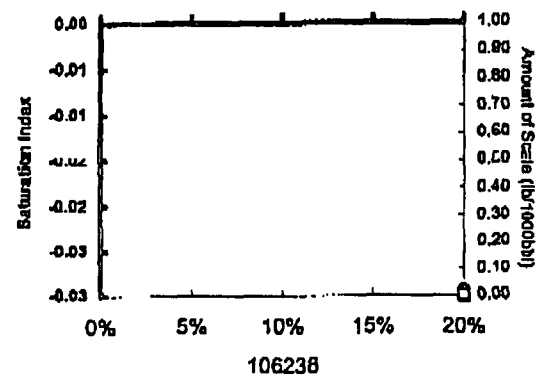
Calcite - $CaCO_3$



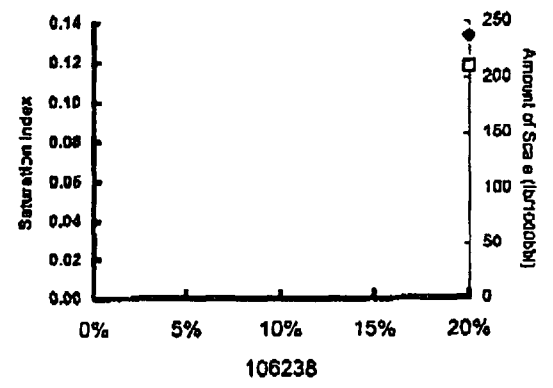
Barite - $BaSO_4$



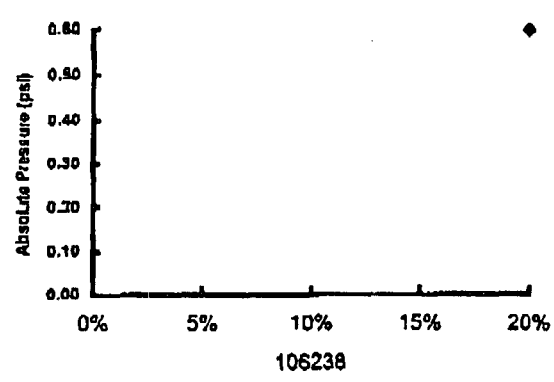
Gypsum - $CaSO_4 \cdot 2H_2O$



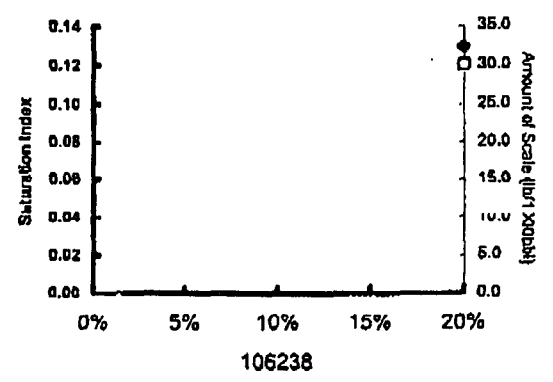
Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



Celestite - $SrSO_4$



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BAKER PETROLITE
A Baker Hughes company

Analysis: 22546

Water Analysis Report from Baker Petrolite

Mixes at 140°F and 0 psi with 106237

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl										
Mix Waters		CO_2	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$	
106238	106640	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
20%	40%	0.71	0.78	23.3	-0.06		0.18	269	0.13	29.8	-0.20	

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: CO_2 Pressure is absolute pressure. Total Pressure is gauge pressure.

Compositions of the Mixed Waters used for the Calculations		
106238	106237	106640
20.0%	40.0%	40.0%

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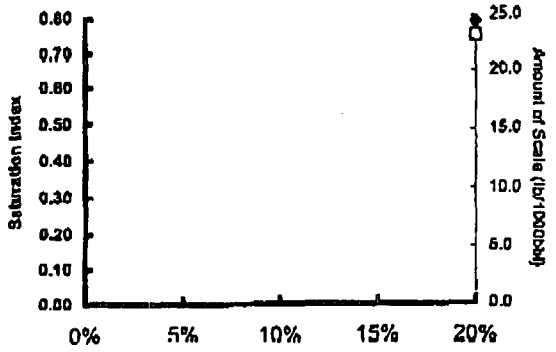
BAKER PETROLITE
A Baker Hughes company

Analysis: 22546

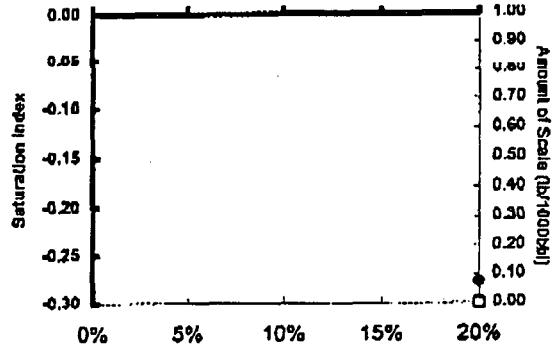
Mixture Predictions from Baker-Petrolite

106238 with 106237 and with 106640 at 140°F and 0 psi

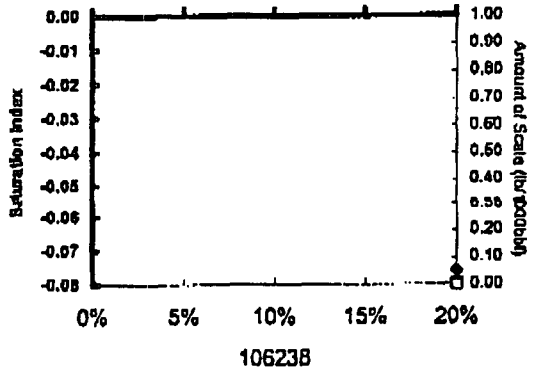
Calcite - $CaCO_3$



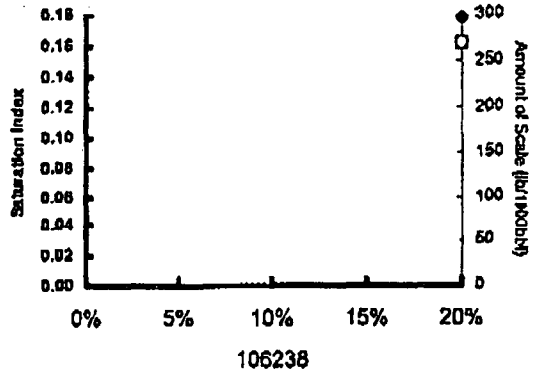
Barite - $BaSO_4$



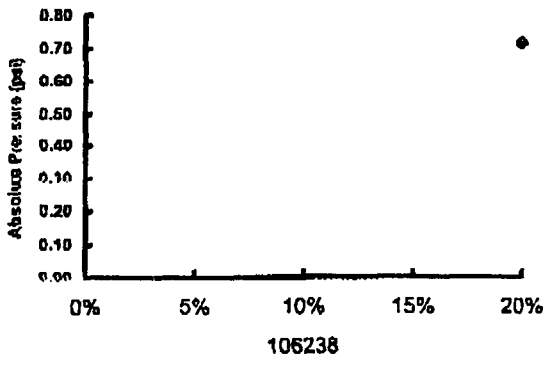
Gypsum - $CaSO_4 \cdot 2H_2O$



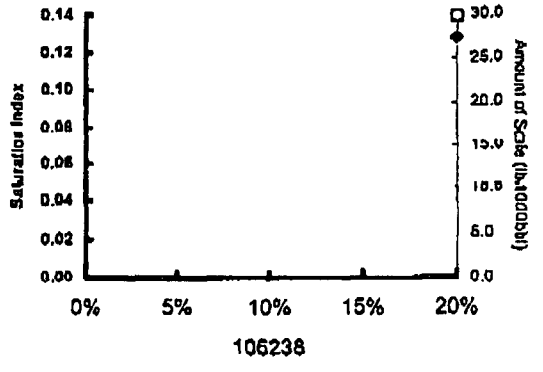
Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



[illegible]



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BAKER PETROLITE
A Baker Hughes company

Analysis: 22535

Water Analysis Report from Baker Petrolite

Summary of Mixing Waters		
Sample Number	106237	106238
Company	MARATHON	COASTAL
Lease	TORANO	GERONIMO
Well	WATER PLANT	WATER PLANT
Sample Location	TANK	TANK
Anions (mg/L)		
Chloride	89,691	153,482
Bicarbonate	187	62.0
Carbonate	0.00	0.00
Sulfate	2,929	900
Phosphate	0.00	0.00
Borate	0.00	0.00
Silicate	0.00	0.00
Cations (mg/L)		
Sodium	51,718	79,884
Magnesium	1,340	2,570
Calcium	4,395	12,651
Strontium	122	339
Barium	0.10	0.30
Iron	4.50	5.50
Potassium	462	919
Aluminum	0.00	0.00
Chromium	0.00	0.00
Copper	0.00	0.00
Lead	0.00	0.00
Manganese	0.00	0.00
Nickel	0.00	0.00
Anion/Cation Ratio	***1.00***	***1.00***
TDS (mg/L)	150,848	250,813
Density (g/cm)	1.10	1.16
Sampling Date	1/6/99	1/6/99
Account Manager	WAYNE PETERSON	WAYNE PETERSON
Analyst	SHEILA HERNANDEZ	SHEILA HERNANDEZ
Analysis Date		1/13/99
pH at time of sampling	7.10	6.90
pH at time of analysis		
pH used in Calculations	7.10	6.90

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BAKER PETROLITE
A Baker Hughes company

Analysis: 22535

Water Analysis Report from Baker Petrolite

Mixes at 80°F and 0 psi

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO_2	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$	
106237	106238	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
0%	100%	0.05	0.60	2.7	-0.05		0.00	3	-0.06		-0.01	
10%	90%	0.06	0.65	3.6	0.01	14	0.06	56	0.02	6.7	0.07	0.02
20%	80%	0.06	0.68	4.5	0.05	79	0.10	106	0.08	26.4	0.13	0.03
30%	70%	0.07	0.71	5.5	0.09	141	0.12	153	0.13	39.7	0.18	0.04
40%	60%	0.08	0.73	6.6	0.11	197	0.14	195	0.17	47.7	0.22	0.05
50%	50%	0.09	0.74	7.6	0.12	245	0.15	230	0.20	51.7	0.25	0.05
60%	40%	0.09	0.75	8.5	0.13	283	0.15	257	0.23	52.4	0.27	0.04
70%	30%	0.10	0.75	9.4	0.13	307	0.15	271	0.24	50.5	0.28	0.04
80%	20%	0.10	0.74	10.2	0.12	311	0.13	268	0.25	48.4	0.29	0.04
90%	10%	0.11	0.73	10.8	0.10	286	0.11	241	0.25	40.6	0.28	0.03
100%	0%	0.11	0.70	11.1	0.07	218	0.08	178	0.24	33.4	0.26	0.02

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: CO_2 Pressure is absolute pressure. Total Pressure is gauge pressure.

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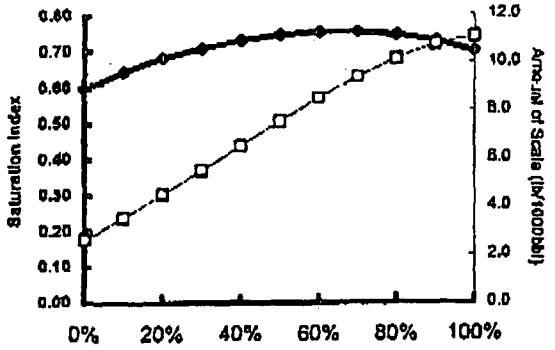
BAKER PETROLITE
A Baker Hughes company

Analysis: 22535

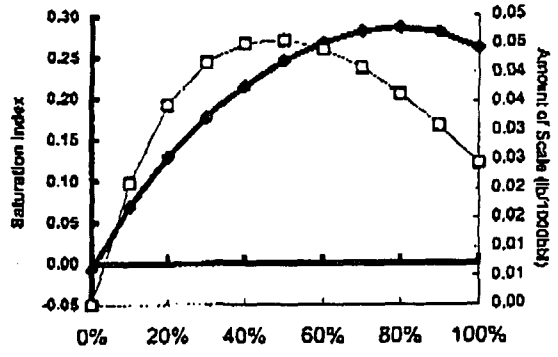
Mixture Predictions from Baker-Petrolite

106237 with 106238 at 80°F and 0 psi

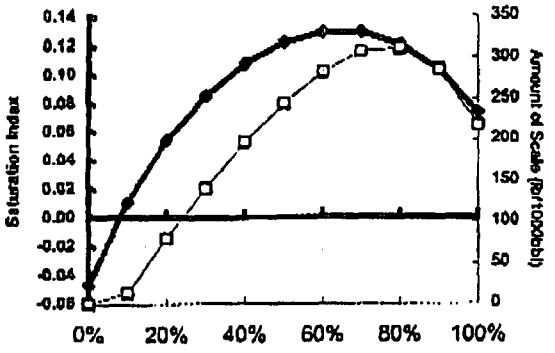
Calcite - $CaCO_3$



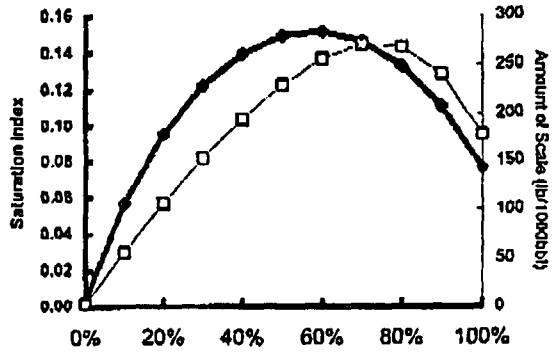
Barite - $BaSO_4$



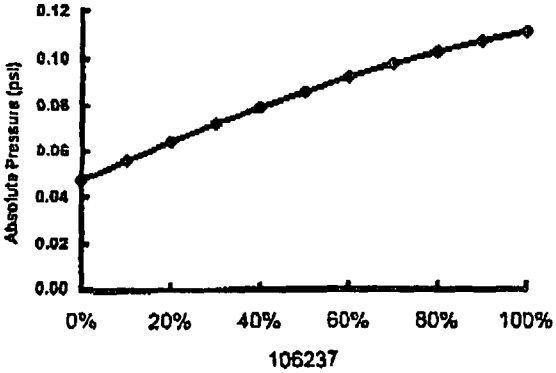
Gypsum - $CaSO_4 \cdot 2H_2O$



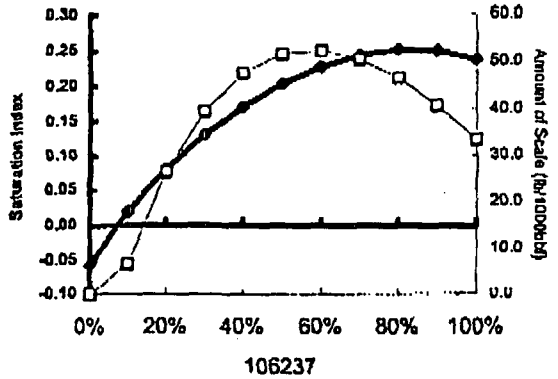
Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



Celestite - $SrSO_4$



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BAKER PETROLITE
A Baker Hughes company

Analysis: 22535

Water Analysis Report from Baker Petrolite

Mixes at 100°F and 0 psi

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO_2	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$	
106237	106238	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
0%	100%	0.06	0.62	3.0	-0.13		-0.01		-0.08		-0.21	
10%	90%	0.08	0.66	4.1	-0.07		0.04	41	-0.01		-0.13	
20%	80%	0.09	0.70	5.2	-0.03		0.08	92	0.05	18.3	-0.07	
30%	70%	0.10	0.73	6.3	0.01	13	0.11	139	0.10	32.5	-0.02	
40%	60%	0.11	0.75	7.5	0.03	63	0.13	183	0.15	41.5	0.02	0.00
50%	50%	0.12	0.77	8.6	0.05	104	0.14	219	0.18	46.3	0.05	0.01
60%	40%	0.13	0.78	9.7	0.06	135	0.15	248	0.20	47.7	0.07	0.01
70%	30%	0.13	0.78	10.8	0.06	150	0.14	265	0.22	46.4	0.08	0.02
80%	20%	0.14	0.77	11.7	0.05	144	0.13	265	0.23	42.9	0.09	0.01
90%	10%	0.15	0.76	12.5	0.04	109	0.11	241	0.23	37.6	0.08	0.01
100%	0%	0.16	0.73	12.9	0.01	30	0.08	182	0.21	30.8	0.06	0.01

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: CO_2 Pressure is absolute pressure. Total Pressure is gauge pressure.

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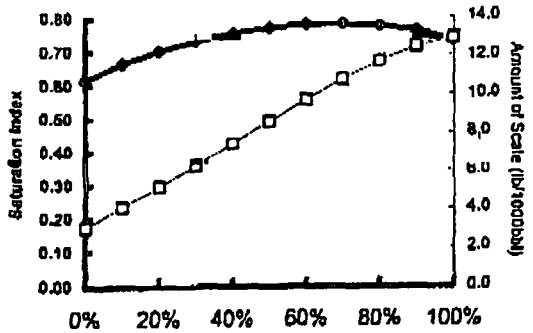
BAKER PETROLITE
A Baker Hughes company

Analysis: 22535

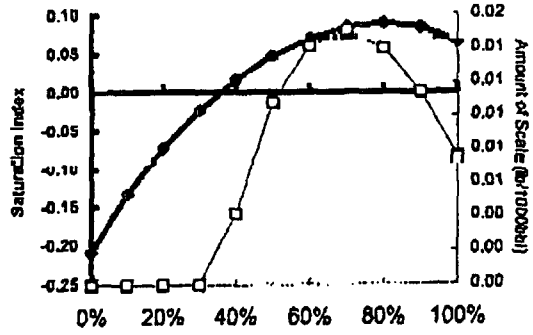
Mixture Predictions from Baker-Petrolite

106237 with 106238 at 100°F and 0 psi

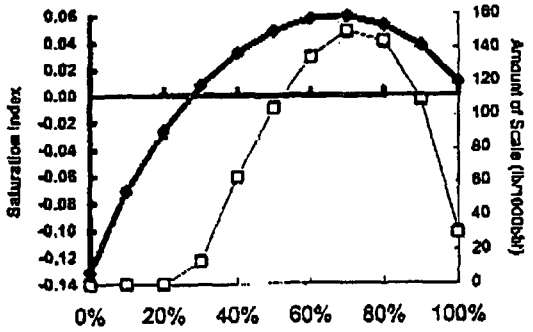
Calcite - $CaCO_3$



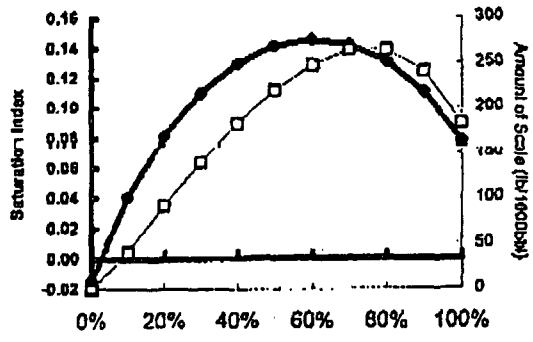
Barite - $BaSO_4$



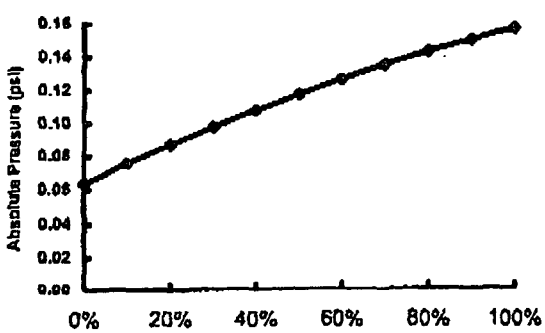
Gypsum - $CaSO_4 \cdot 2H_2O$



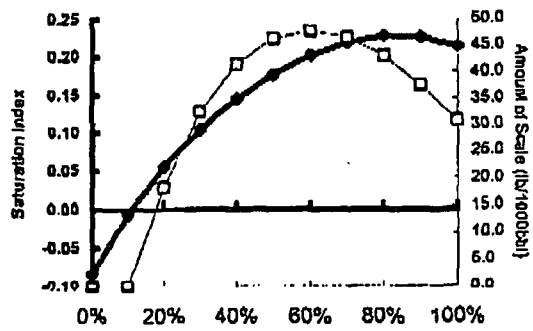
Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



Celestite - $SrSO_4$



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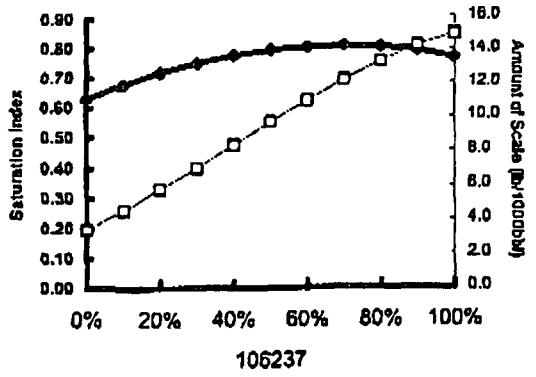
BAKER PETROLITE
A Baker Hughes company

Analysis: 22535

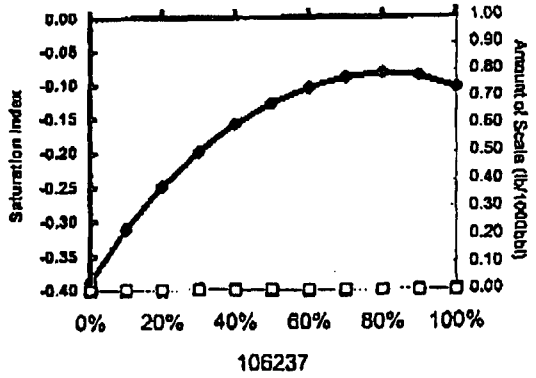
Mixture Predictions from Baker-Petrolite

106237 with 106238 at 120°F and 0 psi

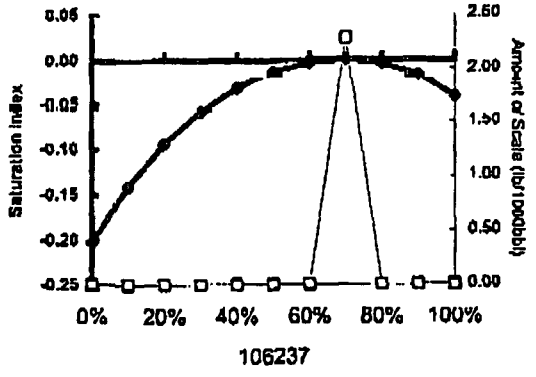
Calcite - $CaCO_3$



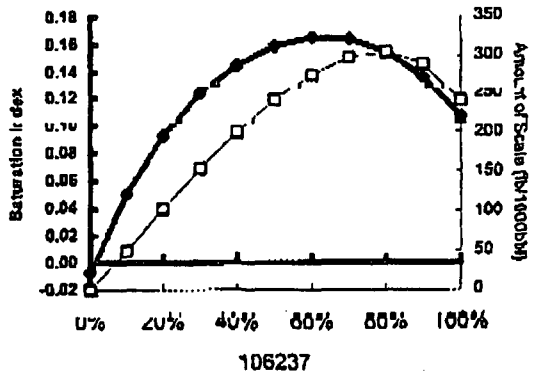
Barite - $BaSO_4$



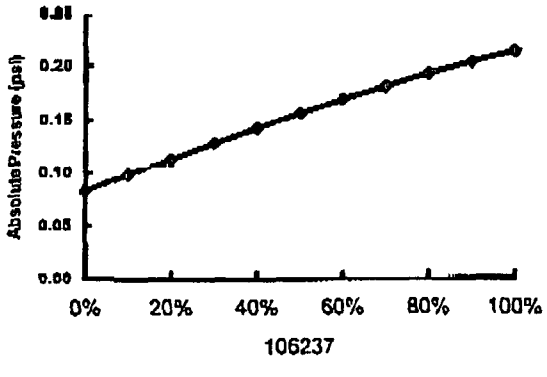
Gypsum $CaSO_4 \cdot 2H_2O$



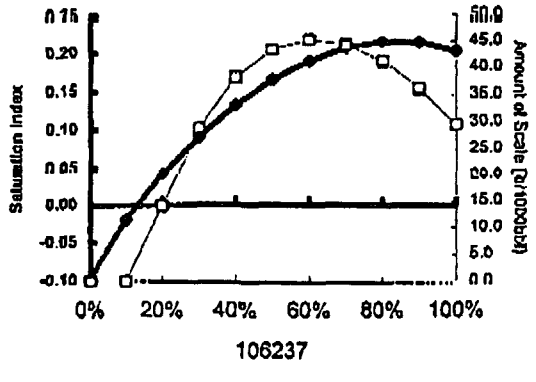
Anhydrite - $CaSO_4$



Carbon Dioxide Partial Pressure



Celestite - $SrSO_4$



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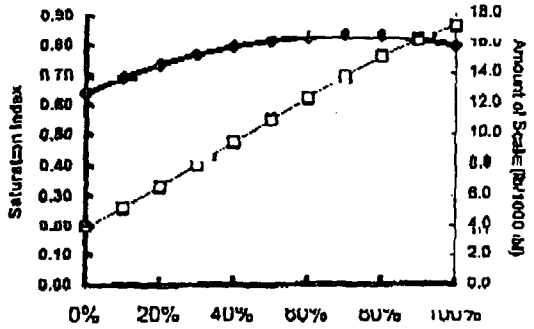
BAKER PETROLITE
A Baker Hughes company

Analysis: 22535

Mixture Predictions from Baker-Petrolite

106237 with 106238 at 140°F and 0 psi

Calcite - $CaCO_3$



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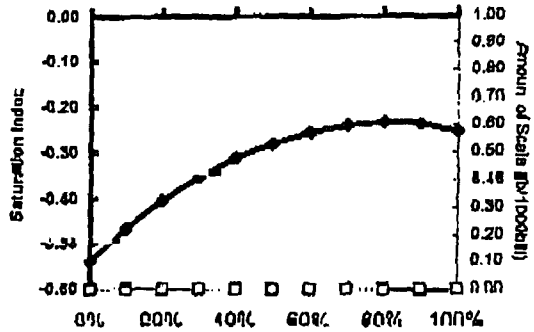
Barite - $BaSO_4$



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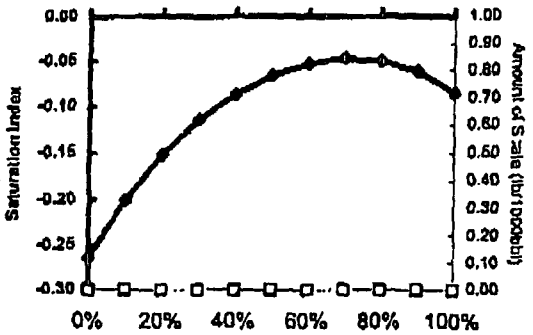
Gypsum - $CaSO_4 2H_2O$



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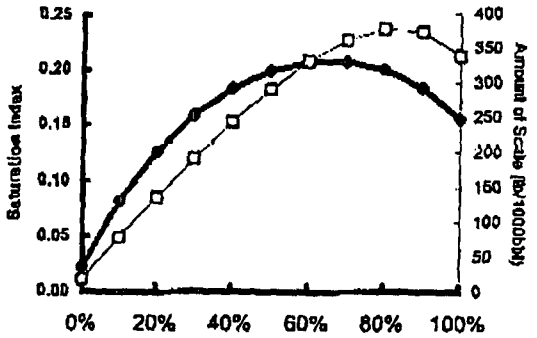
Anhydrite - $CaSO_4$



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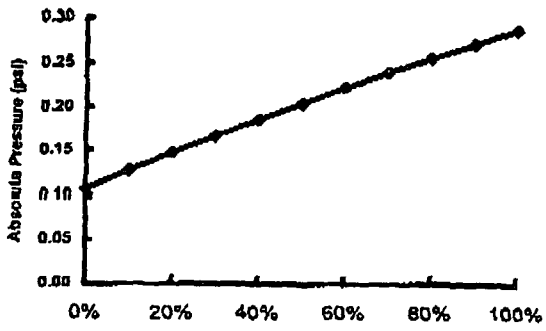
Carbon Dioxide Partial Pressure



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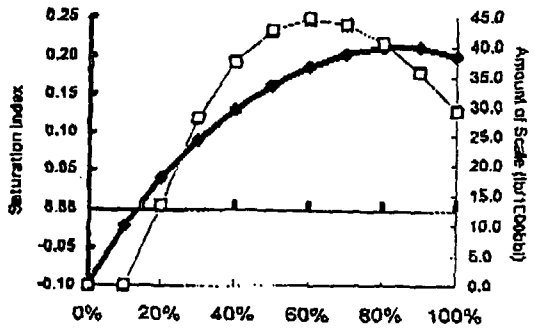
Celestite - $SrSO_4$



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