SUSPENSE	ENGINEER	LOGGED IN	TYPE	APP NO.
10/14/09	Jones	10/14	SWD	PTGW 0928756338

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

ABOVE THIS LINE FOR DIVISION USE ONLY

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 _____

Rosetta's
Tsah Tah SWD #1
API # 30-045-34282
Cancel Menefee & Pt. Lookout
Add Entrada

[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

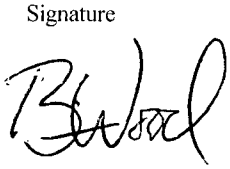
[E] For all of the above, Proof of Notification or Publication is Attached, and/or,

[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.

Print or Type Name	Signature	Title	Date
BRIAN WOOD (505) 466-8120 FAX 466-9682		CONSULTANT	10-7-09 e-mail Address brian@permitswest.com

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

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

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance YES Disposal _____Storage
Application qualifies for administrative approval? XXX Yes _____No

II. OPERATOR: ROSETTA RESOURCES OPERATING LP

ADDRESS: 717 TEXAS, SUITE 2800, HOUSTON, TX 77002

CONTACT PARTY: BRIAN WOOD (PERMITS WEST, INC.) PHONE: (505) 466-8120

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

IV. Is this an expansion of an existing project? _____Yes XXX No
If yes, give the Division order number authorizing the project:

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

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

VII. Attach data on the proposed operation, including:

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

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

IX. Describe the proposed stimulation program, if any.

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

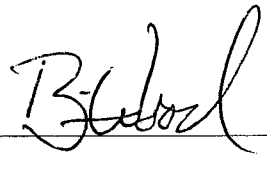
*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

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

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

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

NAME: BRIAN WOOD TITLE: CONSULTANT

SIGNATURE:  DATE: OCTOBER 7, 2009

E-MAIL ADDRESS: brian@permitswest.com

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

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

III. WELL DATA

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

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

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

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

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

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

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

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

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

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

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

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

XIV. PROOF OF NOTICE

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

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

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

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

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

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

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

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

Side 1

INJECTION WELL DATA SHEET

OPERATOR: ROSETTA RESOURCES OPERATING LP

WELL NAME & NUMBER: TSAH TAH SWD #1

WELL LOCATION:	1200' FNL & 1511' FEL	B	1	24 N	10 W
	FOOTAGE LOCATION	UNIT LETTER	SECTION	TOWNSHIP	RANGE

WELLBORE SCHEMATIC

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 12-1/4" Casing Size: 9-5/8" 36# J-55 ST&C

Cemented with: 171 sacks ***or*** 218 ft^3

Top of Cement: SURFACE Method Determine: VISUAL

Intermediate Casing

Hole Size: Casing Size:

Cemented with: _____ sacks ***or*** _____ ft^3

Top of Cement: _____ Method Determined: _____

Production Casing

Hole Size: 8-3/4" Casing Size: 7" 20# & 23# J-55 LT&C

Cemented with: 1,125 sacks ***or*** 2,116.5 ft^3

Top of Cement: SURFACE Method Determine: VISUAL

Total Depth: 7,800'

Injection Interval

From ≈7,505 feet To ≈7,670 feet

(Perforated or Open Hole; indicate which)

INJECTION WELL DATA SHEET

Tubing Size: 2-7/8" 6.5# J-55 Lining Material: PLASTIC

Type of Packer: 7" x 2-7/8" COMPRESSION SET WITH ON/OFF TOOL

Packer Setting Depth: ≈7,455'(WITHIN 50' OF HIGHEST PERFORARTION WHICH WILL BE AT ≈7,505')

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

Additional Data

1. Is this a new well drilled for injection? XXX Yes _____No

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

   _____

2. Name of the Injection Formation: ENTRADA

3. Name of Field or Pool (if applicable): SWD; ENTRADA

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. _____

   NOT YET DRILLED (will spud October 7, 2009)

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

   OVER: FRUITLAND (1,735') & PICTURED CLIFFS (1,710')

   UNDER: GALLUP (5,330') & DAKOTA (6,280')

   _____

I. Purpose is water disposal into the Entrada sandstone.

II. Operator: Rosetta Resources Operating LP
Operator phone number: (720) 359-9144
Operator address: 717 Texas Ave., Suite 2800
Houston, TX 77002
Contact: Brian Wood (Permits West, Inc.)
Phone: (505) 466-8120

III. A. (1) Lease: BLM lease NMNM-112955
Lease Size: 1,761.69 acres
Lease Area: SW4NE4, S2NW4, S2, & Lots 2-4 Section 1
SE4NE4 & NE4SE4 Section 3
SW4 & N2 Section 11
all Section 12
all T. 24 N., R. 10 W.
Closest Lease Line: 191'
Well Name & Number: Tsah Tah SWD #1 (API # 30-045-34282)
Well Location: 1200' FNL and 1511' FEL Sec. 1, T. 24 N., R. 10 W.
(see Exhibit A)

A. (2) Surface casing (9-5/8", 36#, J-55, S T & C) will be set at ≥320' in a 12-1/4" hole. Surface casing will be cemented to the surface with ≈218 cubic feet (≈171 sacks) Class III with 1/4 pound per sack cellophane + 3% $CaCl_2$ + 51.2% fresh water. Yield = 1.28 cubic feet per sack. Weight = 15.2 pounds per gallon. Volume: ≥100% excess. Standard centralizers will be installed on each of the bottom three joints. Thread lock the guide shoe and bottom of float collar only. Will use API casing dope.

Production casing (7", 20# & 23#, J-55, L T & C) will be set at ≈7,800' in a 8-3/4" hole. Twenty pound will be set at ≈6,800'.

Twenty-three pound will be set at ≈7,800'. Production casing will be cemented to the surface in three stages with a total of ≈2,116.5 cubic feet. Volume: ≥70% excess.

Will install ≈22 (10 regular + 12 turbulent) centralizers. Will place 10 regular centralizers spaced on every other joint starting at the float collar. Will place 3 turbulent centralizers, at 120' intervals, above and below each DV tool.

First stage (≈860.7 cubic feet) of long string will have a float collar set at ≈7,758'. Lead slurry (≈722.7 cubic feet) will consist of ≈365 sacks premium light high strength FM + 1/4 pound per sack cellophane + 0.3% CD-32 + 6.25 pounds per sack LCM-1 + 1% FL-52 + 97.5% fresh water mixed at 12.5 pounds per gallon and 1.98 cubic feet per sack. Tail slurry (≈138 cubic feet) will consist of ≈100 sacks Type III + 1% $CaCl_2$ + 1/4 pound per sack cellophane + 0.2% FL-52 + 58.9% fresh water mixed at 14.6 pounds per gallon and 1.38 cubic feet per sack.

Second stage (≈691.8 cubic feet) of long string will have a stage collar set at ≈4,500'. Lead slurry (≈553.8 cubic feet) will consist of ≈260 sacks premium light FM + 3% $CaCl_2$ + 1/4 pound per sack cellophane + 5 pounds per sack LCM-1 + 0.4% FL-52 + 0.4% sodium metasilicate + 8% bentonite + 112.3% fresh water mixed at 12.1 pounds per gallon and 2.13 cubic feet per sack. Tail slurry (≈138 cubic feet) will consist of ≈100 sacks Type III + 1% $CaCl_2$ + 1/4 pound per sack cellophane + 0.2% FL-52 + 58.9% fresh water mixed at 14.6 pounds per gallon and 1.38 cubic feet per sack.

Third stage (≈564 cubic feet) of long string will have stage collar set at ≈2,000'. Lead slurry (≈426 cubic feet) will consist of ≈200 sacks of premium light FM + 3% $CaCl_2$ + 1/4 pound per sack cellophane + 5 pounds per sack LCM-1 + 0.4% FL-52 + 0.4% sodium

metasilicate + 8% bentonite + 112.3% fresh water mixed at 12.1 pounds per gallon and 2.13 cubic feet per sack. Tail slurry (≈138 cubic feet) will consist of ≈100 sacks Type III + 1% $CaCl_2$ + 1/4 pound per sack cellophane + 0.2% FL-52 + 58.9% fresh water mixed at 14.6 pounds per gallon and 1.38 cubic feet per sack.

A. (3) Tubing will be 2-7/8" 6.5# J-55 plastic lined injection string. It will be set at ≈7,455' (disposal interval will be ≈7,505' to ≈7,670').

A. (4) A 7" x 2-7/8" compression set packer with an on/off tool or its equivalent will be set within ≈50' of the highest perforation (≈7,505'). Thus, packer will be set at ≈7,455'.

B. (1) Disposal zone will be the Entrada sandstone (Pool 96436). Fracture gradient is expected to be a normal ≈0.433 psi per foot.

B. (2) Disposal interval will be ≈7,505' to ≈7,670' (well logs will determine exact interval after drilling). It will be perforated (0.32" or 0.34") with two to four shots per foot.

B. (3) Well has not yet been drilled. It will be for Rosetta's exclusive use and for the sole purpose of water disposal from present and future Rosetta wells. Water analyses from four Rosetta Basin Fruitland coal gas wells within a five mile radius are attached.

B. (4) Well bore has not yet been perforated since the well has not yet been drilled. It will be perforated from ≈7,505' to ≈7,670' (logs will determine exact interval after drilling).

B. (5) Top of the Entrada is predicted to be at ≈7,465'. Bottom of the well is planned for ≈7,800', which will still be in the Entrada. There are two potential producing zones (Gallup and Dakota) above the Entrada and one potential producing zone (Pennsylvanian) below the Entrada.

Bottom of the Gallup is at <6,170'. There will be a >1,335' interval between the bottom of the Gallup and the highest Entrada injection perforation. Closest historic Gallup production was the

East Bisti Unit 87 which is 3,205' west-southwest in SWNW 1-24n-10w. It was plugged and abandoned in 1971.

Bottom of the Dakota is at <7,465'. Closest (8,001' east) historic Dakota production is the Big Bird 1 in NWSW 5-24n-9w. It was plugged and abandoned in 1996. There will be ≈955' between the bottom of the Dakota and top of the Entrada (as measured in the Frazzle SWD 1 in 30-24n-10w). This ≈955' interval will include the Morrison, Bluff, and Todilto formations.

Top of the closest underlying potentially productive zone (Pennsylvanian) is estimated to be ≈10,449' based on the closest (>8 miles northwest) historic Pennsylvanian production (Pah 1 in NWSW 3-25n-11w). Pennsylvanian zone in the Pah 1 was plugged in 1972. There will be ≈2,779' interval between the lowest Entrada perforation and top of the Pennsylvanian.

IV. This is not an expansion of an existing injection project. It is an expansion (third SWD) of an existing water disposal project for Rosetta at Tsah Tah.

V. A map (Exhibit B) showing the two existing wells (both Rosetta) within a half mile is attached. A map (Exhibit C) showing all 80 wells (39 P & A + 35 oil or gas producers + 4 water supply + 2 water disposal) within a two mile radius is attached. Details on the two wells within a half mile are:

WELL	API #	Location	ZONE	TD	DISTANCE
Tsah Tah 1 #1	30-045-34133	SWNE 1-24n-10w	Fruitland coal	1,906'	332'
Tsah Tah 1 #2	30-045-34134	SWNW 1-24n-10w	Fruitland coal	1,935'	2,602'
Tsah Tah 36 #4	*30-045-34238*	*NWSE 36-25n-10w*	*Fruitland coal*	*1,935'*	*2,729'*

Exhibit D shows all leases within a half mile radius. Details are:

AREA	LESSOR	LEASE #	LESSEE(S)
31-25n-9w	BLM	NMNM-16759	BP
6-24n-9w	BLM	NMNM-97108	Dugan
W2NE4, NW4, & S2 1-24n-10w	BLM	NMNM-112955	Rosetta

AREA	LESSOR	LEASE #	LESSEE(S)
E2NE4 1-24n-10w	BLM	NMNM-118138	Rosetta
NESE 36-25n-10w	NMSLO	EO-3148-0010	Rosetta & Speer
SESW & NWSE 36-25n-10w	NMSLO	EO-6644-0021	Rosetta & Kaiser-Francis
S2SE4 36-25n-10w	NMSLO	VO-6298-0000	Rosetta & Yates

A map (Exhibit E) showing all lessors within a two mile radius is attached. Most leases are BLM. The remainder are Navajo allotted (FIMO) or State (NMSLO).

VI. There are two wells which are within a 1/2 mile radius. Neither penetrate the proposed injection zone. The deepest of those two wells (Rosetta's Tsah Tah 1 #2) has a total depth of 1,935'. There will be a ≈5,570' interval between the bottom of that Fruitland coal gas well and the highest proposed perforation (≈7,505').

The closest well which penetrated the proposed disposal zone is Dugan's Frazzle SWD 1 which is ≈5 miles southwest in NENW 30-24n-10w. It is is an Entrada salt water disposal well.

VII.

1. Average injection rate will be ≈2,500 bwpd.
   Maximum injection rate will be ≈5,000 bwpd.
2. System will be closed. (Rosetta laid water pipelines with its gas pipelines). Facilities will include a tank battery with skimmer and settling tanks, filters, meter, and an injection pump.
3. Average injection pressure will be ≈1200 psi
   Maximum injection pressure will be 1501 psi (≤0.2 psi x depth of top perforation)
4. Water source will be existing and future Rosetta wells in the San Juan Basin. Rosetta has 39 existing and 2 proposed coal gas wells in Townships 24 and 25 North, Range 10 West as of September, 2009. Rosetta's two existing water disposal wells in Sections 11 and 36 are operating at maximum capacity. Rosetta has 18 additional coal gas wells planned in 25n-13w. Additional capacity is needed to avoid shutting in production.

Water analyses from four different Rosetta Tsah Tah Basin Fruitland coal gas wells are attached as Exhibit F. A summary follows.

Well:	2 #4	33 #2	34 #4	35 #1
Where:	2-24n-10w	33-25n-10w	34-25n-10w	35-25n-10w
What Zone:	Fruitland	Fruitland	Fruitland	Fruitland
Parameter				
Barium	2.44	3.19	2.26	4.34
Bicarbonate	518.5	786.9	549.0	695.4
Calcium	800	400	960	880
Chloride	19,000	18,000	16,000	20,000
Iron	27.62	46.22	21.77	31.09
Magnesium	344.04	245.22	149.33	197.88
pH	7.3	6.8	7.0	6.6
Sodium	10,906	10,980	9,166	11,800
Sulfate	zero	zero	2.0	zero
TDS	31,599	30,462	26,851	33,608

Water analyses from three Entrada wells are attached as Exhibit G. The closest sample is from ≈6 miles west at the Herry Monster well. A summary follows. The data for the USG Section 19 17 well is the average of 8 samples.

Well:	Herry Monster SWD 3	Cedar Hill SWD 1	USG Section 19 17
Where:	11-24n-11w	29-32n-10w	19-29n-16w
What Zone:	Entrada	Entrada	Entrada
Parameter			
Bicarbonate	5612	336	574
Calcium	176	24	not run
Carbonates	40	450	not run
Chloride	2200	7633	48880
Iron	zero	not run	not run
Magnesium	15	15	not run
pH	8.4	8.37	not run
Potassium	200	not run	not run
Resistivity	0.89 @ 70° F	1.38 @ 71° F	not run
Sodium	4165	6245	not run
Specific Gravity	1.005	1.006	not run
Sulfate	2000	1900	1150
TDS	14408	16600	81460

5. The Entrada has not been found to be productive within two miles of the well. Closest Entrada oil production is ≈18 miles south from the Leggs Entrada in 11-21n-10w.

In general, Entrada water near recharge zones (basin fringe) has a specific conductance of <1,500 μmhos. Entrada water from deeper parts of the basin has a specific conductance of >10,000 μmhos. Stone et al in Hydrogeology and water resources of San Juan Basin, New Mexico wrote, "Generally, however, water from the Entrada is not suitable for drinking, especially in deeper parts of the basin."

VIII. The Entrada sandstone is a very porous and permeable æolian sandstone. It produces oil elsewhere in the basin (e. g., Eagle Mesa, Leggs, Media, Ojo Encino, Papers Wash, Snake Eyes Fields). It is estimated to be 100' thick in the well bore. Top is at ≈7,465' and bottom is >7,800'. Estimated well bore formation tops are:

Nacimiento: 0'
Ojo Alamo Sandstone: 922'
Kirtland Shale: 1,110'
top of Fruitland Coal: 1,735'
Lewis Shale: 1,895'
Huerfanito Bentonite: 2,060'
La Ventana Sandstone: 2,590'
Menefee*: 3,245'
Point Lookout Sandstone*: 4,240'
Mancos Shale: 4,450'
Gallup Sandstone: 5,330'
Greenhorn Limestone: 6,170'
Dakota Sandstone: 6,280'
Entrada Sandstone: 7,465'
Total Depth: 7,800'

*Rosetta received approval (SWD-1087) to dispose into the Menefee & Point Lookout in this well. Rosetta has not disposed and no longer plans to dispose into these 2 zones. Disposal will only be in the Entrada.

There are two water wells within a one mile radius and water analyses from both are attached. Both produce from the Ojo Alamo sandstone. Highest TDS of the two wells is 1,913 mg/l, which was found in the Dugan well.

One water supply well is at a mission and ≈5,000' south in the NENE Section 12. Mission director Duane Bristow said on August 31, 2009 that the well is 852' deep.

The second water well is ≈5,200' south-southeast in NWNW Section 7 and is a plugged back (to 1,100') oil well which is used for oil field water supply by Dugan.

There are two water wells more than a mile, but less than two miles from the Tsah Tah SWD #1. radius. All four water wells within a two mile radius are above the Entrada. Likely aquifers are the Nacimiento and Ojo Alamo. From close to far, the four water wells are:

Mission well ≈0.95 miles S in NENE Sec. 12
Dugan well ≈0.98 miles SSE in NWNW Section 7
stock well ≈1.8 miles SE in NWSE Section 7
stock well ≈1.85 miles SW in NWSE Section 11

No existing underground drinking water sources are below the Entrada within a two mile radius. There will be ≈6,365' of vertical separation between the bottom of the deepest water well (Dugan) within two miles and the top of the Entrada.

IX. The well will be stimulated with a sand-water fracture.

X. The following open hole logs will be run from TD to surface and provided to NMOCD: SP, GR, Res., DPHI, and NPHI

XI. There are two water wells within a one mile radius. They are ≈0.95 mile south in the NENE of Section 12 and ≈0.98 mile south-southeast in Section 7. Water analyses from both are in Exhibit H.

XII. Rosetta is not aware of any geologic or engineering data which may indicate the Entrada is in hydrologic connection with any underground sources of water. There will be ≈2,195' of vertical separation between the top (≈6,365') of the Entrada and the bottom (1,100') of the deepest water well within two miles. This interval includes the Lewis shale, Huerfanito bentonite, and Mancos shale.

XIII. Notice (this application) has been sent (Exhibit I) to the surface owner (BLM), operators of all wells (Rosetta), and lessees or lease operating right holders (BP, Dugan, Kaiser-Francis, Speer, and Yates), and lessors (BLM and NM State Land Office) within a half mile. Legal ad (see Exhibit J) was published on September 28, 2009.

change pool

Form C - 102

State of New Mexico
Energy, Minerals & Mining Resources Department
OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505

2007 APR 18 AM 11:24

☐ AMENDED REPORT

RECEIVED
BLM
FARMINGTON NM

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-045-34282	96436	SWD; ENTRADA

Property Code	Property Name	Well Number
35715	TSAH TAH SWD	1

OGRID No.	Operator Name	Elevation
239235	ROSETTA RESOURCES OPERATING, L.P.	6810'

Surface Location

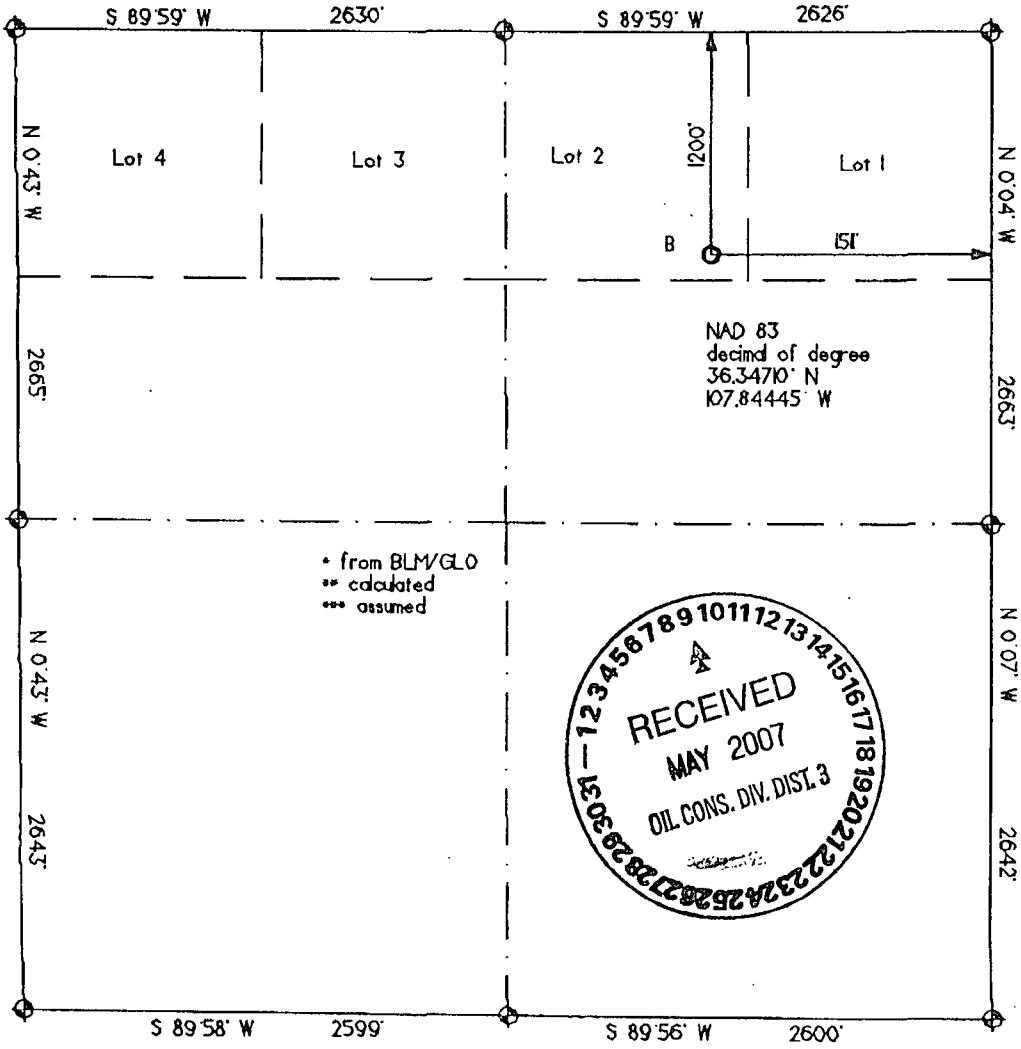
UL or Lot	Sec.	Twp.	Rge.	Lot Idn.	Feet from>	North/South	Feet From>	East/West	County
B	1	24 N.	10 W.	(2)	1200'	NORTH	1511'	EAST	SAN JUAN

Bottom Hole Location If Different From Surface

UL or Lot	Sec.	Twp.	Rge.	Lot Idn.	Feet from>	North/South	Feet From>	East/West	County

Dedication	Joint ?	Consolidation	Order No.

NO ALLOWABLE WILL ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



RECEIVED
MAY 2007
OIL CONS. DIV. DIST. 3

OPERATOR CERTIFICATION

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

Signature: B. Wood

Printed Name: BRIAN WOOD

Title: CONSULTANT

Date: SEPT. 30, 2009

SURVEYOR CERTIFICATION

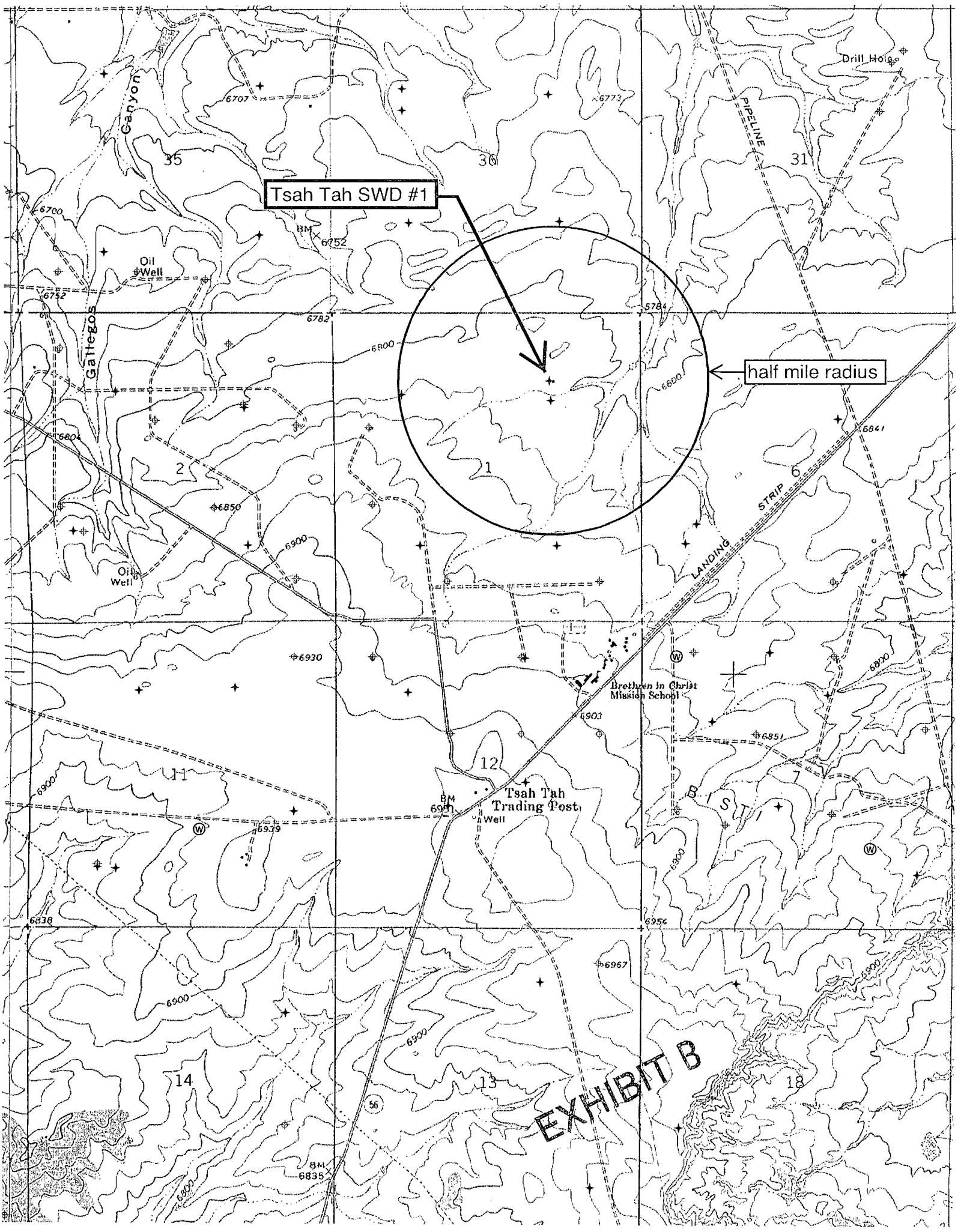
I hereby certify that the well location on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date of Survey: 09/28/06

Signature and Seal of Professional Surveyor:

GERALD HUDDLESTON
NEW MEXICO
6844
REGISTERED LAND SURVEYOR

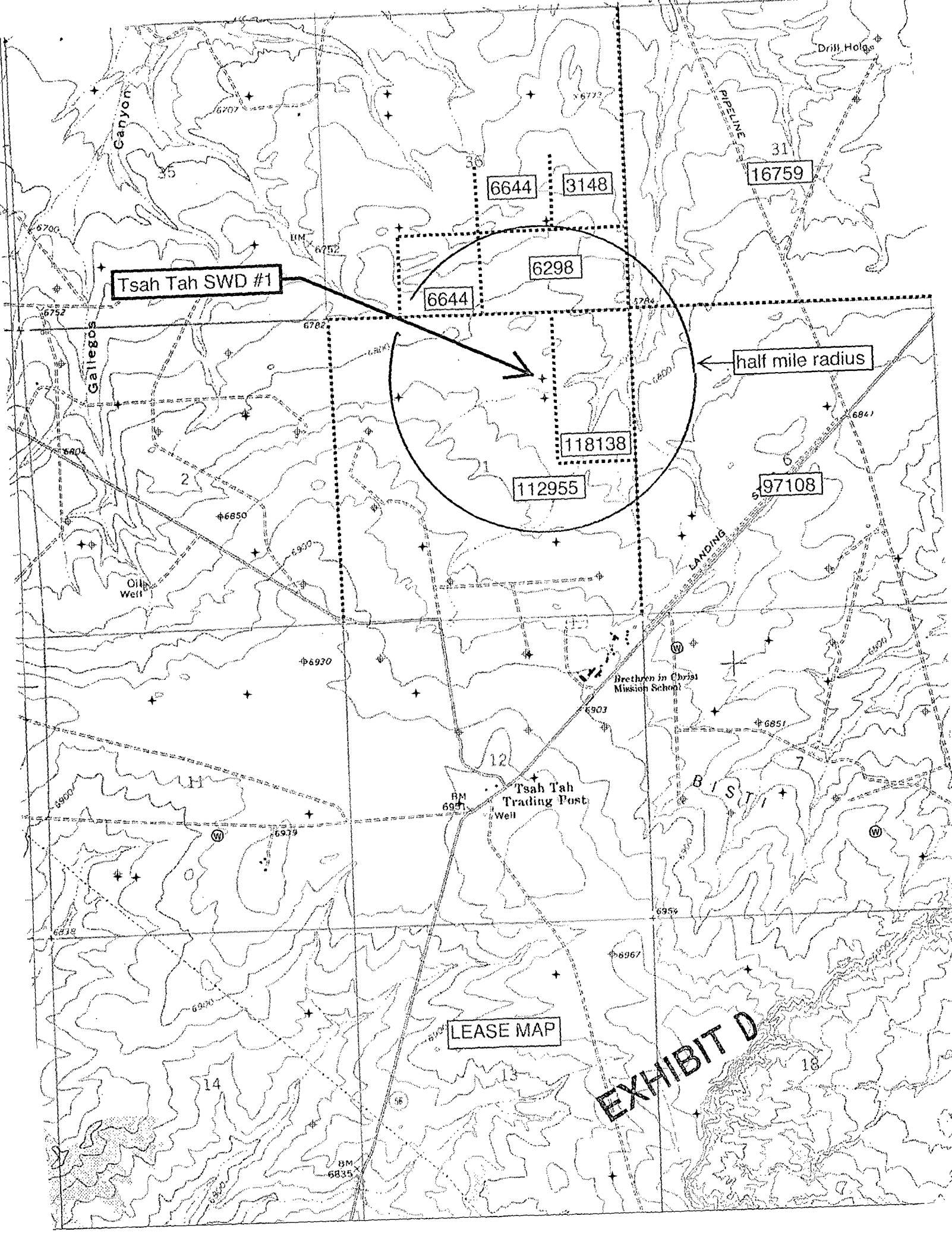
EXHIBIT A

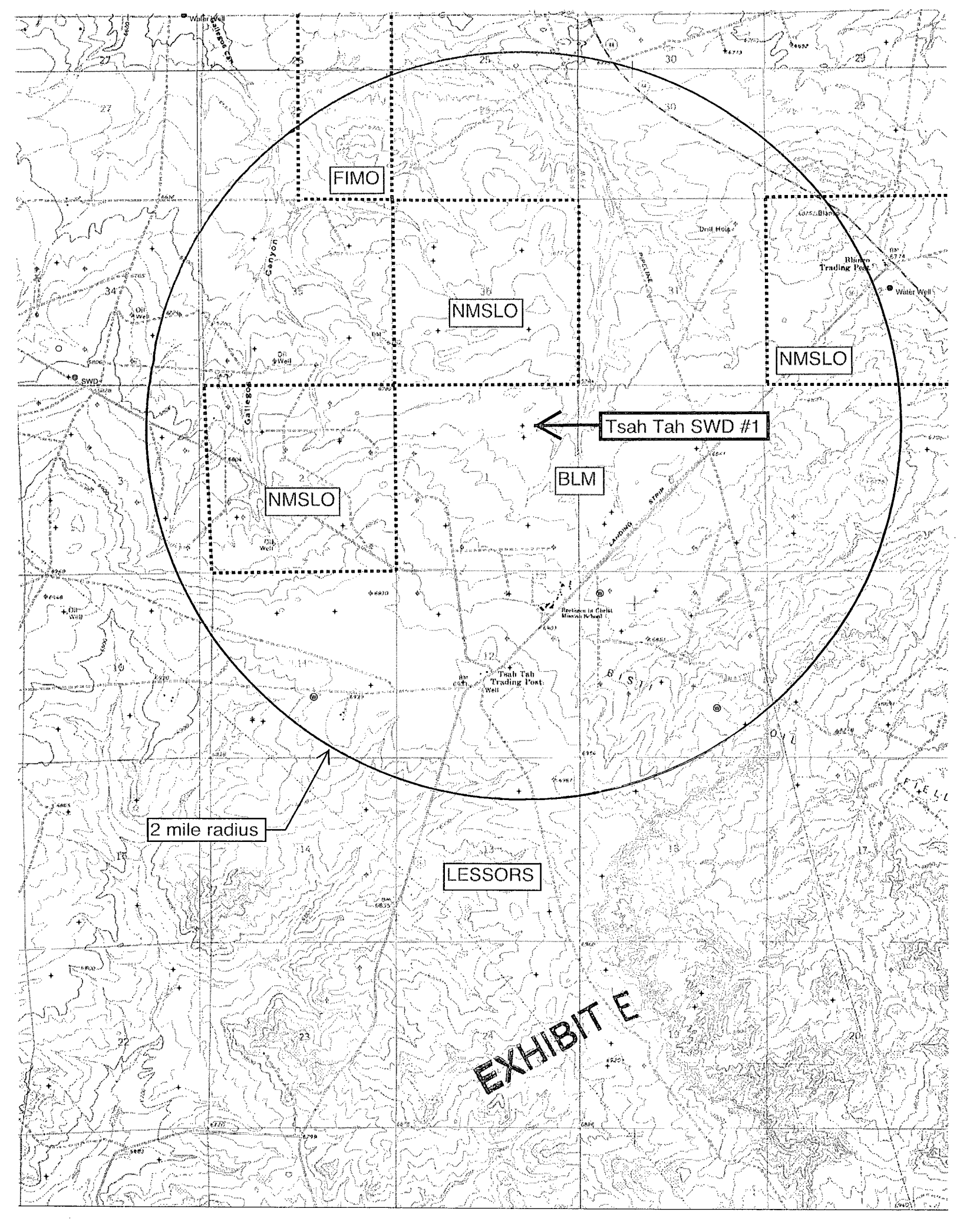

Tsah Tah SWD #1
half mile radius
EXHIBIT B
Gallegos Canyon
PIPELINE
Drill Hole
Oil Well
Oil Well
Oil Well
LANDING STRIP
Brethren in Christ Mission School
Tsah Tah Trading Post
Well
BM 6752
BM 6835
35
36
31
1
2
6
7
11
12
13
14
18
6700
6707
6752
6773
6782
6784
6800
6804
6841
6850
6900
6903
6930
6939
6954
6967
6838
56

Tsah Tah SWD #1

2 mile radius

EXHIBIT C


Tsah Tah SWD #1
half mile radius
6644
3148
16759
6298
6644
118138
112955
97108
Tsah Tah Trading Post
Well
Brethren in Christ Mission School
Oil Well
Gallegos Canyon
PIPELINE
LANDING
LEASE MAP
EXHIBIT D


FIMO
NMSLO
NMSLO
NMSLO
Tsah Tah SWD #1
BLM
2 mile radius
LESSORS
EXHIBIT E

Water Analysis

Analysis #: 1058

Company: Rosetta Resources

Lease:

Location: Farmington, New Mexico

Date: January 16, 2007

Attention: Bryan Enns

Description:

Well: Tsah Tah 2 #4

Sample Point: 2 #4

MULTI-CHEM PRODUCTION CHEMICALS®

DISSOLVED SOLIDS

CATIONS	mg/l	meq/l
Sodium, Na (calc)	10,906.14	474.18
Calcium, Ca	800.00	39.80
Magnesium, Mg	344.04	28.20
Barium, Ba	2.44	0.04
Iron, Fe	27.62	1.48

ANIONS	mg/l	meq/l
Hydroxyl, OH		
Carbonate, CO3		
Bicarbonate, HCO3	518.50	8.49
Sulfate, SO4	0.00	0.00
Chloride, Cl	19,000.00	535.21
Sulfide, S		

OTHER PROPERTIES

pH	7.30
Specific Gravity	1.014
Dissolved Oxygen, (Mg/l)	
Dissolved Carbon Dioxide	19.80
Sulfide as H2S, (ppm)	0.00
Sample Temp	F. 72 C. 22
CO2 in Gas Phase (Mg/l)	
H2S in Gas Phase (Mg/l)	
Total Hardness (Me/l)	68.00

Total Dissolved Solids (Mg/l)	31,599
Total Ionic Strength	0.5784
Maximum CaSO4, (calc.)	0.00
Maximum BaSO4, (calc.)	0.00
Total SRB (colonies/cc)	
Total APB (colonies/cc)	
Total Aerobic (colonies/cc)	
Manganese (Mg/l):	0.84

Conclusion:

Calcium Carbonate scaling index is positive above 9 degrees Centigrade.
Calcium Sulfate scale is not indicated from 0 to 100 degrees Centigrade.
Barium Sulfate scale is not indicated from 0 to 100 degrees Centigrade.

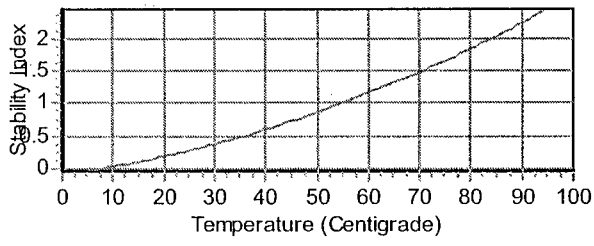
Remarks:

EXHIBIT F

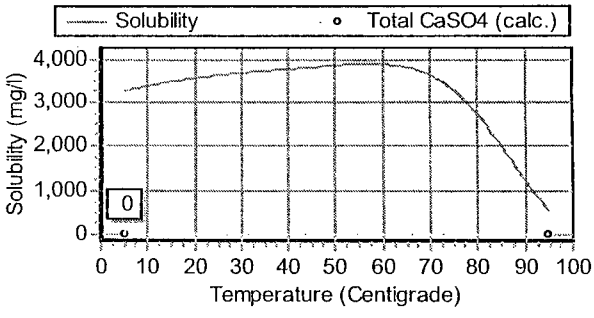
Fahrenheit Degrees 32 85 122 167 212
(C X 1.8) + 32
Centigrade Degrees 0 25 50 75 100

Scaling Indices vs. Temperature

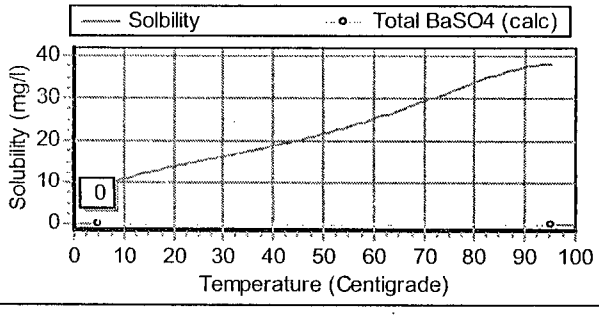
Calcium Carbonate Saturation Index



Calcium Sulfate Solubility



Barium Sulfate Solubility



Water Analysis

Analysis #: 1059

Company: Rosetta Resources

Lease: .

Location: Farmington, New Mexico

Date: January 16, 2007

Attention: Bryan Enns

Description:

Well: Tsah Tah 33 #2

Sample Point: 33 #2

MULTI-CHEM PRODUCTION CHEMICALS®

DISSOLVED SOLIDS

CATIONS	mg/l	meq/l
Sodium, Na (calc)	10,979.97	477.39
Calcium, Ca	400.00	19.90
Magnesium, Mg	245.22	20.10
Barium, Ba	3.19	0.05
Iron, Fe	46.22	2.48

ANIONS	mg/l	meq/l
Hydroxyl, OH		
Carbonate, CO3		
Bicarbonate, HCO3	786.90	12.88
Sulfate, SO4	0.00	0.00
Chloride, Cl	18,000.00	507.04
Sulfide, S		

OTHER PROPERTIES

pH	6.80
Specific Gravity	1.014
Dissolved Oxygen, (Mg/l)	
Dissolved Carbon Dioxide	7.90
Sulfide as H2S, (ppm)	0.00
Sample Temp	F. 72 C. 22
CO2 in Gas Phase (Mg/l)	
H2S in Gas Phase (Mg/l)	
Total Hardness (Me/l)	40.00

Total Dissolved Solids (Mg/l)	30,462
Total Ionic Strength	0.5402
Maximum CaSO4, (calc.)	0.00
Maximum BaSO4, (calc.)	0.00
Total SRB (colonies/cc)	
Total APB (colonies/cc)	
Total Aerobic (colonies/cc)	
Manganese (Mg/l):	0.43

Conclusion:

Calcium Carbonate scaling index is positive above 41 degrees Centigrade.
Calcium Sulfate scale is not indicated from 0 to 100 degrees Centigrade.
Barium Sulfate scale is not indicated from 0 to 100 degrees Centigrade.

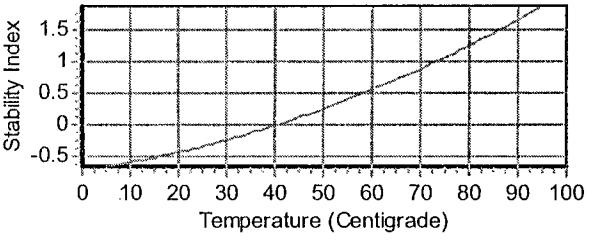
Remarks:

EXHIBIT F

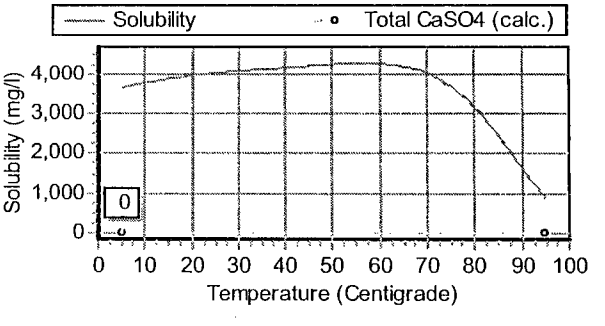
Fahrenheit Degrees 32 85 122 167 212
(C X 1.8) + 32
Centigrade Degrees 0 25 50 75 100

Scaling Indices vs. Temperature

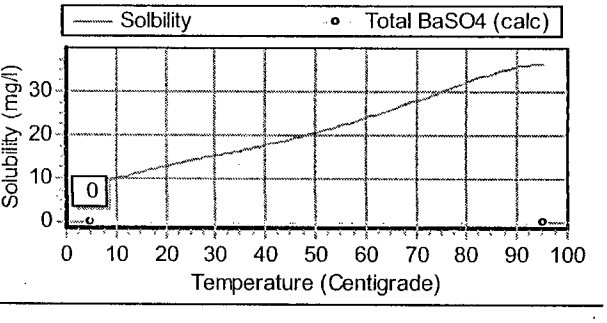
Calcium Carbonate Saturation Index



Calcium Sulfate Solubility



Barium Sulfate Solubility



Water Analysis

Analysis #: 1060

Company: Rosetta Resources

Lease: .

Location: Farmington, New Mexico

Date: January 16, 2007

Attention: Bryan Enns

Description:

Well: Tsah Tah 34 #4

Sample Point: 34 #4

MULTI-CHEM PRODUCTION CHEMICALS®

DISSOLVED SOLIDS

CATIONS	mg/l	meq/l
Sodium, Na (calc)	9,166.19	398.53
Calcium, Ca	960.00	47.76
Magnesium, Mg	149.33	12.24
Barium, Ba	2.26	0.03
Iron, Fe	21.77	1.17

ANIONS	mg/l	meq/l
Hydroxyl, OH		
Carbonate, CO3		
Bicarbonate, HCO3	549.00	8.99
Sulfate, SO4	2.00	0.04
Chloride, Cl	16,000.00	450.70
Sulfide, S		

OTHER PROPERTIES

pH	7.00	Total Dissolved Solids (Mg/l)	26,851
Specific Gravity	1.014	Total Ionic Strength	0.4905
Dissolved Oxygen, (Mg/l)		Maximum CaSO4, (calc.)	2.85
Dissolved Carbon Dioxide	11.90	Maximum BaSO4, (calc.)	3.87
Sulfide as H2S, (ppm)	0.00	Total SRB (colonies/cc)	
Sample Temp	F. 72 C. 22	Total APB (colonies/cc)	
CO2 in Gas Phase (Mg/l)		Total Aerobic (colonies/cc)	
H2S in Gas Phase (Mg/l)		Manganese (Mg/l):	0.26
Total Hardness (Me/l)	60.00		

Conclusion:

Calcium Carbonate scaling index is positive above 19 degrees Centigrade.
Calcium Sulfate scale is not indicated from 0 to 100 degrees Centigrade.
Barium Sulfate scale is indicated below 5 degrees Centigrade.

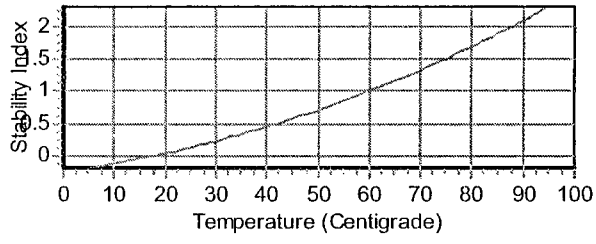
Remarks:

EXHIBIT F

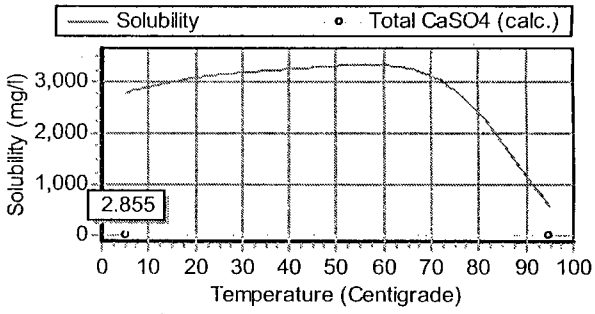
Fahrenheit Degrees: 32, 85, 122, 167, 212
(C X 1.8) + 32
Centigrade Degrees: 0, 25, 50, 75, 100

Scaling Indices vs. Temperature

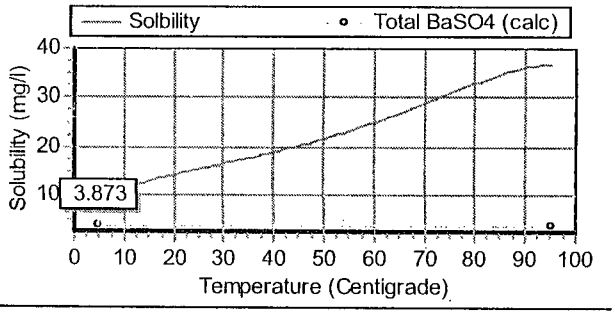
Calcium Carbonate Saturation Index



Calcium Sulfate Solubility



Barium Sulfate Solubility



Water Analysis

Analysis #: 1061

Company: Rosetta Resources

Lease: .

Location: Farmington, New Mexico

Date: January 16, 2007

Attention: Bryan Enns

Description:

Well: Tsah Tah 35 #1

Sample Point: 35 #1

MULTI-CHEM PRODUCTION CHEMICALS®

DISSOLVED SOLIDS

CATIONS	mg/l	meq/l
Sodium, Na (calc)	11,799.69	513.03
Calcium, Ca	880.00	43.78
Magnesium, Mg	197.88	16.22
Barium, Ba	4.34	0.06
Iron, Fe	31.09	1.67

ANIONS	mg/l	meq/l
Hydroxyl, OH		
Carbonate, CO3		
Bicarbonate, HCO3	695.40	11.38
Sulfate, SO4	0.00	0.00
Chloride, Cl	20,000.00	563.38
Sulfide, S		

OTHER PROPERTIES

pH	6.60
Specific Gravity	1.018
Dissolved Oxygen, (Mg/l)	
Dissolved Carbon Dioxide	23.70
Sulfide as H2S, (ppm)	0.00
Sample Temp	F. 72 C. 22
CO2 in Gas Phase (Mg/l)	
H2S in Gas Phase (Mg/l)	
Total Hardness (Me/l)	60.00

Total Dissolved Solids (Mg/l)	33,608
Total Ionic Strength	0.6056
Maximum CaSO4, (calc.)	0.00
Maximum BaSO4, (calc.)	0.00
Total SRB (colonies/cc)	
Total APB (colonies/cc)	
Total Aerobic (colonies/cc)	
Manganese (Mg/l):	0.33

Conclusion:

Calcium Carbonate scaling index is positive above 38 degrees Centigrade.
Calcium Sulfate scale is not indicated from 0 to 100 degrees Centigrade.
Barium Sulfate scale is not indicated from 0 to 100 degrees Centigrade.

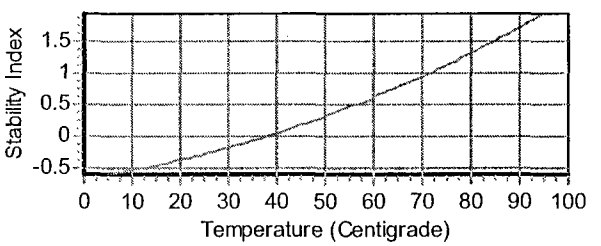
Remarks:

EXHIBIT F

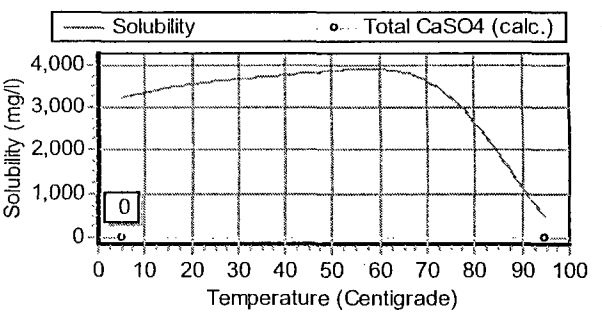
Fahrenheit Degrees: 32 85 122 167 212
(C X 1.8) + 32
Centigrade Degrees: 0 25 50 75 100

Scaling Indices vs. Temperature

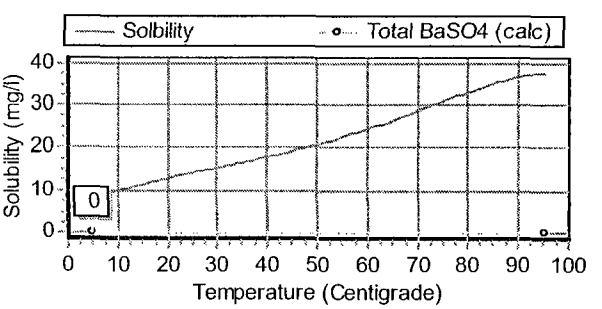
Calcium Carbonate Saturation Index



Calcium Sulfate Solubility



Barium Sulfate Solubility



HALLIBURTON

Water Analysis Report

To:	Dugan Production	**Date:**	11/10/2005
Submitted by:	Halliburton Energy Services	**Date Rec:**	11/10/2005
Attention:	Darrin Steed	**Report #:**	FLMM5A44
Well Name:	Herry Monster #3 SWD	**Formation:**	Entrada/SWD

SENW 11-24n-11w SWD-994
30-045-33217

Specific Gravity	1.005	
pH	8.4	
Resistivity	0.89	@ 70° F
Iron (Fe)	0	Mg / L
Potassium (K)	200	Mg / L
Sodium (Na)	4165	Mg / L
Calcium (Ca)	176	Mg / L
Magnesium (Mg)	15	Mg / L
Chlorides (Cl)	2200	Mg / L
Sulfates (SO4)	2000	Mg / L
Carbonates (CO3)	40	Mg / L
Bicarbonates (HCO3)	5612	Mg / L
Total Dissolved Solids	14408	Mg / L

Respectfully: Bill Loughridge

Title: Senior Scientist

Location: Farmington, NM

EXHIBIT G

TECH LABS

API WATER ANALYSIS REPORT FORM

Company	Sample No.	Date Sampled
MERIDIAN OIL COMPANY	#1	

Field	Legal Description	County or Parish	State
	NE 29-32-10	SJ	

Lease or Unit	Well	Depth	Formation	Water, B/D
Cedar Hill SWD	#1		Entrada	

Type of Water (Produced, Supply, etc.)	Sampling Point	Sampled By
		M. Moran

DISSOLVED SOLIDS

CATIONS

	mg/l	me/l
Sodium, Na (calc.)	6246	272.7
Calcium, Ca	24	1.2
Magnesium, Mg	15	1.2
Barium, Ba		

ANIONS

	mg/l	me/l
Chloride, Cl	7633	213.0
Sulfate, SO_4	1400	29.6
Carbonate, CO_3	450	15.0
Bicarbonate, HCO_3	336	5.5

OTHER PROPERTIES

pH		8.37
Specific Gravity, 60/60 F.		1.006
Resistivity (ohm-meters)	71° F.	1.38
Conductivity		µmho

Total Dissolved Solids (calc.) 16,660

Iron, Fe (total)

Sulfide, as H_2S Neg

REMARKS & RECOMMENDATIONS:

2503-165

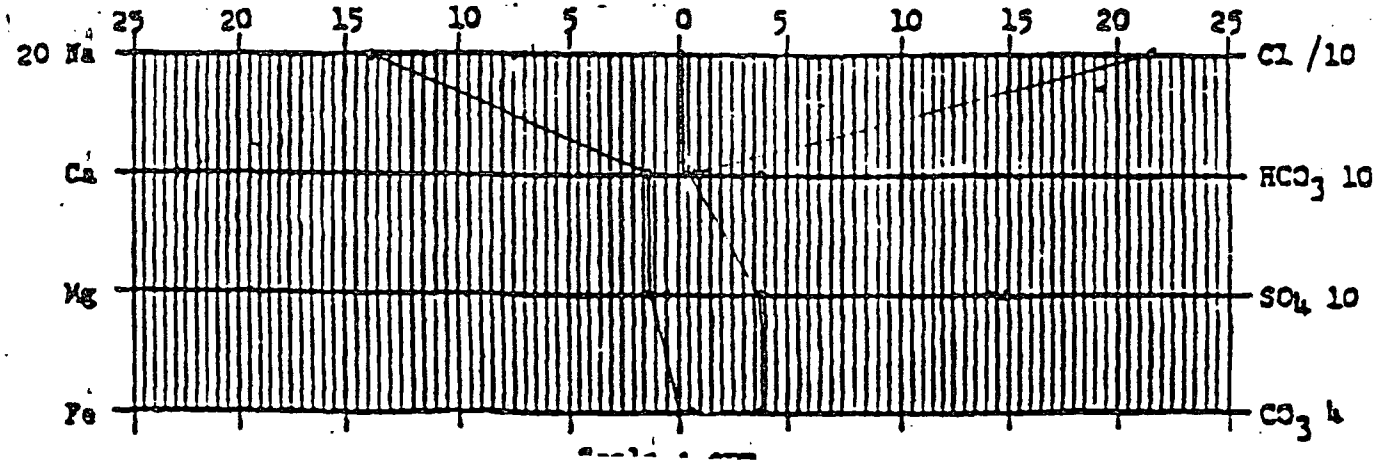


EXHIBIT G

FORMATION FLUID SAMPLE FROM CEDAR HILL SWD #1

NM WAIDS

DATA | MAPS | HOME | SCALE | CORROSION

General Information About: Sample 2556			
USG SECTION 19 017			
API	3004508020	Sample Number	
Unit/Section/ Township/Range	I / 19 / 29 N / 16 W	Field	SWD
County	San Juan	Formation	ENTRADA
State	NM	Depth	
Lat/Long	36.71029 / -108.55859	Sample Source	SEPARATOR
TDS (mg/L)	87035	Water Type	
Sample Date(MM/DD/YYYY)	2/11/1958	Analysis Date(MM/DD/YYYY)	
Remarks/Description			
Cation Information (mg/L)		**Anion Information (mg/L)**	
Potassium (K)		Sulfate (SO)	1039
Sodium (Na)		Chloride (Cl)	52246
Calcium (Ca)		Carbonate (CO_3)	
Magnesium (Mg)		Bicarbonate (HCO_3)	555
Barium (Ba)		Hydroxide (OH)	
Manganese (Mn)		Hydrogen Sulfide (H_2S)	
Strontium (Sr)		Carbon Dioxide (CO_2)	
Iron (Fe)		Oxygen (O)	

New Mexico Tech | PRRC

EXHIBIT G

NM WAIDS

DATA | MAPS | HOME | SCALE | CORROSION

General Information About: Sample 2543			
USG SECTION 19 017			
API	3004508020	Sample Number	
Unit/Section/ Township/Range	I / 19 / 29 N / 16 W	Field	SWD
County	San Juan	Formation	ENTRADA
State	NM	Depth	
Lat/Long	36.71029 / -108.55859	Sample Source	SEPARATOR
TDS (mg/L)	83745	Water Type	
Sample Date(MM/DD/YYYY)	1/31/1958	Analysis Date(MM/DD/YYYY)	
Remarks/Description			
Cation Information (mg/L)		**Anion Information (mg/L)**	
Potassium (K)		Sulfate (SO)	951
Sodium (Na)		Chloride (Cl)	50319
Calcium (Ca)		Carbonate (CO_3)	
Magnesium (Mg)		Bicarbonate (HCO_3)	892
Barium (Ba)		Hydroxide (OH)	
Manganese (Mn)		Hydrogen Sulfide (H_2S)	
Strontium (Sr)		Carbon Dioxide (CO_2)	
Iron (Fe)		Oxygen (O)	

New Mexico Tech | PRRC

EXHIBIT G

NM WAIDS

DATA | MAPS | HOME | SCALE | CORROSION

General Information About: Sample 2544			
USG SECTION 19 017			
API	3004508020	Sample Number	
Unit/Section/ Township/Range	I / 19 / 29 N / 16 W	Field	SWD
County	San Juan	Formation	ENTRADA
State	NM	Depth	
Lat/Long	36.71029 / -108.55859	Sample Source	DST
TDS (mg/L)	86286	Water Type	
Sample Date(MM/DD/YYYY)	12/4/1957	Analysis Date(MM/DD/YYYY)	
Remarks/Description			
Cation Information (mg/L)		**Anion Information (mg/L)**	
Potassium (K)		Sulfate (SO)	984
Sodium (Na)		Chloride (Cl)	52523
Calcium (Ca)		Carbonate (CO_3)	
Magnesium (Mg)		Bicarbonate (HCO_3)	168
Barium (Ba)		Hydroxide (OH)	
Manganese (Mn)		Hydrogen Sulfide (H_2S)	
Strontium (Sr)		Carbon Dioxide (CO_2)	
Iron (Fe)		Oxygen (O)	

New Mexico Tech | PRRC

EXHIBIT G

NM WAIDS

DATA | MAPS | HOME | SCALE | CORROSION

General Information About: Sample 2612			
USG SECTION 19 017			
API	3004508020	Sample Number	
Unit/Section/ Township/Range	I / 19 / 29 N / 16 W	Field	SWD
County	San Juan	Formation	ENTRADA
State	NM	Depth	
Lat/Long	36.71029 / -108.55859	Sample Source	SEPARATOR
TDS (mg/L)	82190	Water Type	
Sample Date(MM/DD/YYYY)	1/9/1958	Analysis Date(MM/DD/YYYY)	
Remarks/Description			
Cation Information (mg/L)		**Anion Information (mg/L)**	
Potassium (K)		Sulfate (SO)	993
Sodium (Na)		Chloride (Cl)	49756
Calcium (Ca)		Carbonate (CO_3)	
Magnesium (Mg)		Bicarbonate (HCO_3)	465
Barium (Ba)		Hydroxide (OH)	
Manganese (Mn)		Hydrogen Sulfide (H_2S)	
Strontium (Sr)		Carbon Dioxide (CO_2)	
Iron (Fe)		Oxygen (O)	

New Mexico Tech

APARC

EXHIBIT G

NM WAIDS

DATA | MAPS | HOME | SCALE | CORROSION

General Information About: Sample 2518			
USG SECTION 19 017			
API	3004508020	Sample Number	
Unit/Section/ Township/Range	I / 19 / 29 N / 16 W	Field	SWD
County	San Juan	Formation	ENTRADA
State	NM	Depth	
Lat/Long	36.71029 / -108.55859	Sample Source	SEPARATOR
TDS (mg/L)	82560	Water Type	
Sample Date(MM/DD/YYYY)	1/10/1958	Analysis Date(MM/DD/YYYY)	
Remarks/Description			
Cation Information (mg/L)		**Anion Information (mg/L)**	
Potassium (K)		Sulfate (SO)	1018
Sodium (Na)		Chloride (Cl)	49930
Calcium (Ca)		Carbonate (CO_3)	
Magnesium (Mg)		Bicarbonate (HCO_3)	427
Barium (Ba)		Hydroxide (OH)	
Manganese (Mn)		Hydrogen Sulfide (H_2S)	
Strontium (Sr)		Carbon Dioxide (CO_2)	
Iron (Fe)		Oxygen (O)	

New Mexico Tech | PRRC

EXHIBIT G

NM WAIDS

DATA | MAPS | HOME | SCALE | CORROSION

General Information About: Sample 2602			
USG SECTION 19 017			
API	3004508020	Sample Number	
Unit/Section/ Township/Range	I / 19 / 29 N / 16 W	Field	SWD
County	San Juan	Formation	ENTRADA
State	NM	Depth	
Lat/Long	36.71029 / -108.55859	Sample Source	SEPARATOR
TDS (mg/L)	90968	Water Type	
Sample Date(MM/DD/YYYY)	4/25/1958	Analysis Date(MM/DD/YYYY)	
Remarks/Description			
Cation Information (mg/L)		**Anion Information (mg/L)**	
Potassium (K)		Sulfate (SO)	907
Sodium (Na)		Chloride (Cl)	54981
Calcium (Ca)		Carbonate (CO_3)	
Magnesium (Mg)		Bicarbonate (HCO_3)	479
Barium (Ba)		Hydroxide (OH)	
Manganese (Mn)		Hydrogen Sulfide (H_2S)	
Strontium (Sr)		Carbon Dioxide (CO_2)	
Iron (Fe)		Oxygen (O)	

New Mexico Tech | PRRC

EXHIBIT G

NM WAIDS

DATA | MAPS | HOME | SCALE | CORROSION

General Information About: Sample 2598			
USG SECTION 19 017			
API	3004508020	Sample Number	
Unit/Section/ Township/Range	I / 19 / 29 N / 16 W	Field	SWD
County	San Juan	Formation	ENTRADA
State	NM	Depth	
Lat/Long	36.71029 / -108.55859	Sample Source	DST
TDS (mg/L)	52596	Water Type	
Sample Date(MM/DD/YYYY)	12/11/1957	Analysis Date(MM/DD/YYYY)	
Remarks/Description			
Cation Information (mg/L)		**Anion Information (mg/L)**	
Potassium (K)		Sulfate (SO)	2482
Sodium (Na)		Chloride (Cl)	28765
Calcium (Ca)		Carbonate (CO_3)	
Magnesium (Mg)		Bicarbonate (HCO_3)	1421
Barium (Ba)		Hydroxide (OH)	
Manganese (Mn)		Hydrogen Sulfide (H_2S)	
Strontium (Sr)		Carbon Dioxide (CO_2)	
Iron (Fe)		Oxygen (O)	

New Mexico Tech | PRRC

EXHIBIT G

NM WAIDS

DATA | MAPS | HOME | SCALE | CORROSION

Produced Water
Ground Water
Conversion Tools

General Informati		2505	
USG SE			
API	3004508020	Sample Number	
Unit/Section/ Township/Range	I / 19 / 29 N / 16 W	Field	SWD
County	San Juan	Formation	ENTRADA
State	NM	Depth	
Lat/Long	36.71029 / -108.55859	Sample Source	WELLHEAD
TDS (mg/L)	86301	Water Type	
Sample Date(MM/DD/YYYY)	8/23/1958	Analysis Date(MM/DD/YYYY)	
Remarks/Description			
Cation Information (mg/L)		**Anion Information (mg/L)**	
Potassium (K)		Sulfate (SO)	823
Sodium (Na)		Chloride (Cl)	52523
Calcium (Ca)		Carbonate (CO_3)	
Magnesium (Mg)		Bicarbonate (HCO_3)	181
Barium (Ba)		Hydroxide (OH)	
Manganese (Mn)		Hydrogen Sulfide (H_2S)	
Strontium (Sr)		Carbon Dioxide (CO_2)	
Iron (Fe)		Oxygen (O)	

New Mexico Tech | PRRC

EXHIBIT G

612 E. Murray Drive
Farmington, NM 87499

Off: (505) 327-1072
FAX: (505) 327-1496

iiná bá

P.O. Box 3788
Shiprock, NM 87420

Off: (505) 368-4065

ANALYTICAL REPORT

Date: *03-Jan-07*

CLIENT:	Permits West	**Client Sample Info:**	
Work Order:	0612022	**Client Sample ID:**	BIC Mission Sec 12
Project:	BIC Mission Sec 12	**Collection Date:**	12/13/2006 10:30:00 AM
Lab ID:	0612022-001A	**Matrix:**	AQUEOUS

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS, DISSOLVED		**SW6010B**				Analyst: **jle**
Iron	< 0.021	0.021		mg/L	1	12/28/2006 9:24:41 AM
Magnesium	0.097	0.010		mg/L	1	12/28/2006 9:24:41 AM
Calcium	1.37	0.490		mg/L	10	12/27/2006 5:28:55 PM
Sodium	233	0.800		mg/L	10	12/27/2006 5:28:55 PM
Potassium	0.414	0.400		mg/L	10	12/27/2006 5:28:55 PM
ANIONS BY ION CHROMATOGRAPHY		**E300**				Analyst: **elc**
Chloride	6.18	0.100		mg/L	1	12/20/2006
Sulfate	160	3.00		mg/L	30	12/27/2006
ALKALINITY, TOTAL		**M2320 B**				Analyst: **elc**
Alkalinity, Bicarbonate (As CaCO3)	245	5		mg/L CaCO3	1	12/22/2006
Alkalinity, Carbonate (As CaCO3)	77	5		mg/L CaCO3	1	12/22/2006
Alkalinity, Hydroxide	ND	5		mg/L CaCO3	1	12/22/2006
Alkalinity, Total (As CaCO3)	322	5		mg/L CaCO3	1	12/22/2006
HARDNESS, TOTAL		**M2340 B**				Analyst: **jem**
Hardness (As CaCO3)	4	1		mg/L	1	1/2/2007
PH		**E150.1**				Analyst: **elc**
pH	8.99	1.00		pH units	1	12/13/2006
Temperature	23.1	0		deg C	1	12/13/2006
RESISTIVITY (@ 25 DEG. C)		**M2510 C**				Analyst: **elc**
Resistivity	9.950	0.001		ohm-m	1	12/13/2006
SPECIFIC GRAVITY		**M2710 F**				Analyst: **elc**
Specific Gravity	1.002	0.001		Units	1	12/13/2006
TOTAL DISSOLVED SOLIDS		**E160.1**				Analyst: **elc**
Total Dissolved Solids (Residue, Filterable)	628	25		mg/L	1	12/14/2006
TOTAL DISSOLVED SOLIDS		**M1030F**				Analyst: **jem**
Total Dissolved Solids (Calculated)	591	5		mg/L	1	1/2/2007

EXHIBIT H

Qualifiers:

ND - Not Detected at the Practical Quantitation Limit
J - Analyte detected below Practical Quantitation Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted precision limits
E - Value above Upper Quantitation Limit - UQL

SMITH ENERGY SERVICES
A DIVISION OF ALLIED PRODUCTS CORPORATION

2198 East Bloomfield Highway
Farmington, New Mexico 87401
Phone (505) 327-7281

SMITH ENERGY SERVICES a division of Allied Products
WATER ANALYSIS

Jun. 11, 1990 Page 1

06-11-90
DUGAN PRODUCTION
JOHN ALEXANDER
Date Sampled: 06-05-90
Well: GOOD TIMES FIELD H20 WELL
SIXTEEN G's WATER well
OJO ALAMO

Formation:
Legals:
County:
Report No.: 90054

Specific Gravity:	1.000	pH:	8.50
Chloride:	1,200.0 mg/l	Calcium:	281 mg/l
Bicarbonate:	85.4 mg/l	Magnesium:	388 mg/l
Sulfate:	110 mg/l	Total Iron:	.0 mg/l
Sulfide:	0 mg/l	Sodium:	-251 mg/l
Total Hardness:	2,300 mg/l	Total Diss Solids:	1,913 mg/l
Potassium:	100 mg/l		
Resistivity:	11.80 Ohm Meters at 60 Degrees F		

Sample Source:

Remarks:

Your water report was prepared by: WALLACE W. WALTERS

OJO ALAMO WATER WELL

EXHIBIT H

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

October 1, 2009

Joe Mraz
NM State Land Office
P. O. Box 1148
Santa Fe, NM 87504

Dear Joe,

Rosetta Resources Operating LP is applying (see attached application) to drill its Tsah Tah SWD #1 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed water disposal well. This letter is a notice only. No action is needed unless you have questions or objections.

Well Name: Tsah Tah SWD #1 Total Depth: ≈7,800'
Proposed Disposal Zone: Entrada (from ≈7,505' to ≈7,670')
Location: 1200' FNL & 1511' FEL Sec. 1, T. 24 N., R. 10 W.,
San Juan County, NM on BLM lease NMNM-112955
Approximate Location: ≈26 air miles south of Bloomfield, NM
Applicant Name: Rosetta Resources Operating LP (713) 335-4104
Applicant's Address: 717 Texas, Suite 2800, Houston, TX 77002

Interested parties must file objections or requests for hearings with the NM Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, NM 87505 within 15 days.

Please call me if you have any questions.

Sincerely,

Brian Wood

7009 0080 0001 4705 5822

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PS Form 3800, August 2006 See Reverse for Instructions

EXHIBIT 1

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

October 1, 2009

BLM
1235 LaPlata Highway
Farmington, NM 87401

Rosetta Resources Operating LP is applying (see attached application) to drill its Tsah Tah SWD #1 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed water disposal well. This letter is a notice only. No action is needed unless you have questions or objections.

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Please call me if you have any questions.

Sincerely,

Brian Wood

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City, State, ZIP+4:

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EXHIBIT 1

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

October 1, 2009

Kaiser-Francis Oil Co.
P. O. Box 21468
Tulsa, OK 74121

Rosetta Resources Operating LP is applying (see attached application) to drill its Tsah Tah SWD #1 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed water disposal well. This letter is a notice only. No action is needed unless you have questions or objections.

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Approximate Location: ≈26 air miles south of Bloomfield, NM
Applicant Name: Rosetta Resources Operating LP (713) 335-4104
Applicant's Address: 717 Texas, Suite 2800, Houston, TX 77002

Interested parties must file objections or requests for hearings with the NM Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, NM 87505 within 15 days.

Please call me if you have any questions.

Sincerely,

Brian Wood

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Sent To: Kaiser - Francis
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PS Form 3800, August 2006 See Reverse for Instructions

EXHIBIT 1

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

October 1, 2009

Bill Speer
P. O. Box 1363
Mt. Pleasant, SC 29465

Dear Bill,

Rosetta Resources Operating LP is applying (see attached application) to drill its Tsah Tah SWD #1 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed water disposal well. This letter is a notice only. No action is needed unless you have questions or objections.

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San Juan County, NM on BLM lease NMNM-112955
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Applicant Name: Rosetta Resources Operating LP (713) 335-4104
Applicant's Address: 717 Texas, Suite 2800, Houston, TX 77002

Interested parties must file objections or requests for hearings with the NM Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, NM 87505 within 15 days.

Please call me if you have any questions.

Sincerely,

Brian Wood

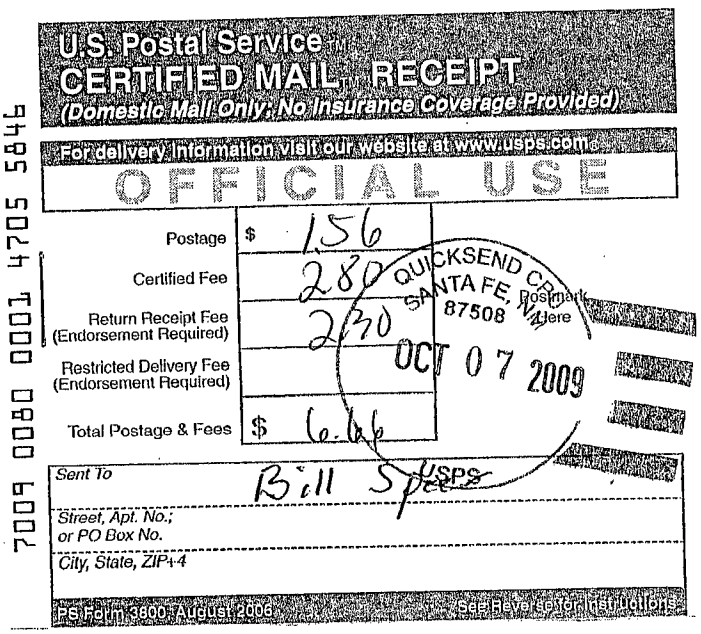
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EXHIBIT 1

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

October 1, 2009

Clifton May
Yates Petroleum Corporation
105 South 4th St.
Artesia, NM 88210

Dear Cliff,

Rosetta Resources Operating LP is applying (see attached application) to drill its Tsah Tah SWD #1 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed water disposal well. This letter is a notice only. No action is needed unless you have questions or objections.

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Interested parties must file objections or requests for hearings with the NM Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, NM 87505 within 15 days.

Please call me if you have any questions.

Sincerely,

Brian Wood

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EXHIBIT 1

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

October 1, 2009

Cherry Hlava
BP America Production Company
P. O. Box 3092
Houston, Tx. 77253-3092

Dear Cherry,

Rosetta Resources Operating LP is applying (see attached application) to drill its Tsah Tah SWD #1 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed water disposal well. This letter is a notice only. No action is needed unless you have questions or objections.

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Approximate Location: ≈26 air miles south of Bloomfield, NM
Applicant Name: Rosetta Resources Operating LP (713) 335-4104
Applicant's Address: 717 Texas, Suite 2800, Houston, TX 77002

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Please call me if you have any questions.

Sincerely,

Brian Wood

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EXHIBIT 1

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

October 1, 2009

John Alexander
Dugan Production Corp.
P. O. Box 420
Farmington, NM 87499

Dear John,

Rosetta Resources Operating LP is applying (see attached application) to drill its Tsah Tah SWD #1 water disposal well. As required by New Mexico Oil Conservation Division Rules, I am notifying you of the following proposed water disposal well. This letter is a notice only. No action is needed unless you have questions or objections.

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Please call me if you have any questions.

Sincerely,

Brian Wood

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EXHIBIT 1

AFFIDAVIT OF PUBLICATION

Ad No. 63623

STATE OF NEW MEXICO
County of San Juan:

TIA AVILES, being duly sworn says: That she is the CLASSIFIED MANAGER of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication and appeared in the Internet at The Daily Times web site on the following day(s):

Monday, September 28, 2009.

And the cost of the publication is $54.25

Tia Aviles

ON 10/01/09 TIA AVILES appeared before me, whom I know personally to be the person who signed the above document.

Christine Sellers

My Commission Expires - 11/05/11

COPY OF PUBLICATION

Rosetta Resources Operating LP is applying to drill the Tsah Tah SWD #1 as a water disposal well. The Tsah Tah SWD #1 will be located at 1200' FNL & 1151' FEL, Sec. 1, T. 24 N., R. 10 W., San Juan County, NM. The well will dispose of water produced from oil and gas wells into the Entrada zone at an approximate depth of 7,505' to 7,670' at a maximum rate of 5,000 barrels of water per day and at a maximum pressure of 1,501 psi. Interested parties must file objections or request for hearing with the NM Oil Conservation Division, 1220 South Saint Francis Dr., Santa Fe, NM 87505 within 15 days. Additional information can be obtained by contacting Brian Wood, Permits West, Inc., 37 Verano Loop, Santa Fe, NM 87508. Phone number is (505)466-8120.

Legal no. 63623 published in The Daily Times on Tuesday, September 28, 2009.

EXHIBIT J

Injection Permit Checklist (8/14/09)

Case ______ R-______ SWD 1087-A WFX ______ PMX ______ IPI ______ Permit Date 11 ______ UIC Qtr ______

Wells 1 Well Name: Tsah Tah SWD #1

API Num: (30-) 045-34282 Spud Date: ______ New/Old: ____ (UIC primacy March 7, 1982)

Footages 1200 FNL / 1591 FEL Unit B Sec 1 Tsp 24N Rge 10W County San Juan

Operator: Rosetta Resources Operating LP Contact: Brian Wood

OGRID 239235 RULE 5.9 Compliance (Wells) 0/47 (Finan Assur) OK

Operator Address: 717 Texas Suite 2800, Houston, TX 77002

Current Status of Well: New Well

Planned Work to Well: Cancel Menefee/PLO & add Entrada Planned Tubing Size/Depth: 2 7/8 @ 7455

	Sizes Hole.......Pipe	Setting Depths	Cement Sx or Cf	Cement Top and Determination Method
Existing ✓ Surface	12 1/4 9 5/8	320	171	Surf.
Existing ___ Intermediate				
Existing ✓ Long String	8 3/4 7"	7800	1125	

DV Tool ______ Liner ______ Open Hole ______ Total Depth 7,800'

Well File Reviewed ______

Diagrams: Before Conversion ____ After Conversion ____ Elogs in Imaging File: ______

Intervals:	Depths	Formation	Producing (Yes/No)
Above (Name and Top)			
Above (Name and Top)	7465	Entrada	
Injection Interval TOP:	7505	"	
Injection Interval BOTTOM:	7670	"	
Below (Name and Top)			

1500 PSI Max. WHIP

NO Open Hole (Y/N)

NO Deviated Hole?

7505 / 2 = 1501

Sensitive Areas: ~~Capitan Reef~~ ______ ~~Cliff House~~ ______ ~~Salt Depths~~ ______

~~Potash Area (R-111-P)~~ ______ ~~Potash Lessee~~ ______ ~~Noticed?~~ ______

Fresh Water: Depths: ______ Wells 2 ______ Analysis? ✓ Affirmative Statement ✓

Disposal Fluid Sources: ______ Analysis?

Disposal Interval Production Potential/Testing/Analysis Analysis: Entrada is OK per Steve Hayden

Notice: Newspaper(Y/N) ✓ Surface Owner BLM / ~~FIMO~~ ✓ Mineral Owner(s) ✓

RULE 26.7(A) Affected Parties: BP / DUGAN / FIMO / Koin Fu / SPear / Yates / SLO ✓

Area of Review: Adequate Map (Y/N) ✓ and Well List (Y/N) ✓

Active Wells 0 Num Repairs — Producing in Injection Interval in AOR —

P&A Wells 0 Num Repairs — All Wellbore Diagrams Included? —

Questions to be Answered:

______

Required Work on This Well: ______ Request Sent ______ Reply: ______

AOR Repairs Needed: ______ Request Sent ______ Reply: ______

______ Request Sent ______ Reply: ______