

Rosetta Resources

Request for approval to inject into the La Ventana tongue of the Cliff House member of the Mesaverde Fm

Rosetta Operations overview

40 wells producing 4000 mcf/d & 3500 bbls/d water from Fruitland Formation Coal

2 SWD wells disposing ~2500 bbls/d water at full capacity into Menefee & Point Lookout

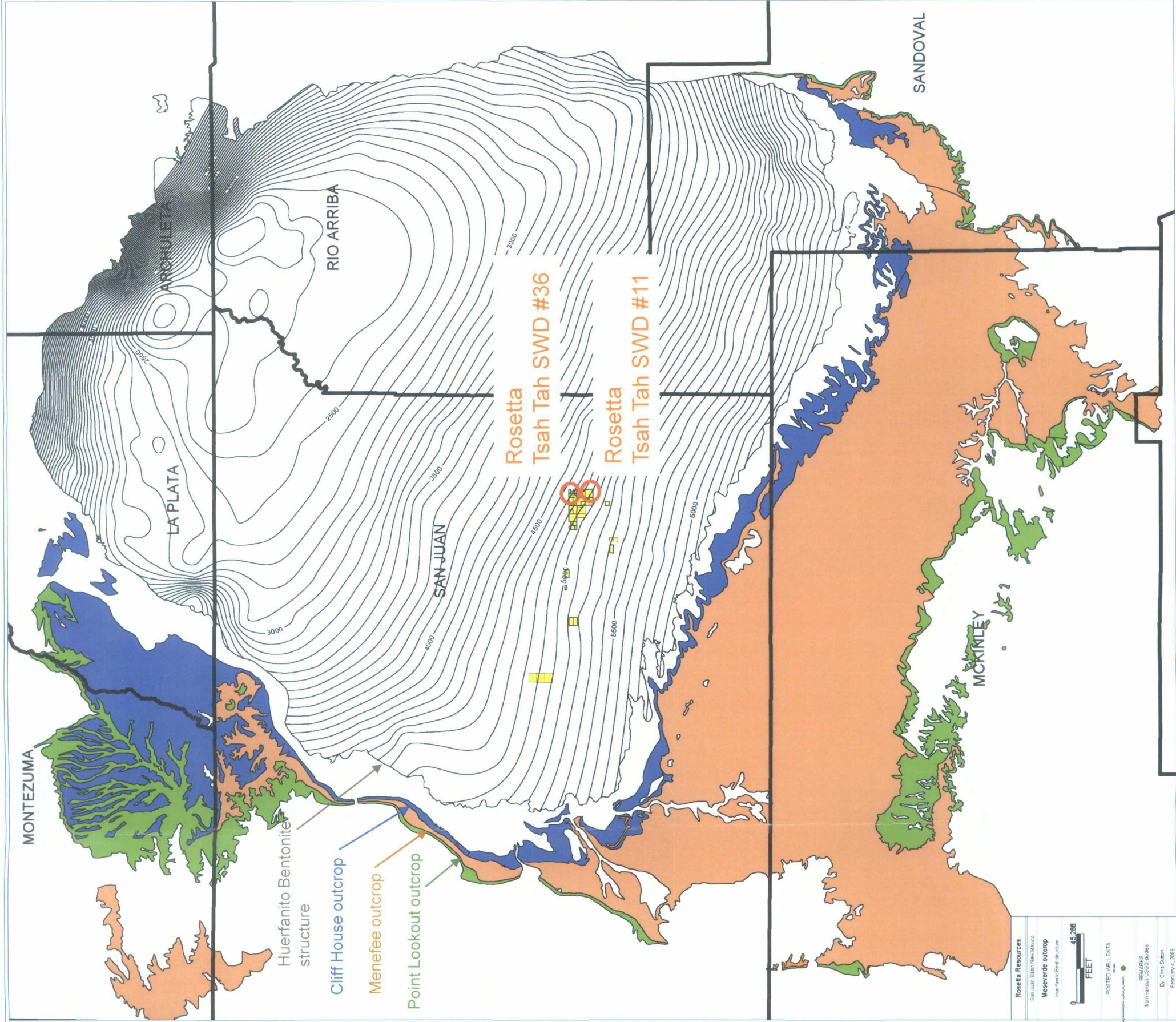
- Tsah Tah SWD #11
- Tsah Tah SWD #36

Currently trucking ~1000 bbls/d to Basin Disposal and Agua Moss facility, 50 mi. each way.

Oil Conservation Division

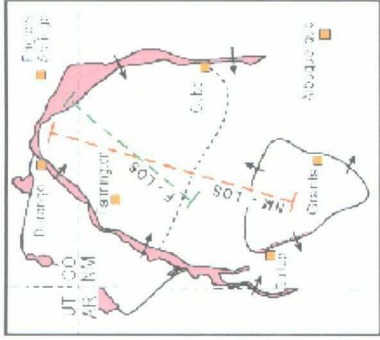
Case No. 5

Exhibit No. Rosetta



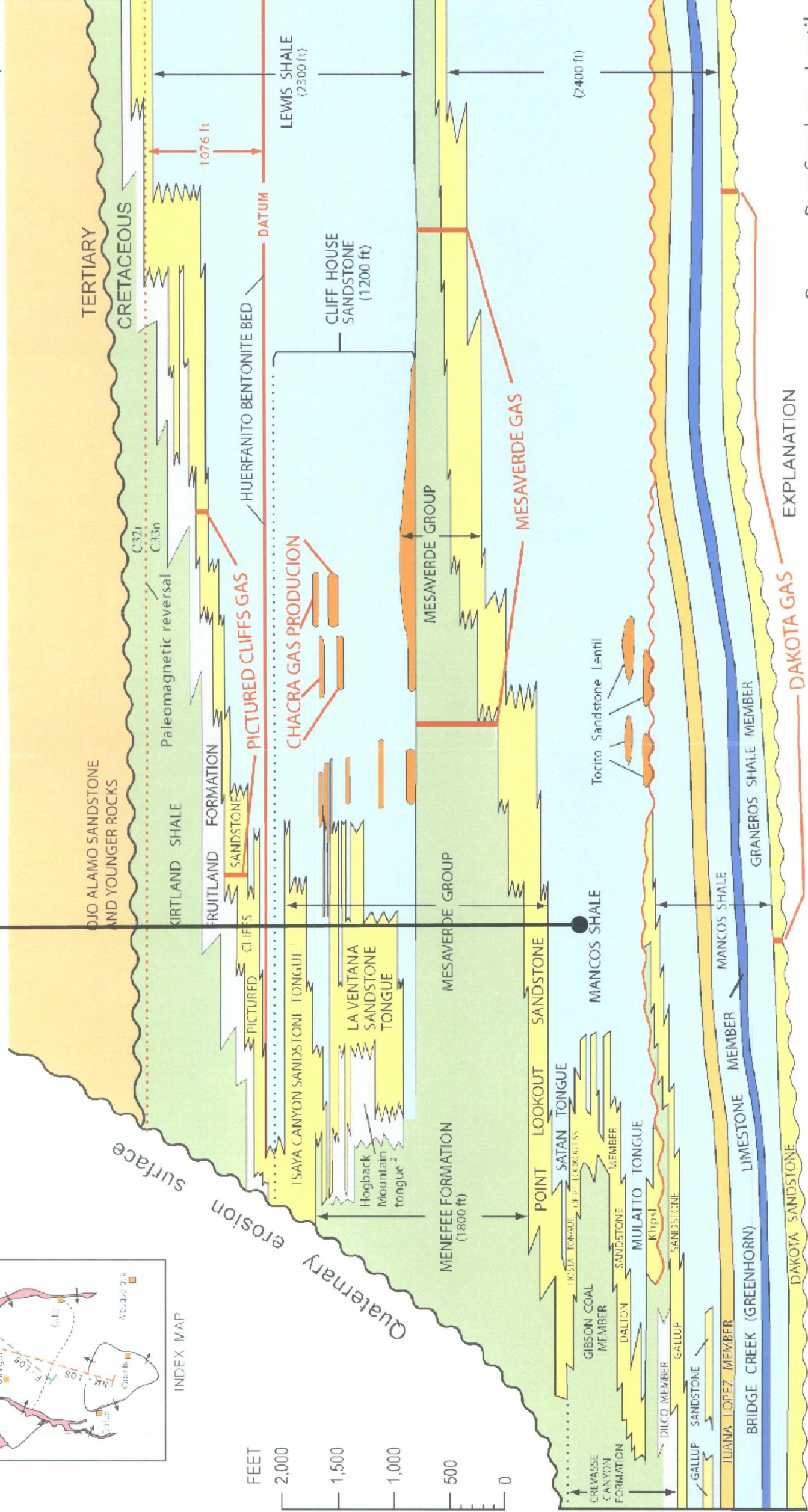
Approximate location of SWD #11 & SWD #36

NE
NM | CO



INDEX MAP

FEET
2,000
1,500
1,000
500
0



NOTES

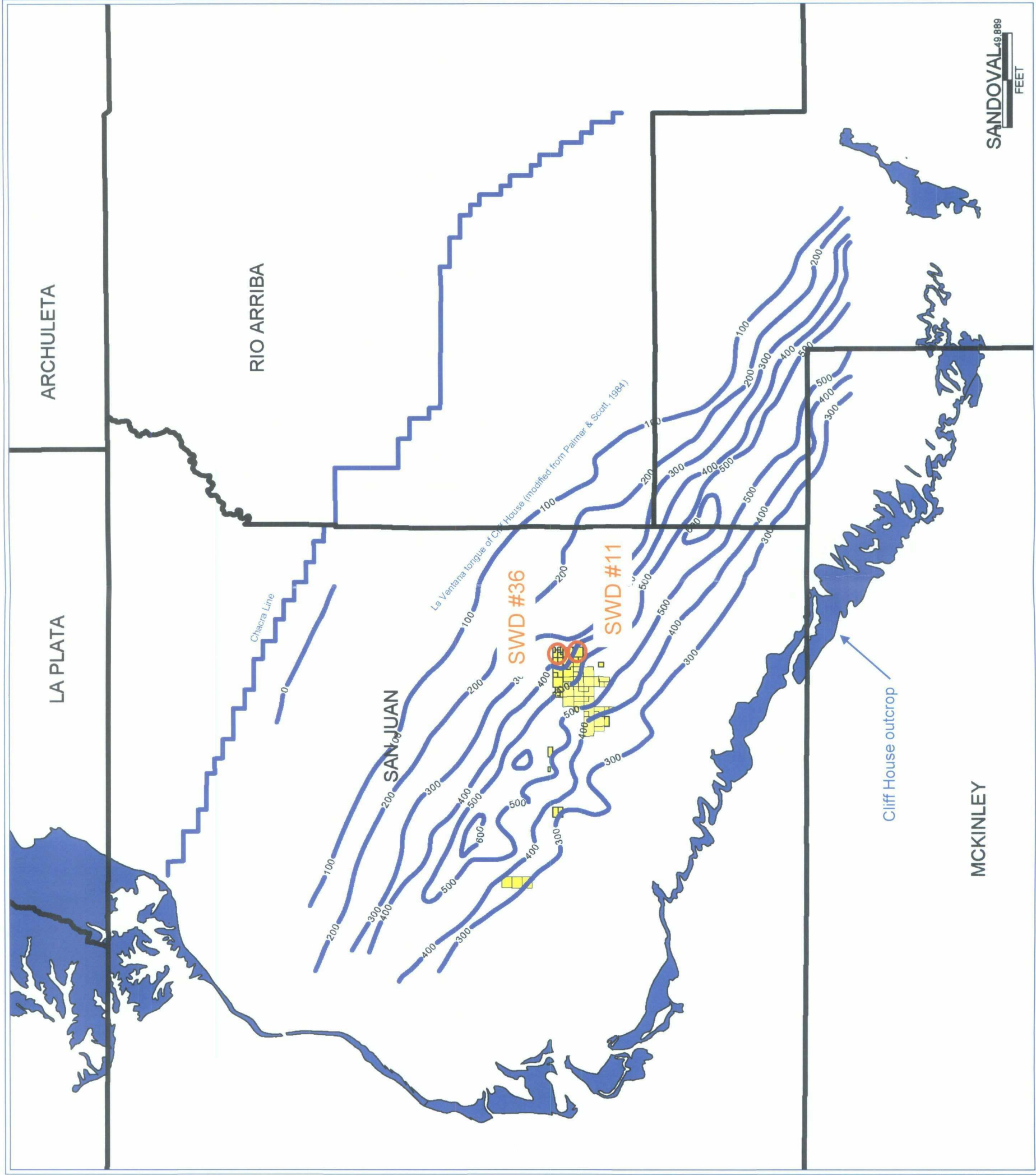
- 1 Tsaya Canyon Sandstone Tongue (of Cliff House Sandstone) name from Fassett (1977)
- 2 Hogback Mountain tongue (of Menefee Formation) name from Whyte and Shomaker (1977)

EXPLANATION	EXPLANATION
Nonmarine (Tertiary)	Shoreface
Nonmarine (Cretaceous)	Shelf
Coal-bearing	
Marine	

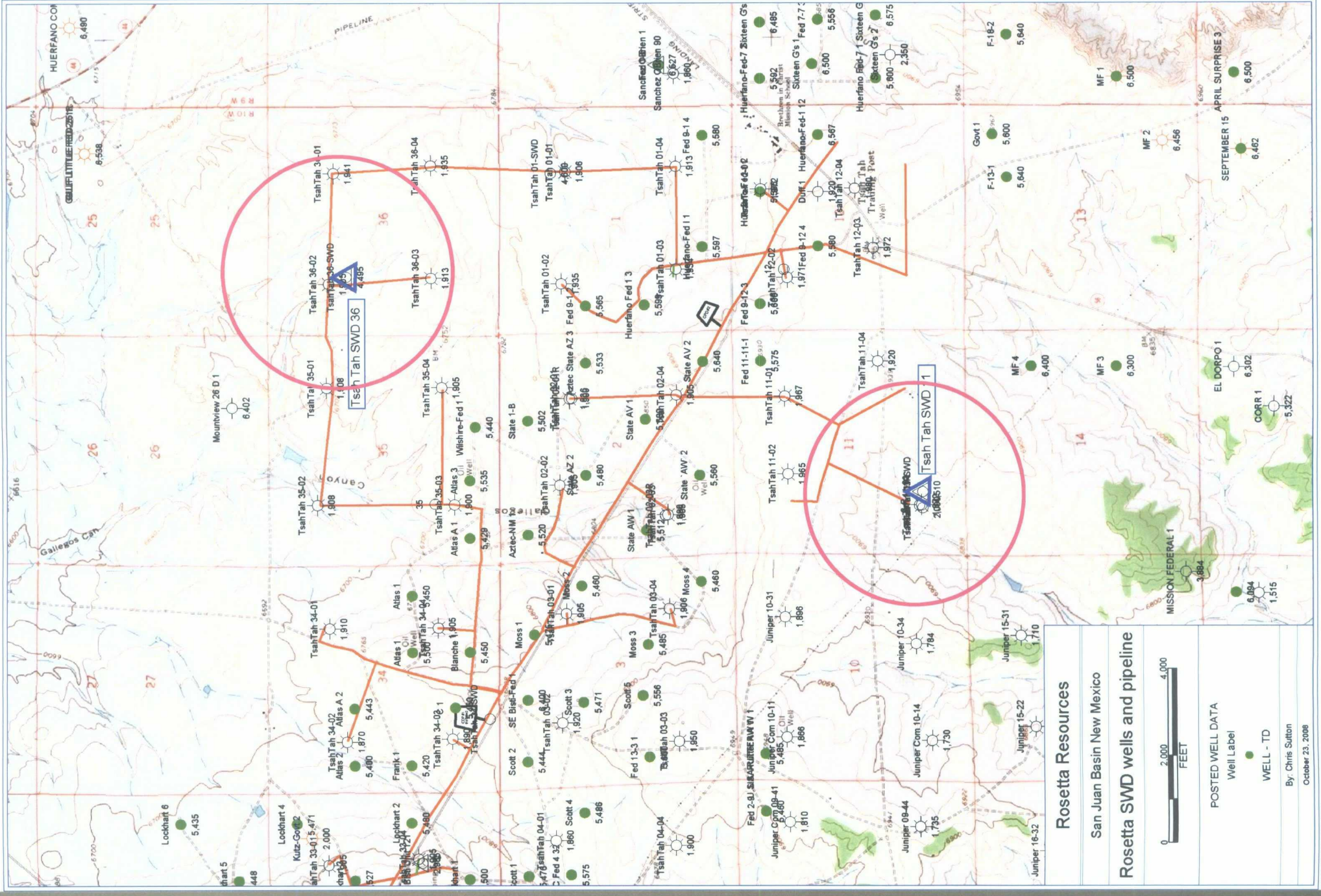
- Borrego Pass Sandstone Lenticle of Crevasse Canyon Formation
- Unconformity - K-T boundary
- End-Turonian unconformity
- Paleomagnetic reversal

140 Miles

La Ventana tongue of Cliff House net sand isopach

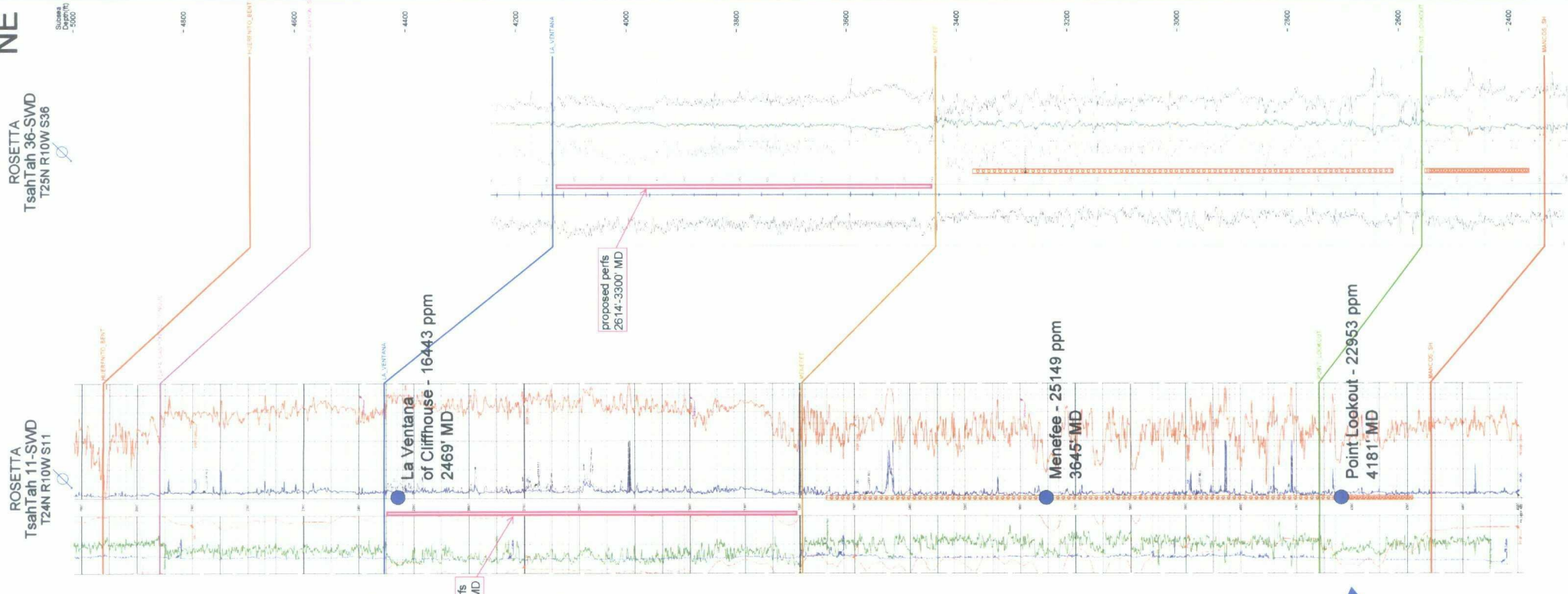


No wells penetrate the Mesaverde within the ½ mile area of review surrounding SWD #11 and SWD #36



SW

NE



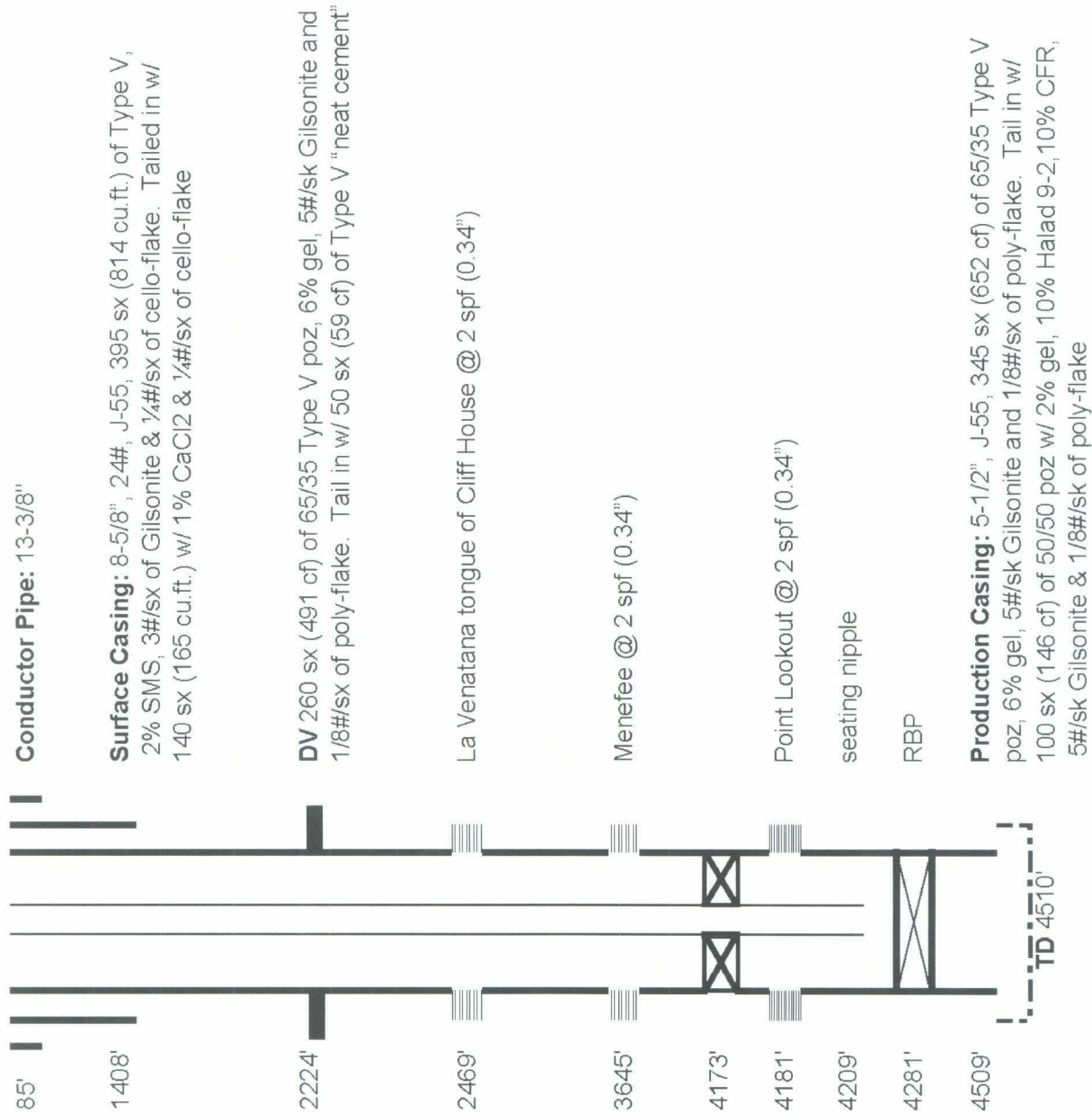
Request approval to inject into Cliff House

Currently injecting into Menefee & Point Lookout

Tsah Tah SWD #11

Sec. 11, T24N, R10W
San Juan, NM

Spud : 1-Jan-2007



14-Mar-2007: Initial fluid level at 200', swabbed to 4000' in 5 runs. Made a total of 7 runs, hesitating 1 hr between 6th and 7th, and swabbed a total of 14.9 bbls. Runs 6 & 7 we recovered no fluid. SDON. We will continue swabbing until reaching formation fluids at approx 17bbls recovered.

15-Mar-2007: Ran in with swab tools, made 6 runs and recovered 3.1 bbls of fluid, collected samples on runs #5 & #6.

Key analysis dated 17-Mar-2007 of 15-Mar-2007 sample indicates 22953 ppm TDS

Key Pressure Pumping Services
Water Analysis Result Form

Farmington, NM.
708 S. Tucker
Phone:(505)325-4192
Fax:(505)564-3524
Zip:87401



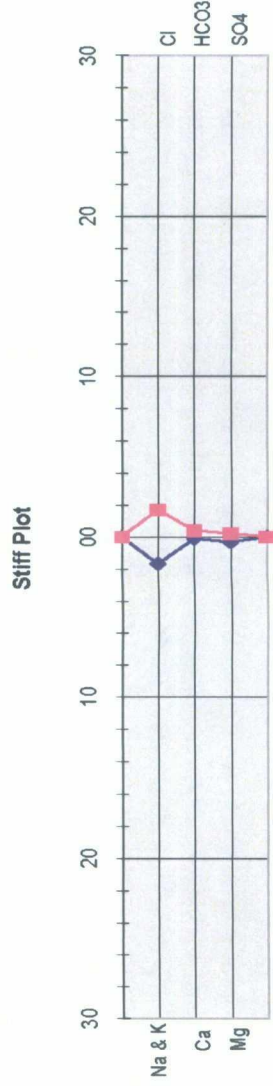
Operator:	Rosetta Resources	Sample Date:	March 15, 2007
		Analysis Date:	March 17, 2007
Well	Tsah Tah SWD # 11	District:	Farmington
Formation:	POINT LOOKOUT	Requested By:	RUSS MCQUITTY
County:	SAN JUAN N.M.	Technician:	BEN BARELA
Depth:	4181	Source:	Swab Run #6

PHYSICAL AND CHEMICAL DETERMINATION

SPECIFIC GRAVITY:	1.010	47 (°F)	S.G. (Corrected):	1.010
pH:	10.00		MAGNESIUM:	77 ppm
RESISTIVITY:	0.40 ohm/meter		CALCIUM:	40 ppm
IRON:	0.46 ppm		BICARBONATES:	483 ppm
H2S:	0 ppm		CHLORIDES:	13465 ppm
POTASSIUM:	38 ppm		SODIUM :	8752 ppm
SULFATES:	97 ppm		TDS:	22953 ppm

CaCO3 Scale Tendency = Remote

CaSO4 Scale Tendency = Remote

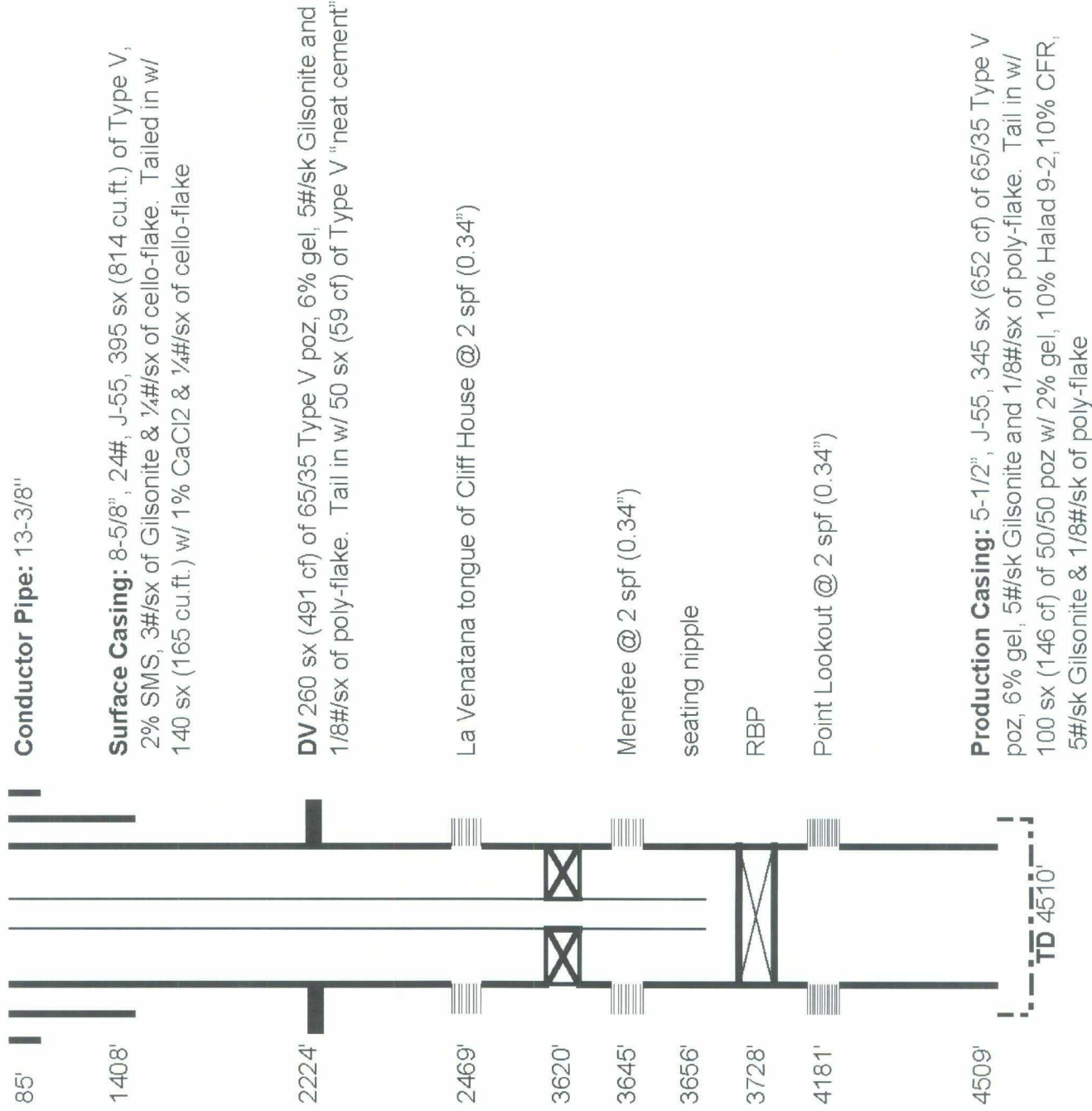


Data contained in this document is based on the best information & most current test procedures and materials available. No liability is expressed or implied.

Tsah Tah SWD #11

Sec. 11, T24N, R10W
San Juan, NM

Spud : 1-Jan-2007



Ran in with swab tools, made 9 runs and recovered 25bbbls of fluid, collected samples on last 3 runs.

Key analysis dated 17-Mar-2007 of 15-Mar-2007 sample indicates 25149 ppm TDS

Key Pressure Pumping Services

Water Analysis Result Form
Farmington, NM.
708 S. Tucker
Phone:(505)325-4192
Fax:(505)564-3524
Zip:87401



Operator:	Rosetta Resources	Sample Date:	March 15, 2007
		Analysis Date:	March 17, 2007
Well	Tsah Tah SWD # 11	District:	Farmington
Formation:	Menefee	Requested By:	RUSS McQUITTY
County:	SAN JUAN N.M.	Technician:	BEN BARELA
Depth:	3645	Source:	Swab Run #1

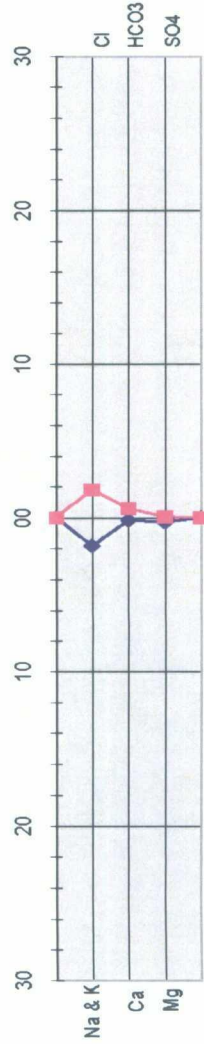
PHYSICAL AND CHEMICAL DETERMINATION

SPECIFIC GRAVITY:	1.010	52 (°F)	S.G. (Corrected):	1.010
pH:	9.00		MAGNESIUM:	77 ppm
RESISTIVITY:	0.80 ohm/meter		CALCIUM:	63 ppm
IRON:	0.16 ppm		BICARBONATES:	725 ppm
H2S:	0 ppm		CHLORIDES:	14653 ppm
POTASSIUM:	11 ppm		SODIUM :	9586 ppm
SULFATES:	32 ppm		TDS:	25149 ppm

CaCO3 Scale Tendency = Remote

CaSO4 Scale Tendency = Remote

Stiff Plot



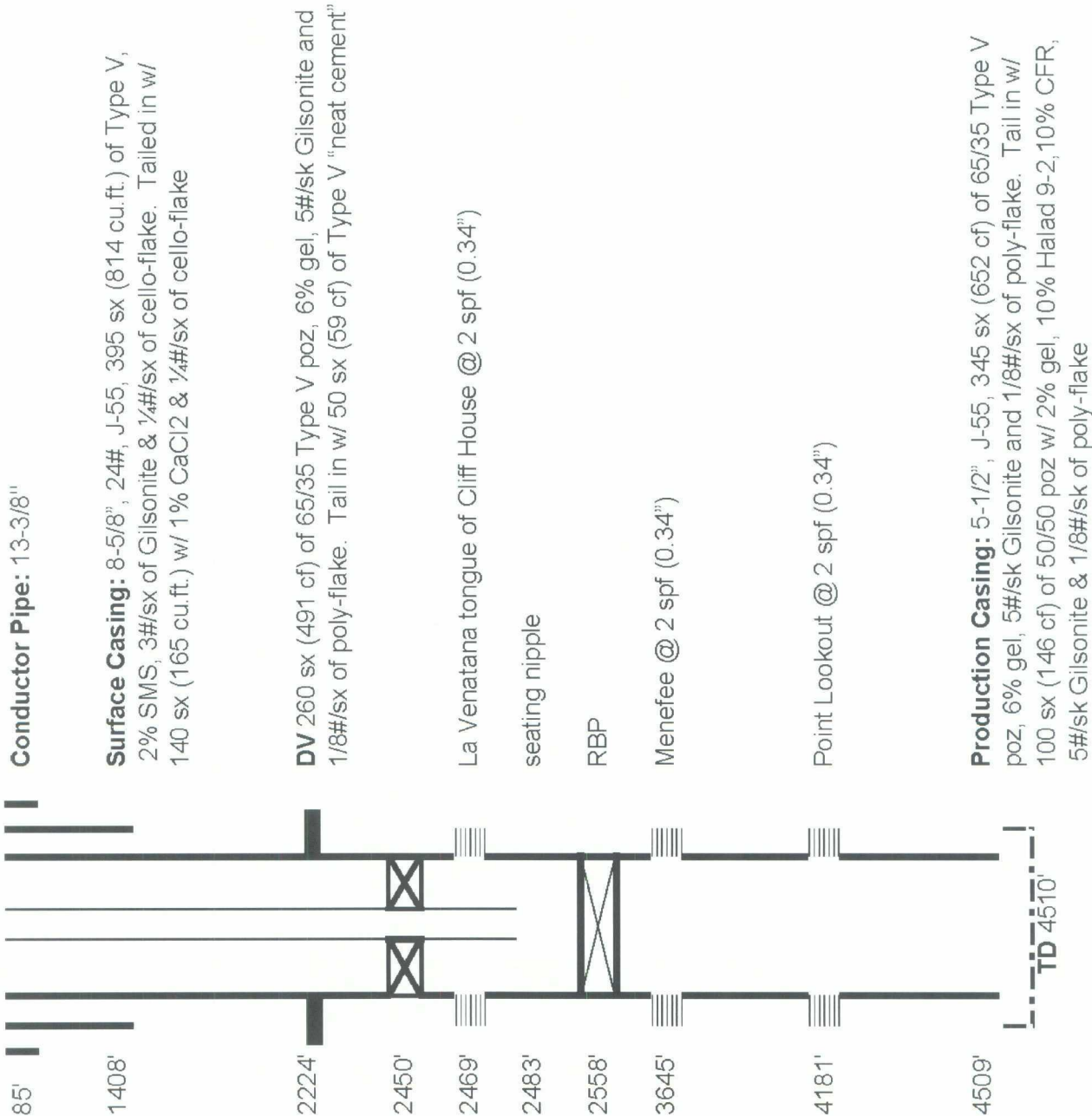
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Tsah Tah SWD #11

Sec. 11, T24N, R10W

San Juan, NM

Spud : 1-Jan-2007



Ran in with swab tools, made 10 runs and recovered 18bbbls of fluid, collected samples on last 2 runs.

Key analysis dated 17-Mar-2007 of 15-Mar-2007 sample indicates 16443 ppm TDS

Key Pressure Pumping Services

Water Analysis Result Form

Farmington, NM.
708 S. Tucker

Phone:(505)325-4192

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Zip:87401



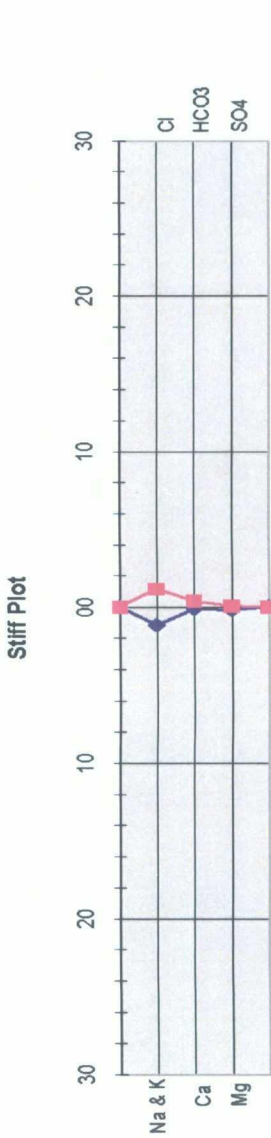
Operator:	Rosetta Resources	Sample Date:	March 15, 2007
		Analysis Date:	March 17, 2007
Well	Tsah Tah SWD # 11	District:	Farmington
Formation:	CLIFFHOUSE	Requested By:	RUSS McQUITTY
County:	SAN JUAN N.M.	Technician:	BEN BARELA
Depth:	2469	Source:	Swab Run #1

PHYSICAL AND CHEMICAL DETERMINATION

SPECIFIC GRAVITY:	1.005	59	(°F)	S.G. (Corrected):	1.005
pH:	8.50			MAGNESIUM:	48 ppm
RESISTIVITY:	0.70	ohm/meter		CALCIUM:	56 ppm
IRON:	0.10	ppm		BICARBONATES:	486 ppm
H2S:	0	ppm		CHLORIDES:	9552 ppm
POTASSIUM:	38	ppm		SODIUM :	6240 ppm
SULFATES:	23	ppm		TDS:	16443 ppm

CaCO3 Scale Tendency = Remote

CaSO4 Scale Tendency = Remote



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§ 144.4

Schedule of compliance means a schedule of remedial measures included in a "permit," including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the "appropriate Act and regulations."

SDWA means the Safe Drinking Water Act (Pub. L. 93-523, as amended; 42 U.S.C. 300f *et seq.*).

Septic system means a "well" that is used to replace sanitary waste below the surface and is typically comprised of a septic tank and subsurface fluid distribution system or disposal system.

Site means the land or water area where any "facility or activity" is physically located or conducted, including adjacent land used in connection with the facility or activity.

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, or an Indian Tribe treated as a State.

State Director means the chief administrative officer of any State, interstate, or Tribal agency operating an "approved program," or the delegated representative of the State director. If the responsibility is divided among two or more States, interstate, or Tribal agencies, "State Director" means the chief administrative officer of the State, interstate, or Tribal agency authorized to perform the particular procedure or function to which reference is made.

State/EPA agreement means an agreement between the Regional Administrator and the State which coordinates EPA and State activities, responsibilities and programs.

Stratum (plural strata) means a single sedimentary bed or layer, regardless of thickness, that consists of generally the same kind of rock material.

Subsurface fluid distribution system means an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground.

Total dissolved solids means the total dissolved (filterable) solids as deter-

40 CFR Ch. I (7-1-02 Edition)

mined by use of the method specified in 40 CFR part 136.

Transferee means the owner or operator receiving ownership and/or operational control of the well.

Transferor means the owner or operator transferring ownership and/or operational control of the well.

UIC means the Underground Injection Control program under Part C of the Safe Drinking Water Act, including an "approved State program."

Underground injection means a "well injection."

Underground source of drinking water (USDW) means an aquifer or its portion:

- (a)(1) Which supplies any public water system; or
- (2) Which contains a sufficient quantity of ground water to supply a public water system; and
- (i) Currently supplies drinking water for human consumption; or
- (ii) Contains fewer than 10,000 mg/l total dissolved solids; and
- (b) Which is not an exempted aquifer.

USDW means "underground source of drinking water."

Well means: A bored, drilled, or driven shaft whose depth is greater than the largest surface dimension; or, a dug hole whose depth is greater than the largest surface dimension; or, an improved sinkhole; or, a subsurface fluid distribution system.

Well injection means the subsurface emplacement of fluids through a well.

[48 FR 14189, Apr. 1, 1983, as amended at 49 FR 45305, Nov. 15, 1984; 52 FR 20676, June 2, 1987; 53 FR 37412, Sept. 26, 1988; 58 FR 63895, Dec. 3, 1993; 59 FR 64345, Dec. 14, 1994; 64 FR 68565, Dec. 7, 1999]

§ 144.4 Considerations under Federal law.

The following is a list of Federal laws that may apply to the issuance of permits under these rules. When any of these laws is applicable, its procedures must be followed. When the applicable law requires consideration or adoption of particular permit conditions or requirements also must be followed.

(a) *The Wild and Scenic Rivers Act*, 16 U.S.C. 1273 *et seq.* Section 7 of the Act prohibits the Regional Administrator from assisting by license or otherwise

injection."

Underground source of drinking water (USDW) means an aquifer or its portion:

- (a)(1) Which supplies any public water system; or
- (2) Which contains a sufficient quantity of ground water to supply a public water system; and
- (i) Currently supplies drinking water for human consumption; or
- (ii) Contains fewer than 10,000 mg/l total dissolved solids; and
- (b) Which is not an exempted aquifer.

USDW means "underground source of drinking water."

Well means: A bored, drilled, or driven shaft whose depth is greater than the largest surface dimension; or, a dug hole whose depth is greater than the largest surface dimension; or, an improved sinkhole; or, a subsurface fluid distribution system.

Well injection means the subsurface

Tsah Tah SWD #11 Operations Summary

1/20/2007 - Spud

1/25/2007 - TD'd well at 4510' Unable to get past 1575' with OH logs.

1/27/2007 - logged w/ IND/DEN/NEUT/GR from 4508' to 1375'.

1/28/2007 - Finish running casing. Ran 104 jts (4496.20') of 5-1/2", J-55, LT&C casing. Bottom of casing landed at 4509' KB, float collar at 4496' KB, marker jt at 4033' and DV tool at 2224' KB. Wash casing to bottom and circulate. RU Halliburton

(HES) and hold safety meeting. Pump 1st stage as follows: Precede cement w/ 20 bbls of mud flush followed by a 5 bbl water spacer. Mix and pump 345 sx (652 cf) of 65/35 Type V poz, 6% gel, 5#/sk Gilsonite and 1/8#/sx of poly-flake. Tail in w/ 100 sx (146 cf) of 50/50 poz w/ 2% gel, 10% Halad 9-2, 10% CFR, 5#/sk Gilsonite & 1/8#/sk of poly-flake. Displace cement w/ 60 bbls of water and 47.5 bbls of mud. PD at 12:00 hrs 1/27/07. Pressure up on casing to 1500 psi, check float held OK. Drop bomb and open DV tool. Circulate out 40 bbls of cement to surface. Continue circulating mud while WOC.

Pump 2nd stage as follows: Precede cement 20 bbls of mud flush followed by a 5 bbl water spacer. Mix and pump 260 sx (491 cf) of 65/35 Type V poz, 6% gel, 5#/sk Gilsonite and 1/8#/sx of poly-flake. Tail in w/ 50 sx (59 cf) of Type V "neat cement". Displace cement w/ 53.4 bbls of water. PD at 16:00 hrs 1/27/07. Pressured up on casing to 2500 psi to close DV tool, check float - held OK. Circulated 8 bbls of cement to surface. ND BOP and set slips w/ 40 K tension on casing. RD and ready rig for rig move. Rig Released at 00:00 hrs 1/28/07.

3/13/2007 - drilled cement to PBTD 4496'. Tested Casing and DV tool to 1100psi, good test.

3/14/2007 - Rigged up Blue Jet and ran cased hole gamma ray / casing collar locator log from PBTD (loggers TD was 4492' KB) to 2200'. Correlated cased hole logs with open hole logs and perforated Point Lookout at 4181'KB, Menefee at 3645'KB and the La Ventana (Cliffhouse) at 2469'KB at 2 spf (0.34", total of 6 holes). Rigged down wireline. Picked up a 5-1/2" RBP, retrieving head, seating nipple, one joint of 2-3/8" tubing, and a 5-1/2" packer. TIH on 2-3/8" tubing and set the RBP at 4281'KB, pulled up hole and set packer at 4173'KB (packing elements), seating nipple is at 4209' KB. Picked up swab tools. Initial fluid level at 200', swabbed to 4000' in 5 runs. Made a total of 7 runs, hesitating 1 hr between 6th and 7th, and swabbed a total of 14.9 bbls. Runs 6 & 7 we recovered no fluid. SDON. We will continue swabbing until reaching formation fluids at approx 17bbls recovered.

3/15/2007 - (Pt. Lookout, perfs at 4181'KB) Ran in with swab tools, made 6 runs and recovered 3.1 bbls of fluid, collected samples on runs #5 & #6.

Unset packer, TIH and retrieved RBP. Pulled up hole and set RBP at 3728'KB, pulled up hole and set packing elements at 3620'KB with seating nipple at 3656'KB.

(Menefee, perfs at 3645'KB) Ran in with swab tools, made 9 runs and recovered 25bbls of fluid, collected samples on last 3 runs. Unset packer, TIH and retrieved RBP. Pulled up hole and set RBP 2558'KB, pulled up hole and set packing elements at 2450'KB with seating nipple at 2483'KB.

(La Ventana, perfs at 2469'KB) Ran in with swab tools, made 10 runs and recovered 18bbls of fluid, collected samples on last 2 runs. Unset packer, TIH and retrieved RBP. TOOH with packer and RBP. Shut in well and SDON. We will LD Tbg and DC's out of derrick, rig down and MOL in A.M.

3/16/2007 - TIH with 2-3/8" tbg out of derrick and LD singles on trailer. LD DC's. Wait for call on water analysis to verify formation fluids. Water sample analysis; (Pt. Lookout perfs at 4181'; TDS=22953, Potassium=570); (Menefee perfs at 3645'; TDS=25175.5, Potassium=11); (La Ventana (Cliffhouse) perfs at 2469'; TDS=16567, Potassium=38). ND BOP, install mandrel in well head and shut well in. Rig down and released Mesa Well Service rig #211.