BP Amoco

Amoco Production Company
Durango Operations Center
380 Airport Road
Durango, Colorado 81301
(970) 247-6800

April 28, 2000

New Mexico Oil Conservation Division
1000 Rio Brazos Road
Aztec, NM 87410

Attention: Mr. Charlie Peerin

Step Rate Test Procedure
Order No. SWD-376
E. E. Elliot SWD Well No. 1 D 26-30N 09W
San Juan County, New Mexico

Amoco respectively submits the attached step rate test procedure and supporting documents for the E. E. Elliot SWD #1 for your review and approval. The results of this step rate test will be used to support a request to increase the maximum allowable surface injection pressure on the E. E. Elliot SWD No. 1. We would like to perform this step rate test as early in May as possible. Thank you for your prompt attention to this matter.

If you have any questions please contact Daryl Erickson at (970) 247-6821.

Sincerely,

Buddy Shaw for

Daryl Erickson
Project Engineer

Attachment

cc: UIC Environmental File

Elliot SWD #1 - Step Rate Test
Morrison, Bluff, and Entrada Formations

Step Rate Test Procedure:

Prior to performing the step rate test the building setting over the wellhead must be removed by a roustabout crew. Ensure that water storage tanks are completely full before initiating the step rate test. Water storage capacity on location is 2000 bbls, available capacity for test is 1520 bbls. Must contact NMOCD prior to the step rate test so that they can have a representative witness the test.

1. Shut-in well for 24 hours prior to running step rate test.

2. Rig up wireline unit and lubricator. Trip in the hole with tandem pressure bombs capable of measuring pressure from 0 psig to 10,000 psig. Land bombs in 2.25" ID F seating nipple at approximately 7414'. Note the exact time the gauge was set in the seating nipple.

   - the gauge should allow water to pass by.
   - Program bombs to take readings every 5 seconds throughout the test.

3. Rig up pump trucks (if required provide second pump truck to span range of injection rates for step rate test). Tie suction to disposal tanks and discharge to tubing. Pressure test lines and connections. Monitor casing and bradenhead pressures during the test.

4. Perform step rate test as follows:

Step	Time	Injection Rate (BPM)	Injection Rate (BWPD)	Cum. Inj. Vol. BW
1	7:00 AM - 8:00AM	0.40	576	24
2	8:00 AM - 9:00 AM	0.80	1152	48
3	9:00 AM - 10:00 AM	1.20	1728	72
4	10:00 AM - 11:00 AM	1.60	2304	96
5	11:00 AM - 12:00 PM	2.00	2880	120
6	12:00 PM - 1:00 PM	2.40	3456	144
7	1:00 PM - 2:00 PM	2.80	4032	168
8	2:00 PM - 3:00 PM	3.20	4608	192
9	3:00 PM - 4:00 PM	3.60	5184	216
10	4:00 PM - 5:00 PM	4.00	5760	240
			Total =	1320 bbls

- Continuously monitor surface injection pressure and rate in a digital format. Use a computer van or equivalent if necessary.
- The 1 hour time step intervals are critical. Inconsistencies such as shorter or longer time steps are unacceptable.
- Once an injection rate has been established at or near the requested rate every effort must be made to keep the rate constant.

5. After performing the step rate test, trip out of the hole with pressure gauges.

6. Perform Mechanical Integrity Test following New Mexico Oil Conservation Division guidelines.

7. Return well to injection. Send all test results to Daryl Erickson in Durango immediately.

E. Elliott SWD #1 - Completion Information

Entrada: Date: 11/24/90
Perf interval: 8202' - 8418'
Frac: 70 mgal 40# x-l pad
86 mgal 30# x-l + 243 m# 20/40 sand
max/min/avg prs - 1500/1200/520 psig @ 45 bpm
ISIP = 740 psig

Bluff: Date: 11/30/90
Perf interval: 7924' - 8048'
Frac: 70 mgal 30# x-l pad
82 mgal 30# x-l + 232 m# 20/40 sand
max/min/avg prs = 2500/2030/1770 psig @ 45 bpm
ISIP = 1940 psig

Morrison: Date: 1/3/91
Perf interval: 7564' - 7764'
Frac: 40 mgal 30# x-l pad
44 mgal 30# x-l + 121 m# 20/40 sand
max/min/avg prs = 2600/na/2050 psig @ 35 bpm
ISIP = 2400 psig

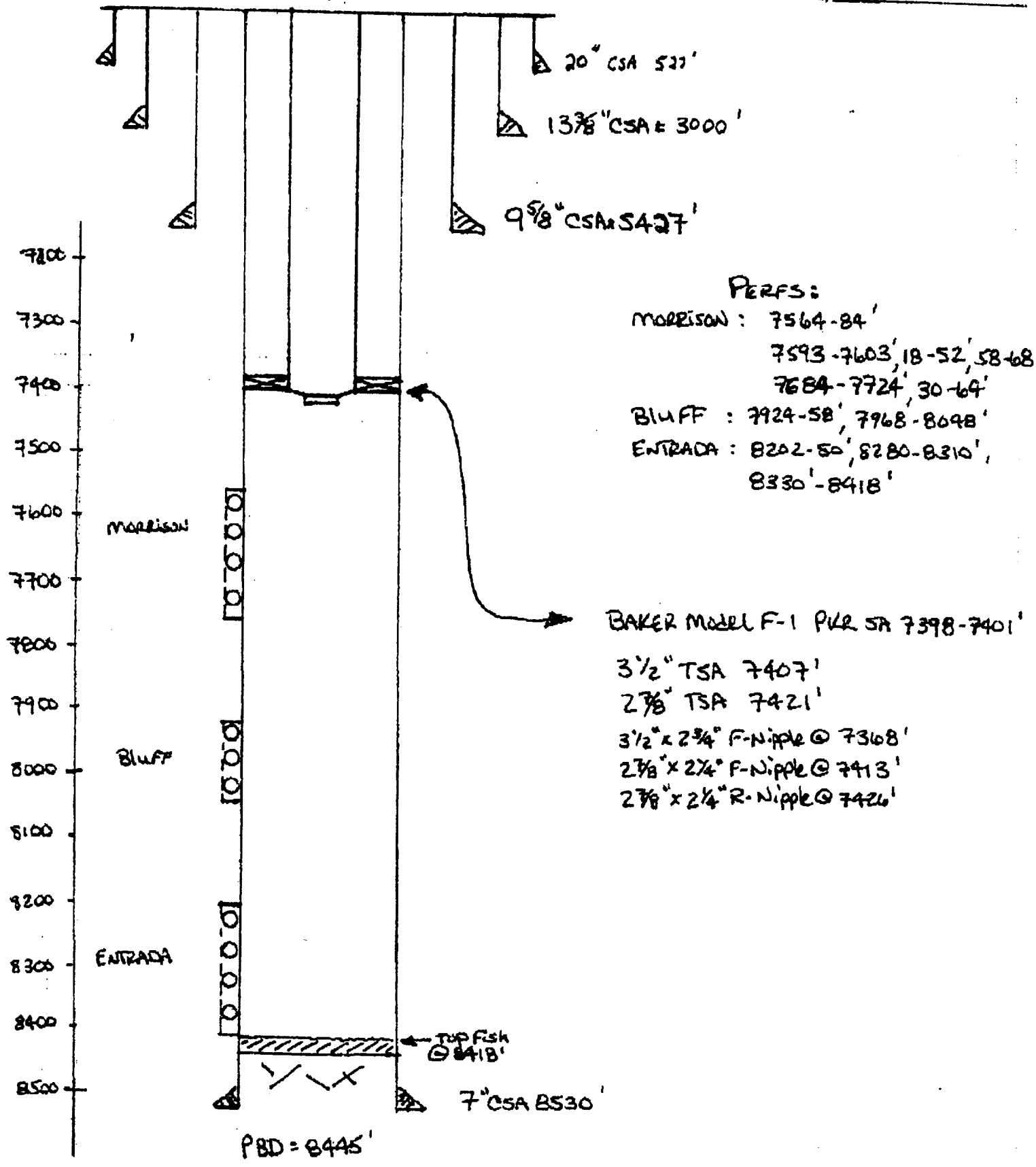
Refrac of Morrison, Bluff, & Entrada:
Date: 11/10/99
Perf intervals: 8202' - 8418' Entrada
7924' - 8048' Bluff
7564' - 7764' Morrison
Frac: 167 mgal 30# x-l gel + 260 m# 20/40 sand
max/min/avg prs = 2051/1030/1500 psig @ 45.5 bpm
ISIP = 1680 psig

ENGINEERING CHART

File
Appn
Date 12/1/99
By GMK

SUBJECT Elliott SWD #1

Wellbore Diagram



PERFS:

Morrison : 7564-84'
7593-7603', 18-52', 58-68
7684-7724', 30-64'

Bluff : 7924-58', 7968-8048'

Entrada : 8202-50', 8280-8310',
8330'-8418'

BAKER Model F-1 PKR SA 7398-7401'

3 1/2" TSA 7407'

2 7/8" TSA 7421'

3 1/2" x 2 3/4" F-Nipple @ 7368'

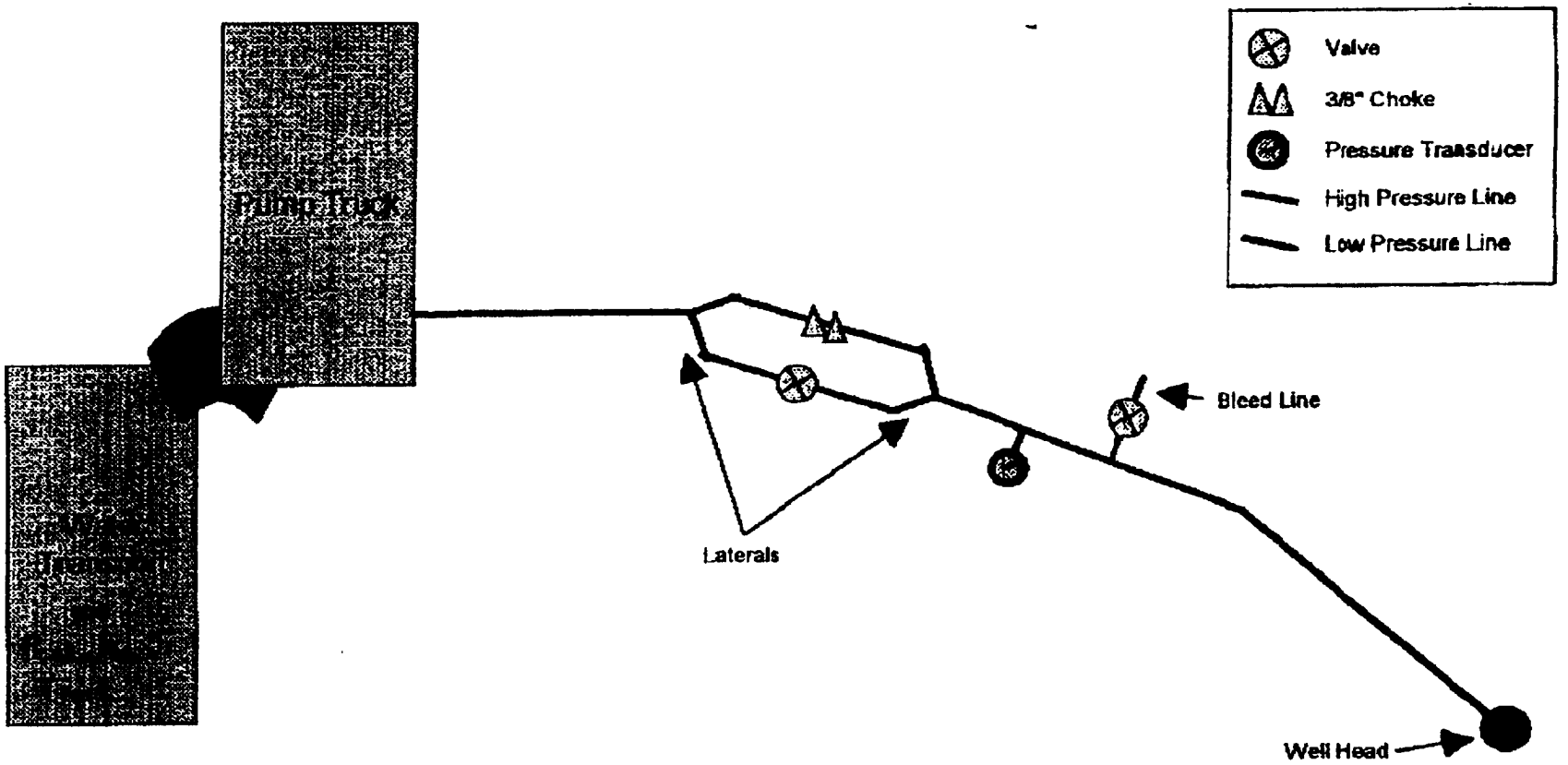
2 7/8" x 2 1/4" F-Nipple @ 7413'

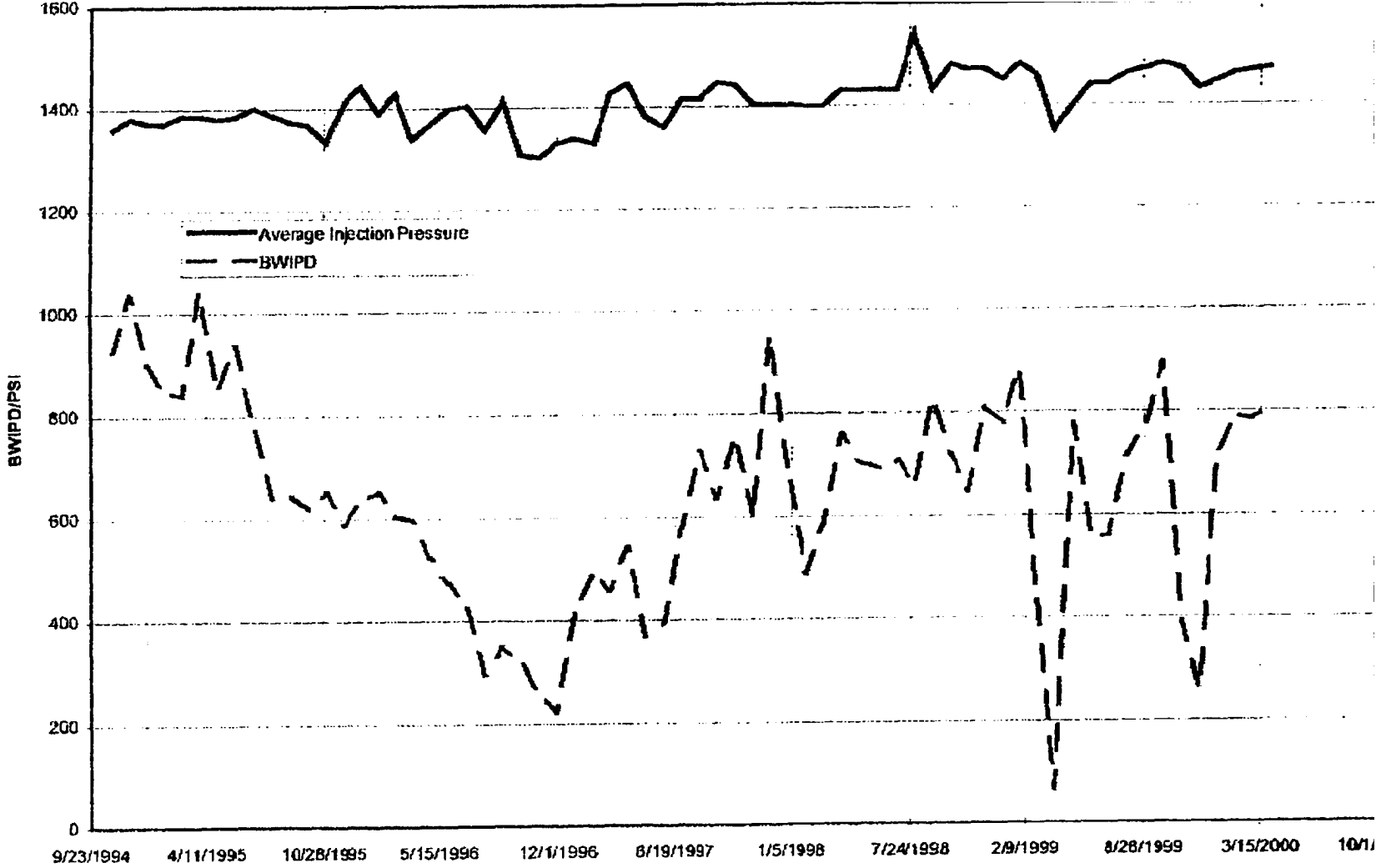
2 7/8" x 2 1/4" R-Nipple @ 7426'

Form 371 1-88

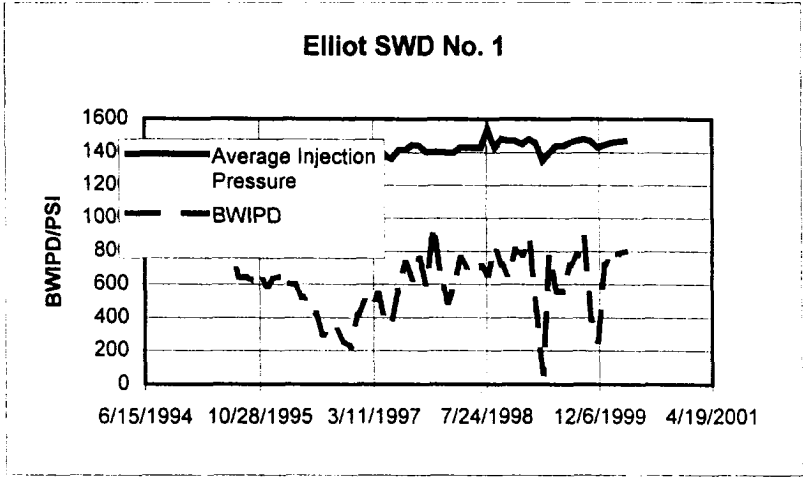
E.E. EL

	LENGTH
1 JT 3½ EU BRD N-80 TBG	32.66
10 FT, 3 FT & 2 FT 3½ PUP JOINT 4.50 OD	15.27
229 JTS 3½ EU BRD N-80 TBG	
3½ x 2.75 F NIPPLE 316 STAINLESS STEEL TOP 7368.49 OD 4.50 ID 2.75 F	.98
1 JT 3½ EU BRD N-80 THERMAL PLASTIC COATED TOP 7369.47	28.57
BAKER FB-40 EBT-22 ANCHOR SEAL ASSEMBLY TOP @ 7398.04 OD 4.50 ID 3.00 3.CC	.75
BAKER 85-40 7" PERMANENT PRODUCTION PKR TOP @ 7398.79 FT OD 5.875 ID 4.0625 END @ 7401.72	2.93
85-40 7" MILL OUT EXT END @ 7406.49 OD 5.5F ID 4.5625	5.37
SWLC BOX x 2⅞ EU BRD BCM OD 5.5625 ID 2.4375 END @ 7407.11	.62
2⅞ x 6 FT J-55 EU BRD PUP JT OD 3.625 END @ 7413.31	6.20
2⅞ x 2.25 F NIPPLE 316 STAINLESS STEEL END @ 7414.34 OD 3.625 ID 2.25 F	1.03
2⅞ x 6 FT J-55 EU BRD PUP JT OD 3.625 END @ 7420.47	6.13
2⅞ x 2.25R NIPPLE 4140 STEEL OD 3.625 ID 2.25R	1.03
2⅞ WIRELINE ENTRY GUIDE OD 3.625 ID 2.4375 END @ 7421.13	.66
8417'	
INVERTED GASKET ON BOTTOM OF OLD ALT FLSH UNIT	


Valve
3/8" Choke
Pressure Transducer
High Pressure Line
Low Pressure Line
Pump Truck
Laterals
Bleed Line
Well Head



Elliot.xls 4/24/2000


Elliot SWD No. 1
BWIPD/PSI
1600
140
120
100
80
600
400
200
0
Average Injection Pressure
BWIPD
6/15/1994
10/28/1995
3/11/1997
7/24/1998
12/6/1999
4/19/2001

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3. Rig up pump trucks (if required provide second pump truck to span range of injection rates for step rate test). Tie suction to disposal tanks and discharge to tubing. Pressure test lines and connections. Monitor casing and bradenhead pressures during the test.

4. Perform step rate test as follows:

Step	Time	Injection Rate (BPM)	Injection Rate (BWPD)	Cum. Inj. Vol. BW
1	20 minutes	0.40	576	8
2	20 minutes	0.80	1152	16
3	20 minutes	1.20	1728	24
4	20 minutes	1.60	2304	32
5	20 minutes	2.00	2880	40
6	20 minutes	2.40	3456	48
7	20 minutes	2.80	4032	56
8	20 minutes	3.20	4608	64
9	20 minutes	3.60	5184	72
10	20 minutes	4.00	5760	80
			Total =	440 bbls

Use a computer van or equivalent if necessary.

- The time step intervals are critical. Inconsistencies such as shorter or longer time steps are unacceptable.
- Once an injection rate has been established at or near the requested rate every effort must be made to keep the rate constant.

5. Shut down and record ISIP.

6. After performing the step rate test, trip out of the hole with pressure gauges.

7. Perform Mechanical Integrity Test following New Mexico Oil Conservation Division guidelines.

8. Return well to injection. Send all test results to Daryl Erickson in Durango immediately.