AMOCO POINTED MOUNTAIN A-1

RE-ENTRY DRILLING PROGRAM

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Amoco Canada Petroeum Company Ltd.

NAME: Amoco Pointed Mountain Recompletion
LOCATION: Amoco A-~~8~~ Pointed Mountain ~~K-45~~ P-53

PERSONNEL CONTACT SHEET

		OFFICE	RESIDENCE	FAX	CELLULAR
AMOCO OPERATIONS PERSONNEL					
COMPLETIONS	Bruce Collin	234-2772	240-0563	234-4248	651-8496
	Gary Russell	234-2379		234-4248	
	Dennis Erickson	234-4442	948-3194	234-4248	
RIG FOREMAN	Phil Boetcher		604-774-1417		
	Gary Russell		604-774-1417		
	Dave Cairns		604-774-1417		
	Pointed Mtn.Plant		604-774-1844		
DRILLING	Trevor Ironside	233-6373	239-2554	233-6365	
	Al Nord	233-5991	239-1365	233-6377	
OTHER CONTACTS					
AMOCO SWITCHBOARD		Calgary	233-1313 (24 hrs)		
NEB OFFICE	Ed Raven	299-3865	235-5876	292-5876	
PLAINS BUSINESS UNIT CONTACTS					
GEOLOGY	Ivor Cooke	234-4857	281-0358	234-2721	651-5591
	Derek Lamb	234-4547			
	Ken White	234-4544	283-7982		
OPERATIONS ENGINEER	Mark Bradshaw	234-2340	295-1814	234-4777	
PRODUCTION ENGINEER	Nicole Deyell	234-2386			541-1492
OPERATING CENTER	Crossfield	946-7100		946-7108	
	Ray Babiuk	946-7103		946-7108	
	Marty Whetter	946-7105		946-7108	
POINTED MTN. PLANT	Guy Miller	604-774-1844		604-774-1844	
	Ron McGinnis	604-774-1844		604-774-1844	

SERVICE COMPANIES

SERVICE	COMPANY	NUMBER	LOCATION	CONTACT
DRILLING FLUID	IDF	266-0722	Calgary	Brian Swindells
CEMENTING	Nowsco	531-5203	Calgary	Jeff Latos
WHIPSTOCK, FISHING	Weatherford-Homco	262-3901	Calgary	Norm Thomas
DIRECTIONAL	Sperry Sun	264-6702	Calgary	Dave Sikel
LOGGING	Western Atlas	290-5100	Calgary	Bill Lisoway
PROD. TESTING	Central Alta. Testing	277-5777	Calgary	Ed Gallant
DRILLPIPE, RENTALS	Energy Rentals	340-2505	Red Deer	Scott Biluk
SAFETY	Safety Boss	261-5075	Calgary	Randy Cusson
PARAMEDICS	Guardian	556-1160	Olds	
BEAVER CONTRACTING	Trucking/Construction Eqpt.			
RIG CONTRACTOR	Drive Well Servicing	261-9950	Calgary	Fred Berchtold
LINER HANGER & ACCESS	Import Tool	261-3032	Calgary	Bob Kilbach
BARGE	Cooper Barging	1-800-663-5220	Fort Nelson	Cameron Cooper

AMOCO CANADA PETROLEUM COMPANY LTD.

RE-ENTRY DRILLING OUTLINE

FLAC:994147007 DRAFT August 9 ,1994 AFE#: 56102400

WELL NAME: Amoco A-1 Pointed Mountain P-53 RIG: DRIVE 41 GL ELEV: 1180.8m

LOCATION: 60 23" N. Lat. 123 54"W. Long. TIGHT HOLE CLASS: I KB ELEV: 1187.0m

WELLHEAD CASING BOWL 14,000 kPa WP

EVALUATION | FORMTN TOPS | HOLE SIZE / TVD | CASING & CEMENT | MUD

OVERVIEW:

The existing A-1 well is damaged beyond economic repair. After abandoning the lower section. A window will be cut at 3710m measured depth, heading north of the existing 96.0 degree azimuth. A build, turn and hold wellpath will be established to get 50 meters north of the existing wellbore. The top 120 meters of the Nahanni formation will be penetrated and completed open hole. A 4 1/2" liner will be cemented from 50 meters above the window to the Nahanni Top.

444.5mm

SURFACE CASING :

339.7mm J55 81.1 Kg/m

GelCaustic

386.2m

INTERMEDIATE CSG

311.1mm

244.5mm 64.9/59.6,N-80/S95/j55,8rd
Cemented w/ 400 sks "G" + 2% gel 1.2%HR-12
& 300 sks "G" + 20% silica flour + 1.2% HR12

1985.1mKB

LOGGING:

Run 1) Sonic

SAMPLES:

AMOCO

KOP - TD 5m frequency

1 set washed

NEB as per well licence

PRODUCTION CASING

222.2mm

177.8mm ,43.2/38.7 Kg/m,P110/s95/n80,LT&C

MAXIMUM PRESSURES:

Nahanni Formation

36.1 MPa Virgin Res. Pressure

~~14.5~~ 17.3 MPa Expected Res. Press

GAS DETECTION:

Hotwire

GEOLOGRAPH:

Surface Casing to TD
1.0m Frequency

SURVEYING:

Surf. Recording Gyro for Kickoff

MWD through build section
(9 meter intervals)

DIRECTIONAL PLAN:

Objective 50m displ. north
Tragetory Build & Hold 30 deg
Build Rate 6°/30m
Azimuth 0 deg. (due North)
Target 20 meter square
Target Coord.43 m North
(of surf. loc.) 298 m East
Max. Dogleg 12 deg. / 30m

Fort. Simpson	3230 mKB	
Canol Shale	3610mKB	
Liner top	3660md	
Kick Off Point	3710md	3689.7TVD @ 6 deg
Whipstock		
Perm. Bridge Plug	3,725	
8m Cement Plug	3,726	
Perm Bridge Plug	3736	
"D" Baker Packer	3,749.4	
# Nahanni Top	3895.3mKB	3910 md ~~3938~~md 3882.4TVD
Re-Entry TD.		4037 ~~4058~~md 4002TVD
Fault/ 1st Blk.Shale	mKB	
5" Liner Top	3874.3mKB	
Total Depth (7" Csg)	3912.2mKB	

LINER & EQUIPMENT

270m (min) -114.3mm,18.23 Kg/m,13-CR80,STL
-Combination Stage tool/ Casing packer set @ 3938
-Liner Hanger and Tieback receptile set at 3660
(50 overlap)

LINER CEMENT DATA:

5 Tonne (3.75m3) of Thermal 40F cement
+ 0.5% D24- 0.5% T-10 + 0.2% R-55

HEC/STARCH MUD SYSTEM

152.4mm

COMPLETION DATA:

- Open Hole completion from the Nahanni Top to T
- Acid wash stimulation planned

KEY: # = Primary Zone * = Secondary Zone S = Potential Sour zone AP = Potential Abnormal Pressure

AMOCO POINTED MOUNTAIN A-2 /
RE-ENTRY DRILLING PROGRAM

Overview

Following is a detailed program for Amoco Pointed Mountain re-entry gas well. The Nahanni reservoir has a maximum of 12.2% CO2 and 0.74% H2S content. The existing A-1 well ~~has parted tubing and~~ is believed to be damaged beyond economical repair. The old hole below will be abandoned with cement and bridge plugs. A whipstock packer will be set and oriented to the left of high-side with a steering tool. A window will be cut at approximately 3710 meters measured depth. A build, turn, and hold trajectory is planned to obtain a new entry target into the Nahanni Formation. A fifty meter displacement, due north was selected to separate the new wellbore from any effects caused by the old wellbore; while staying on strike with the producing formation. The target has a +/- 20 meter size in both directions. The top 120 meters of Nahanni will be penetrated and completed open-hole. A high alloy, 4 1/2" liner will be cemented from fifty meters above the window to the Nahanni top.

Potential Problems

> Differential sticking / lost circulation in depleted Nahanni reservoir.

> Slow ROP., combined with high temperature effects on the downhole equipment.

> The logistics, without readily available services; precise timing, and through preplanning

Drilling Plan

A. Preparation

- The completion rig will have pulled tubing, and abandoned the existing lower wellbore.

- Dennis Erickson will ensure all conditions of the NEB are met.

- Notify NEB. when the window cutting has commenced.

- Extreme caution must be exercised when tripping the whipstock into position. **Run slow and strap the drillpipe.**

- Orient the Homco bottom trip packer at an azimuth of 70 degrees left of the existing hole high-side. An inclination angle of 6 degrees has been confirmed by a multishot and a dip-meter log

- Set the Whipstock face at least 2 meters above any 7" casing collars. Follow the Homco setting instructions provided.

- Prior to cutting the window, ensure the circulation system is operational at flowrates of 1 m3 /min. Also have the ditch magnets in place.

B. Main Hole

- Once the window has been cut and dressed, trip for the 152 mm bit and a high performance downhole motor.
- Refer to the Directional drilling, Bit, and Hydraulics programs attached. If changes are being contemplated, contact the drilling engineer to ensure all design assumptions are considered. Optimize trips to change bits, tools and BHA's. Stopping during trips to cool electronic components should be optimized to save rig time

- The MWD may be used immediately with high-side orientation only. Establish the desired build rate using a combination of right hand settings and rotation. (side-to-side tool flopping is not recommended) No abnormal pressures are anticipated, but **Be alert for potential tight shale gas.**

- Plan to get slightly ahead of the designed wellpath. Once the holding angle of greater than 26 degrees is attained, rotating assemblies may be run. Continue with the high speed motors if the demonstrated increase in ROP can be justified economically. The MWD can be left on the bank once the Nahanni formation has been penetrated. (extrapolate a survey for the final 100 meters)

- Consult with the on-site geologist for the expected Nahanni top Lost circulation and differential sticking will become a concern. **Keep the pipe moving as much as possible**.

- Consult the drilling fluids program attached for steps to combat lost circulation. If hole drag or tight connections become a problem, pump a viscous sweep and dummy trip to clean the hole. If the drillstring becomes differentially stuck spot a Diesel/IDFREE pill immediately.

- Once the geologist has determined TD., POOH, and run the two logging suites as per the logging program.

C. Liner and Clean-out

- Rig and run the 114.3mm liner as outlined in the casing program.

- Follow the liner setting procedures to set the liner hanger, inflate the packer, and open the stage tool. The setting string can be pulled out freely without breaking the hydraulic seal to the liner. Allow enough margin to prevent being pushed out by pressure while cementing.

- Cement as per the procedures outlined in the cementing program. Once displacement is complete monitor the number of wet connections and pull out as quickly as possible. **Do not stop and reverse circulate.**

- Allow 12 hours for the cement to set up prior to pressure testing and polishing down to the overlap. A re-run 6" bit can be used to drill out the cement.

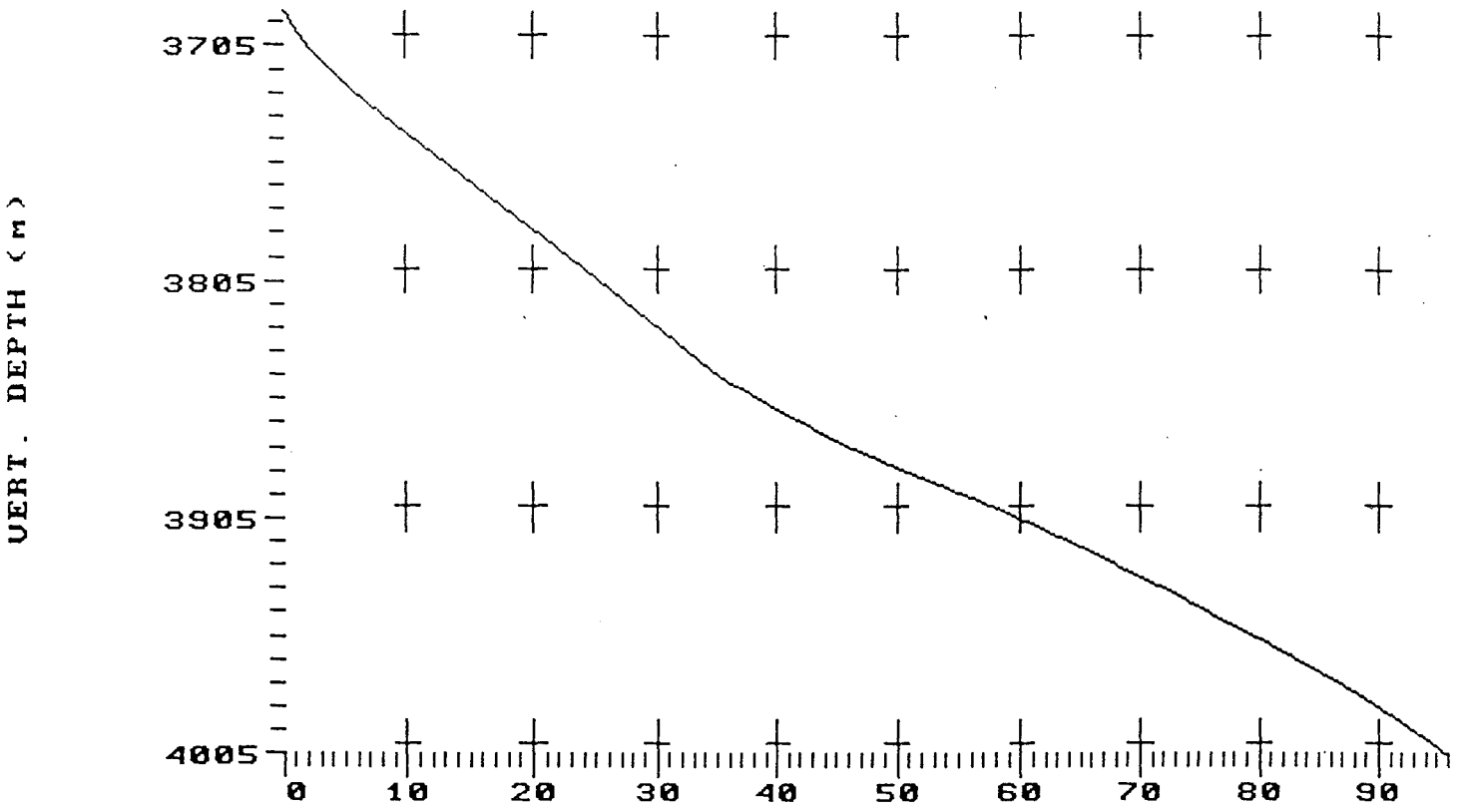
- Trip in with a 3 3/4" bit and a 2 3/8" tubing string to drill out the liner. Once inside the liner, pressure test the overlap. Trip to bottom and drill out the stage tool and float equipment. Consider a downhole motor for this operation.

- The service rig will now go back to a completion mode. Consult the completion program.

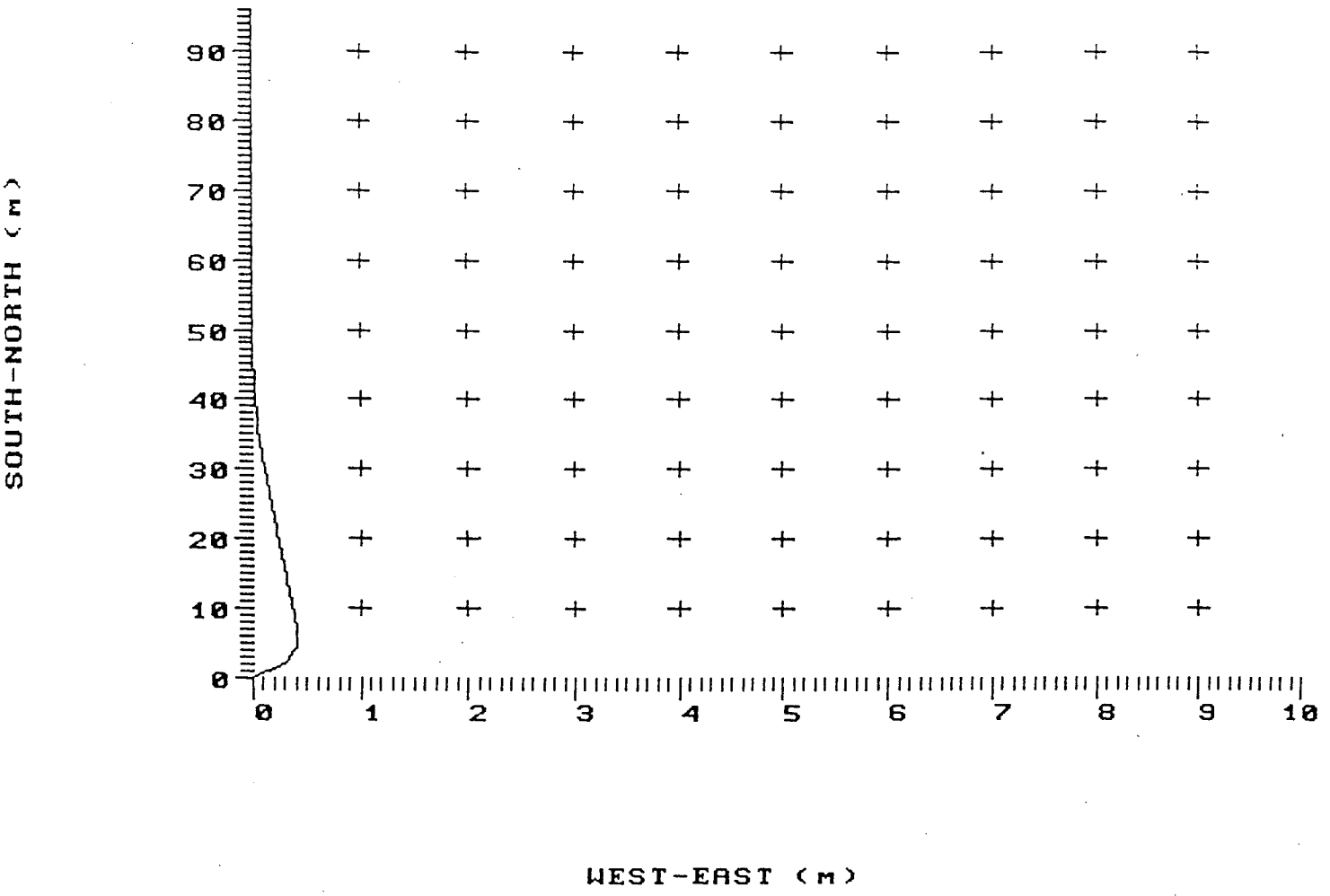
WELLPATH DATA

Sta. Num.	M.D. m	Incl. Angle Deg.	Azi. Angle Deg.	Coordinates +N,-S m	+E,-W m	TVD m	Vert. Sec. m	Closure Dist. m	Closure Dire. Deg.	Rate Change Incl. Deg/30 m	Rate Change Azi. Deg/30 m	Total D.L. Deg/30 m	TFO Deg.
	(M)3D, BR1 6, BR2 6												
1	3710	6.10	13.00	0	0	3690	0	0	0.0	0.00	0.00	0.0	-24.2
2	3725	8.97	4.97	2	0	3705	2	2	3.2	5.65	15.31	6.0	-16.2
3	3740	11.92	0.85	5	0	3720	5	5	5.0	5.82	8.11	6.0	-12.2
4	3750	13.70	359.25	7	0	3729	7	7	3.5	5.88	5.34	6.0	-10.6
5	3853	13.70	359.25	31	0	3830	31	31	0.2	0.00	0.00	0.0	1.6
6	3869	16.74	359.55	35	0	3844	35	35	0.1	6.00	0.59	6.0	1.3
7	3884	19.79	359.76	40	0	3859	40	40	0.0	6.00	0.41	6.0	1.1
8	3899	22.84	359.91	46	0	3873	46	46	0.0	6.00	0.31	6.0	1.0
9	3910	25.00	360.00	50	-0	3883	50	50	360.0	6.00	0.25	6.0	0.9
	(M)Drop, BR 2, WALK 0												
10	3920	24.33	360.00	54	-0	3892	54	54	360.0	-2.00	0.00	2.0	0.0
11	3930	23.67	360.00	58	-0	3901	58	58	360.0	-2.00	0.00	2.0	0.0
12	3940	23.00	360.00	62	-0	3910	62	62	360.0	-2.00	0.00	2.0	0.0
13	3950	22.33	360.00	66	-0	3920	66	66	360.0	-2.00	0.00	2.0	0.0
14	3960	21.67	360.00	70	-0	3929	70	70	360.0	-2.00	0.00	2.0	0.0
15	3970	21.00	360.00	73	-0	3938	73	73	360.0	-2.00	0.00	2.0	0.0
16	3980	20.33	360.00	77	-0	3948	77	77	360.0	-2.00	0.00	2.0	0.0
17	3990	19.67	360.00	80	-0	3957	80	80	360.0	-2.00	0.00	2.0	0.0
18	4000	19.00	360.00	84	-0	3966	84	84	360.0	-2.00	0.00	2.0	0.0
19	4010	18.33	360.00	87	-0	3976	87	87	360.0	-2.00	0.00	2.0	0.0
	4020	17.67	360.00	90	-0	3985	90	90	360.0	-2.00	0.00	2.0	0.0
21	4030	17.00	360.00	93	-0	3995	93	93	360.0	-2.00	0.00	2.0	0.0
	TD												
22	4040	16.33	360.00	96	-0	4005	96	96	360.0	-2.00	0.00	2.0	0.0

SECTION VIEW



PLAN VIEW


SOUTH-NORTH (m)
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
WEST-EAST (m)

* Vertical wellbore multishot surveys

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DO YOU NEED INSTRUCTIONS FOR RUNNING PROGRAM?
N
WHAT IS THE NAME OF YOUR DEVIATION FILE?
PDTA-1
FILE DOES NOT EXIST, PLEASE REENTER
PTDA-1
DO SURVEY CALCULATIONS START FROM SURFACE?
N
ENTER STARTING MEASURED DEPTH, TRUE VERTICAL DEPTH

75,75
ENTER DISPLACEMENT NORTH ( - FOR SOUTH) ,
DISPLACEMENT EAST ( - FOR WEST) .....

0,0
DATA ABOVE "MS" SURVEY @    75. FEET IGNORED.

CALULATION METHOD:
                ENTER   A    FOR ANGLE AVERAGING METHOD
                ENTER   B    FOR BALANCED TANGENTIAL METHOD
                ENTER   M    FOR MINIMUM CURVATURE METHOD
                ENTER   ME   FOR MERCRY METHOD
                ENTER   R    FOR RADIUS OF CURVATURE METHOD
                ENTER   T    FOR TANGENTIAL METHOD
R
TARGET DIRECTION ( N, 44.5, E OR 0 )
0
START PRINTOUT AT WHAT DEPTH (TO USE TVD ROUTINE, ENTER 1)
75
```

RADIUS OF CURVATURE METHOD

VERTICAL SECTION OR CLOSURE DIRECTION IS 88.0 DEGREES

PTDA-1 AUG 25, 1981 1.38 PM

MEAS. DEPTH	DEPTH (TVD)	NORTH -SOUTH	EAST -WEST	VERT. SECTION	DEPARTURE FEET	DIR	INCLINATION ANGLE	DIR	DOG LEG
75	75.00	0.00	0.0	0.00	0	N 0E	1.00	N40E	0.0
>>>>>>> THE ABOVE LINE IS COMPUTED ON INITIAL INPUT DATA >>>>>>>									
80	80.00	0.06	0.05	0.05	0	N40E	0.75	N40E	0.0
92	92.00	0.16	0.13	0.14	0	N40E	0.50	N40E	1.9
100	100.00	0.21	0.18	0.19	0	N40E	0.50	N40E	0.0
110	110.00	0.26	0.22	0.23	0	N40E	0.25	N40E	2.2
138	138.00	0.40	0.34	0.35	1	N40E	0.50	N40E	0.8
144	144.00	0.43	0.36	0.38	1	N40E	0.25	N40E	3.7
197	197.00	0.61	0.51	0.53	1	N40E	0.25	N40E	0.0
222	222.00	0.74	0.62	0.64	1	N40E	0.50	N40E	0.9
251	251.00	0.93	0.78	0.81	1	N40E	0.50	N40E	0.0
285	284.99	1.16	0.97	1.01	2	N40E	0.50	N40E	0.0
321	320.99	1.34	1.12	1.17	2	N40E	0.25	N40E	0.6
350	349.99	1.48	1.24	1.30	2	N40E	0.50	N40E	0.8
378	377.99	1.62	1.36	1.42	2	N40E	0.25	N40E	0.8
411	410.99	1.79	1.50	1.56	2	N40E	0.50	N40E	0.7
435	434.99	1.99	1.67	1.74	3	N40E	0.75	N40E	0.9
474	473.99	2.38	2.00	2.08	3	N40E	0.75	N40E	0.0
506	505.98	2.65	2.22	2.31	3	N40E	0.50	N40E	0.7
533	532.98	2.90	2.43	2.53	4	N40E	0.88	N40E	1.4
570	569.98	3.33	2.79	2.91	4	N40E	0.88	N40E	0.0
600	599.97	3.68	3.09	3.22	5	N40E	0.88	N40E	0.0
634	633.97	4.27	3.58	3.73	6	N40E	0.75	N40E	0.2
697	696.96	4.77	4.00	4.17	6	N40E	1.00	N40E	0.5
728	727.96	5.13	4.31	4.49	7	N40E	0.75	N40E	0.7

879	878.95	6.36	5.33	5.55	8	N40E	0.88	N40E	0.7
918	917.95	[illegible]	5.72	5.95	9	N40E	0.88	N40E	0.0
933	932.94	6.97	5.85	6.10	9	N40E	0.75	N40E	0.7
950	949.94	7.15	6.00	6.24	9	N40E	0.75	N40E	0.0
981	980.94	7.35	6.17	6.43	10	N40E	0.25	N40E	1.6
1011	1010.94	7.45	6.25	6.51	10	N40E	0.25	N40E	0.0
1167	1166.93	8.63	7.24	7.54	11	N40E	0.88	N40E	0.4
1205	1204.93	9.10	7.64	7.96	12	N40E	1.00	N40E	0.3
1229	1228.92	9.42	7.91	8.24	12	N40E	1.00	N40E	0.0
1262	1261.92	9.82	8.24	8.59	13	N40E	0.80	N41E	0.6
1300	1299.91	10.27	8.58	8.94	13	N40E	0.90	N33E	0.3
1400	1399.90	11.54	9.65	10.05	15	N40E	1.00	N47E	0.3
1500	1499.89	12.87	10.77	11.21	17	N40E	1.00	N33E	0.2
1600	1599.87	14.39	11.79	12.29	19	N39E	1.10	N35E	0.0
1700	1699.85	15.77	13.11	13.66	21	N40E	1.10	N52E	0.3
1800	1799.83	17.05	14.77	15.36	23	N41E	1.30	N53E	0.2
1900	1899.80	18.33	16.74	17.38	25	N42E	1.40	N61E	0.2
2000	1999.76	19.93	19.03	19.72	28	N44E	1.80	N49E	0.5
2100	2099.71	22.05	21.22	21.99	31	N44E	1.70	N43E	0.2
2200	2199.67	24.28	23.30	24.15	34	N44E	1.80	N43E	0.0
2300	2299.61	26.64	25.50	26.43	37	N44E	1.90	N43E	0.0
2400	2399.56	29.13	27.83	28.84	40	N44E	2.00	N43E	0.0
2500	2499.49	31.64	30.61	31.71	44	N44E	2.30	N53E	0.5
2600	2599.40	33.81	34.08	35.26	48	N45E	2.40	N63E	0.4
2700	2699.30	36.21	37.93	39.19	52	N46E	2.80	N53E	0.6
2800	2799.18	38.75	41.99	43.34	57	N47E	2.70	N63E	0.5
2900	2899.06	41.66	46.00	47.44	62	N48E	3.00	N45E	0.9
3000	2998.92	44.78	50.28	51.84	67	N48E	3.10	N63E	1.0
3100	3098.77	48.44	54.28	55.97	73	N48E	3.20	N32E	1.7
3200	3198.57	53.01	58.54	60.38	79	N48E	4.00	N54E	1.6
3300	3298.32	56.69	64.56	66.53	86	N49E	4.10	N63E	0.6
3400	3398.03	60.71	70.98	73.09	93	N49E	4.60	N53E	0.9
3500	3497.69	65.69	77.59	79.87	102	N50E	4.90	N53E	0.3
3600	3597.31	70.56	84.82	87.26	110	N50E	5.10	N59E	0.6
3700	3696.88	75.52	92.61	95.22	119	N51E	5.50	N56E	0.5
3800	3796.50	78.52	100.61	103.33	128	N52E	4.40	N83E	2.5
3900	3896.23	79.41	107.88	110.63	134	N54E	4.00	N83E	0.4
4000	3995.95	79.68	115.45	118.20	140	N55E	4.70	S87E	1.0
4100	4095.66	79.28	123.03	125.76	146	N57E	4.00	S87E	0.7
4200	4195.49	78.49	128.63	131.33	151	N59E	2.50	S77E	1.6
4300	4295.41	76.90	132.39	135.03	153	N60E	2.20	S57E	0.9
4400	4395.31	74.21	135.82	138.37	155	N61E	2.80	S47E	0.7
4500	4495.18	70.93	139.67	142.09	157	N63E	3.00	S52E	0.3
4600	4595.00	67.28	144.34	146.63	159	N65E	3.80	S52E	0.8
4700	4694.74	63.13	150.16	152.30	163	N67E	4.40	S57E	0.7
4800	4794.41	59.37	157.23	159.24	168	N69E	4.80	S67E	0.9
4900	4894.04	56.35	165.31	167.20	175	N71E	5.10	S72E	0.5
5000	4993.65	54.00	173.79	175.59	182	N73E	5.00	S77E	0.4
5100	5093.23	51.17	182.48	184.18	190	N74E	5.50	S67E	1.0
5200	5192.72	46.47	191.31	192.84	197	N76E	6.00	S57E	1.1
5300	5292.23	40.37	199.13	200.44	203	N79E	5.40	S47E	1.2
5400	5391.77	33.59	205.79	206.85	209	N81E	5.50	S42E	0.5
5500	5491.27	26.45	212.81	213.61	214	N83E	6.00	S47E	0.7
5600	5590.72	20.79	221.53	222.13	223	N85E	6.00	S67E	2.1
5700	5690.17	15.50	230.51	230.91	231	N86E	6.00	S52E	1.6
5800	5789.72	10.73	238.59	238.83	239	N87E	4.80	S67E	1.8
5900	5889.43	7.51	245.36	245.47	245	N88E	3.80	S62E	1.1
6000	5989.22	3.77	250.60	250.58	251	N89E	3.60	S47E	1.0
6100	6089.00	0.18	256.13	255.97	256	N90E	4.00	S67E	1.4
6200	6188.73	-3.79	262.24	261.94	262	S89E	4.40	S47E	1.5
6300	6288.46	-9.01	267.37	266.88	268	S88E	4.00	S42E	0.5
6400	6388.25	-13.68	271.95	271.30	272	S87E	3.50	S47E	0.6
6500	6488.04	-17.13	277.27	276.49	278	S86E	3.80	S67E	1.3
6600	6587.80	-18.96	283.89	283.04	285	S86E	4.10	S82E	1.1
6700	6687.53	-21.51	290.69	289.75	291	S86E	4.30	S57E	1.8
6800	6787.22	-24.56	297.88	296.82	299	S85E	4.70	S77E	1.6
[illegible]	[illegible]	[illegible]	306.03	304.90	307	S85E	4.90	S77E	[illegible]

[illegible]	[illegible]	[illegible]	191.31	192.64	197	N76E	6.00	S57E	1.1
[illegible]	[illegible]	[illegible]	199.13	200.44	203	N79E	5.40	S47E	1.[illegible]
[illegible]	[illegible]	[illegible]	205.79	206.85	209	N81E	5.50	S42E	0.[illegible]
5500	5491.27	25.45	212.81	213.61	214	N83E	6.00	S47E	0.7
5600	5590.72	20.79	221.53	222.13	223	N85E	6.00	S67E	2.[illegible]
5700	[illegible]	[illegible]	230.51	230.91	231	N86E	6.00	S52E	1.[illegible]
5800	[illegible]	[illegible].73	238.59	238.83	239	N87E	4.90	S57E	1.[illegible]
5900	5889.43	7.51	245.36	245.47	245	N88E	3.80	S62E	1.1
6000	5989.22	3.77	250.60	250.58	251	N89E	3.60	S47E	1.0
[illegible]	[illegible]	[illegible]	256.13	255.97	256	N90E	4.00	S67E	1.[illegible]
[illegible]	[illegible]	[illegible]	262.24	261.94	262	S89E	4.40	S47E	1.[illegible]
6300	6288.46	-9.01	267.37	266.88	268	S88E	4.00	S42E	0.5
6400	6388.25	-13.68	271.95	271.30	272	S87E	3.50	S47E	0.6
6500	6488.04	[illegible]	277.27	276.49	278	S86E	3.80	S67E	1.[illegible]
6600	6587.80	[illegible]	283.89	283.04	285	S86E	4.10	S82E	1.[illegible]
6700	6687.53	-21.51	290.69	289.75	291	S86E	4.30	S87E	1.8
6800	6787.22	-24.56	297.88	296.82	299	S85E	4.70	S77E	1.[illegible]
[illegible]	[illegible]	[illegible]	306.03	304.90	307	S85E	4.90	S77E	0.[illegible]
7000	[illegible]	[illegible]	314.59	313.37	316	S85E	5.30	S72E	0.[illegible]
[illegible]	[illegible]	-31.70	323.73	322.41	325	S84E	5.70	S72E	0.4
[illegible]	[illegible]	-34.82	333.87	332.45	336	S84E	6.30	S79E	[illegible]
[illegible]	[illegible]	[illegible]	345.27	343.79	347	S84E	6.90	S87E	[illegible]
[illegible]	[illegible].01	-37.89	357.47	355.90	359	S84E	7.40	S72E	[illegible]
7500	7483.16	-42.21	369.69	367.96	372	S83E	7.50	S69E	0.4
7600	7582.30	-46.03	382.16	380.29	385	S83E	7.50	S77E	1.0
[illegible]	[illegible].54	-49.84	393.90	391.89	397	S83E	6.70	S67E	1.5
[illegible]	7780.80	[illegible]	405.40	403.24	409	S82E	7.20	S77E	1.3
7900	7880.01	-55.86	417.71	415.47	421	S82E	7.20	S82E	0.6
8000	7979.16	-58.77	430.33	427.98	434	S82E	7.70	S72E	1.4
8100	8078.19	-61.90	443.88	441.40	448	S82E	8.30	S82E	1.5
8200	8177.20	-63.85	457.74	455.19	462	S82E	7.80	S82E	0.5
8300	8276.22	-66.14	471.47	468.83	476	S82E	8.20	S79E	0.6
8400	8375.13	-69.82	485.69	482.91	491	S82E	8.70	S72E	1.1
8500	8473.96	-73.89	500.34	497.41	506	S82E	8.80	S77E	0.8
8600	8572.70	-76.77	515.89	512.84	522	S82E	9.40	S82E	1.0
8700	8671.37	-78.75	532.01	528.89	538	S82E	9.30	S84E	0.3
8800	8770.04	-80.73	548.14	544.94	554	S82E	9.40	S82E	0.3
8900	8868.68	-82.30	564.48	561.20	570	S82E	9.50	S87E	0.8
9000	8967.25	-83.18	581.30	577.99	587	S82E	9.90	S87E	0.4
9100	9065.77	-85.56	598.22	594.81	604	S82E	9.80	S77E	1.7
9200	9164.30	-88.68	615.04	611.51	621	S82E	9.90	S82E	0.9
9300	9262.88	-91.01	631.64	628.01	638	S82E	9.40	S82E	0.5
9400	9361.50	-94.74	647.78	644.01	655	S82E	9.70	S72E	1.7
9500	9460.07	-99.24	664.01	660.08	671	S81E	9.70	S77E	0.8
9600	9558.68	-102.26	680.32	676.27	688	S81E	9.40	S82E	0.9
9700	9657.34	-103.83	696.57	692.45	704	S82E	9.40	S87E	0.8
9800	9755.90	-107.60	712.90	708.64	721	S81E	10.00	S67E	3.4
9900	9854.38	-113.25	729.31	724.84	738	S81E	10.00	S75E	1.4
10000	9952.80	-119.01	746.04	741.35	755	S81E	10.40	S67E	1.5
10100	10051.17	-125.74	762.70	757.76	773	S81E	10.30	S69E	0.4
10200	10149.61	-132.05	779.15	773.98	790	S80E	10.00	S69E	0.3
10300	10248.13	-138.04	795.17	789.78	807	S80E	9.70	S70E	0.3
10400	10346.71	-142.80	811.24	805.66	824	S80E	9.60	S77E	1.2
10500	10445.35	-146.63	827.20	821.48	840	S80E	9.30	S76E	0.3
10600	10544.09	-150.33	842.58	836.72	856	S80E	8.90	S77E	0.4
10700	10642.93	-152.44	857.62	851.68	871	S80E	8.60	S87E	1.5
10800	10741.84	-153.21	872.30	866.32	886	S80E	8.30	S87E	0.3
[illegible]	[illegible]	-154.48	[illegible]	879.49	899	S80E	8.50	S82E	0.8
11000	10939.77	-154.62	900.84	894.79	914	S80E	7.70	N83E	[illegible]
11100	11038.87	-153.57	914.11	908.09	927	S80E	7.60	N88E	0.7
11200	11138.06	-151.48	926.60	920.65	939	S81E	7.00	N73E	[illegible]
11300	11237.40	-147.65	937.43	931.61	949	S81E	6.20	N68E	1.0
11400	[illegible]	-144.10	947.45	941.74	958	S81E	6.00	N73E	0.6
11500	11436.29	-142.40	957.64	951.99	968	S82E	5.90	N88E	1.6
11600	11535.77	-140.73	967.58	961.98	978	S82E	5.70	N73E	1.5
11700	[illegible]	[illegible]	976.16	970.66	986	S82E	4.60	N73E	1.1
11800	11735.06	[illegible]	983.04	977.65	992	S82E	4.30	N53E	1.6
11900	11834.70	-128.95	989.32	984.13	998	S83E	5.40	N43E	1.4
12000	11934.22	-120.61	994.23	989.33	1002	S83E	5.80	N18E	2.5
[illegible]	[illegible]	[illegible]	996.98	992.43	1003	S84E	6.00	N13E	0.5
[illegible]	[illegible]	[illegible]	997.99	993.82	1003	S84E	6.20	N 2W	[illegible]
12300	12232.46	-88.79	997.10	993.32	1001	S85E	6.90	N 7W	0.9
12400	12331.69	-76.72	994.53	991.19	997	S86E	7.30	N17W	1.3
[illegible]	12430.86	-64.58	990.23	987.32	992	S86E	7.50	N22W	0.7
[illegible]	[illegible].01	[illegible]	985.38	982.90	987	S87E	7.40	N22W	[illegible]
12700	12629.15	-40.26	981.02	978.98	982	S88E	7.60	N17W	0.7
12800	12728.34	-27.85	978.38	976.78	979	S88E	7.00	N 7W	1.4
[illegible]	[illegible]	[illegible]	977.96	976.79	978	S89E	7.00	N 3E	[illegible]
[illegible]	12926.90	[illegible]	978.57	977.82	979	S90E	6.50	N 3E	[illegible]
13100	13026.39	5.96	979.97	979.56	980	N90E	5.00	N13E	1.8
13200	13126.08	13.14	983.02	982.86	983	N89E	4.00	N33E	1.8
[illegible]	[illegible]	[illegible].45	985.58	985.51	986	N89E	4.00	N63E	[illegible]
[illegible]	[illegible]	[illegible]	989.58	989.54	990	N89E	5.50	S87E	[illegible]
13350	13275.50	16.03	994.80	994.74	995	N89E	6.50	S87E	[illegible]
13400	13325.20	15.74	1000.24	1000.17	1000	N89E	6.00	S87E	1.0

72 105.3 708.5 80 23.15 9782E 12838

13700	13682.56	15.08	1009.92	1039.20	1039	N89E	10.00	N83E	2.5
13800	13720.05	18.49	1059.82	1059.81	1060	N89E	14.00	N78E	4.0
13900	13816.80	24.39	1087.59	1087.77	1088	N89E	19.00	N78E	5.0
14000	13902.70	30.64	1124.90	1125.08	1125	N88E	25.50	N83E	6.8
14100	13998.19	36.07	1169.19	1169.73	1170	N88E	27.50	N83E	2.0
14150	14042.02	39.00	1193.06	1193.69	1194	N88E	30.00	N83E	5.0
14200	14085.10	42.10	1218.24	1218.97	1219	N88E	31.00	N83E	2.0
14250	14127.62	44.16	1244.46	1245.25	1245	N88E	32.50	N88E	6.1
14335	14199.30	45.75	1290.11	1290.92	1291	N88E	32.50	N88E	0.0

CHANGE: TITLE, WELL, METHOD, VERTICAL SECTION, TVD, PLOT, OR STOP
(ENTER TI TO CHANGE TITLE; ENTERING T WILL CHANGE TVD)
STOP

#400 - 816 - 7th Avenue S.W.
Calgary, Alberta T2P 1A1

Phone: (403) 262-3501
Fax (403) 265-7157

Weatherford Homco

Bottom Trip Whipstock

Suggested Procedure for Cutting a Casing Window

1. Pickup Casing Scraper and Tapered Mill .050 larger than drift of casing, run in hole. Scrape casing where bridge plug and whipstock is to be set, also area where liner slips would be set if liner is to be run. Circulate hole clean and pull out of hole

2. Run gyro on wireline if deviation of hole now is a concern.

3. Run in hole with a wireline set bridge plug and set same 1 meter above a casing collar.

4. Make up Bottom Trip Whipstock onto starting mill complete with orienting sub above starting mill, on 1jt. of drill pipe or Hevi-wate.

5. Run in hole with whipstock and stop one joint above bridge plug.

6. Run gyro in hole on wireline to find out which direction whipstock face is pointing.

7. Re-position whipstock face to the desired direction of window.

8. Run down hole with whipstock and tag bridge plug to shear bottom trip to set slip assembly. Pickup 1/2-1m and land whipstock, checking position of whipstock with the gyro.

9. Set down on whipstock to shear bolt on starting mill to release whipstock off of starting mill.

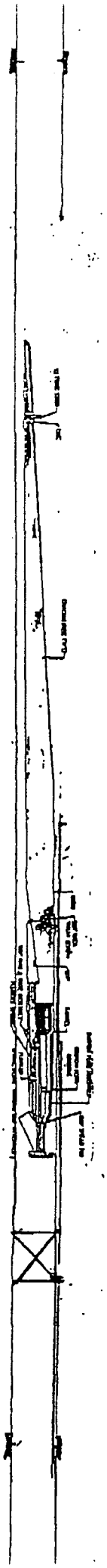
10. Start milling window make about .75m with starting mill.

11. Pull out of hole with starting mill and make up window mill drill pipe or Hevi-wate above, run in hole.

12. Start milling at point where starting mill left off. Continue milling to within 1 meter of the run off of the concave face, pull out of hole.

13. Trip out of hole and make up window mill, two watermelon mills on drill pipe or Hevi-wate - run in hole. Dress top of window, spending as little time as possible at top of whipstock to reduce thinning, continue down face of whipstock and complete milling window off bottom of concave. If possible make approx. 1-1/2" meters of open hole to dress bottom of concave, trip up and check top of window for any drag.

14. On trip in to drill ahead with motor, it should have a bent housing and a orienting sub should be run above motor so it can be oriented to drill off.



CASING COLLAR

1 METER

TOP OF WINDOW

1,5 METERS

TOP OF WHIPSTOCK

3.88 METERS

BOTTOM OF CONCAVE ON WHIPSTOCK

1.4
~~1.9~~ METERS

BOTTOM OF WHIPSTOCK

1.0 METER

BRIDGE PLUG

1 METER

CASING COLLAR

DRILLING FLUID PROPOSAL

FOR

AMOCO CANADA PETROLEUM COMPANY LTD.

AMOCO ~~A2~~ A1 POINTED MOUNTAIN

* Note Same as A2 Mud Program

DRILLING FLUID PROPOSAL

FOR

AMOCO CANADA PETROLEUM COMPANY LTD.

AMOCO A2 POINTED MOUNTAIN

CONTENTS

PREPARED FOR

MR. TREVOR IRONSIDE

PREPARED BY

DOWELL IDF

TECHNICAL SERVICES DEPARTMENT

JUNE 1994

AMOCO CANADA PETROLEUM COMPANY LTD.

AMOCO ~~A2~~ A1 POINTED MOUNTAIN

GEOLOGICAL PROGNOSIS

FORMATION	DEPTH (m)
Second Black Shale	2768-3023
Cut Window	±2850
Top of Fish	2870
Nahanni	3023
TD	**±3173**
Fault	3300

Use A1 Depths

AMOCO CANADA PETROLEUM COMPANY LTD.

AMOCO A2 POINTED MOUNTAIN

DRILLING FLUID PROCEDURES

177.8mm CASING and WINDOW MILLING OPERATION

All work in the casing will be attempted with water. In addition, water will be used to mill the window in the casing. Due to the potential for losses, Bentonite and Calcium Carbonate may be required.

The Polymer mud will be premixed in the tanks for the drilling operation and if necessary, can be used during milling.

155mm SIDETRACK HOLE SECTION

While working on inside casing operations (depending on requirements for Gel/$CaCO_3$):

1. Fill the available surface tanks with water and, if necessary, reduce the hardness below 100mg/L with Soda Ash.

2. Increase the pH to 9.5-10.0 with Caustic Soda.

3. Mix 1.5kg/m^3 of **HEC** and 1.0kg/m^3 **IDBOND DP** through the hopper to obtain a Yield Point of 2-6 Pa.

Drill out the window in the casing with water or Gel/Chemical mud from the plug back operation, adding Bicarbonate to treat out cement.

When through the window, displace the water system with the Polymer fluid. Treat out any residual cement with Bicarbonate to reduce the Ca^{++} to 100mg/L.

The Yield Point should be maintained at 2-8 Pa and the density maintained as low as possible.

AMOCO CANADA PETROLEUM COMPANY LTD.

AMOCO A2 POINTED MOUNTAIN

DRILLING FLUID PROCEDURE (Continued)

RECOMMENDED PROPERTIES AND MAINTENANCE

DENSITY:	Control as low as possible, or as hole conditions dictate.
YIELD POINT:	2-6 Pa initially with **HEC** and **IDBOND DP**. The preference will be to increase annular velocity or employ viscous sweeps for improved hole cleaning before increasing the rheology throughout the entire system. Minimum viscosities are recommended to prevent high temperature gellation while tripping. Increase to 5-7 Pa for logging. Kelzan XCD will be used to supplement the **HEC** if solids suspension is required.
GEL STRENGTH:	Initial gels in the 3-4 Pa range; 10 minute gels in the 5-8 Pa range. Flat gels are desirable. Increase to the 6-8 Pa range for logging.
pH:	Control at 9.5-10.0 with Caustic Soda. Monitor closely for any decrease.
FLUID LOSS:	Maintain in the 6-8 cc's range with **IDF-FLR** and **FLOPLEX** in a 1:2 ratio. Filter cake quality, as opposed to an absolute value for filtration rate, will be used to control fluid loss on this hole interval. A thin, firm, more flexible cake less than 1mm thick is viewed as ideal.
CALCIUM:	100 mg/L or less. Polymers to be used on this well are tolerant to calcium concentrations in this range.

AMOCO CANADA PETROLEUM COMPANY LTD.

AMOCO A/ POINTED MOUNTAIN

DRILLING FLUID PROCEDURES (Continued)

COMMENTS

1. **LOSSES**

   Seepage Loss Control: Initially, add 50kg/m^3 Calcium Carbonate "0" (Fine) to the system. If this procedure is unsuccessful, mix and pump LC pill.

   Lost Circulation (LC) Pill - in 10kg/m^3 mud, add 1 sack Kelzan XCD, 12 sacks Poultry Grit (if drilling motor can handle), 12 sacks Supercal, 24 sacks Calcium Carbonate "0" Grind and 16 sacks Fiber Fluid.

2. Should the rheology become higher than desirable, dilution or DFLC will be used for reductions. The use of Lignite, Lignosulphonates, and Tannins is to be avoided due to detrimental effects to the formations.

3. Prior to pulling out to of the hole for bits or logging, add 3kg/m^3 of **PTS-200** stabilizer to the fluid which will be in the hole. It is not necessary to add **PTS-200** to the surface system.

4. To prevent bacterial degradation due to temperature, maintain 0.05kg/m^3 of X-Cide 207 bactericide in the system.

5. A magnet should be kept in the mud ditch to catch iron fillings from the casing to determine if any excessive wear is occurring.

6. Monitor the returns with a Hach Test Kit to detect any H_2S which may be encountered. Should H_2S tests be positive, treat with Sulban 380 to scavenge any soluble sulfides (2.9kg/m^3 of Sulban 380 will scavenge approximately 356mg/L of H_2S).

7. If torque and drag become a problem, add 2-3 drums **IDLUBE** at the suction.

AMOCO CANADA PETROLEUM COMPANY LTD.

AMOCO A4 POINTED MOUNTAIN

MATERIALS AND COST ESTIMATE

VOLUME ESTIMATE

155mm HOLE SECTION

178mm Casing Volume	69
155mm Hole Volume	8
Surface Volume	50
Maintenance (20 days @ 10m^3)	200
Total Volume	327 m^3

PRODUCT	QUANTITY	COST PER UNIT	EST. COST
Caustic Soda	30 x 50 lb sacks	$ 31.32	$ 939.60
Bicarbonate	10 x 100 lb sacks	42.92	429.20
IDBOND DP	10 x 25 kg sacks	222.72	2,227.20
X-Cide 207	20 x 6 lb cans	115.42	2,308.40
IDF-FLR	40 x 50 lb sacks	145.00	5,800.00
DFLC	30 x 25 lb sacks	125.00	3,750.00
HEC	25 x 50 lb sacks	262.16	6,554.00
PTS-200	50 x 20 L pails	234.90	11,745.00
FLOPLEX	40 x 50 lb sacks	107.30	4,292.00
	INTERVAL TOTAL		**$ 38,045.40**
	ENGINEERING (20x$350.00/DAY)		**$ 7,000.00**
	FREIGHT		**$ 7,500.00**
	WELL TOTAL		**$ 52,545.40**

DOWELL IDF

AMOCO A2 POINTED MOUNTAIN

ION ADDITION FROM DRILLING FLUID CHEMICAL USAGE

PRODUCT	UNIT SIZE(kg)	NO. SACK	ESTIMATED CHEMICAL USAGE (kg) TOTAL	Ca++	K+	Na+	OH-	Cl-	SO4=	N	ESTIMATED METALS ADDITIONS (kg) BORON	CAD.	CHROM	COPPER	LEAD	NICKLE	VANAD.	ZINC
CAUSTIC SODA	22.7	30	681	0	0	195		5	0	0	0.00068	0.00007	0.00007	0.00014	0.00068	0.00341	0.00007	0.00007
IDBOND DP	25	10	250	0	0	8		1			0.00050	0.00008	0.00005	0.00018	0.00075	0.00013	0.01250	0.00178
FLOPLEX	22.7	40	908	4	4	1		0	0	0	0.03632	0.00018	0.00981	0.00463	0.00272	0.00454	0.00091	0.01444
HEC	22.7	10	227	0	1	4		39	0	0	0.00454	0.00005	0.00506	0.00066	0.00045	0.00817	0.00320	0.00724
SODIUM BICARB	45.4	10	454			124					0.00091	0.00009	0.00023	0.00014	0.00136	0.00036	0.00014	0.00006
X-CIDE 207	2.72	20	54	0	1	0		2	1	1	0.00022	0.00001	0.00544	0.00508	0.00060	0.00027	0.00002	0.00146
TOTAL KILOGRAMS				**4**	**6**	**332**	**0**	**47**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DISPOSAL LIMITS	Cl-	N							
BURIAL (kg/SITE)	1600	400	25	3	200	400	200	50	200	600
LAND SPREADING (kg/Ha)	800	400	5	1.5	100	200	100	25	100	300
ALLOWABLE MAXIMUM (kg) BEFORE TESTING REQUIRED			2.5	0.75	50	100	50	12.5	50	5

NOTE: OTHER CRITERIA TO BE MET INCLUDE pH, EC,TSS, SAR, etc.

DOWELL IDF

AMOCO A2 POINTED MOUNTAIN

RECOMMENDED PRODUCT INVENTORY

ION ADDITION FROM DRILLING FLUID CHEMICAL USAGE

PRODUCT	UNIT SIZE(kg)	NO. SACK	ESTIMATED CHEMICAL USAGE (kg) TOTAL	Ca++	K+	Na+	OH-	Cl-	SO4=	N	ESTIMATED METALS ADDITIONS (kg) BORON	CAD.	CHROM	COPPER	LEAD	NICKLE	VANAD.	ZINC
BENTONITE	45.4	192	8717								0.00523	0.00349	0.01743	0.03574	0.19177	0.12204	0.03574	0.66596
BIOCIDE	20	32	640	0	0	0					0.00000	0.00000	0.00000	0.00000	0.00512	0.00384	0.00000	0.01088
CALCIUM CARBONATE	25	840	21000								0.00630	0.01260	0.13860	0.06720	0.08400	0.06300	0.05460	0.51660
CAUSTIC SODA	22.7	50	1135	0	0	325		9	0	0	0.00114	0.00011	0.00011	0.00023	0.00114	0.00568	0.00011	0.00011
FLOPLEX	22.7	80	1816	7	9	2		0	0	0	0.07264	0.00036	0.01961	0.00926	0.00545	0.00908	0.00182	0.02887
HEC	22.7	40	908	0	4	17		156	0	0	0.01816	0.00018	0.02025	0.00263	0.00182	0.03269	0.01280	0.02897
IDBOND DP	25	30	750	0	0	23		2			0.00150	0.00023	0.00015	0.00053	0.00225	0.00038	0.03750	0.00533
IDF-FLR (REG & XL)	22.7	80	1816								0.00182	0.00036	0.00182	0.00363	0.00036	0.00363	0.00363	0.00363
IDLUBE	212	8	1696	0	3	2		23	16	0	0.00678		0.02714	0.01187	0.03392	0.05088	0.04579	0.02883
KELZAN XCD	25	40	1000								0.00100	0.00120	0.00100	0.00090	0.00040	0.00500		
TOTAL KILOGRAMS				**8**	**17**	**368**	**0**	**191**	**16**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**

DISPOSAL LIMITS	Cl-	N							
BURIAL (kg/SITE)	1600	400	25	3	200	400	200	50	200	600
LAND SPREADING (kg/Ha)	800	400	5	1.5	100	200	100	25	100	300
ALLOWABLE MAXIMUM (kg) BEFORE TESTING REQUIRED			2.5	0.75	50	100	50	12.5	50	5

NOTE: OTHER CRITERIA TO BE MET INCLUDE pH, EC,TSS, SAR, etc.

qproVTT-38AD

AMOCO CANADA PETROLEUM COMPANY LTD.

AMOCO A1 POINTED MOUNTAIN

RECOMMENDED PRODUCT INVENTORY

PRODUCT	USAGE	CONTINGENCY	TOTAL
Bentonite	--	192	192
Bicarbonate	10	20	30
Biocide	20	12	32
$CaCO_3$ "0"	--	560	560
$CaCO_3$ Poultry Grit	--	112	112
$CaCO_3$ Supercal	--	168	168
Caustic Soda	30	20	50
Drillaid DFLC	30	--	30
Fiber Fluid	--	200	200
FLOPLEX	40	40	80
HEC	25	15	40
IDBOND DP	10	20	30
IDF-FLR	40	--	40
IDF-FLR XL	--	40	40
IDLUBE	--	8	8
Kelzan XCD	--	40	40
PTS 200	50	14	64
Freight	**2,500.00**	**5,000.00**	**7,500.00**
Cost	**38,045.40**	**58,299.64**	**96,345.04**
Engineering	**7,000.00**	**0.00**	**7,000.00**
TOTAL	**$47,545.40**	**$63,299.64**	**$110,845.04**

AMOCO - 42% DISCOUNT PRICE LIST - FORT ST. JOHN

WAREHOUSE LOCATION
FORT ST. JOHN:
H.L. POWELL LTD. (604) 785-4222

EFFECTIVE: DECEMBER 1, 1992

DISCOUNT PRICE LIST 42 % DISCOUNT

(REPLACES PRICE LIST DATED NOVEMBER 15, 1989)

DRILLING FLUID CLAYS AND WEIGHT MATERIALS

			LIST	DISC.				LIST	DISC.
IDF-GEL (Wyoming Bentonite)	100	lb	15.00	8.70	BARITE	40	kg	17.00	9.86
NATURAL GEL	100	lb	15.90	9.22	SALT GEL	50	lb	19.00	21.00
IDF-GEL EX (Untreated High Yield)	100	lb	18.80	10.90					

DRILLING FLUID LOST CIRCULATION MATERIALS

SAWDUST		bag	7.00	4.06	MICA	50	lb	32.00	18.56
PRIMA-SEAL	40	lb	35.00	20.30	WALNUT	50	lb	33.00	19.14
CELLOPHANE	25	lb	41.00	23.78	VEN-FIBRE	40	lb	84.00	48.72

DRILLING FLUID COMMERCIAL CHEMICALS

ALUMINUM STERATE	25	lb	99.00	57.42	POTASH	25	kg	14.50	8.41
SULBAN 380	40	lb	380.00	220.40	SALT	40	kg	18.00	10.44
CALCIUM CARBONATE	25	kg	8.40	4.87	SAPP	40	kg	178.00	103.24
CALCIUM CHLORIDE (77% FLAKE)	40	kg	48.00	27.84	SODA ASH	40	kg	30.00	17.40
CALCIUM CHLORIDE (POWDER)	40	kg	60.00	34.80	SODIUM BICARBONATE	100	lb	74.00	42.92
CAUSTIC SODA	50	lb	54.00	31.32	SODIUM SULPHITE (CATALYZED)	25	kg	76.00	44.08
CALCIUM NITRATE	80	lb	56.00	32.48	XCIDE 207	6	lb	199.00	115.42
GYPSUM	25	kg	15.00	8.70	X-PEL-G	50	lb	84.00	48.72
LIME	25	kg	13.50	7.83	ZINC CARBONATE	50	lb	151.00	87.58

DRILLING FLUID CONDITIONING PRODUCTS

BENEX	2	lb	22.00	12.76	IDBOND	20	L	183.00	78.00
CHROME FREE LIGNOSULPHONATE	50	lb	44.00	25.52	IDBOND DP	25	kg	384.00	222.72
CMC (PURE)	50	lb	219.00	127.02	IDF-FLR	50	lb	250.00	145.00
CYPAN	50	lb	218.00	126.44	IDFLO	50	lb	64.00	37.12
DESCO	25	lb	86.00	49.88	IDF HITEMP	50	lb	114.00	66.12
DRISPAC	50	lb	257.00	149.06	IDFLOC	1	kg	20.00	11.60
KELZAN XCD	25	kg	654.00	379.32	IDF FCL	50	lb	48.00	27.84
LIGNITE	50	lb	22.00	12.76	IDF SV (EXTENDER)	2	lb	22.00	12.76
STAFLO	25	kg	284.00	164.72	IDVIS D	50	lb	602.00	349.16

IDF SPECIALTY PRODUCTS

IDFLO HTR	25	kg	130.00	75.40	IDSCAV 110	20	L	220.00	127.60
IDHEC	50	lb	452.00	262.16	IDFILM 220X	20	L	144.00	83.52
POLYTEMP	25	kg	799.00	463.42	IDFREE	50	L	430.00	249.40
VISPLEX	25	lb	350.00	203.00	IDLUBE	55	gal	1220.00	707.60
FLOPLEX	50	lb	185.00	107.30	IDF DRILLING DETERGENT	20	L	110.00	63.80
PTS 200	20	L	405.00	234.90	IDF DEFOAMER	5	gal	195.00	113.10
IDSPERSE HT	20	L	295.00	171.10	HYMUL	5	gal	258.00	149.64

IDF OIL MUD PRODUCTS

INTERDRILL EMUL	55	gal	1200.00	696.00	TRUMUL	55	gal	1300.00	754.00
INTERDRILL FL	55	gal	1365.00	791.70	TRUSPERSE	55	gal	1700.00	986.00
INTERDRILL OW	55	gal	1520.00	881.60	TRUVIS	50	lb	265.00	153.70
INTERDRILL ESX	55	gal	1980.00	1148.40	TRUDRILL S	50	lb	66.00	38.28
INTERDRILL S	50	lb	66.00	38.28	TRULOSS	55	gal	1700.00	986.00
INTERDRILL NA	50	lb	101.00	58.58	TRUFLO 100	25	lb	299.00	173.42
VISTONE	50	lb	134.00	77.72	TRUPLEX	25	lb	299.00	173.42

INTERNATIONAL DRILLING FLUIDS CORPORATION
CALGARY (403) 266-0722 FAX NO. (403) 237-8331

TABLE 1
SUGGESTED DRILLING BIT PROGRAM

6" bits will be subject to limited availability, discuss and research alternate bits thouroughly

Size (mm)	IADC Code	Preferred Bit Name	Alternate Bit Name	Interval (m)	Meters Drilled	Time (hours)	ROP (m/hr)	FOB (daN)	RPM
2ND BLACK SHALE									
152.4	5-3-7	ATJ-M22D	ATJ-M33D	3710-3940	230	76	3.0	motor	100-250
Nahanni									
152.4	6-3-7	F57D	ATJ-M55D	3940-4070	130	33	4.0	8-10	80 - 120

Note: 1) 'The Nahanni top may scrub any PDC bit.
2) Use mini-extended nozzles to optimize jet impact forces
3) Maximum weight @150 RPM -- 8,000 to 10,000 DaN

TABLE 2
SUGGESTED HYDRAULICS PROGRAM

(SEE ATTACHED REED PROGRAM OUTPUT)

Depth (m)	Flowrate (l/min)	Jets (mm)		Pressure (kPa)	Ann Vel (m/min)	HHP (HKW)	P Drop (% bit)	ECD (kg/m3)
Main Hole								
3200	700	8.7/8.7/15.9		16500	58	7.54	5.0	1100

Note: 1) Use cross flow jet configuration to optimize bottom hole cleaning

PLANNED WELL HYDRAULICS

REED TOOL COMPANY

WELL NAME : Amoco Pointed Mountain
CUSTOMER : Amoco Canada Petroleum Inc.
LOCATION : A-1 Re-Entry

Cross flow for cleaning

WELL DATA

DEPTH.....	4070 m ← TD
HOLE SIZE...	152 mm 6"
MUD WEIGHT..	1040 Kg/m3
PLAS. VISC..	22.0 cp
YIELD PT....	5.00 Pa

RECOMMENDED HYDRAULICS

	#11	#11	#20 ← or leave one nozzle out
NOZZLES	8.7	8.7	15.9

TFA.....	318 mm2
PUMP PRESSURE.....	16200 KPa ← High
FLOW RATE.....	0.7000 m3/min
BIT HSI.....	0.3581
BIT HW/cm2.....	41.4

HYDRAULIC DETAILS

FLOW RATE / HOLE DIA.....	30.8 GPM/inch
FLOW RATE / HOLE DIA.....	0.0460 m3/min/cm
SYSTEM PRESSURE LOSS.....	12513 KPa
BIT NOZZLE PRESSURE DROP.....	687 KPa
DOWNHOLE MOTOR / MWD PRESSURE DROP.....	3000 KPa
MOTOR BEARING FLOW LOSS (6.0%).....	0.0420 m3/min
ANNULAR PRESSURE LOSS.....	2414 KPa
NOZZLE PRESSURE DROP (% OF AVAILABLE PRESSURE)....	5.21 % ← Low
PUMP OUTPUT HYDRAULIC POWER.....	189 HKW
BIT HYDRAULIC POWER.....	7.54 HKW
NOZZLE VELOCITY.....	34.5 m/sec ← OK
JET IMPACT FORCE.....	88.5 lbs
JET IMPACT FORCE.....	39.4 daN
IMPACT FORCE / HOLE AREA.....	3.13 PSI ← Low
IMPACT FORCE / HOLE AREA.....	0.2161 daN/cm2
HYDROSTATIC HEAD.....	41507 KPa
EQUIVALENT CIRCULATING DENSITY.....	1100 Kg/m3
CUTTINGS SLIP VELOCITY (chip size=.30 inch).....	16.46 m/min — OK
SURFACE EQUIPMENT LENGTH.....	76.0 m X 76.2 mm
AVAILABLE BUOYANT COLLAR WEIGHT.....	11381 daN

DRILL STRING AND ANNULAR VELOCITY DATA

DEPTH			OD	X	ID	LENGTH	HOLE SIZE	AV m/min	EST. CHIP VEL	CRIT VEL	FLOW TYPE
								OK	LOW		
0	-	3881	88.9	X	66.0	3881	152	58.2	42	88.7	LAM
3881	-	4030	121	X	57.1	149	152	104	88	118	LAM
4030	-	4070	121	X	50.8	40.0	152	103	87	117	LAM

Author: Kenneth E. WHITE at calgary,plains/c=US/a=ATTMAIL/p=AMOCO
Date: 7/14/94 10:07 AM
Priority: Normal
TO: Trevor X. IRONSIDE at calgary,drilling
TO: Dennis X. ERICKSON at calgary,plains
TO: John E. HAWKINS at calgary,plains
TO: Albert P. CHOI at calgary,plains
TO: Derek N. LAMB at calgary,plains
TO: D B. COLLIN at calgary,plains
TO: Gary S. Rozak at calgary,plains
Subject: NOTE 07/14/94 10:56:00

---------- Message Contents ----------

The Pointed Mountain A-1 well will be re-entered and drilled at an azimuth of 0 degrees, or due north. The Horn River shales directly above the Nahanni have a dip of approximately 10 degrees in a south-easterly direction. By drilling due north, we are heading up plunge on the Pointed Mountain Anticline, which strikes north-south.

? South Easterly Direction

The measured depth, top of the Nahanni in the A-1 well is 12,780 feet. In the A-1 well the best porosity is in the top 370 feet of the Nahanni, down to a measured depth of 13,150 feet. Therefore, it is recommended that the new sidetrack well penetrate to an equivalent TVD depth. The drillers have the directional survey and will determine a TVD depth target for the new drill.

The open hole logging program will consist of Western's sonic log for porosity determination.

AMOCO POINTED MOUNTAIN A-3 RE-ENTRY

I. Liner Program (114.3mm)

1. Tubular Details:

Interval (m)	Size (mm)	Mass (Kg/m)	Grade	Conn.	Collapse (KPa)	Burst (KPa)	Jt. strength (daN)	Opt Tq. (N/m)	Max. (N/
3939-3660	114.3	18.23	13cr80	FL4S/Fox	51,530	52,900	66,720	2,850	3,52
Imp. Units	(in)	(lb/ft)			(psi)	(psi)	(lbs)	(ft-lbs)	(ft-lb
	4 1/2	12.24			7,500	7,700	150,000	2,100	2,60

Note: check values to confirm before use.

2. Tubular Volumes:

Size (mm)	Mass (Kg/m)	Inside Dia. (mm)	Drift (mm)	Capacity (m3/m)	Wet Displ. (m3/m)	Gage Ann. vol. (m3/m)	Open Hole gage (m3/m)
114.3	18.23	100.53	97.358	0.0079	0.0024	0.0088	0.019
							156mm hole
Imp. Units	(lb/ft)	(inches)	(inches)	(bbls/ft)	(bbls/ft)	(bbls/ft)	
4 1/2"	12.24	3.958	3.833	0.0152	0.0458	0.0168	

Note: check values to confirm before use.

3. Remove thread protectors. (clean and return for credit)

4. Tally and drift casing. Clean all connections. (use a catch pain to conform to the new environmental regulations)

5. Prior to the last trip out with the drillstring, stage up circulation rates to similar annular velocities expected during cementing. (as high as possible if pump limited). Circulate long enough at maximum rates to **ensure the hole is clean of cuttings** and the mud is well conditioned prior to tripping.

6. Drift the drillpipe and POOH.

7. Run the 114.3mm Liner as follows (with assistance from the tool representative):
   - Combination Float Shoe/Receiver (thread lock the pin end only)
   - Inflatable annulus packer with one standoff band below for packer protection. (ensure the knock-off plug has been removed)

- Make up the hydraulic stage tool to the packer.

- Make up the remaining aprox. 6 joints of 114.3mm liner.(follow the recommended make-up procedures for running FL4S connections)

-Make up the cross-over from FL4S to Kawasaki Fox threads.

- Make up the remaining aprox. 17 joints of 114.3mm liner.(follow the recommended make-up procedures for running Kawasaki Fox connections)

- Install a slip type stop collar on every joint. Starting with a stand off band, alternate one free-floating rigid bar turbulator or a standoff band between the stop collars. (check the OD of these centralizers with a gage ring)

- Pick up top liner assembly consisting of hanger, setting sleeve and tie-back extension.

- The entire liner assembly can then be tripped in on drillpipe. **Caution must be exercised as the packer exits the window.**

- The packer is to be placed at the Nahanni Top. **(double-check measurements & tally)**

- The hanger can be set at this point using right hand rotation.

- With the hanger set, circulate a ball into the receiver/shoe to blank off the casing and inflate the packer.
  a) Estimated ACP opening pressure _____KPa
  b) Estimated surface pressure _____KPa

- Continue pressuring up to open the hydraulic stage tool and establish circulation.
  a) Estimated stage tool opening pressure _____KPa
  b) Estimated opening surface pressure _____KPa

- Refer to the Nowsco liner program.

- Displace cement with water at an annular velocity of 120m/min (approx 1.4 m3/min) Only slow down for the final 0.5 m3 of displacement. DO NOT OVER-DISPLACE
  a) Estimated displacement volume _____ m3

- Release pressure and check floats.

- Pull out of the tieback and **measure flowback**. POOH, as quickly as possible. (note the number of wet stands but **do not stop to circulate)**

*** END OF PROGRAM ***

SOONER PIPE SUPPLY LTD. CANADA

Sooner Pipe & Supply (Canada) Limited

#6, 540 - 42ND AVENUE N.E.
CALGARY, ALBERTA, CANADA
T2E 7J9

TELEPHONE (403) 230-4282

DATE: July 21/94

FAX NUMBER: 234-4248

TO: DENNIS ERICKSON

COMPANY: AMOCO CANADA

FROM: SOONER PIPE & SUPPLY (CANADA) LIMITED

PHONE #: (403) 230-4282 FAX#: 276-6760

NUMBER OF PAGES BEING TRANSMITTED INCLUDING THIS PAGE #6

REMARKS:

DENNIS -

4½" 12.60LB/FT 13CR80 FOX RANGE 3

@ 156.22 per meter FOB NISKU - Delivery 8-10 days.

If you need further technical data, please call.

→ w/EL 4S (cut w/ FOX) – 175.63

diff = 19.61/m × $12 = $235/jt.

REGARDS,

Brad

HEAD OFFICE
FIRST NATIONAL TOWER
P.O. BOX 1530
TULSA, OKLAHOMA 74101
TELEPHONE (918) 587-3301

P.002

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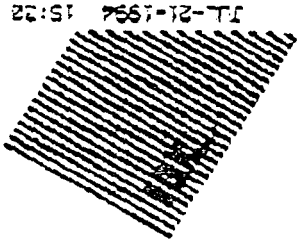
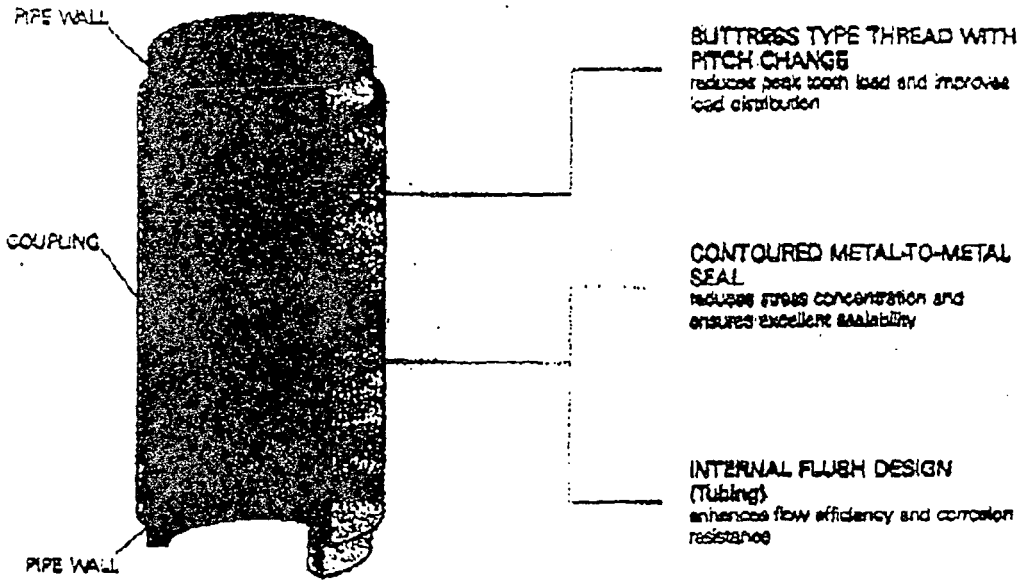
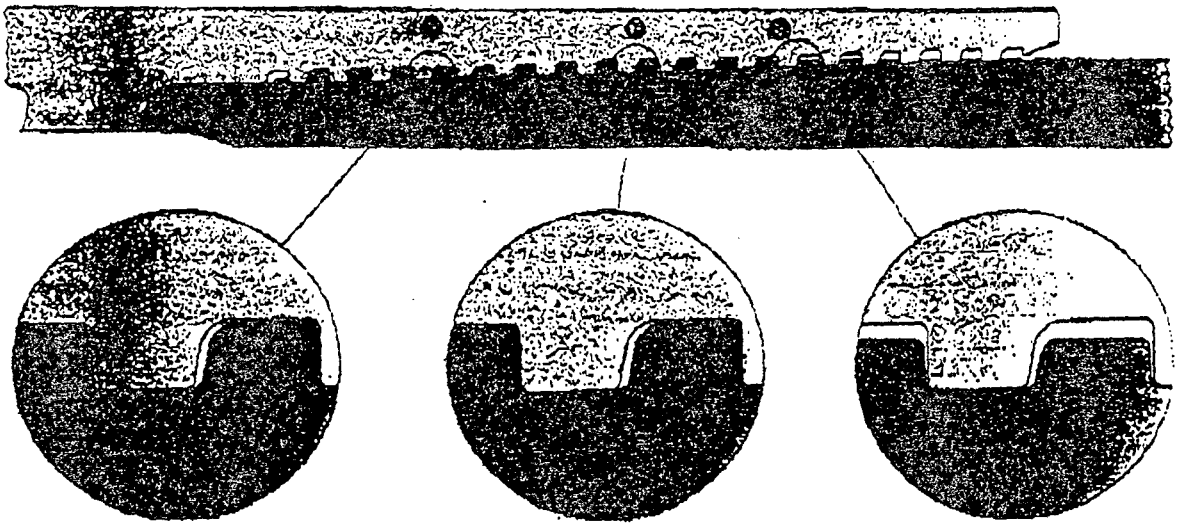


FOX CONNECTION DESIGN FEATURES



DESIGN FEATURE	EFFECT	IMPROVEMENT
THREAD PITCH CHANGE	1. Reduction of maximum tooth load 2. More even tooth load distribution	a. High resistance to thread galling b. Good control of make-up c. High resistance to back off d. High resistance to coupling galling and unzipping e. Increased fatigue life
METAL-TO-METAL TRIPLE RADIUS SEAL	1. Localized high sealing pressure 2. Reduced stress concentration	a. Ensure excellent sealability b. Reduce shoulder damage c. High resistance to over-torquing d. High resistance to seal galling
INTERNAL FLUSH	1. Reduction of turbulence	a. Enhanced resistance to corrosion b. High flow efficiency

THE FOX PITCH CHANGE CONCEPT



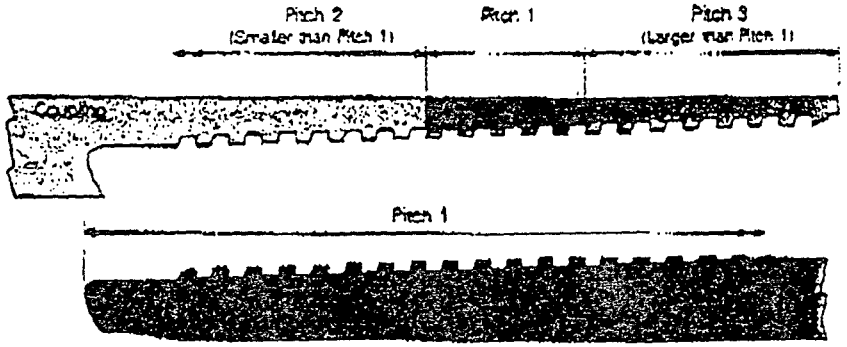
❶ The gap between load flanks closes as the joint is made up to torque condition.

❷ The standard pitch area acts to concentrate loads in the center section of the thread.

❸ The gap between load flanks on initial assembly closes as the joint is axially loaded in tension.

DOUBLE PITCH CHANGE

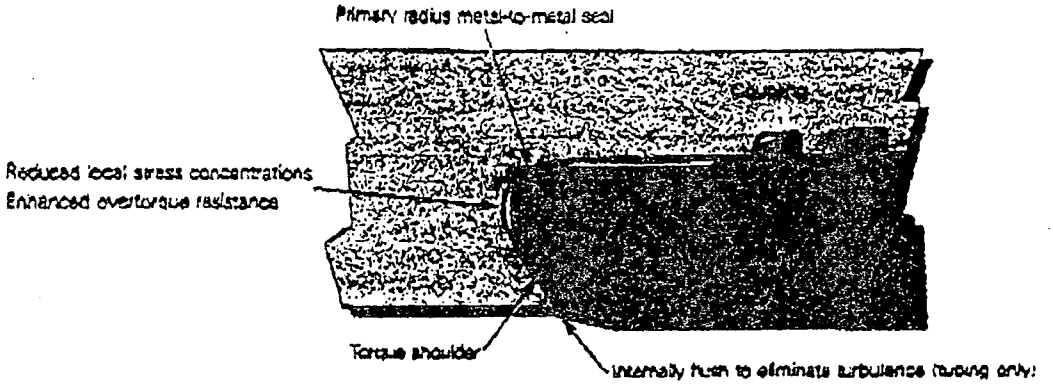
The pin member retains a standard pitch over its entire length. The box member features three sections, each having a different pitch: increased pitch (in relation to the pin) in the outer part of the box, standard pitch in the center section, and reduced pitch in the inner section. This produces gaps at the load-bearing flanks of the threads in the inner and outer regions of the thread prior to make-up and running.



The gaps between the load-bearing flanks of the threads are closed by make-up torque and by the axial load imposed by pipe weight. Threads are preferentially loaded in the center of the connection, with reduced loads in the inner and outer sections. The risk of thread galling is reduced by the lower level of radial thread interference in the FOX connection in comparison to other designs.

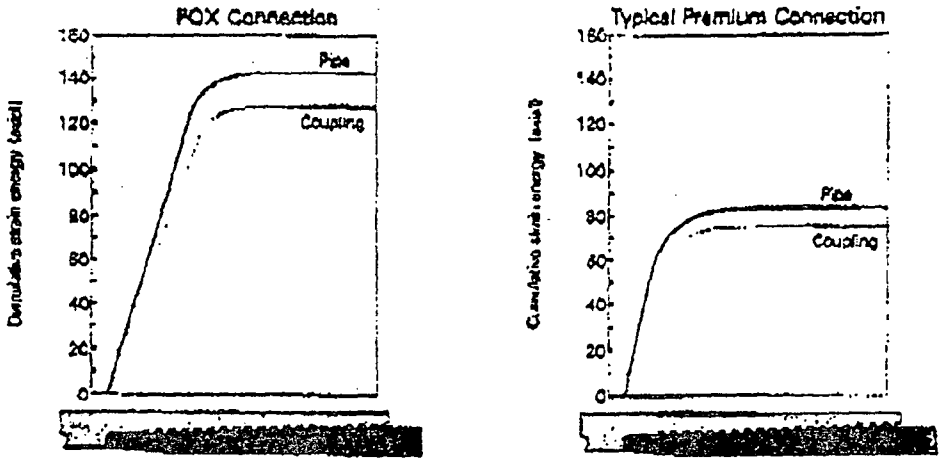
THE TRIPLE RADIUS SEAL CONCEPT

The triple radius seal used in the 'FOX' connection comprises a pin seal feature having a profile of three interacting radii engaging with a corresponding sealing surface profile in the coupling. Because of the generous blending radius which this design allows, there is a reduced local stress concentration giving better resistance to over torquing and fatigue.



The smooth, continuous profile of the FOX triple-radius seal improves sealing performance, reduces stress concentrations and provides for increased overtorque resistance.
A more gradual lead-in during make-up is achieved compared with the conventional double taper design, and the principle of tri-axial compression is included. Sealing is achieved as a result of combined radial and axial compression of the pin end. The smooth interior pin to coupling profile produces internally flush bores for tubing applications, maximizing bore diameter and reducing turbulence.

COMPARISON OF SEAL STORED ENERGY



Plots of strain energy induced in the pin and coupling for both a conventional and the FOX connections were obtained from the finite element analysis. These confirm the prediction that the strain energy stored across the metal-to-metal seal for the FOX is significantly greater than for a conventional connection.

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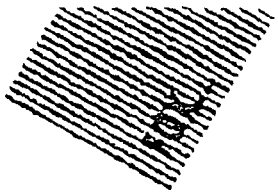

FOX FIELD SERVICE

FOX OCTG field service professionals are knowledgeable and experienced with all aspects of premium connection make-up and casing and tubing installation. Our trained representatives coordinate with the operating company, rig personnel and other on-location service companies to advise and ensure a worry-free job. These service consultants routinely inspect connections, accessories and running equipment prior to running, as well as monitor and verify OCTG handling and connection make-up during the running operation.

The following is a pre-running checklist:

Pre-run Inspection	Hand Drift	Pipe Dope
Stabbing Guide	Extra Couplings	Dope Brushes
Cross-over Subs	Lift Subs	

SUMMARY OF RUNNING INSTRUCTIONS

Inspection

1. Thoroughly clean and visual inspect all pins and boxes prior to make-up.
2. Deduct make-up loss from overall tally length measurement.
3. Minor thread burrs with dings can be removed with a fine triangular file by a trained representative. Scratches and minor dents can be smoothed with scotch bright materials.
4. Never file or grind seal areas.

Make-up Tongs

1. Ensure torque gauge calibration.
2. Verify tongs to pipe diameter.
3. Mount or suspend tong axis parallel to tube axis.
4. Verify tong arm angle to back-up line is 90 degrees or compensated for the actual angle.

Thread Compound

1. API modified (friction factor = 1.0) thread compound complying with API Bul 5A2 is recommended.
2. Disperse or brush compound evenly over thread and seal areas of pins and boxes.
3. Do not use contaminated thread compound.

Running

1. Ensure pin protectors are installed for lifting tube from rack or lifting through Vee door.
2. Ensure vertical alignment.
3. Stabbing guides are recommended.
4. Stab pin and engage threads by hand prior to tong rotation.
5. Make-up rotation should not exceed 15 RPM. Bring seals and shoulders into final position in low gear (3 to 5 RPM is Recommended)

Breakout

1. Breakout torque may exceed make-up torque.
2. Premature pulling or "jumping" pins from engagement can tear/yield threads.
3. Verify that back-up tong grips the bottom half of the coupling diameter and break-out tong grips the upper tube O.D.
4. Always install pin protectors. Add box protector if pipe is to be laid down.

JUL 21 '94 15:29 TO CALGARY PAGE.005

AUG-08-1994 20:10 FROM AMOCO PLAINS BUSINES UNIT TO DRILLING P.05

FULL MAKE-UP TORQUE

(CONDITION)
GRADE : API 5CT L80
COMPOUND: FRICTION FACTOR = 1.0

OD (in.)	NOMINAL WEIGHT (pounds)	OPTIMUM TORQUE (FT-LB)	
		REGULAR COUPLING	100% EFFICIENCY COUPLING
2-⅜	4.60	1,130	1,130
	5.10	1,310	1,310
	5.80	1,540	1,840
	6.20	1,500	1,600
	6.30	1,730	1,730
	7.30	2,180	2,180
2-⅞	6.40	1,890	1,890
	7.70	2,390	2,390
	8.60	2,750	2,750
	9.80	3,380	3,380
	10.70	3,880	3,880
3-½	7.70	2,360	2,360
	9.20	2,870	2,870
	10.20	3,220	3,220
	12.70	4,670	4,670
	13.70	5,230	5,230
	15.55	5,840	5,840
	16.80	6,180	6,180
4	9.60	2,930	2,930
	10.90	3,520	3,520
	13.00	4,500	4,500
	14.60	5,660	5,660
	16.60	6,640	6,640
4-½	10.50	3,210	3,290
	11.60	3,710	3,860
	12.60	4,120	4,240
	13.50	4,500	4,580
	15.10	5,580	5,585
	18.80	6,830	7,370
	21.60	7,800	8,760
	24.60	8,660	9,870
5	13.00	4,150	4,470
	15.00	5,160	5,380
	18.00	6,960	7,010
	20.30	8,130	8,230
	20.80	8,440	8,730
	21.40	8,760	9,160
	23.20	9,630	10,350
	24.10	10,080	10,990
5-½	15.50	5,260	5,570
	17.00	6,040	6,270
	20.00	7,860	7,880
	23.00	9,270	9,650
	26.80	10,740	11,670
6-⅝	20.00	6,550	7,570
	23.20	7,970	8,860
	24.00	8,750	9,590
	28.00	11,330	12,500
	32.00	14,880	15,020
	36.00	17,070	17,220

OD (in.)	NOMINAL WEIGHT (pounds)	OPTIMUM TORQUE (FT-LB)	
		REGULAR COUPLING	100% EFFICIENCY COUPLING
7	20.00	6,870	7,620
	23.00	8,370	9,140
	26.00	10,240	10,770
	29.00	12,770	12,890
	32.00	14,900	15,180
	35.00	16,860	17,390
	38.00	18,170	19,450
	41.00	19,830	21,860
	44.00	21,880	24,470
	46.00	22,890	26,890
	49.50	24,740	29,050
7-⅝	26.40	8,430	8,850
	29.70	10,380	11,710
	33.70	12,680	13,760
	35.80	14,220	16,090
	39.00	17,450	18,120
	42.80	20,480	20,660
	46.30	21,730	21,930
8-⅝	32.00	8,910	10,890
	36.00	11,080	12,880
	40.00	13,120	14,830
	44.00	15,260	16,400
	49.00	18,600	20,610
	52.00	21,630	22,110
9-⅝	36.00	9,230	11,030
	40.00	10,950	12,820
	43.50	12,620	14,140
	47.00	15,470	16,900
	53.50	18,900	19,780
	58.40	21,360	21,900
	59.40	22,680	24,150
	61.10	24,680	24,920
10-¼	40.50	8,960	19,810
	45.50	10,740	18,040
	51.00	12,720	20,900
	55.50	14,590	10,310
	60.70	18,680	12,250
	65.70	20,900	14,020
11-¼	47.00	8,660	15,640
	54.00	12,370	18,360
	60.00	15,680	21,230
	65.00	18,040	24,190
13-⅜	54.50	9,880	11,630
	61.00	12,180	13,810
	68.00	14,250	17,180
	72.00	15,700	16,890
	77.00	18,400	11,440
	80.70	19,790	13,590
	83.00	21,100	15,370
	86.00	23,120	16,880

NOTE: FIGURES SHOWN ARE FOR GENERAL GUIDANCE ONLY. PLEASE CONSULT WITH FOX TECHNICAL SUPPORT FOR FULL INFORMATION PRIOR TO RUNNING.

IMPORT TOOL CORPORATION LTD.

440, 910 - 7th Avenue S.W., Calgary, Alberta T2P 3N8
Bus: (403) 261-3032
Fax: (403) 263-4955

Edmonton
Bus: (403) 434-6406
Fax: (403) 434-8400

FACSIMILE TRANSMISSION

COVER SHEET

DATE: July 13/94

TOTAL # OF SHEETS 4 (INCLUDING COVER SHEET)

TO: Amoco fax # 233-6365
Attn Trevor Ironside

FROM: Peter Wells

COMMENTS: ① Item 1 & 2 is at least the best possible deal I am able to negotiate.

② Item 4 could be replaced by using a piece of casing & have us prep it & install valve/receiver assembly in Edmonton using your pipe.

③ We will be able to provide the service of Ray West again to run the liner and hope that his expertise will enable you to run our tools and service again.

④ The more lead time we can get the better.

Please call 261-3032 if you have any problems or questions regarding this transmission.

Thanks
Peter.

Awarded Based on Performance of last Job (A2)
July 11/94

IN BUSINESS SINCE 1952

QUOTATION

IMPORT TOOL CORPORATION LTD.

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Edmonton, Alberta T6E 0W8
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Fax (403) 434-6400

440 - 910 - 7 Avenue S.W.
Calgary, Alberta T2P 3N8
Phone (403) 261-3032
Fax (403) 263-4955

AMOCO CANADA
Attention: Trevor Ironside

July 13, 1994
Pointed Mountain A1
Liner Proposal

ITEM No.	QUANTITY	DESCRIPTION	PRICE EACH (CDN. $)	TOTAL

JOB DESCRIPTION

- A 114.3mm alloy liner is to be set inside 177.8mm 38.7 kg/m S00-95 casing and run out through a window into 156mm open hole. There will be a build section with a maximum 12°/30M build rate. The liner is to be set and cemented off bottom. The presence of 12% CO_2 and 0.75% H_2S dictate that a liner of 13-CR80 material be run. The operator requires the option of running a 127mm 22.3 kg/m LS-65 Sealoc HC tie-back string.

Intermediate: 177.8mm 38.7 kg/m S00-95
Liner: 114.3mm 18.23 kg/m 13-CR80 (FL4S/STL?) 3073M MD
Liner Length: 245M Hole Size: 156mm Build Rate: 12°/30M Max.

A. EQUIPMENT REQUIRED TO HANG LINER, PACKOFF ANNULUS AT LINER SHOE AND PERMIT CEMENTING OPERATIONS WHILE PROVIDING OPTION FOR FUTURE TIE-BACK

1.	127mm B.O.T. Type RH Setting Sleeve c/w 1.82M PBR Extension, 114.3mm Box Down, 146mm Extension OD, 133mm Extension ID, 13CR80 Material	ea.	12,245.00
2.	114.3mm X 177.8mm B.O.T. Type Flex-Lock RH Mechanical Set Liner Hanger	ea.	6,640.00
3.	114.3mm Davis Type 777HY Hydraulic Stage Collar, 13-Cr80 Material, FL4S Box X Pin	ea.	6,665.00
4.	114.3mm Davis Type 500 PVTS Combination Float Shoe/ Receiver, FL4S Box Up, 13CR80 Material	ea.	3,405.00
5.	114.3mm B.O.T. Type Liner Wiper Plug	ea.	460.00
6.	88.9mm B.O.T. Type Pumpdown Plug	ea.	270.00

SALES TAX-NOT INCLUDED

E. & O.E.

IMPORT TOOL CORPORATION LTD.

By _____

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Fax (403) 263-4955

AMOCO CANADA
Attention: Trevor Ironside

July 13, 1994
Pointed Mountain A1
Liner Proposal

ITEM No.	QUANTITY	DESCRIPTION	PRICE EACH DOLLARS	TOTAL

Note: 1. Amoco to provide sufficient casing material for installation of Flex-Lock hanger system. Prices for hanger does not include machining charges to prepare the body.
2. All prices F.O.B. Edmonton, Alberta and do not include G.S.T.
3. Delivery - 3 weeks from receipt of order.

B. SERVICE/RENTAL

1.	Import Tool Liner Operator	/day	580.00
2.	B.O.T. Type 2RH Setting Tool c/w PBR Type Retrievable Packoff System	/job	685.00
3.	HD Cement/Plug Loading Head c/w Plug Launch Indicator Sub	/job	540.00
4.	Kilometer Charges Edmonton to Location and Return	/km.	0.75

Note: 1. Per job rental prices for items 2 & 3 are for 3 day minimum charges. Rental charges after 3 day minimum are $75.00 and $55.00 per day respectively.

C. CENTRALIZATION

1.	114.3mm Davis Close Tolerance Bow Spring Centralizer for 156mm hole	ea.	42.50
2.	114.3mm Ray Solid Stop Collar c/w Set Screws	ea.	34.95
3.	114.3mm Ray Solid Spiral Rigid Centralizer for 156mm hole	ea.	169.00

SALES TAX-NOT INCLUDED

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AMOCO CANADA
Attention: Trevor Ironside

July 13, 1994
Pointed Mountain A1
Liner Proposal

ITEM No.	QUANTITY	DESCRIPTION	PRICE EACH DOLLARS	TOTAL

RUNNING PROCEDURE

1. Make up float/receiver shoe to pup joint (or full casing joint).
2. Make up inflatable casing packer to pup joint c/w shoe. Install a centralizer on the pup joint below the packer.
3. Make up hydraulic stage tool to packer.
4. Make up X joints of casing back to top liner assembly installing centralizers as required.
5. Pick up top liner assembly consisting of hanger, setting sleeve and tie-back extension and make up to top joint of liner. Note: Liner running tool will be stabbed up into top liner assembly in Import shop.
6. Run in well on drill pipe. When liner is at TD set the hanger by right hand rotation.
7. With the hanger set circulate a ball into the receiver/shoe to blank off the casing and inflate the packer. Continue pressuring up to open the hydraulic stage tool and establish circulation.
8. Proceed with cementing operations and close the stage tool by landing the liner wiper plug in the closing seat in the stage tool.
9. Job is now completed. Pull out of hole.

SALES TAX-NOT INCLUDED

E. & O.E.

IMPORT TOOL CORPORATION LTD.

By Peter Aiello
Peter Aiello

QUOTATION

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AMOCO CANADA
Attention: Trevor Ironside

July 13, 1994
Pointed Mountain A1
Liner Proposal

ITEM No.	QUANTITY	DESCRIPTION	PRICE EACH (CDN ARS)	TOTAL

JOB DESCRIPTION

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Liner Proposal

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