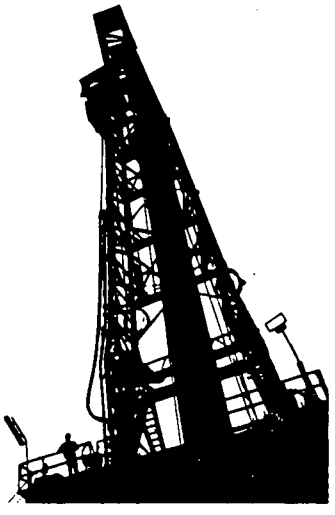
GL00505



Appendix S

First Flow Test Raw Field Data

FIRST FLOW TEST - "F" TYPE

SSSDP

12/28/85

13:24 Start flow test, open V-3 (blooie line valve)

13:40 Temp still below guage TI-2. Flow from blooie ~35 gpm
~80 psi

13:44 Trising ~5°C in 3 mins at TI-2

13:22 Initial well head pressure during logging ~160 psi

13:59 165°F at end of blooie (up ~30° in 20 mins)

14:13 74°C at end of blooie
170°C at end of blooie

14:20 Changing P guage at PI-SP1 (well head)

14:25 new PI - SPI guage, 100 psi max

14:20 173°F T at end of blooie

14:30 178°F T at end of blooie ~35 gpm

14:40 193°F blooie temp
99°C blooie temp

14:47 gpm at end of blooie is slowing down to ~20-25 gpm (est)

14:50 87°C at blooie

15:16 91°C at blooie

15:22 91°C at blooie

15:27 90°C at blooie flow rate ~15 gpm

15:42 Flow rate in general has been slowly dropping off out of blooie, 90.5°C at blooie

15:54 Otis N_2 trucks started rigging up

15:55 Rabb commended note/data taking and promised free meal

17:36 Just a trickle out of blooie pipe - Otis feeding out 1st 1000 ft of hose.

17:42 1500 ft, 250cfm N_2 will be pumped into well

17:57 Still pumping N_2 (~200 gpm)

17:59 82°C at blooie pipe

18:01 1st blast out of blooie
shut off N_2

18:15 Slow switching to spl. bypass - changing PI-SP1 guage back to 1,000 psi guage

18:22 OTIS POOH

18:27 Started coming out of brine pit blooie

18:29 Shut off cuttings pit blooie completely, all out across sheet. Menzies logging muffler area until flow stabilizes.

18:58 Switch to muffler with max flow - with 7" James tube.
Get some back pressure, can call enthalpy r_x out of well

19:38 Start to shut down flow from muffler and shift to brine pond blooie because of excessive foam in weir box
Also cause: water level in muffler is so high it's backing out of James tube

19:44 Muffler off, all brine pond blooie to clear muffler and weir of foam, etc.

19:50 Geothermax propose go back to rectangular design of weir and larger orofice of James tube

20:00 Otis and walden here to start rigging up Kuster P&T tube

20:10 ~90 percent steam by volume; estimate ~500,000 lb/hr bring steam being prop

20:26 Cancelled

Note: If cut flow back to ~100,000 lb, can fill pit in ~20 hrs

20:46 Well producing rx. obo by Bechtel mngr, WPT and DOE mngr and confirmed by S. Priest

20:59 Continue flow as is until weir fixed or decide to throttle back well. Don't want to throttle back because may wash out valve before flowtest is over

21:51 Opened muffler and running thru blooie and muffler to alleviate spray falling behind levy; reduced pressure on blooie

22:00 Welder here ~1 hr to change out weir. Take ~1 to 1-1/2 hr to change weir. After that we can go to spling ports. Well should be all cleaned out

22:12 Throttled on U-30 to cut back flow at pit end

22:17 Flow dying as throttled down but came back when opened valve again. ~260 psi - 410°F and tried to die.

22:35 Well dying off. PI-8 reads 215 psi. Start putting valve in DPR-1. Changed range -(0-200) on DPR-1

22:50 Well stabilized at throttled back conditions; all run out of muffler

23:08 Pinch down on throttling valve ~1/4 turn

23:45 Welder arrived and started setting up

12/29/86

00:33 Switching from muffler to blooie _____.
Welders working on Weir box

02:30 Exercised Strachman valve on PI-8
Conferred with Menzies and Harper re downhole flowing logs. T-P logs post sampling; get P buildup post shutdown.

02:47 15" rectangular weir, 5" orofice in James tube, 4 - 5" cut off baffle. Undulating baffle scientifically designed

03:27 Opening valve diverting to muffler

03:30 Flashing back from James tube (can't read PPR-1)

03:39 Opening valve U-13, gradually.
Flashing by muffler

03:43 Closing valve U-13

04:13 Not enough production to Weir box, diverted to Blooie line by U-20

04:24 Removing salt scale from James tube baffle.
5" orifice is plugging because of excess salt deposition.
Giving up on pressure measurements. (Menzies 0443) changed out orifice to 10" on James tube

05:22 Diverting back to muffler
Opening U-20

05:29 U-20 valve partially stuck
Still opening

05:31 Opening U-13 valve

05:37 PI1 surging 400-420 psi
Pressure surge in line

06:00 Valve U-13 almost shut
Too much pressure

06:54 Diverting to blooie
Brine flashing out of James tube
Contaminating ground

07:00 Kennecott sampling at SP2

07:16 Opening valve U-20

7:23 Close valve 13 1/4 turn

07:48 Preparing to divert to test loop

08:53 Opening U14 to sample ports
Closed valve, trapped fluid in line

08:15 Al Williams hook up to sampling port

08:21 Water loss backwash
5 gals, 35 seconds

08:22 Opening V14

08:30 Note: opening and closing valves gives apparent discrep in T's and P's

08:52 Pinch down on V14

09:07 Pressure guages on sampling line irrelevant

09:08 Bucket check in blockback from James tube
Run 1: 5 gals/38 secs
Run 2: 5 gals/39 secs
2" over weir os 1/2" at LT/B (dipstick)

09:09 Trying to drain out sampling loop to change orifice plates

12:34 Changing over to sampling side. Muffler off, all diverted to brine pit blooie

12:40 PI-11 5
P1-10 35

12:44 Shut in spl port side

12:40 Venting spl ports to clean out system. Not enough differential T on spl port side. Need to Δ orofice. Ti's on spl spool removed by Michels

13:23 Water level 1" below top of 1 x 1 hollow beam in weir box.
Running 400-450 lb now.
Add 1" to weir box readings now that rectangular opening is installed

13:50 Opening UI-14 (spl port side) slightly. Opening spl side again.
Muffler still off - changing James tube area

14:16 All flow thru spl port side but it's throttled back due to orofice plate capacities

14:30 Otis back and setting up.
Trusdale setting up gas coils on spl port apparatus

14:57 Testing spl ports and setting up. Otis nearly rigged up for down hole Kuster PT run

15:23 Est 244,000 ppm dissolved solids with higher than average (~5%) CO_2 contents. DIfferent combination than adj wells. Still changing output muffler area. 2-3" salt buildup inside 10" pipe

15:30 1st spl coming out

15:46 Talk with Otis on schedule of events:
Spling over ~7p.
Otis run in stopping every 500' after 1000' for 10 min each to 6000' for 20 min then back up to 4000' for 20 min
~140,000 lb flow (as is now for spling)
Full flow rate ~4 hrs
Spling again
60 in a 2nd time for shift in and TP
Run inst. TP in
Shut well in
Run fluid samples - WRD hoist

16:50 Active spling still, well holding very steady.
Started taking tempo at spl ports with Michels hand-held thermometer.
Still working on James tube area.

17:28 Active spling still
Welding new piece at James tube
Well holding steady

17:50 Muffler reassembled
Depth of weir 17" from top.
Nut on sight glass 18-5/8" from top
(1-5/8" to get weir height)
Measuring bar ~ 15-13/16" from top
Weir length 15"
End pipe (James tube) diam 9"/16"
TD of weir = 3'

20:07 Fluid and gas splers all done and leaving site.
Otis and Kuster tools being assembled.

20:33 Otis still trying to get bad dewar threaded.

20:37 Tools together and getting ready to go into hole

21:05 Steam blowing out from subfloor - leaky flange just up from master valve (WH-2). Kuster just ready to drop in hole

21:15 Shut in to fix valve. Retightening nuts. If still leaks, then, this may be it!

21:39 Rigging up kill lines in case they are needed.

21:40 Bleeding off Pi-SP1 to connect kill line there.

21:53 Summary - Seal above master valve gave so closed master valve, then seal below master valve gave. Tried to attach kill lines at Pi-SP1 but it won't seat on that valve. So need to get Otis off rig floor and rig kill lines on rig floor so can shut down up there if needed.

22:33 Conf room meeting
Problems:
1) Gasket above - master valve
2) Gasket below - master valve
3) Kill line valve
Options:
1) Abort flow test, downhole logging, and fluid spling
2) Kill and repair problems, restart flow test

22:35 ~325,000 gal in brine pond now.
Pump can pull down to 1' level ..
~160,000 gal can be pumped (reinj.)

<u>Timing if restart flow test:</u>
Kill well = ~12 hrs
Replace gaskets = 2 days
Kickoff = 1 day
Flow = 2 days (to get where we were tonight)
Kill, reinj, rig BOP = 2 days

<u>Timing if abort flow and go to drilling</u>
Kill = ~12 hrs
Replace gaskets = 2 days
Drill

23:48 Master valve Pi-SP1 will take kill line now and its being hiked up. Add turnbuckles to xmas tree to hold tree up.

Conclusion: When kill line hooked up, close wing valve, and test gaskets for further leaking. If don't leak, start slow flow and keep tightening nuts and watch for leak as flow increases. If leaks, then kill with drilling mud and abort rest of flow test. Flow to mud pit to watch for buildup better. Otis sent home and on call.

12/30/85

01:13 Opening master valve
Getting steam at bring pit
Master valve wide open
V-14 set same as earlier today
Turnbuckles set on well head.

01:30 Well appears to be coming up.
T & P are increasing
Xmas tree not leaking now

01:55 Tightening tree area

02:15 Well steadily picking up pressure and temperature

03:20 Start diverting to muffler
Pi-11 scaled over, no readings from it
Pi-9: read 1-1/2 when should have been 0 on guage

03:28 All diverted on muffler

03:30 Diverted from Spool line to bypass

04:29 1/4 turn on V-13
Slowly opening valve

04:25 V-13 wide open
5 min readings taken near muffler

05:15 Sludge near top of water surface Weir box may affect calculations

05:48 Flow pressure tapping scaled near muffler.
Kennecott sampling SP-1

05:58 Opening valves on sampling ports

06:13 Throttling back V-13

06:34 Pinched down V-13
Pressure 300 → 310 psi
Opened up again to get flow back

06:45 PI-8 surging
250 → 300 psi

07:00 Changed out gauges on PI-1 and PI-8.
(PI-8 has been reading about 10 psi too high)

07:43 Opening U-14
Don Michels reports 1.230 density, 97°C
Sample from Weir box

09:11 Preparing to sample
Well surging
Has calmed, not steady

11:40 Kenncott sampling SP-1

12:43 Still spling at ports.
Assembly of Kuster tools.

13:50 Kuster running in hole

14:17 Weir box full of salts. Readings may not be too reliable.
Pi-9 may not be working right.
Very low, if anything, registering.

15:20 Otis running in hole
Science spling pretty much done.

15:43 Estimate by Al Williams:

344,000 ppm TDS preflash _____
35-38% - flash %
-370,000 ppm TDS at weir

Maxi flow = 370,000 lb/hr brine out of weir

16:52 Putting 1,000 lb guage (P) at lubricator so we can get shut in pressures. Guage came from Pi-SP2 (Kennecott port)

16:58 Ti-6 blew out so divert flow to bypass spl side.
Valves to close off spl side aren't seating totally, so spl line won't bleed off.

17:28 Start shut in

17:31 Finish shut in, Kuster P&T in hole

18:40 Well head 375 psi

18:58 Well head 340 psi

19:35 Well head 60 psi

20:08 Well head 0 psi

23:20 Otis started POOH, with Kuster P/T

12/31/85

00:20 Tool hung in master valve assembly

01:00 Tool in lubricator

01:50 Kuster temp out

01:55 Kuster pressure out

02:00 Rig Hodges

04:00 Hodges (fluid sample) start down hole

04:45 On bottom, sampler won't open due to resistance probably in cable head

07:05 Tool out, no sample

07:30 Service cable head

09:20 Run in hole with second Hodges sample try

~11:15 Out of hole

16:04 Downhole spler went in hole

19:30 Tool out of hole. Orofice plugging with salt from brine flashing upon entry into evacuated spl tube .·. some gas and very light ug which could be only condensate. Decided to adjust spl container and run a 2nd time.

20:00 Abort 2nd downhole spl run. Initiate reinjection.

23:00 Start pumping ~600 gpm into well, reinjecting brine, and adding 35 lbs of sulfur hexaflourine to reinjected brine for a tracer.

<u>1/1/86</u>

END LOG 10:00

Still Pumping