GLO2562-4

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Raft River Committee Meeting 12 May 79

Here: Mink, Goldman, Stiger, Delance, Mckey, Keys, Paul Williams, Belo , Charles Morse

Not Here : Hank Ramey; Freeze, Leer

Washington Meeting Report -

WDC group had thought that wells had limited production capability. However, the limit is the pump - lift, size pump dependant on casing size 9 5/8" - etc.. By changing pumps, could get ~4000 gpm - we are still injection limited - also have to inject deep because of 6 ppm Fluorine, which is 4 ppm above max state standards. -

13 3/8" case		high temp 290°F	9 5/8" 270°F	injection		total pumping
#1	#2	#3	#5	#6	#7	power to do
1500	920	750	750	1350	550	this = 1.6-1.7 MW out of a 5 MW plant.

If #1 goes down, can't run plant

need 2250 gpm plant + 200 gpm archeap
+ 300 for elect-experiments + 400 non electric experiments
= 3150 gpm

Can Inject : 2700 gpm limit on injection side is max well head pressure of 600 psi -

Washington has said "no more production wells" - so they are looking @ trying to get larger pumps; Cliff MacFarland is trying to get them a larger vandle pump -- could run #1 @ 1/2 prod if could

get Conger, variable speed pump - second new well FY 81.

Terra Tek - they prob will do acid proc on #7, then follow it with the same on ___? DOE thinks that #6 has cleaned stuff up -- ~~at~~ injectability seems to get better with each test.

#6 - at first had ~150 psi skin effects - Since then have cleaned well, and have done series of 72 hr tests and then a 21 day test (injection) - conclude only 10 psi skin effect. Borehole seems to be enlarging, bottom of hole accumulating crud. - when put in (hot warm) water, #6 is a good well -- they will also try cold water again. -- they are getting filters to go micron size of solids in - They have not seen any plugging -- they are happy about injection tests -

In all wells in basin, there is a thief zone @ 1,200' - 1,800' : 1,400 - 1,600 is best part this zone -

All current stuff suggests previous data not good on skin effects. -

So have decided to have Terra Tek concentrate on #7, at least until after impending 21-day injection test.

#6 is cased to 1700' #6 to 2040'. In #6 1/2 flow goes into first 100' below pipe. So difference between 6 & 7 may be casing instead.

#7 from initial tests appears no skin damage, but simply poor well, whereas #6 was identified as skin damage early on. However, conclusions on #7 are from preliminary, low quality data.

Objective of Case Study Review Group - to investigate mud temp, log data geothermal resource, using R River as a model. Review group will 1) aid EG&G/DOE in identifying new data needed 2) publish a geoscience model, 3) recommend other similar places where model applies — — Funds will go till end FY79, but committee will go on till about end calendar 1979. We will have to do new survey work, major expenditures in FY79, while $ are avail.

SEISMIC REFLECTION - Ackerman will handle -- Marshall Reed says it is out to USGS -
- about DOE #GOK - ases put in that #GOK
- what will be done (?) -- will be a contract -
- told him to have Hans call Ted & Leon re Ted's work etc.
- velocity profiles in wells (?) none that get -
- plans were for two cross lines and one longitudinal line --

~~FRACTURE IDENTIFICATION~~

RESERVOIR MODELING - plan had been joint project w/ Jim Mercer, USGS/Reston - Mercer has been too busy to do anything -- has perhaps lost interest --
This will probably have to be contracted now or done in house - The model is finite difference, 2-D, permeability model. -- He was going to come up w/ 3 layer case model to predict reservoir parameters. -- Wairakei model
Current tests would suggest that a fracture type model must be looked at.
Conclusion: 1) go to Mercer and his boss to see what he can do. If no interest, 2) try to get something done in other ways.

RGI has done recent work and have been able to get fracture reservoir model, wellbore model, etc.

S3
CBC
INTERCOMP
} all have different models, which Charles has used -

X-RAY WORK AT BOISE STATE - Still in contract writing stage -- contract is thru -- they need more samples -- have completed all x-ray except #7. They will do #7 and interpret all data. Jim Sanders -

PETROG ANALYSIS - Idaho Bur Mines Geol -- report expected June

How were samples selected (?) wells 1 & 2, clay & helped in selection, but no one knows criteria after that -

Paul Williams - Steve Bressler of USGS has been able to correlate in Inter #1 hole and get nice magnetic reversals --

Estimated accumulate rate 550 ft / million years, which gives basin age of 10 my (using known thickness), which correlates with 8-9 my of volcanic rocks.

HC logs this as a unconformity (?)

Jim Scott USGS is developing borehole magnetometer for magnetic reversals & dynamic expansion

Paul - asked about trenching to map soil profiles for directions of fault movement

HARRY
COVINGTON'S WORK - has been getting data on slope -- magnetics would help (it looks like)

Don M. will get a consultant out of Mauny Walters area when thermal gradient stuff will be out

RAFT RIVER TEST SCHEDULE -

RGI - it will take them 16 days @ 12 hrs/day from start to begin of test + - + 40 days per well - so they need 40 total days per well -- they need 14 days of flow per well for post stim. test.

Scott Keys would like to see televiewer during stimulation/frac. test -- idea sort of shot down -

16 days for stimulation
10 rig for test
14 test
40

RGI's costs: open hole packer $1,801C
cemented liner $2,10C

#5

A) extend out 2000' etc. -- long lateral & shot fracture -- 1000' host 10C 66/5
B) frac 500' inbound, penny thrust each, up & down - 500' host 250 Mlbs vertical

	A (large)	B (small)
RRGP5		
w/ liner	$276K	$211K
w/ open hole packers	$252K	$185K
RRGP4		
w/ liner	$272K	$206K
w/ open hole packer	$247K	$180K

Larger frac requires more polymer and fluid -

- would use 100 mesh sand to close small fracs, get big frac going, follow w/ polymer + 16/30 sand to extend frac, while keeping subsidiary fracs sealed - then follow w/ 16-40 sand, then cap off last bit w/ plastic coated sand that goes in and solidifies to keep sand from flowing back at design production - then wait 12 hrs, clean hole out and test -

"Super Sand"

Televiewer - shows in #5 a large, open fracture 4548 - 4560. On order of 8' wide -

#4 - very few open fracs -- some tight ones - bids dip to NE ± 20 - 40°. Drilling induced vertical fracs

9,840' step frac. 9,860' E-W frac - vertical fracs ≈ 5000 - 5030.

Few more tight fracs just above bottom of hole -

4150', 4365' opening along bdc -

4697 is a "bed" - cored across this contact w/ basement

Pre-stimulation Questions: what 200' interval in each hole would be preferable for packing off? - How far should we try to extend the fractures?

There will be a meeting about week of 29th May for discussion of logs & data on #4 for purpose of answering above questions. Meet in Denver. -

- Scott Keys - x-spec analysis - being done -
- chemical work Tony Allen is doing
- paleomag - will only do interval with both holes because that is all we have complete core for -- work is done in Flagstaff -
- Truesdell has done water work - Kathy will contact him on this

⇒ Paul - get an ESL person going on description of #4 hole core -- 16' total core - interface w/ Henry Covington USGS on descriptions, etc.

⇒ next meeting 10 August at the Raft River Site.

Stigers - Injection into Thief Zone -

Just to north of #6 there is a monitor well which tracked the test of #6 closely. It is in the thief zone.

5 MW plant ejects @ 100 psi. Injection pumps are 600 psi, but could save $ on cost of these pumps by drilling 1-4 shallow wells into this thief zone and using lower pressure pumps.