

WELL CONSTRUCTION SUMMARY

LOCATION or COORDS: Railroad V.
T3N, R52E, Sec 2, 2 1/2, SE 1/4

ELEVATION: GROUND LEVEL ≈ 5000'
 TOP OF CASING 1.5' above surface

DRILLING SUMMARY:

TOTAL DEPTH 484' (Filled with cuttings to 475')
 BOREHOLE DIAMETER 9 7/8" pilot; 24" - 0-40'; 16" - 40-475'
 DRILLER Randy Tolman, Mike Keele, Carroll Johnson
 RIG Ingersoll-Rand T4
 BIT(S) 9 7/8" milltooth; 16" reaming milltooth; 24" reaming milltooth
 DRILLING FLUID Bentonite mud
 SURFACE CASING 22" OD 0-39'

WELL DESIGN:

BASIS: GEOLOGIC LOG GEOPHYSICAL LOG
 CASING STRING(S): C=CASING S=SCREEN

+1	- 39	C	-	-
+1.5	- 302	C	-	-
302	- 382.4	S	-	-
382.4	- 403.7	C	-	-
403.7	- 443.9	S	-	-
443.9	- 461.6	C	-	-

CASING: C1 All casing 10" ID .365
 C2 _____
 C3 _____
 C4 _____
 SCREEN: S1 All screen 10" ID 60 mesh
 S2 _____
 S3 _____
 S4 _____

CENTRALIZERS 103'; 180'; 294'; 385' from TOC

FILTER MATERIAL 8-12 sand - 270' - TD;
pea gravel 40' - 247'

CEMENT 0 - 40'; 247 - 270'
≈ 1011 cement; bentonite

OTHER 2" ID sounding well welded on outside of 10" ID casing 0 - 450'

CONSTRUCTION TIME LOG:

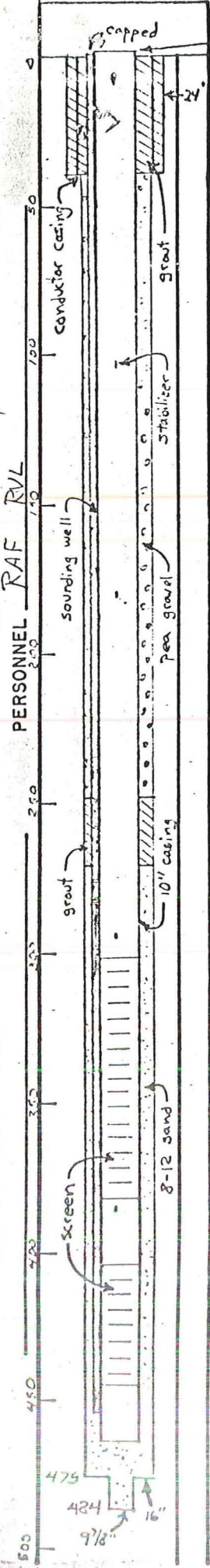
TASK	START		FINISH	
	DATE	TIME	DATE	TIME
DRILLING:				
<u>9 7/8" pilot</u>	<u>8/1/80</u>	<u>1200</u>	<u>8/3/80</u>	<u>0700</u>
<u>24" ream</u>	<u>8/5/80</u>	<u>0600</u>	<u>8/5/80</u>	<u>11:0</u>
<u>16" ream</u>	<u>8/4/80</u>	<u>1000</u>	<u>8/10/80</u>	<u>220</u>
GEOPHYS. LOGGING:	<u>8/3/80</u>	<u>1115</u>	<u>8/3/80</u>	<u>220</u>
CASING:				
<u>22" conductor</u>	<u>8/5/80</u>	<u>1400</u>	<u>8/5/80</u>	<u>1600</u>
<u>10" ID</u>	<u>8/10/80</u>	<u>1200</u>	<u>8/11/80</u>	<u>2200</u>
<u>1 1/2" trawie</u>	<u>8/11/80</u>	<u>2200</u>	<u>8/11/80</u>	<u>2245</u>
FILTER PLACEMENT:	<u>8/12/80</u>	<u>0945</u>	<u>8/12/80</u>	<u>2200</u>
CEMENTING:	<u>8/13/80</u>	<u>0045</u>	<u>8/13/80</u>	<u>0145</u>
DEVELOPMENT:	<u>8/13/80</u>	<u>1000</u>	<u>8/13/80</u>	<u>2145</u>
OTHER:				
<u>conductor grout</u>	<u>8/5/80</u>	<u>1900</u>	<u>8/5/80</u>	<u>2015</u>
<u>8 yd³ pea gravel</u>	<u>8/12/80</u>	<u>2130</u>	<u>8/12/80</u>	<u>2200</u>

WELL DEVELOPMENT

Well airlifted from bottom. Each section of screen surged and airlifted @ 15 min intervals for 7 hrs. Top of screen then airlifted for 2.75 hrs. Water slightly turbid with minor sand @ termination $Q \approx 50-60$ gpm $T = 21.5^\circ C$

COMMENTS:

conductor casing dimensions 40' 22" OD .25" wall



LOG OF BOREHOLE

BOREHOLE RR-5-T-1
PAGE 1 OF 4

LOC. or COORDS. T3N, R52E,
Section 2, SE 1/4, SE 1/4
GROUND ELEV. 492
TOTAL DEPTH _____
BOREHOLE DIAM. 9 7/8"

DRILLER Randy Tolman
R-B Drilling
RIG Ingersoll Rand 2500
BIT(S) 9 7/8" rock tricone
FLUID Bentonite mud

START DATE 8-1-80 FINISH _____
TIME 1150
GEOPHYS. LOG YES NO
HOW LEFT _____

LOCATION Valley
RAJ / RVL
LOGGED BY

DEPTH	PENE. RATE	CIRC. RET. LOS.	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
0'						Valley fill composed of interbedded sands, gravels, and clays. Sands and gravels consist of multicolored angular fragments and rounded grains of volcanic debris. Volcanic debris derived from basaltic and probably andesitic flows and tuffs. Colors include black, gray, white, and brown as well as rust, pink, and green. Clays evidenced by tan balls containing some sands and silts. Intermittent calcareous material present but barely detectable.
	30 ft/hr					
20	37.5	8 min	37.5			
	50 ft/hr					
40	24 ft/hr		31.5			
	428					
60	36				gravel	
	50					
	37.5					
	33.3					
80	37.5					
	50					
	100					
	37.5					
100	43					
	60					
	43					
	25					
120	50				gravel	
	37.5					
	333				Clay balls starting to appear	
	333				Not many cuttings - mud thinning	
	37.5					
	60				gravel - sand	
	23					
	30					
160						

PROJECT 243-80

LOG BOREHOLE

BOREHOLE RR-S-T-1
PAGE 2 OF 4

LOC. or COORDS. <u>T3N, R52E,</u> <u>Section 2, E1/2, SE1/4</u> GROUND ELEV. _____ TOTAL DEPTH <u>492</u> BOREHOLE DIAM. <u>9 7/8"</u>	DRILLER <u>Randy Tolman</u> <u>R-B Drilling</u> RIG <u>Ingersoll-Rand 2500</u> BIT(S) <u>9 7/8" rock tricone</u> FLUID <u>bentonite mud</u>	START _____ FINISH _____ DATE _____ TIME _____ GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO HOW LEFT _____
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LOCATION NGAINWOOD
 LOGGED BY RAF/RVL

DEPTH	PENE. RATE	CIRC. RET. LOS.	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
160	25					Sandy gravel
2217	30					Valley fill composed of interbedded sands, gravels, and clays. Sands and gravels consist of multicolored angular fragments and round grains of volcanic debris. Volcanic debris derived from basaltic and probably andesitic flows and tuffs. Colors include black, gray, white, and brown as well as rust, pink and green. Clays evidenced by tan balls containing some sand and silt. Intermittent calcareous material but barely detectable.
2222	37.5					
2233	37.5					
2247	42.8					
2256	25					
2264	33					
2277	33					
2282	21.4					
2297	16					
2307	15.8					
2315	25					
2328	12					
2332	16.7					
2337	17.6					
2347	20.0					
2358	20.0					
2368	18.7				Small gravel + sand	
2377	15.8					
2387	15.0					
2397	13.0					
2408	23					
2421	17.6					
2438	18.8				Tan clay	
2454	16.7					
2472	11.5					
2487	15.9				Fine gravel small clay particles	
2500	15.0					
2518	13.6					
2537	20.0					
2558	37.5					
2577						
2597						
2615						
2628						
2647						
2668						
2687						
2708						
2728						
2747						

LOG OF BOREHOLE

BOREHOLE KK-5-1-1
PAGE 3 OF 4

LOC. or COORDS. <u>T2N, R52E, Section 2, E 1/2, SE 1/4</u>	DRILLER <u>Randy Tolman R E B Drilling</u>	START _____	FINISH _____
GROUND ELEV. _____	RIG <u>Jurgersoll Band 2500</u>	DATE _____	TIME _____
TOTAL DEPTH <u>492</u>	BIT(S) <u>9 7/8" rock trievor</u>	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
BOREHOLE DIAM. <u>9 7/8"</u>	FLUID <u>Bentonite Mud</u>	HOW LEFT _____	

LOCATION RAILROAD Valley
 LOGGED BY RAFI RVL
 PROJECT 272-60

DEPTH	PENE RATE	CIRC RET LOS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
320 1736	15.0					
1756	2.0					
1811	18.7					
1827	13.6					
340 1842	13.4					Some amount of Clay About 1/4 inch diameter balls I would say about 10% of sample.
* 1904	12.0					
1910	8.6					higher drilling rate also due to increase in return clay
1935	30					very little return - appears to be fine material
2010	30					
360 2030	25					
2030	21.4					
2042	15.8					Valley fill composed of interbedded sands, gravels, and clays. Sand and gravel consist of multicolored angular fragments and rounded grains of volcanic debris. Volcanic debris derived from basaltic and probably andesitic flows and tuffs. Colors include black, gray, white, and brown as well as rust, pink and green. Clay evidenced by tan balls containing small and intermittent calcareous material barely detectable.
2048	15.8					
2054	4					
2205	25					
2211	27.3					
2217	21.4					
400 2243	21.4					Small gravel w/ large amounts of sand.
2243	21.4					
2254	20.0					
2315	14.3					
2321	10.0					
2327	13.0					
440 0111	21.4					Small gravel and sand layers.
0134	18.7					
* 0140	20.0					
0154	20.0					
0210	15.0					
460 0225	8.6					Sand + gravel most of it small particles. Similar lithology in the last 50 ft.
0225	6.7					
0240						
0301						
0335						Drill rate low due to mud pump problems.
480 0420						

LOG OF BOREHOLE

BOREHOLE KK-5-1
PAGE 4 OF 4

LOC. or COORDS. <u>T2N, R52E</u> <u>Section 2, E 1/2, SE 1/4</u>	DRILLER <u>Pandy Tolman</u> <u>P. B. Drilling</u>	START _____	FINISH <u>8/3/80</u>
GROUND ELEV. _____	RIG <u>Jagersoll-Rand 2500</u>	DATE _____	TIME <u>0430</u>
TOTAL DEPTH <u>492</u>	BIT(S) <u>9 7/8" rock tricone</u>	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	HOW LEFT _____
BOREHOLE DIAM. <u>9 7/8"</u>	FLUID <u>Bentonite Mud</u>		

DEPTH	PENE. RATE	CIRC. RET. LOSS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
480	0420					Very small gravel + sand. Hard any broken cobbles.
	20.0					
485	8.6					
510						Valley fill composed of interbedded sands, gravels, & clays. Sands and gravels consist of multicolored angular fragmented & rounded grains of volcanic debris. Volcanic debris derived from basaltic & probably andesitic flows & tuffs. Colors include black, grey, white, & brown as well as rust, pink, & green. Clays evidenced by tan balls containing some sand & silt. Intermittant calcareous material but barely detectable.
500						
520						

LOCATION _____
 LOGGED BY RAF/RVL

PROJECT 612-00