APPENDIX E.1

Geologist Field Notes

CONTENTS

PAGE NO.	REFERENCE	DATE

7/10/00 MONDAY

13:30 Arrive at OK City Airport
15:30 Arrive in Altus OK.
16:00 Meet with Rodney for site orientation and equipment check

PWA
7/10/00

Phil Hammons

7/11/00 Tuesday

0800 Meet w/ Rodney Hickmon for Bottle count and supply organization.

09:45 Go to Ace to buy field supplies
11:00 Arrive on-site at AMS No. 7
11:15 Baker Tank arrives with two roll offs, tarp covered

11:50 Complete of load of bins
12:15 Ayon Chemical Can arrives w/ portable toilet.

12:30 Ayon leaves

12:50 Finish Recong site
13:00 Leave for Altus
13:30 Arrive back at Altus for move shopping

15:40 Meet w/ Rodney to discuss sampling protocols.

[signature]

7/12/00 Wednsday

0800 Meet Rodney to Prefill out COCs, Sample Collection logs and sample labels.

0900 Lining truck tailgates w/ Plastic Sheeting
10:10 Run to Walmart for ice
10:30 Leave for site
11:00 Arrive at AMS No. 7
11:05 Prime Equipment Rental arrives w/ Bobcat for Drillers
11:20 Prime E. leaves site
11:45 Houzon drilling shows up
Mike Sever, Superintendent
Richard Reherman, Driller
Barry ~~Ga Bettm~~ Beeman, helper
two support vehicles w/ Harlen

12:10 begin Decon Pad construction
12:30 Roy Wedell Sup.
Gabe Perez driller
Tommy Jordon helper
Peter Bill Lucus helper
Joe Rodriguez hel.

Peterson Drilling, Amarillo, TX.

1315 H&S Briefing and Tailgate Mtg

1350 Begin initial hole to set mud pit Driller "Gabe Perez

0-2' Sand w/ some silt, light brown 5YR 5/6, fine grained, poorly graded 15% silt, trace soft caliche nodules, SM

20' Sand w/ some silt as above
30' as above
36-40' as above w/ Caliche layers
60' - Sand medium grained w/ clay clasts and caliche nodules
80' - as above
84' - TOB
Sandstone, mod reddish brown 10R 4/6, fine grained.

~~15~~ pmn 15:31 Finish coring 5' into bedrock 88'-93'

88'-93' 5/5'
Sandstone, mod reddish brown 10R 4/6, v. fine gr. Prominent low angle crosshedding, hard fractures at 6" spacing.
pmd

~~1550~~ pmn 16:10 lay mast down on rig, for the day will ream and set casing tommarrow Morning

16:40 Leave site for the day
17:15 at Hotel

Pmd
7/12/00

6 7/13/00 AMS No. 7

0704 Arrive on site

Peterson Rig to set Casing to isolate Seymour Aquifer is a Gardner-Denver 1500, Driller - Gabe Perez

07:30 begin reaming pilot hole w/ 12" tricone bit. Original pilot hole drilled w/ 4 1/4" tricone

0800 Reamed to 55'
0825 Reamed to 80'
0835 Carol Weis arrived onsite
0843 Carol decided that 230' is max depth to core on BH-09
Carol 918 669-7519 direct
0910 T.D. at 98' reaming
~~0920~~ pmh 7/13/00
0930 finish Cleaning out borehole w/ fresh water
0945 welding wings on casing as centralizers
10:00 finish Welding wings on casing
0955 Water downed grass beneath welding to prevent fire

Paul Hamm

7/13/00 7

11:30 45' of casing in the ground and the casing ~~is stuck~~ has hit a hard spot. The hole appears to have sluffed in to about 45' bgs.
11:45 Drillers advance casing to about 50' bgs but will go no further, will have to come out of hole w/ casing and ream hole again. This time drillers will mud up.
12:00 Break for lunch
13:00 Back at site
13:40 Drill crew shows up. Bill ~~tank~~ pmh takes water truck to refill. We are still awaiting Roy who is looking for supplies including a lanyard.
14:15 Roy back onsite
14:30 begin coming out of hole w/ casing
14:50 All casing out of hole
16:10 Hole has been mudded up sufficiently and now tripping out of hole.

Paul Hamm

8 7/13/00

16:50 Tripping into hole w/ Casing. Bottom of casing sitted at 91' bgs (7' into bedrock).

17:30 All casing in the hole

17:40 Shut down due to thunderstorms

18:10 Resume work, placing tremie pipe in hole.

19:00 Leave site for the day

PMA
7/13/00

7/14/00 AMS No. 7 EST 9

0700 Arrive at Site

Weather

Temp high 102
low 70
Wind 5-10 mph

0710 Safety Mtg

0720 Going down hole w/ tremie pipe took collars off pipe to allow better access down annulus

0810 95' of tremie down hole, bottom at 89' bgs

0815 Placed 3 bags of bentonite chips in casing to prevent cement from coming up the casing

0830 Grout mixture (45g hopper)
25 gallon water
3 bags portland
6% bentonite

0920 5 batches of grout in hole.

10:30 Grout to surface 36 bags of grout 12 batches.

10:50 Isolation casing cut at surface

11:45 Return and Horizon Remove Site Cleanup

11:50 Sampling SS-08
12:20 Finish sampling SS-09
12:30 Leave site to pack samples
13:10 Packing samples at Hotel
14:00 Drop off Samples at Felex Crop.
14:15 Doing paper work and Reports
15:15 Finish for the day

Phil H
7/17/00

Phil Hammons

7/17/00 Monday

0700 Meet Rodney H. to collect bottles/ice for Rinsate and surface soil samples.
0800 at AMS No. 7. start sampling surface soils at SS10
1030 Complete surface soils sampling SS10, 05, 06, 07, 06EB
11:00 Jerry Pioneer shows up w/ Reagent grade water and coolers
11:35 Dullers show up - Richard Lehermon
12:00 Support truck shows up w/ Alan Brantley (supervisor) Wes Dawson (helper)
12:30 Begin Backing Rig
12:40 Setting up on BH 09.
11:50 Rodney leaves to shuttle samples to Fedex and fax COCs to Ellen
13:25 Allan calls Pump Rental and Pump well not be in until tommarrow so we well start on shallow holes BH-07
13:50 Setting up at BH-07
14:50 Rodney shows up w/ bottles
15:00 Start bailing w/ HSA at BH-07

Phil Hammons

 7/17/00

16:00

17:40 at 50-55' run, core barrell gets stuck in augers.

18:10 Can not get core barrel unstuck. Start Pulling all augers and rods

19:00 Leave site for the day all Augers out of hole

7/17/00

Paul Hammons

7/18/00

0700 Onsite at ams No. 7

0705 Measure Water level in open hole 11.3' bgs.

Jim Watkins - new hand for Horizon

725 Tailgate Mtg

735 going down hole w/ augers

Lithologic logging

Name (USCS code), color, grain size sorting, silt/clay %, gravel %, other

0845 Cable jumped off winch, have to lay derrick down to fix.

0745 Drilled from 55 to 65' w/o sampling. from 65' to TD will sample with 2' spoon (2" Diam) thru auger catcher. Rig uses down hole hammer on wire line:

0937 Up and running sampling from 65-67'

0955 Sampled from 67-69' then augered ahead to 69' bgs

Paul Hammons

7/18/00

69-71'

73-75' Stuck sampler in augers

11 45 Allan shows up w/ new cables for wench - Drillers putting it on

12:00 Sampling surface soil at BH06 and BH08.

12:15 Break for lunch

12:45 Back to Work

13:00 Tripping in hole w/ tricone and rod to drill out sand in augers

13:20 Weigh daily out sand.

14:10 Sampled from 75-79' at 2' intervals

14:15 Sand in augers again

14:30 Ran augers down to bedrock at 85.5' bgs and then washed augers out.

PMH 7/18/00

1550 Make run w/ 5' barrel from 83-87' to collect last sample of sand above bedrock

16:00 Core barrel is locked in sand so will pull augers and rods together

16:25 20' of auger out of hole

16:50 45' of augers out of hole

17:20 All augers out of hole

17:40 Collected sample of SS at 85'

Phil Hammer

7/18/00

17:50 Drillers set up on next hole BH-09

18:00 Flushing mud out of casing

18:15 100 gallons of mud flushed out of hole

18:30 Leave site for the day

7573

PMH 7/18/00

Phil Hammer

7/19/00

06:30 Onsite at AMS No. 7
06:50 H&S Mtg
07:00 Getting ready to pump mud out of hole
0740 Pipe down to 91' bgs and starting to core.
0805 Drill thru grouting casing to 98' bottom of reamed hole
0830 Core from 98'-108'
Excess water is coming out of hole while coring - looks like isolation casing did not seal off upper seymour aquifer.
0840 Core out of barrel - silty sandstone and sandy siltstone. dry.
Water in hole is coming from upper aquifer
0850 Shut down to discuss problem
0930 decide to abandon hole and reset isolation casing.
0940 Coming out of hole w/ pipe
Mike was called by Allan and informed of casing problem. Mike will call Allan Peterson drilling.

7/19/00

10:30 mobbed and set up at BH07 to install well, will install well in new hole 7' feet north of borehole since BH caved in to 10' below g.s.
1050 begin augering to install MW07 in new hole
11:25 begin setting MW07
11:30 Sanding hole
12:00 leave for Altus to fax lithologic log to Mike Sever
12:40 On way back to site, phone call w/ Mike Sever. Mike proposes we Cement bond log the casing at BH-09 to determine seal. If seal is bad there is no cost to MK. If seal is good MK pays for it $650. 350 logging 300 mob
13:10 back onsite
13:50 Start drilling at BH06
16:10 T.D into weathered bedrock at ~~80~~ 79'
16:15 Collect last sample S-76
16:35 Auger out of hole and at decon pad.
16:45 Leave site for the day

Paul Hammons

7/19/00

1310 Called Jerry Pioneer to inform on Mike Severs Proposal. Jerry concurs with proposal and instructed to go ahead w/ scheduling logger.

18:00 Logger is scheduled to arrive Thursday (7/20) at about 9:00am

PMH
~~7/20/00~~ PMH
7/19/00

Emil Hammers

7/20/00

0600 Packing Samples for Fedex Drop off

0715 arrive onsite

0730 H&S Mtg

0740 move about 7' north to install MW02

0830 Logger out of Wichita Falls shows up (Master Wireline Services, Inc.)

10:00 Start running cement bond log at BH09

11:00 Break for lunch

11:35 Setting up at BH-08 to drill

12:00 Start augering at BH-08

~~16:20~~ PMH 7/20/00

10:30 Logging complete and Logger printing copies. Bond log shows good cement bond from surface to ≈55' from 55' to 88' partial bond or bad seal. Tool bottomed in hole at 95' bgs but detector is 7' off bottom of tool

11:00 Call Kari Sever and inform her of results, awaiting Petersons desicion

11:20 Jerry drives to Altus to ~~fax~~ PMH fedex 3 copies of log to Peterson

11:30 ~~12:00~~ PMH Alan leaves site for the day

Emil Hammers

7/20/00

~~12:00 (cont)~~ pmh 7/20/00

11:30 (cont.) Alan will fax copy of log to Peterson before leaving Altus.

16:30 Drilling at BH-08 at 70' bgs.

15:00 Jerry Pioneros called and informed me that Mike and Hem had discussed Change Order for coring by Peterson. They decided on $500 w/ no markup for coring.

17:30 T.D. at 85' bgs at BH08 Collect sample directly above bedrock

EB on spoon after decon

1810 Packing up supplies

1830 Leave site for the day

MWH
7/20/00

Phil Hammons

7/21/00

0730 Arrive on site

0740 Tailgate Mtg.

0815 Moving rig 7 feet south to Instal MW08

0845 Augers down to 25' bgs will set screen from 10-25'

0820 Water level in open hole is 15' bgs

0830 Measure sound of auger rig during augering UFL to 86.6 behind rig and at Cullers Stand. Mainly UFL

95-99.9 at engine.

0945 MW08 installed and seal set

1000 Start pad installation and soil clean up at MW-08

1200 Pad and bollards at MW08 Complete

12:40 Bollards Painted at MW08

1240 Start Pad construction at MW07

14:10 Surface Completion at MW07 complete

1330 Grouting BH-06 and constructing frame for pad

Phil Hammons

7/21/00

15:45 Surface completion at MW06 complete

15:50 Drillers demobing

16:30 Leave site for the day

7/21/00
PMA

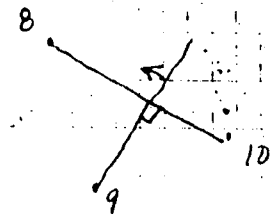
Phil Hammons

7/24/00.

0900 on site

0800 Fedex packages, make copies and get supplies

0915 Measuring water levels and calculating purge volumes for MW06, 07, 08



0955 Finish calculating purge volumes on all three shallow wells

1045 Drillers show up
Richard, Wess, Jim

11:50 Begin development at MW06

12:40 Well Development complete at MW06

12:50 begin development at MW07

13:10 pumped MW06 dry, waiting for recharge

13:20 Let MW07 set to recharge

13:30 Start development on MW08

1345 pumped well dry

Phil Hammons

7/24/00

13:50 Set up on MW07 to bail
Bailed dry at 1415 w/ 10.5
gallon removed
14:00 Richard and Jim go to get
more water for tommarrow
15:00 Leave site for the day
17:00 Steve Roe calls to know
Rodney's availability
1715 Unpicking Pump delivered from
Geotech.
1745 Done for the day

MWA
7/24/00

Phil Hammons

7/25/00

0840 Arrive onsite
0850 Start Development on MW-07
to remove more sediment from
well.
0920 Ray and Tony of Petersen
Shows up
0920 Allan of Horizon shows up.
0930 begin welding casing at BH07
to pressure grout.

1015 remove another 10 gallons
from MW07 to lower turbidity
1025 Cement truck and Compressor truck
arrive onsite to pressure grout
Petersen has subcontracted pressure
grout to FCI out of Electra, Tx.
11:25 finish grouting casing
grout returned to surface so
seal was not good even in
upper part of formation
11:30 Cleaning pump out w/ water
11:45 Petersen and FCI demob
13:00 leave site for the day
13:30 back at Hotel inventory
supplies for GW sampling

Phil Hammons

405 820 7572 Alan

7/26/00

0720 at site forgot key have to go back to Hotel
0820 Reduce at site
0830 Tadgale H&S Mtg
0840 Setting up to sample MW06
0950 Tubing does not fit connectors, Rodney goes to town to get new fittings.
1005 108.6 on control box is 0.5 L/min
107.8 " " .5 × 134/60 = 0.224 L/min
.5 L × / 134 sec = .00373 L/sec × 60 sec/1 m = .224 L/m
1055 Begin Pumping at MW06
For 30 sec measurement L × 2 = L/min
0330 Finish sampling MW06/QA/QC
1350 ~~0750~~ leave site to pack samples
~~02~~ 1420 at Walmart getting ice
1435 at Hotel packing samples
1530 finish packing samples, Rodney Shuttles samples to Fedex
1540 Filling out paperwork
1730 Paper work complete

Phil
7/26/00

Phil Hammond

7/27/00 Thursday

0700 Arrive at site
0705 take pressure nipple off well head
0710 1st rod w/ bit that core paired sets in is 13' long.
0715 Measuring SU at MW06
2.38' above pad + 1.5" to ground
2.53
0725 Casing cut off at BH09
0735 Drill bit (roller cone) is 1.35' long
0751 Wesard Richard arrive onsite
0805 Drill bit on top of grout
65.0 + 1.4 = 66.4 − 1.7 (SU) 64.7'
approximately 26' ft of grout in casing
91 − 65 = 26
0820 Begin reaming out grout in casing
0825 75' of pipe in hole
0835 80' of pipe in hole
0845 85' " " " "
0900 90' " " "
0905 95' " "
0915 at 91.0 hgs hole began to make water bit is at base of casing

Phil Hammond

7/27/00

0920 100' of pipe in hole
0922 96.5' bgs w/ reamed hole
T.D. hole making lots of water.
0925 Awaiting logging truck to run
Cement bond log.
1035 Logging truck arrives on site.
1100 logging complete, Downhole tool/cable has
1130 Loggers demob site crude oil on it.
1200 Leave site for lunch and to fax
logs to Lee Peterson
1315 Back at site
1320 call Jerry Pioneera and inform
on Logging results
Jerry decides that a conference call
w/ USACE/MK/Horizon is needed on
Monday 7/31/00, before we proceed.
1430 Drillers demobing from site
1500 leave site for the day
1545 preparing faxes to Carol Weis and
Joel Siegel and Jerry Pioneera and
Daily Paperwork
1730 Paperwork finished

PMH
7/27/00

Phil Hammons

7/28/00

0754 ~~0850~~ pmm Arrive onsite
0845 Begin sampling MW07
0925 Parameter Stable
0935 Collect sample AMST-MW07-GW
10:30 Leave site to pack and ship
sample
11:05 at Hotel packing samples
11:20 Rodney leaves to ~~await~~ pmh 7/28/00
~~pickup on bobcat and compressor~~
~~by Rental company and close gate~~
find stainless steel funnel
12:15 Finish packing samples
12:20 Rodney leaves to await pickup
on bobcat and compressor by Rental
company and close gate
1330 drop off samples at fedex and
make copies of Daily Reports
1400 Labeling Rinsate sample labels
1515 talk to Jerry about Casing
Resolution

PMH
7/28/00

Phil Hammons

7/31/00

0630 Compiling info for Joel

0645 Fax to Joel.

0745 Arrive on site setting up on MW07

0810 Begin purging MW07 - low flow

0830 Parameters stable and sample collected for Fl/NO_2/NO_3 - 1 bottle.

0900 Set up at MW08 - preparing to low flow purge.

0915 Begin purging

0920 Water being turbid - will allow the well to low flow purge for 20-30 min w/o measuring parameters to cleanup well.

0950 3-4 gallon removal - pump is acting up. Appears there is not enough head above the pump intake to allow it to pump.

0955 Pull pump out of well and clean

10:05 Back in hole and restarting pumping

10:20 Flow stops again - not enough head.

Phil Hammers

7/31/00

10:45 Pump will dry w/ pump on bottom w/ high flow rate

11:15 Supplies and equipment packed up and leaving site

11:45 at Hotel

11:50 Talk to Clyde Murray of USACE Tulsa district about BH09 casing.

~~12:30 Stainless steel funnel arrives~~

13:00 Stainless steel funnel arrives

14:00 Collect EB on pump decon from MW07

1515 Drop samples off at Fedex

7/31/00

Phil Hammers

8/01/00

0730 Arrive on site
0735 Prepare to sample MW08 w/ bailer
0800 Sample collected

0830 Repurging MW07 to resample
Purging 2.5 gal at 0.30 L/m prior to parameter measurements
0850 begin parameter measurements
0940 Parameter stable
0950 Collect sample at MW07
10:15 Site cleaned up.
10:30 leave site to pack samples
11:00 back at Hotel
11:30 Drop off samples at Fedex
Supplies needed
Gatorade
3 paper towels
bottles for MW06 PCB/Tox
rush bags

Hours
144 16+ 45 + 45 74+
149 11+ 50 + 45 79+
+500 carry
? +700 logging

Phil Hammons

8/01/00 6hrs

Supplies: Bread, cheese, meat
Yogurt (6), juice, bananas
mayonaise TV dinners 3
1210 Jerry Pioneesa shows up for lunch
1300 Monthly update of AMS No. 7 w/ Jerry and Rodney
1400 Jerry leaves for Fredrick
1635 Kari w/ Horizon calls about additional costs for pumping water out of casing
1652 Additional cost faxed to Hotel
1700 ~~1500~~ Call Jerry Pioneesa about costs
Horizon suggest buying a pump to remove stagnant water in isolation casing that probably has some crude oil from logging tool and cable. Proposal seems unacceptable since rental of 4" grundfos is far cheaper than purchase of pump.
On second logging run on 7/27/00 down hole cement bond tool and cable had crude oil on it from former job in the oil field. Decision was made to allow tool down hole since hole is cased off by isolation casing and

Phil Hammons

08/01/00

Casing can be better purged by air or ~~water~~ pump. Any Crude oil contamination can be removed by purging and water replaced by clean aquifer water arising from bottom of casing at 91.0' bgs.

1830 Jerry informs drillers will have 4" groundfos on site tomorrow to purge casing.

Estimated casing volume on 8 5/8" casing is 3.0 gal/ft x 70' = 210 gallons

8/01/00

Phil Hammond

08/02/00 11½ 24½ hr

0700 Rodney on site, Baker tank delivers another 25 yd roll off w/ liner

0730 Phil shows up on site

0745 Drillers, Mike, Wess, Allen show up on site.

0800 Preparing to go down hole w/ 4" pump to evacuate casing

0835 Generator arrives on site to run pump

0900 Set Pump intake at ~~35~~ 40' bgs

0910 Begin pumping casing

0915 Water drawn down to pump intake lowering pump another 20'

0935 ~~beg~~ water drawn down to pump intake at 60'

0950 water drawn down to 80' bgs

1010 water drawn down to 91' bgs - based casing 635 gallon removed

1015 Flow rate into well casing is ≈ 9 gal/min

1100 4" PVC placed in isolation casing to decrease mud necessary for ~~drill~~ casing bedrock. PVC base at 92.8' bgs

Phil Hammond

08/02/00

1125 Going down hole w/ core pipe bit (13') 17/1111

Placed 2 buckets and 2 bags of bentonite chips (200#s) around PVC casing to get water seal

1140 break for lunch

1220 begin coring at 92.5'

1310 at 10 98' bgs

1314 another 5' added 108'

1326 at 103' bgs add 5' pipe 113'

1348 at 108' bgs add 5' " 118'

1407 at 113' bgs add 5' " 123'

1423 at 118' bgs add 5' " 128'

1423 at 123 bgs add 5' " 133'

1453 at 128 bgs add 5' " 138'

1507 at 133 bgs " " 143'

1515 at 138 bgs " " 148'

1540 at 143 bgs " " 153'

1547 at 148 bgs " " 158

1520 have lost about 100 gallons of mud into porose sandstone above 138'

1601 at 153 bgs " " " 163'

1619 at 158 bgs " " " 168'

1402 stop to refuel rig

Phil Hammers

08/02/00

1644 at 163' bgs " " " 173'

1653 at 168' bgs add 5' pipe 178'

1655 Mike Sever adds Instavis to well pit to increase viscosity. I stop drilling to inform drillers that liquid polymer is not allowed

17:00 Shut down for the day

17:20 Drillers will have to flush casing/hole and mud pit of liquid polymer in morning prior to further coring

17:35 leave site for the day

18:05 at Hotel doing paperwork

19:30 finish paperwork

PWH
8/02/00

Phil Hammers

38 08/03/00

0700 arrive onsite

0710 Preparing to pump used mud out of mud pit into new roll off

0815 Finish pumping and cleaning out mud pit

0820 Waiting on Wess to return w/ more water

0827 beginning at 168' bgs 178' pipe

0835 at 173' bgs add 5' pipe 183' pipe

0843 at 178' bgs " " " 188' pipe

0923 at 183' bgs " " " 193' pipe

10 00 at 188 bgs " " " 198' pipe

0925 lost about 150 gallons of water to Fm above 183' bgs
lost another 100 gallons of water to Fm between 183-188' bgs

1108 at 193' bgs " " " 203'
~~at 198' bgs " " " 208'~~ pms

1115 Break for lunch

11:45 Back to drilling at 193' bgs

11:55 Shut down, PVC casing dropped and broke joint at surface have to repair

11:56 PID reads 1500 ppm off outlet to mud pit

Paul Hammons

8/03/00

gas bubbles diffusing from mud in pit. gas is coming out of solution in mud probably or possibly natural gas in fractured shale is giving high PID readings

1209 back to drilling

1217 at 198' bgs add on five' to 208'
Broke pipe 690 ppm at pipe head.

1236 back to drilling at 198' bgs 208' pipe

1304 at 203' bgs add 5' to 213'

1305 Chain on water pump breaks so shut down to fix

1340 Chain fixed

1419 at 208' bgs add 5' to 218'

15 at 210' bgs TD.

1600 all pipe out and pulling PVC (4") Isolation casing

1630 Rig moved off site bore hole and driller stacking augers on it.

1645 Allan leaves w/ drill rig

1700 leave site for the day

1730 back at Hotel doing paperwork

MWH
8/3/00

Paul Hammons

08/4/00

0630 Get supplies for sampling at Walmart

0709 arrive at site to sample Bin 1 for waste characterization

0720 Bin sampled

0745 Sampled packed for Saturday Delivery

0800 leave site

0830 at Hotel orignizing field supplies and doing paperwork

11:30 Go to fedex to make copies and drop off packages

13:00 Done for the day

DMH
8/4/00

Phil Hammons

08/07/00

0700 Supplies to get
Generator
3 sodium vials crystals
2 Env Health Cubes
Call Ellen

Rental A&L 2200 Falcon Rd
Rent City 1025 N. Main

0750 arrive on site after picking up generator for sampling

0815 Set up at MW06 to test pump and generator

0845 Generator works and does not trip converter

0950 Still waiting on Drill Rig to ream BH09 for well installation

1100 Drill Rig delayed will be in by 1200-1300

1130 Measure PID reading on open solution casing >2000 ppm

1200 Break for lunch

1300 Venture Drilling shows up - placing drill pipe in carousel and putting bit
Drill Rig is a Dultech D40K percussion hammer rig

Phil Hammons

8/07/00

1420 set up on ~~[illegible]~~ leaved tripping pipe into hole
We are using tricone bit instead of downhole hammer so not to introduce oil into airstream that hammer rig technique requires.

1430 80' in hole
1625 Reamed to 200' bgs
1645 last 20' reamed T.D. at 220' bgs
1646 cleaning up hole w/ bit off bottom
1710 Tripping out of hole
1735 leave site for the day
1800 at ~~Hotel~~ Hotel doing paperwork

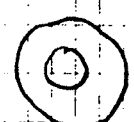
MWA
08/07/00

Phil Hammon

8/08/00

0700 Arrive on site
0720 preparing rig to retrip back in hole to clean bottom of hole up.

0750 tripping out of hole w/ pipe
0820 out of hole w/ pipe
0845 leave site to get Houlo U-22 at Hotel
0945 back onsite, 75' of casing in hole, centralizers every 20' 25' of screen.
1045 215' of screen and pipe in hole Rig getting off hole.
12:25 Collect sample at MW06 resample for PCB/Tox analysis
1340 Begin pumping MW09 to place sand filter pack. Pump set at about 210' bgs.
1400 Begin placing filter pack



8" $\pi r^2 \times h$ 221 − 183 17 +21 38'

1700 Filter pack at 199' bgs
Will place sand to 183' bgs

Phil Hammon

8/08/00

1800 15 bags of sand in hole
Weighted tape got stuck on
bottom centralizer
1830 pm 1815 unstick tape
1835 leave site for the day
1905 Back at Hotel

8/08/00

8/02/00

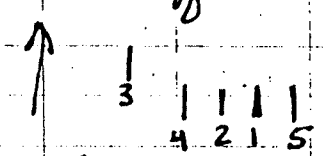
0700 arrive onsite
0710 Tailgate Safety Mtg
0715 Drillers cutting weight on
weighted tape.
0750 Pumped well for 10 min
in attempt to lower sand
0800 no drop on sand pack top at
182.0' bgs
0815 Preparing to grout hole
will place bentonite slurry from
182 to 120' bgs and cement
from 120' - ground surface.
0830 leave site to make copies at
Altus
1015 Back on site, bentonite seal
set to 146' bgs, will place cement
to surface
1113 1st batch of cement set in well
1117 mixing 2nd batch
1215 Grout Returned to surface
1217 Cleaning out grout pump on
rig.
1230 tremie pipe out of hole
1250 Coming out of hole w/ 4" pump
1305 pump out of hole

8/09/00

1310 Break for lunch
1340 Back to Work.
1350 T.D. at base of well 215.5
- 4.0
211.5'

1355 Grout in steel casing has dropped 15'. Have to add more.
300 gallons used so far
110 gallons of Bentonite slurry

1425 Roll off bins



1425 Begin transfering water from Bin 2 to Bin 4
1535 Stop transfering in order to mix grout to top of hole
1605 Back to transfering water from Bin 1 to Bin 5
1645 stop to help move dirt
1805 leave site for the day

PMA
8/19/00
Phil Hammas

8/10/00

0655 Arrive onsite
0720 Drillers arrive onsite
Mike is getting a welder
~~08~~ 0745 Grading site around MW09 and settling pit
0830 Time est. lost due to casing
Caps 1 1/2, 1/2, 1/2, 1 1/2, 1, 1
Time est. lost due to deeper bedrock at shallow wells 1 1/2
Time est due to sloughing sands 1
0845 Mike arrives on site, preparing to develop MW09.
0915 Development pump set at 200' bgs.
0945 begin pumping well at 4.5 gal/min
If well is dry will take ≈ 7 mins
1002 4 gal min
1005 Pump cuts off ~~not enough~~, not getting power, rewiring lead to generator
1025 Pump back up and running 4 gal/min
1045 Pump converter blew up, hung other convertor - did not work
1100 Decide to bail well w/ sand bailer

Phil Hammas

8/10/00

11:10 Water level at 97'
77 gallons left in casing
1130 Start sand bailing
1158 25 galons removed
1205 water level at 143'
1234 water level at 175' 55 total gallons removed
Need to get Daily footage from Mike
1310 water level at 205' 75 gal removed
1325 well bailed dry ≈ 95 gal removed
1339:30 measuring time takes to raise a ft in well
1346:20 raised one' at 211.9
1355:10 at 210.9
1401:40 at 209.9
1409:10 208.9
8/10/00 203.9 pmh

1510 Closed all drums and cleaning up site.
1554 water level at 200' bgs begin bailing again
1630 add pmh well is dry
1645 add 40 gallons to well to assist in cleanup of sediment

Phil Hammons

pmh 8/10/00
1445 water out of well is very turbid
1645 and sediment laiden
1755 Begin surging w/ PVC surge block w/ 220' of 1" pvc in hole.
Surging 3' sections at a time
1815 begin bailing water out of hole after surging
1925 Shut down for the day
Bailed 52 gallons out of hole
will continue development tomorrow
1935 leave site for the day

3.5
3.75
2.25

PMH
8/10/00

Phil Hammons

50

8/11/00

0710 arrive onsite

0725 tag water in MW09 at 146 b toc

0740 going down hole w/ surge block

~~0815 Surge block out of hole pmh~~

~~0805 Rodney arr pmh~~

0830 Rodney arrives onsite

0835 Surge block out of hole

0845 going in hole w/ PVC bailer

0850 PVC bailer breaks off

0855 going downhole w/ metal sand bailer

0950 Surging and Bailing complete. Well is dry again.

Horizons Costs as of 7/28/00

		$
Per diem	9 day	195/day
Waste handling	11 days	150/day
Other activities	0.5	90/hr
Decon	2 hr	115/hr
Development	3.5 hr	115/hr
Surface Completions	3	425/ea
Shallow Wells	79'	20/ft
Steel Casing	91'	68/ft
Auger drilling	250'	20/ft
Mob/demob		2000

coring at BH09

[signature]

51

8/11/00

1000 Surveyors from OID arrive onsite, They are setting up to survey

1055 Mixing concrete for pad at MW09

1150 Pad complete

1055 to 1230 welding top on gate

1230 take lunch

1300 back to ~~drilling~~ work

1440 bollards placed and painted

1450 drillers demobing

1550 leave site for motel

pmh 8/11/00

TOTALS	
1755	
1650	
45	
230	
402.5	
1275	
1580	
6188	
5000	
2000	
580	

Total 20,706
320
21,026

850
425

Air Coring 10' × 32/" = 320

pmh 8/11/00

[signature]

8/11/00

Horizons Cost as of 7/28-8/11:

	Amount	rate	TOTAL
Air Rotary Coring	102'	32/ft	3264
MW installation	211.5' ft	33/ft	6980
Decon	0.5 hr	115/hr	57.5
Other Activities	8.5 hr	90/hr	765
Perdiam	6 day	195/day	1170
Washehaugh	34	150/day	~~430~~ 600
Surface Completion		425/ea	425
well develop	9.75	115/hr	1,121
Rental		~~160~~	110
Supplies			34
			21
			40
			205

1830 Arrive back at site to set pump in MW09. Set pump at 200' below top, 196' bgs. Water level at 150' bgs

1900 Started pump. Can not get mhz past 170' w/o tripping ground fault interrupter. Can not get flow to surface w/o tripping control box.

1930 leave site for the day

Phil Hammons

8/14/00

0800 Arrive onsite to sample MW09 w/ bailer

Water levels 42.46' BTOC M09
23.65' BTOC M08
15.07' M07
24.37 M06

Start bailing MW09 at 0820
Screen interval 186-211 bgs
Want to bail from 200' bgs 3.5' SU
203.5' of rope.

0930 finished sampling MW09

0940 Paint Protective casing at MW09

1000 leave site for the day

1030 at Hotel Demobig equipment to office and Rental Supply stores

1530 Finish packing and shipping supplies.

1730 Washing vehicle

1900 done for the day. Leave tommorrow Morning at 9:10 out of OKC.

8/14/00

Phil Hammons