Appendix E.

Field Records in DOE/Sandia Reports for Drilling the Boreholes for Monitoirng Wells MWL-BW2, MWL-MW7, MWL-MW8 and MWL-MW9.

The Field Records for Monitoring Well MWL-BW2 are from the following DOE/Sandia Report:

Griffith, Stacy, April 2008. DOE/Sandia *Summary Report for Mixed Waste Landfill Monitoring Well Plug and Abandonment and Installation: Decommissioning of Groundwater Monitoring Well MWL-BW1 and Installation of Groundwater Monitoring Well MWL-BW2.* Sandia National Laboratories/New Mexico. http://www.nmenv.state.nm.us/hwb/documents/Summary_Rpt_MWL_MW_PandA_Install-Decom_GW_Mon_Well_MWL-BW1_Install_GW_Mon_Well_MWL-BW2_4-200.pdf

The Field Records for Monitoring Well MWL-MW7, MWL-MW8 and MWL-MW9 are from the following DOE/Sandia Report:

Sandia National Laboratories/New Mexico Environmental Restoration Project, September 2008. DOE/Sandia *Summary Report for Mixed Waste Landfill Monitoring Well Plug and Abandonment and Installation: Decommissioning of Groundwater Monitoring Wells MWL-MW1, -MW2 and -MW3, and Installation of Groundwater Monitoring Well MWL-MW7, -MW8 and -MW9.* Sandia National Laboratories/New Mexico. *ftp://ftp.nmenv.state.nm.us/hwbdocs/HWB/snl/MWLDrillingSummaryReport_Final_Sept08.pdf*

Monitoring Well MWL-BW2 – Field Records for Drilling the Borehole and Installing the Monitoring Well from Pages 174-179 in Attachment B in the DOE/Sandia Report.

174

1-15-06 Tuesday
Task: MWL Drilling
Weather: Cold, clear
Personnel: SRG - SNL/GRAM
Mark Green
Richard Bare → WOC

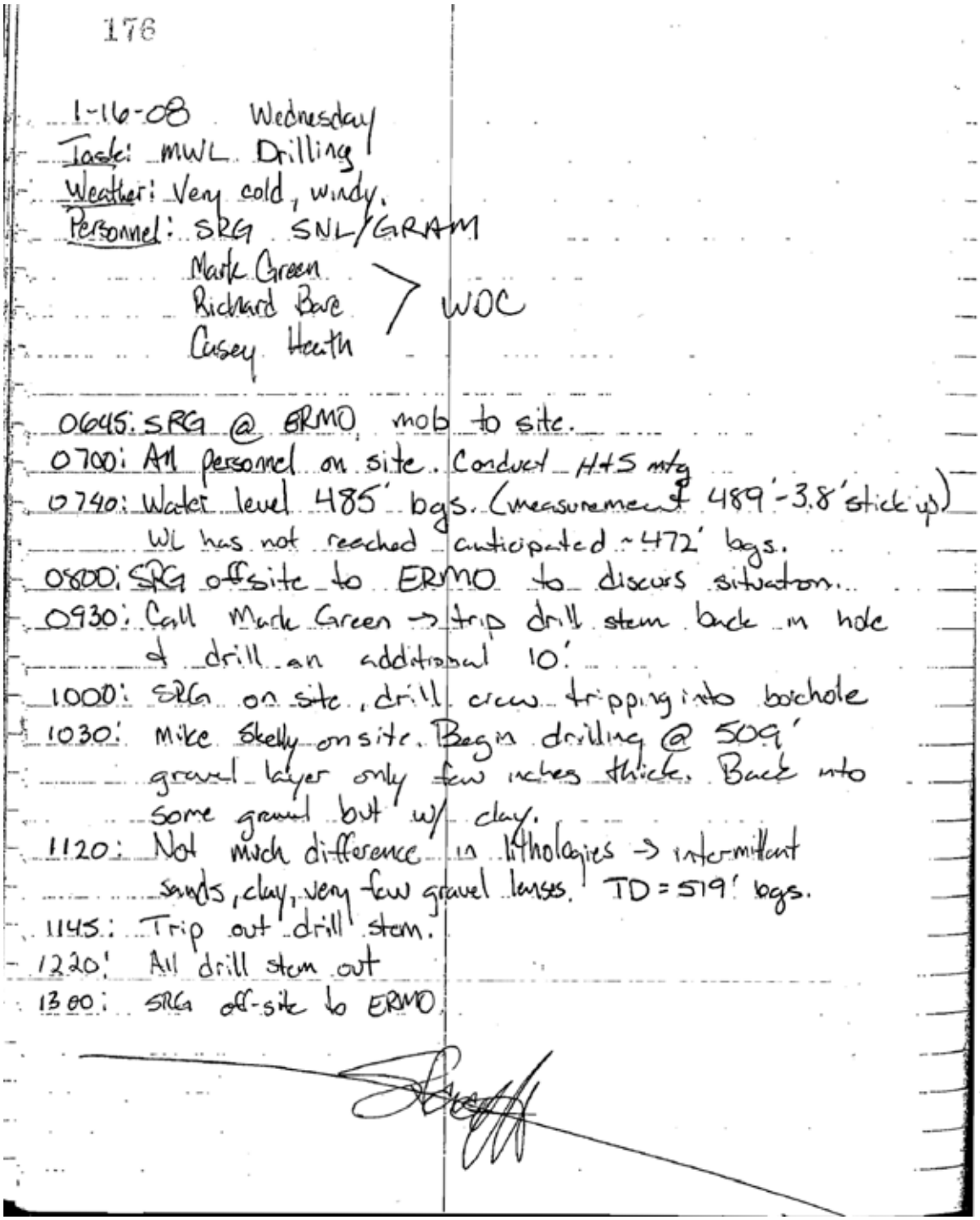
0645: SRG @ ERMO, mob to site
0700: Personnel on-site. Conduct H+S mtgs.
0732: Prepare to resume drilling @ 300'. 220' of casing on pipe truck.

			on truck
0740:	casing 1 X 20'	→ 320'	200'
0802:	2 X 20'	→ 340'	180'
0818:	3 X 20'	→ 360'	160'
0840:	4 X 20'	→ 380'	140'
0902:	5 X 20'	→ 400'	120'
0917:	6 X 20'	→ 420'	100'
0930:	Casey Heath on-site, Badge #		CT42053 Temp
	Mark Green		CT41780
	Richard Bare		CT41975
0935:	7 X 20'	→ 440'	80'
0950:	8 X 20'	→ 460'	60'
1017:	9 X 20'	→ 480'	40' expect WT ~ 472'
1050:	10 X 20'	→ 500'	20' + 10' on truck

1100: Cyclone & tube blocked after encountering material below WT

1-15-08 cont

1140: Add 10' casing → total 510'
1210: Total Depth ~509'. Added ~100-150 gallons water to clean out. Will evacuate all added water.
1245: Start tripping out drill stem.
1315: All drill stem out of hole.
1330: Drill crew prep well materials. SRG offsite to ERM9
1400: Skelly, SRG & JetWest Geophysical Services on site. Neutron probe & resistivity logging of well w/in drive casing. (JetWest personnel - Al Henderson
1445: Start logging borehole.
1700: JetWest finished. Skelly offsite.
1720: Secure site. SRG w/ JetWest to Eubank Gate.



176

1-16-08 Wednesday
Task: MWL Drilling
Weather: Very cold, windy.
Personnel: SRG SNL/GRAM
Mark Green
Richard Bare > WOC
Casey Heath

0645: SRG @ ERMO mob to site.
0700: All personnel on site. Conduct HtS mtg
0740: Water level 485' bgs. (measurement 489'-3.8' stick up)
WL has not reached anticipated ~472' bgs.
0800: SRG offsite to ERMO to discuss situation.
0930: Call Mark Green → trip drill stem back in hole & drill an additional 10'.
1000: SRG on site, drill crew tripping into borehole
1030: Mike Skelly on site. Begin drilling @ 509'
gravel layer only few inches thick. Back into some gravel but w/ clay.
1120: Not much difference in lithologies → intermittent sands, clay, very few gravel lenses. TD = 519' bgs.
1145: Trip out drill stem.
1220: All drill stem out
1300: SRG off-site to ERMO.

177

1-17-08 Thursday
Task: MWL Drilling
Weather: Very, very cold → 1°F w/ wind chill
Personnel: SRG / SNL/GRAM
Mark Green
Casey Heath } WDC
Richard Bare
0630: SRG @ ERMO mob to site.
0655: SRG, Green + Heath on site. Very cold conditions. -
0720: Conduct H+S mtgs.
0730: Tag water level. 502.3' - 3.8' stick up = 498.5'
Tag bottom of borehole ~ 523'-3.8' " = 519'
Borehole stayed open, water level has not come up to expected level (~472')
There is ~20.7' of water in borehole.
Expect ~47' of water in borehole.
0945: Mike Skelly called Will Moats (NMED) to discuss situation. Moats agreed to set the well as proposed w/ an anticipated water level of 472'.
1000: Begin to build well. Brand new tape measure for tag.
1030: Add Volclay coarse chips to bottom of hole
50 lb bags → HHT II
pulled 10' casing left in hole 510'
added plug to 509.2' bgs
Build well - 5" cap, sump, 30' 0.010 slot screen
centralizer @ base of screen + at top

1-17-08 cnA

1400 Set well → 504.66' of PVC set bottom @ 502' add 5' of stick up for building well (7.66' of stick up w/ addition)

1420: Start adding 20-40 sand 50lb bags ||||-|||| bringing sand up to 462' (need ~37 bags 20-40 sand)

Clint on-site to deliver more 20-40 sand

1440: Pull casing 1 x 10' → 500' in hole adding 20-40 sand ||||-||||

1500: pull casing 1 x ~~20~~ 10' → 480' in hole add sand @ ~489' ||||-||||

1515: pull 1 x ~~20~~ 10' 460' in hole add sand to ~469' ||||-||||

1530: pull 1 x 10' 470' tag sand @ 460', swab the well to settle sand around ea screen. Used 40 bags 20-40 sand

1600: pull 1 x 10' casing 460' tag sand @ 461.5', add 60 sand (40-60 sand is no longer available) 100 lb bags → II (2 total)

tag top of 60 sand @ 456'

pull 1 x 20' casing (440' in hole)

1630: Adding volclay chips 50 lb. bags |||11 (calc. 9, use 7)

pull 1 x 10' casing (430' in hole)

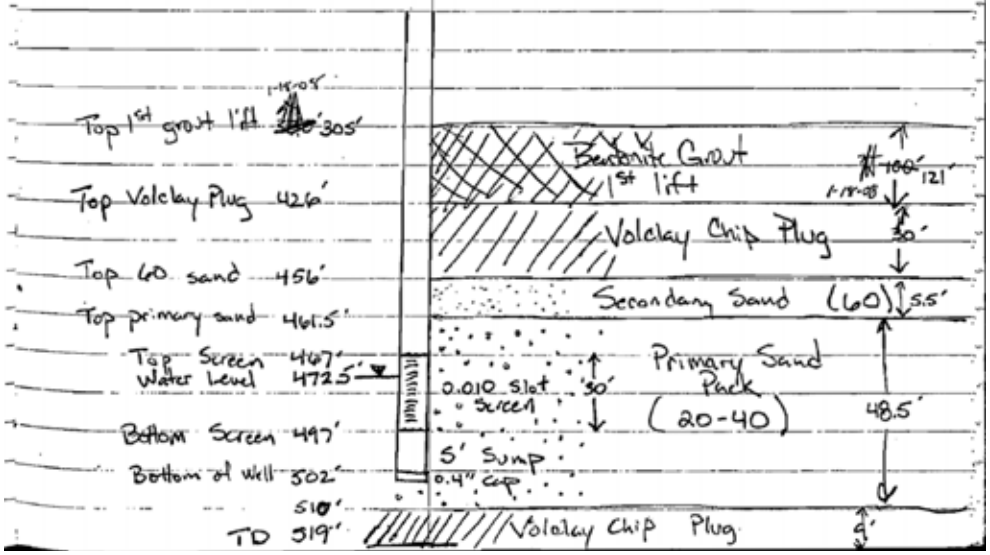
chips @ 438' will hydrate & let sit overnight

1715: add ~ 100 gallons water

1730: Secure site. SRC to ERMO

1-18-08 Friday
Task: MWL Drilling
Weather: Cold & clear
Personnel: SRG SNL/GRAM
Mark Green
Richard Bare > WDC
Casey Heath
0700: SRG @ ERMO, mob to site
0750: All personnel @ site. Conduct H&S mtgs.
0754: Adding Volclay chips to 426' need 4 → 1111 (4) used
0820: Water level 472.5' → Yeah.
0830: Hydrate last 10' of chips w/ 140 gallons
0850: Pull 1x20' casing (410' in hole)

Well Construction Diagram



Monitoring Well MWL-MW7 – Field Records for Drilling the Borehole on Pages 7-8 in Appendix C of the DOE/Sandia Report.

Well MWL-MW7 – page 1 of 2.

MWL - MW7

7

Michael Shelley 28 April 08

0715 at ER MO, send email to Mick Peterson (Stoller) re: Health and Safety documents. Pack gear, head to site

0735 Onsite, crew is warming up equipment and preparing to drill. Tailgate Safety briefing

0753 Begin drilling 200-ton ft w/ 9 5/8" drive casing

0808 Bit at ~217' bgs, add another joint.

0829 Bit at ~237' bgs, add another joint.

0852 Bit at ~257' bgs, add another joint.

0917 Bit at ~277' bgs, add another joint; Honey dipper on site to service port-o-let.

0924 Talked to Schofield. Facilities crew is supposed to do some dirt work on the berm.

0936 Bit @ ~297' bgs, add another joint.

1002 Bit @ ~317' bgs, add another joint; Schofield on site w/ bird survey. Road grader crew onsite.

1022 Bit @ ~337' bgs, add another joint.

1043 Bit @ ~357' bgs, add another joint.

1105 Bit @ ~377' bgs, add another joint.

1112 Stacy Griffith onsite, Road crew working berm.

1125 Frantz Lauffer onsite

1137 Bit @ ~397' bgs, add another joint. Stacy heads offsite.

1202 Bit @ ~417' bgs, add another joint.

1211 Take lunch break.

1243 Fire up rig. Road crew back on site.

1259 Bit @ ~437' bgs, add another joint.

1325 Bit @ ~457' bgs, add another joint. Cuttings are damp to wet, sticking inside discharge line and cyclone. Not adding water (air only).

1404 Discharge line clogged at cyclone. Disconnect and clean out cuttings.

1427 Bit @ ~477' bgs, add another joint. Re-attach discharge line to cyclone.

8

MWL - MW7

28 april 08

Michael Gelb

456 at 495 ft bgs, discharge line is plugged due to very wet cuttings. Disconnect and clean out.

1505 Begin tripping out drill stem and bit.

1537 Tripped out; drill pipe had a lot of slough fall off during trip. Tag top of slough at ~ 7 ft above TD of borehole. Tagger came out dry -- no water at top of slough. Trip drill stem and bit back in to remove slough.

1640 Clean out slough; add ~ 100 gallons of water to clean out drill stem / drive casing; blow all water out of drive casing.

1653 Trip out drill stem and bit; pipe relatively clean.

1721 Finish tripping drill stem and bit. WDC crew Ready Rig for the night.

1735 Unload gear at Fairbanks for ERM0

1802 Leave ERM0 for the night.

Monitoring Well MWL-MW8 – Field Records for Drilling the Borehole on Pages 20-21 in Appendix C of the DOE/Sandia Report.

Well MWL-MW8 – page 1 of 2.

20

07 May 08
Task: Drilling @ MWL: MWL-MW8
Personnel: S. Griffith
H. Leon > WDC
T. Leon
Weather: Partly cloudy, expected high 80's & breezy

0630: SRG @ ERMOs. Mob to site. Conduct tailgate mtg w/ Leon brothers.
0700: Resume drilling @ 380' bgs. Mark Green off-site for fuel. Plan to drill to ~535' bgs.
0800: Add 20' → 400' total
0845: Add 20' → 420' total
~405' silts & clays begin to plug cyclone line
0920: Add 20' → 440' total
0930: ~428' sand & gravel possible 'ARG B' unit. Skelly on-site
0945: ~435' well-rounded gravel & clay balls.
Add 20' → 460' total
Sample @ ~440' clean sand
Sample of washed well rounded gravels collect ~435'
1010: Add 20' → 480', expect water table in this next interval (460'-480')
Skelly offsite. Skelly's discussion w/ Will Moats (NMED) this morning concerning setting the screen for this well. Will stated to set well as proposed in work plan. Work Plan stated 'screen interval'
1035: ~465' bgs cyclone line plugs, cuttings moist (silty sand), same to ~475'
Cyclone & line plugged.
1100: Clear cyclone & line. Resume drilling.
Add 20' → 500'
1130: Scho came by to notify me that fence contractors will be on-site next Monday.

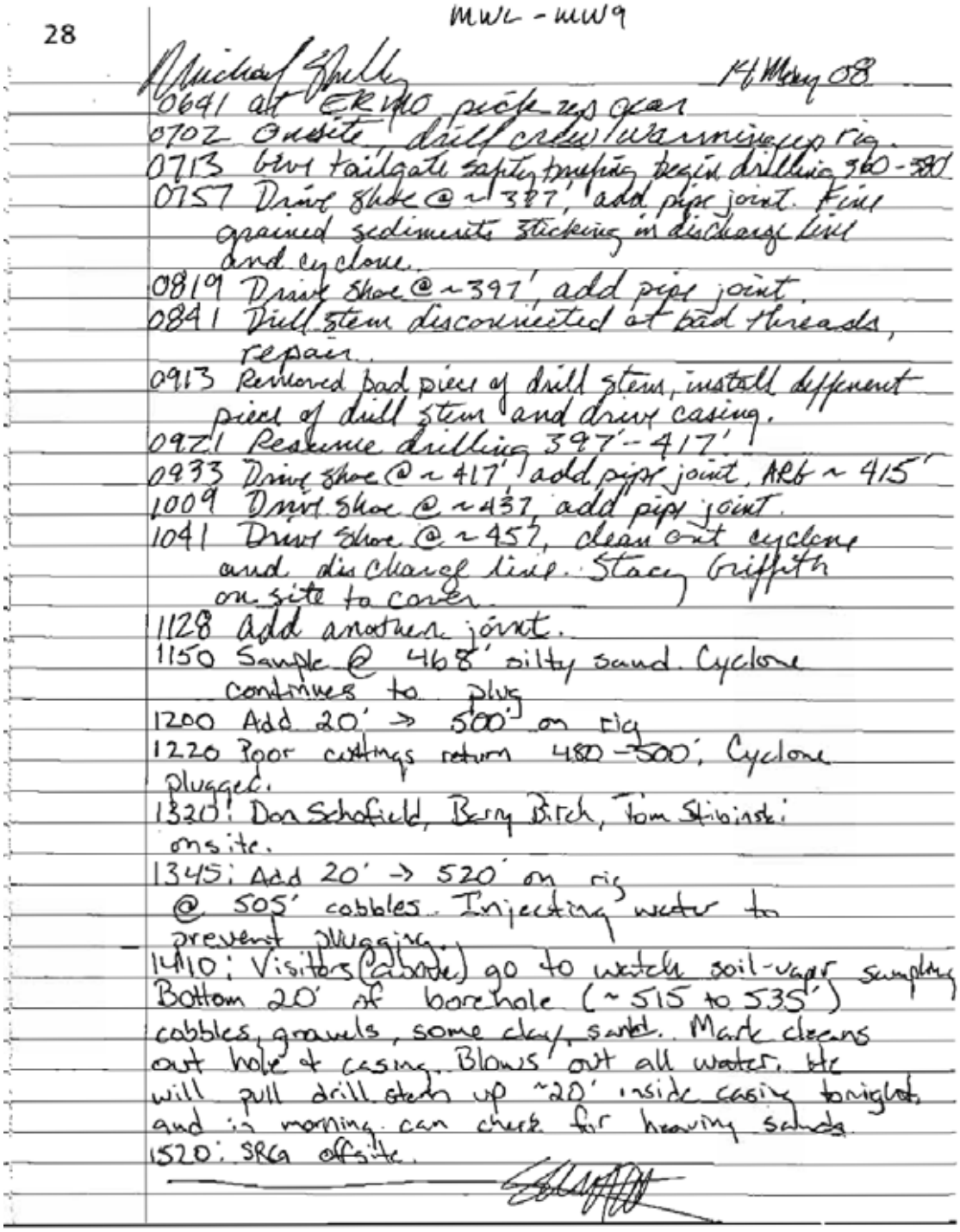
21

07 May 08 cont

1130: Add 20' → 520'
B/W 500' – 505' transition from fine silty sand to higher % of silt
Same from 505 – 515'
1155: Add 20' → 540' Final length of casing. drill
1205 @ ~518' sand/gravel w/ some silt → ARG
drill to ~535'
~518' – 522' ARG type sand/gravel.
522' – 535' silty sand & clay
1220: Total Depth ~535' BGS
Begin injecting water to clear out casing.
All added water will be blown out. (~250 gallons)
1235: Trip out drill stem to ~460' (above 4") & stand by for geophysical logging in am. Will check for heaving sand in am before tripping out all drill stem for the logging.
1300: WDC crew remain onsite to work on rig maintenance. Either trip out some drill stem @ end of day or raise ~20'.
Mark Green not concerned w/ heaving sands. Will check bottom in am & trip out then.
SRG back to ERMD.

Monitoring Well MWL-MW9 – Field Records for Drilling the Borehole on Pages 28 in Appendix C of the DOE/Sandia Report.

Well MWL-MW9 – page 28.



28

MWL - MW9

Michael Shelly 14 May 08

0641 at ER/HO pick up ops gear
0702 Onsite drill crew warming up rig.
0713 Brief tailgate safety briefing begin drilling 360-380
0757 Drive shoe @ ~387', add pipe joint. Fine grained sediments sticking in discharge line and cyclone.
0819 Drive shoe @ ~397', add pipe joint.
0841 Drill stem disconnected at bad threads, repair.
0913 Removed bad piece of drill stem, install different piece of drill stem and drive casing.
0921 Resume drilling 397'-417'
0933 Drive shoe @ ~417' add pipe joint. ARB ~ 415'
1009 Drive shoe @ ~437, add pipe joint.
1041 Drive shoe @ ~457, clean out cyclone and discharge line. Stacy Griffith on site to cover.
1128 Add another joint.
1150 Sample @ 468' silty sand. Cyclone continues to plug
1200 Add 20' → 500' on rig
1220 Poor cuttings return 480-500'. Cyclone plugged.
1320: Don Schofield, Barry Birch, Tom Stibinski onsite.
1345: Add 20' → 520' on rig @ 505' cobbles. Injecting water to prevent plugging.
1410: Visitors (Cabrite) go to watch soil-vapor sampling. Bottom 20' of borehole (~515 to 535') cobbles, gravels, some clay, sand. Mark cleans out hole & casing. Blows out all water. He will pull drill stem up ~20' inside casing tonight and in morning can check for heaving sands.
1520: SRCa offsite.