

Appendix A

Boring Logs

This page intentionally left blank.

DD WELL LOGS

DD-139, 140, 141,
142, 143, 144, 145



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory
 LOCATION Area IV
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring
 SAMPLING METHOD Grab/Coring
 GROUND ELEVATION (FT MSL) 1790.91
 TOP OF CASING (FT MSL) 1793.01
 LOGGED BY Frank Morris
 REMARKS _____

BORING/WELL NUMBER DD-139
 DATE DRILLED 2/25/16 - 3/4/16
 CASING TYPE/DIAMETER 1/4-inch Mild Steel 6-inch ID
 SCREEN TYPE/SLOT Open Borehole
 GRAVEL PACK TYPE Not Applicable
 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 DEPTH TO WATER (FT BGS) 43.00
 GROUND WATER ELEVATION (FT MSL) 1750.01

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60						SILTY SAND: dark brown (10YR 3/3), very fine grained, trace organics.		
						SM			3.0	
0					5			SANDSTONE: yellowish brown (10YR 5/6); highly weathered, fine grained, harder drilling at 5 ft bgs.		<p>14-in diameter borehole, grouted (0-10 ft bgs)</p> <p>6-in ID x 1/4-in wall mild steel surface casing (0-19.2 ft bgs)</p>
					10					

NEWGINT_SSF_L_VER09062016.GPJ_LAEVND01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

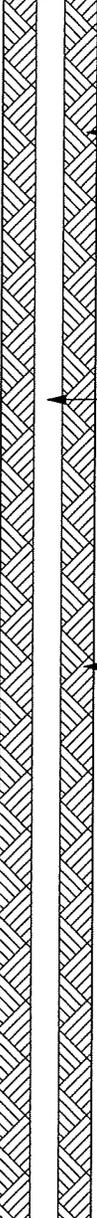
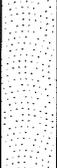
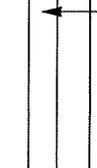
PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-139

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		120				SS		At 10 ft bgs, change to fine to medium grained, pulverized, dry.		 <p>9-7/8-in borehole (10-19.2 ft bgs)</p> <p>6-in ID x 1/4-in wall mild steel surface casing (0-19.2 ft bgs)</p> <p>Portland cement/bentonite grout (10-19.2 ft bgs)</p>
				G	15			Color change at 17 ft bgs to light gray (2.5Y 7/1).		
		2.4/ 20%			20	SS		SANDSTONE: fragments, broken, highly weathered and friable, dry.	19.2	 <p>5-7/8-in open borehole (19.2-206 ft bgs)</p>
0		60/ 100%						SANDSTONE: dark yellowish brown (10YR 4/2); fine to	21.2	

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEVNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-139

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		51.6/ 86%			25			medium, slightly weathered, friable.		
						SS		<p>SHALE: parting at 24.1 ft bgs (2 mm thick) along bedding plane, in contact with coarse sand above and very fine grained sand below</p> <p>At 24.2 ft bgs, SANDSTONE: dark yellowish brown as previous; with weak cement at bedding plane fracture, very narrow aperture, trace feldspar clasts (1/4-in). RQD for 26 to 31 ft bgs = 100%.</p>		<p>← 5-7/8-in open borehole (19.2-206 ft bgs)</p>
0		52.8/ 88%			30					

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEVNN01.GDT 9/6/16

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-139

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		67.2/ 112%						<p>SANDSTONE: dark yellowish brown as previous; with weak cement at bedding plane fracture, very narrow aperture, trace feldspar clasts (1/4-in).</p>	33.0	<p>5-7/8-in open borehole (19.2-206 ft bgs)</p> <p>First water (43 ft bgs)</p>
					35	SS		<p>Mechanical break at 35.4 ft bgs.</p>		
								<p>At 36 ft bgs, SANDSTONE: dark yellowish brown (10YR 4/2); medium to coarse, 40° dip at contact with shale/siltstone laminae (37 ft bgs).</p>		
						SH		<p>SHALE: pale yellowish brown (10YR 6/2), 0.25 ft thick, fractured.</p>	37.0 37.3	
								<p>SANDSTONE: medium yellowish brown (10YR 5/4); fine to medium, vertical fracture to 38 ft bgs, probably water bearing.</p>		
0		N/A						<p>Bedding plane fractures (40.1 to 40.3 ft bgs), iron stained.</p>		
						SS		<p>Color change at 42.7 ft bgs to medium gray (N5).</p>		
								<p>Soft sediment deformation 44 to 46 ft bgs, with mottling</p>		

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-139
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		49.2/ 82%			45			gray and brown alternating to light olive gray (5Y 5/2).		
									48.0	
								SANDSTONE: light olive gray (5Y 5/2); medium to coarse, moderately strong, trace shale clasts at 48 ft bgs.		
								Clay filled, open fracture at 48.6 ft bgs.		
					50					
0		61.2/ 102%						At 50.2 ft bgs, change to fine to medium grained.		
						SS				
								Intersecting open fractures 52.2 to 52.5 ft bgs, with clay and friable, loose sand grains, very weathered.		
					55					

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNND1.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-139
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		66/ 110%						SANDSTONE: as previous but medium to coarse, mottled gray/brown with some iron staining.	56.0	
0		60/ 100%			60	SS	Shale clast inclusion at 59.8 ft bgs (2-in size).			
0		58.8/ 98%			65		SANDSTONE: as previous (with mottling) but becoming fine to medium grained at 62.5 ft bgs.			
0								SANDSTONE: medium yellowish brown (10YR 5/4); fine to medium, broken at 66 ft bgs (top of core run), vertical fracture 66 to 66.3 ft bgs, tight, aperture extremely narrow.	66.0	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEVWNO1.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-139

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		N/A			70			<p>Color change from 67.5 to 68 ft bgs, to mottled brown/gray.</p> <p>Predominantly medium gray (N5) starting at 68 ft bgs.</p>		<p>← 5-7/8-in open borehole (19.2-206 ft bgs)</p>
								<p>Very thin shale parting at 71.3 ft bgs, 1/4-in thick. Broken, vertical, uneven fracture above parting. Sandstone is medium grained.</p> <p>Massive, very consolidated from 72 to 75.9 ft bgs.</p>		
						SS				
0		39.6/ 66%			75			<p>Broken at 76 ft bgs, and with tight vertical fracture.</p>		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWINN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-139
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/100%			80			Core barrel break at 79.3 ft bgs.		
						ST	XXXXXX XXXXXX XXXXXX	SILTSTONE/very fine grained SAND: light gray (N6/N7); consolidated, massive, 0.3 ft thick.	80.4	
								SANDSTONE/SILTSTONE: light to medium light gray (N6/N7) (81 to 85.6 ft bgs).	81.0	
						SS		Laminae from 82.6 to 83 ft bgs. SANDSTONE: very fine grained from 83 to 83.2 ft bgs. Grading to fine to medium grained at 83.2 ft bgs, poorly graded, massive, well consolidated, to shale parting at 85.6 ft bgs.		
					85					
0		63.6/110%				ST	XXXXXX XXXXXX XXXXXX	SHALE/SILTSTONE: light gray (N6/N7); vert fracture 0.3 ft, laminae and soft sediment deformation.	85.6	
								SANDSTONE: as previous (83.2 to 85.6 ft bgs), massive, consolidated, well cemented.	86.5	
						SS				
					90					

← 5-7/8-in open borehole (19.2-206 ft bgs)

NEWGINT SSFL_VER09062016.GPJ LAE/VNN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-139
PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		0/0% 61.2/ 102%						No Recovery, approximately 90.8 to 91 ft bgs.	90.8 91.0	
								SHALE/SILTSTONE: light to medium gray (N5/N6); laminated 0.6 ft thick, shale black to 91.4 ft bgs.	91.4	
								SANDSTONE: very fine grained.		
								SHALE: light to medium gray (N5/N6), with laminated SILTSTONE (0.7 ft thick).	92.5	
								SANDSTONE: medium dark gray (N4); fine to medium.	93.3	
								Broken fracture, weak at 94.5 ft bgs.		
					95			SHALE: light gray (N6/N7); laminated with minor siltstone stringers, soft sediment deformation at top contact with sandstone.	94.9	
0		57.6/ 96%						SANDSTONE: light olive gray (5Y 5/2); fine to medium, weak cement, broken at 96 ft bgs (top of run).	96.0 96.2	
								SHALE partings from 96.2 to 96.4 ft bgs.	96.4	
								SANDSTONE: light olive gray (5Y 5/2); fine to medium, weak cement, broken at 96 ft bgs (top of run).		
								SHALE/SILTSTONE: light to medium gray (N5 to N7); soft sediment deformation (0.4 ft thick).	99.4	
					100			SANDSTONE: as previous, consolidated.	100.0	
0		49.2/ 82%								

← 5-7/8-in open borehole (19.2-206 ft bgs)

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-139

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		62.4/ 104%				SS			103.0	
								SANDSTONE: light olive gray (5Y 5/2); poorly graded, fine to medium, competent to about 104.6 ft bgs then weakly cemented and broken (mechanical).		
					105					
								Rough, vertical fracture at 106 ft bgs (top of core run), 0.4 ft long, weaker cementation.		
										← 5-7/8-in open borehole (19.2-206 ft bgs)
						SS				
								Fracture zone approximately 109 to 109.4 ft bgs, intersecting (52° dip with about 90° intersection), open with clay and sand, some iron oxide staining.		
					110					
								Broken at 110.1 ft bgs.		
								Broken at 110.8 ft bgs.		
0		62.4/ 104%								
								High angle fracture (50°), from 112.1 to 112.5 ft bgs.		
								Color change at 112.5 ft bgs to mottled brown and gray.		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-139

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		61.2/102%			115	SH		INTERBEDDED SHALE AND SILTSTONE: with several high angle fractures, open, narrow apertures along bedding planes (1.7 ft thick).	114.2	<p>5-7/8-in open borehole (19.2-206 ft bgs)</p>
0		60/100%			121	SS		<p>SANDSTONE: light olive gray (5Y 5/2); poorly graded, fine to medium, weak to strong, broken in some areas. RQD for 116 to 121 ft bgs = 62%, fair.</p> <p>Fracture zone approximately 117 to 117.6 ft bgs, about 45° dip in middle of zone with roughly vertical intersection, iron staining along surface, narrow aperture intersecting.</p> <p>Broken zone from approximately 118.9 to 119.2 ft bgs.</p> <p>Broken at 120 ft bgs.</p> <p>Broken at 120.5 ft bgs.</p> <p>SANDSTONE: at 121 ft bgs, as previous but slightly more competent, medium to coarse grained.</p> <p>Color at 122.2 ft bgs grading to medium gray (N5).</p>	115.9	

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-139

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/ 100%			125			Broken (rough surface) at 125.8 ft bgs.		
								SANDSTONE: dark greenish gray (5G 4/1); contact with light gray (N6/N7) siltstone grading to fine grained sandstone, very strong, competent. RQD for 126 to 131 ft bgs = 100%.	126.7	
								Mechanical break at 128.7 ft bgs.		← 5-7/8-in open borehole (19.2-206 ft bgs)
0		67.2/ 112%			130			RQD for 131 to 136 ft bgs = 98-100%.		
						SS		Broken at 132.4 and 132.5 ft bgs (mechanical?).		
					135					

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWN01.GDT 9/6/16



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-139
PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/ 100%						<p>SANDSTONE: medium gray (N5), poorly graded, fine to medium, consolidated, moderately strong. RQD for 136 to 141 ft bgs = 98%.</p> <p>Color change at 138.4 ft bgs to light olive gray (5Y 5/2), slightly weaker cementation.</p> <p>Horizontal breaks at friable, weaker zone, 140 to 141 ft bgs.</p>	136.0	<p>← 5-7/8-in open borehole (19.2-206 ft bgs)</p>
0		55.2/ 100%				SS	<p>RQD for 141 to 146 ft bgs = 100%.</p> <p>Color change at 141.7 ft bgs back to medium gray (N5).</p> <p>Medium to coarse grained interval from 144 to 145.4 ft bgs.</p>			
0		0/ 0% 57.6/ 96%					<p>Contact between fine and coarse grained sands at 145.4 ft bgs. No Recovery, approx. 145.6 to 146 ft bgs, then Loose sand, extremely friable, water bearing potential very high above shale.</p>	146.6		
						SH		<p>SHALE: light gray (N7) to medium gray (N6); with siltstone, laminated, deformation structures; shale 0.7 ft thick.</p>		

Continued Next Page

NEWGINT SSFL_VER0902016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-139
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/100%				SS		<p>SANDSTONE: medium gray (N5); medium to course becoming finer grained around 150 ft bgs, competent from shale contact to about 150.8 ft bgs.</p> <p>Friable, slightly weaker at 150.8 ft bgs.</p>	147.3	 <p>← 5-7/8-in open borehole (19.2-206 ft bgs)</p>
						SH		<p>SHALE: dusky yellow to light olive gray (5Y 6/4 - 5/2); laminated, clay covered, fractured/broken, wet.</p>	152.0	
0		60/100%						<p>SANDSTONE: medium light gray (N6), fine to medium, well consolidated.</p> <p>Color change at 155.6 ft bgs to brown.</p> <p>Broken and friable approximately 156.8 to 157 ft bgs.</p> <p>Color change at 157.2 ft bgs back to gray (mottled).</p>	153.0	

NEWGINT SSFL_VER09062016.GPJ LAE\WNN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-139

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		61.2/ 102%			160	SS		Color change at 160 ft bgs back to brown, with iron staining. Broken with fractures (horizontal, low angle), very friable, sand grains, 0.4 ft thick.		
0		61.2/ 102%			161			Color change at 161 ft bgs to medium gray (N5), wet. Broken fragments, loose sand grains to about 161.5 ft bgs. Weak friable zone at top of run (161 ft bgs).		
					161.8			High angle fracture from 161.8 to 162.2 ft bgs (0.4 ft).		← 5-7/8-in open borehole (19.2-206 ft bgs)
					164.3			Broken zone (horizontal) from approximately 164.3 to 164.5 ft bgs.		
					165					
0		61.2/ 102%			165.6	SH		SHALE: 0.2 ft thick stringer, with horizontal fracture.	165.6	
					165.8			SANDSTONE: light olive gray (5Y 5/2); slightly mottled, with iron stained fractures, weakly cemented. RQD for 166 to 171 ft bgs = 63%, fair.	165.8	
					166.7			Broken at 166.7 ft bgs.		
					167			Broken at 167 ft bgs. High angle, open fracture from 167 to 167.5 ft bgs (70° from horizontal).		
					168	SS		Fractured and broken zone from about 168 to 169 ft bgs, several fractures, narrow apertures.		
					170					

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-139
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/100%						Broken at 170.1 ft bgs (mechanical?).	170.9	
						SS	SANDSTONE: greenish gray (5G 6/1), poorly graded, fine to medium, moderate to weak cementation, holding moisture, numerous breaks (at 4-in long). RQD for 171 to 176 ft bgs = 75%. Broken at 171.6 ft bgs. Broken at 172.2 ft bgs. Broken at 173.5 ft bgs. Fractures from 174.2 to 174.6 ft bgs, about 45° angle. Broken, friable sand below.			
0		63.6/106%						Broken at 171.6 to 171.8 ft bgs.	176.0	
0		50.4/84%				SS		SANDSTONE: light to medium gray (N6); poorly graded, fine to medium, some iron stain mottling, closed fracture (54° dip). RQD for 176 to 181 ft bgs = 100%. Mechanical break at 180.4 ft bgs. RQD for 181 to 186 ft bgs = 60%. Broken at 181.2 ft bgs.		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-139

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Broken at 181.7 and 181.8 ft bgs.		
								Broken at 182.6 ft bgs.		
								Fracture from 183 to 183.2 ft bgs, iron stained, 30° dip, wet.		
								Very weak cementation at 184.4 ft bgs, friable, wet.		
					185			Broken, friable sands at 184.9 to 185.3 ft bgs.		← 5-7/8-in open borehole (19.2-206 ft bgs)
		0/ 0%						Color change at 185.6 ft bgs to dark greenish gray (5G 4/1).	186.0	
						NR		No Recovery, 186 to 186.7 ft bgs.	186.7	
0		68.4/ 133%						SANDSTONE: as above but alternating fine to medium grained and medium to coarse grained, well cemented (strong to very strong), no fractures. RQD for 186 to 191 ft bgs (excluding missing section) = 100%.		
					190					
0		67.2/ 112%								
								Horizontal break at 192.4 ft bgs.		

Continued Next Page

NEWGINT SSFL_VER09092016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-139
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		51.6/ 86%			195	SS		<p>Break at 193.9 ft bgs along bedding plane contact with fine grained sandstone, 25° dip.</p> <p>RQD for 196 to 201 ft bgs = 100%.</p> <p>Broken (rough) at 196.8 ft bgs, slightly weaker zone.</p>		<p>← 5-7/8-in open borehole (19.2-206 ft bgs)</p>
0		62.4/ 111%			200			<p>Broken at 199.5 ft bgs (mechanical?).</p> <p>Mechanical break at 200.1 ft bgs.</p> <p>Small, high angle fracture (0.3 ft) at 200.4 ft bgs.</p>	202.0	
						SS		<p>SANDSTONE: light to medium gray (N6); poorly graded, fine to medium; RQD for 201 to 206 ft bgs = 95%.</p> <p>Weak zone, fractured, 203.7 to 203.8 ft bgs.</p>		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

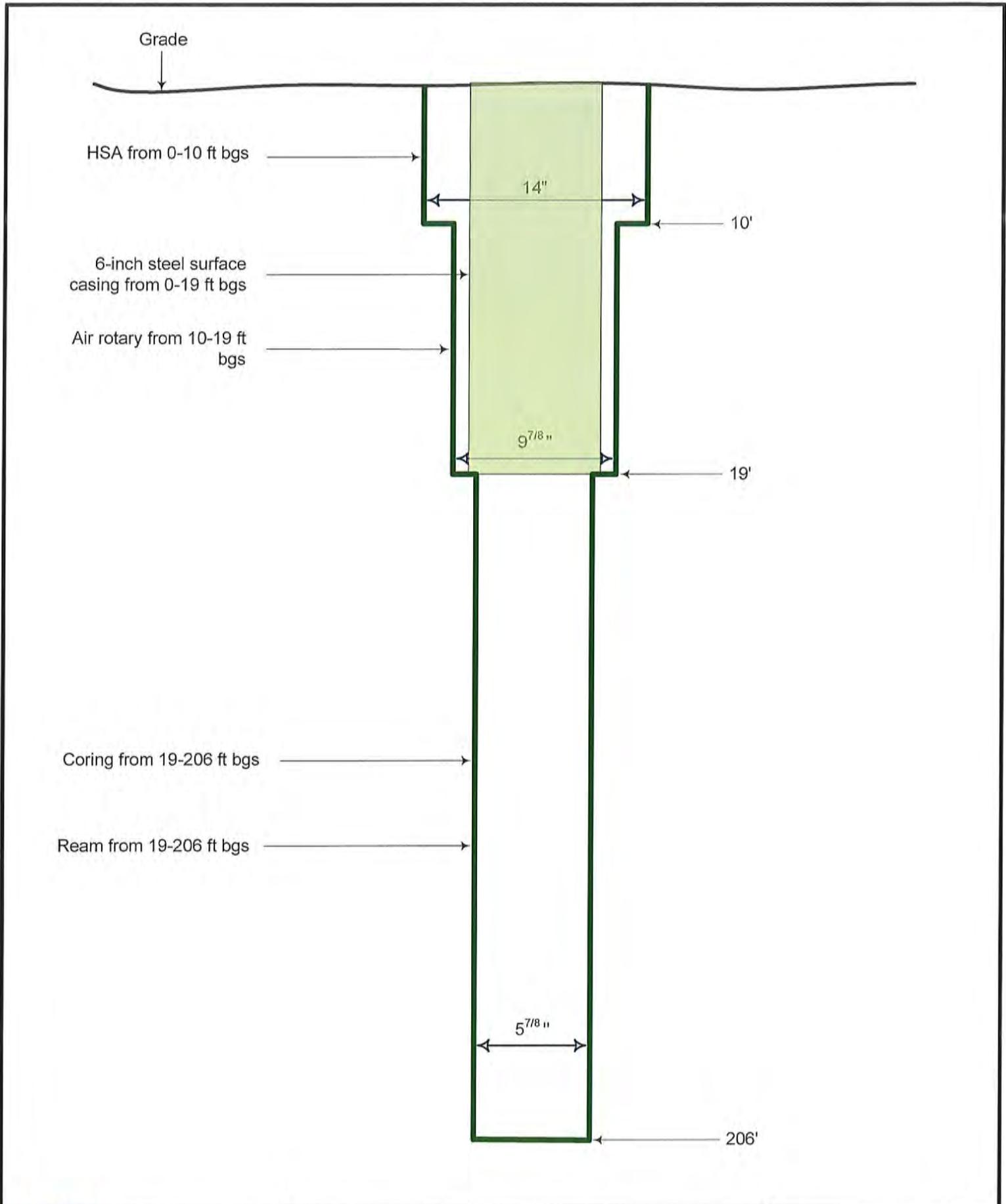
BORING/WELL NUMBER DD-139

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/25/16 - 3/4/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					205			Horizontal mechanical break at 204.5 ft bgs.		
								Weak zone, slightly weathered, 205.4 to 205.6 ft bgs.	205.7	5-7/8-in open borehole (19.2-206 ft bgs)
								Total depth of core is 205.7 ft bgs.		





111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16
 LOCATION Area IV CASING TYPE/DIAMETER 1/4-inch Mild Steel\6-inch ID
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring SCREEN TYPE/SLOT Open Borehole
 SAMPLING METHOD Grab/Coring GRAVEL PACK TYPE Not Applicable
 GROUND ELEVATION (FT MSL) 1796.01 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 TOP OF CASING (FT MSL) 1798.16 DEPTH TO WATER (FT BGS) 132.00
 LOGGED BY Frank Morris GROUND WATER ELEVATION (FT MSL) 1666.16
 REMARKS _____

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		120						SILTY SAND: dark reddish brown (2.5YR 3/3); fine, trace organics, moist. (used DS-46 log for details)		
						SM				
								SANDSTONE: brown (10YR 4/2); highly weathered, pulverized into 1/4-inch fragments by augers. (used DS-46 log for details)	3.0	14-in diameter borehole, grouted (0-10 ft bgs)
					5					6-in ID x 1/4-in wall mild steel surface casing (0-60 ft bgs)
						SS				
					10				10.0	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								SANDSTONE: yellowish brown (10YR 5/4); weathered, pulverized into poorly graded sand by air rotary bit, fine, angular to subangular, moist. (see also log for DS-46)		<p>9-7/8-in borehole (10-60 ft bgs)</p> <p>Portland cement/bentonite grout (10-60 ft bgs)</p> <p>6-in ID x 1/4-in wall mild steel surface casing (0-60 ft bgs)</p>

NEWGINT SSFL_VER09062016.GPJ LAEWN01.GDT 9/6/16

Continued Next Page

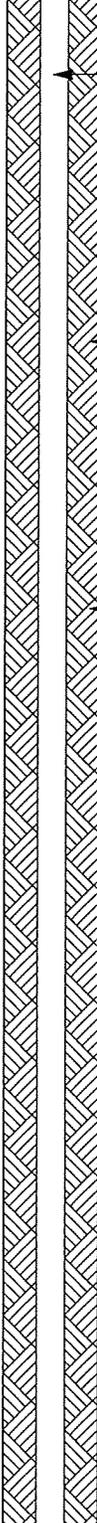


111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					22.0			SANDSTONE: yellowish brown (10YR 5/4); pulverized into poorly graded sand by air rotary bit, fine, angular to subangular, moist. (see also log for DS-46)	22.0	 <p>6-in ID x 1/4-in wall mild steel surface casing (0-60 ft bgs)</p> <p>Portland cement/bentonite grout (10-60 ft bgs)</p> <p>9-7/8-in borehole (10-60 ft bgs)</p>
					25					
						SS				
					30					
									32.8	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-140

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					35			SANDSTONE: yellowish brown (10YR 5/4); pulverized into poorly graded sand by air rotary bit, fine, angular to subangular, moist. (see also log for DS-46)		<p>6-in ID x 1/4-in wall mild steel surface casing (0-60 ft bgs)</p> <p>Portland cement/bentonite grout (10-60 ft bgs)</p> <p>9-7/8-in borehole (10-60 ft bgs)</p>
					40	SS			44.3	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					45			SANDSTONE: yellowish brown (10YR 5/4); pulverized into poorly graded sand by air rotary bit, fine, angular to subangular, moist. (see also log for DS-46)		<p>6-in ID x 1/4-in wall mild steel surface casing (0-60 ft bgs)</p> <p>Portland cement/bentonite grout (10-60 ft bgs)</p> <p>9-7/8-in borehole (10-60 ft bgs)</p>
					50					
					55	SS				

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		0/0%			60			SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, massive, 1-inch shale stringer with trace of shale clasts. (approximately 1.5 feet missing between Runs 1 and 2?) SILTSTONE: dark greenish gray (5G 4/1); then fine sandstone at 64.1 ft bgs to mechanical break. SANDSTONE: olive gray (5Y 4/1); poorly graded, fine, weathered fracture, iron stained, 48° dip, friable with near vertical fracture to 65 ft bgs, then massive, fine to medium grained, consolidated. RQD = 72%, fair.		<p>6-in ID x 1/4-in wall mild steel surface casing (0-60 ft bgs) Portland cement/bentonite grout (10-60 ft bgs) 9-7/8-in borehole (10-60 ft bgs) 5-7/8-in open borehole (60-167.2 ft bgs)</p>
0		66/110%							63.1	
						ST			64.1	
						SS				67.1

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEVNN01.GDT 9/6/16



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		57.6/ 96%						SANDSTONE: olive gray (5Y 4/1); poorly graded, massive, fine to medium, consolidated, more broken than overlying.		<p>5-7/8-in open borehole (60-167.2 ft bgs)</p>
						SS			69.2	
					70	ST	XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX	SILTSTONE: dark greenish gray (5G 4/1); grading to fine grained, some soft sediment deformation, RQD = 53%, fair.	70.3	
								SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine, broken, low angle fractures.		
0		45.6/ 76%						At 72 ft bgs, very broken and friable.		
								At 73.7 ft bgs, trace of shale clasts, 1/4-in maximum diameter, soft sediment deformation.		
						SS				
					75			At 75 ft bgs, SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine, low angle fractures, trace of shale clasts, RQD = 26%, poor.		
0		68.4/ 114%						Massive from 77 to 80.2 ft bgs, then broken from 80.2 to 81.9 ft bgs, feldspar and shale clasts, 1/8-inch diameter throughout, RQD = 73%, fair. Rock fell into broken section decreasing previous run recovery and increasing current cun recovery.		
									78.6	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		58.8/ 98%			80			SANDSTONE: light olive gray (5Y 5/2); poorly graded, fine to medium, massive, fractures with 45° dip near bottom of run, trace of feldspar and shale clasts, 1/4-in diameter.		<p>5-7/8-in open borehole (60-167.2 ft bgs)</p>
						SS		Color change at 82.2 ft bgs.		
0		44.4/ 74%						Intersecting 45° fractures from 86.4 to 86.9 ft bgs. RQD = 79%, good (87 ft bgs). Color change at 88 ft bgs to dark greenish gray (5GY 4/1), minor oxidation.		
					90				90.0	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNND1.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-140
 DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		62.4/ 104%				SS		SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, competent from 90.7 to approximately 95 ft bgs, RQD = 98%, excellent. At least 1 foot of core is from previous run.		<p>5-7/8-in open borehole (60-167.2 ft bgs)</p>
					95	SH		SHALE: Core missing from weak or fractured zone. Driller noted increase in water loss and black powdery returns (shale?). Bailed 55 gallons from mud pit.	95.0	
						SS		SANDSTONE: as previous.	96.0	
0		78/ 130%				SS		SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, very competent, feldspar clasts from 96 to 97.3 ft bgs, RQD = 100%, excellent.	97.0	
					100					
									101.4	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWIND1.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0								<p>SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, very competent, RQD = 100%, excellent.</p> <p>Fracture at 104.1 ft bgs, 28° dip, some iron staining.</p> <p>Abundant fractures around 105 ft bgs, high angle to near vertical broken, slightly weathered, RQD = 15%, poor, 55 gallons of water came in.</p>		<p>5-7/8-in open borehole (60-167.2 ft bgs)</p>
0		60/100%				SS	<p>Broken sandstone fragments from 108 to 109.1 ft bgs.</p>			
0		24/100%					<p>Intersecting 45° fractures, intensely weathered, and broken at approximately 111 ft bgs.</p>			
0		58.8/163%					<p>Iron staining from 111.8 to 112 ft bgs.</p>	112.8		

Continued Next Page

NEWGINT SSFL_VER0802016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		24/100%			115			SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, very competent.		<p>5-7/8-in open borehole (60-167.2 ft bgs)</p>
0		57.6/96%				SS	Fracture at 114 ft bgs, 54° dip, iron staining, weak cementation.			
0		60/100%					SANDSTONE: as previous at 117 ft bgs, no fractures, well cemented, RQD = 100%, excellent.			
					120			SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, massive, well consolidated, RQD = 100%, excellent.	124.2	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-140
 DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		54/ 90%			125			SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, massive, well consolidated, fracture with 70° dip, RQD = 95%, excellent.		<p>5-7/8-in open borehole (60-167.2 ft bgs)</p> <p>First water (132 ft bgs)</p>
					130	SS		Medium to coarse grained, fining up sequence from 129.5 to 131.4 ft bgs.		
0		24/ 100%						Vertical fracture at break between cores (at 132 ft bgs), extends 0.4 ft through finer grained sequence.		
0		36/ 100%			135				135.7	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-140

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/100%						<p>SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, massive, well consolidated, RQD = 95%, excellent.</p> <p>Contact between fine and coarse grained fining upward sequence at 136.6 ft bgs, approximate 50° dip.</p>		<p>← 5-7/8-in open borehole (60-167.2 ft bgs)</p>
0		50.4/84%			140	SS		<p>SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, trace coarse, massive, strong to very strong, RQD = 100%, excellent.</p>		
					145			<p>Mechanical break at 146.2 ft bgs.</p>	147.1	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		69.6/ 11.6						SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, trace coarse, massive, moderate, RQD = 98%, excellent.		<p>← 5-7/8-in open borehole (60-167.2 ft bgs)</p>
						SS			149.6	
					150	ST	xxxxxxx xxxxxxx xxxxxxx	SILTSTONE: gray (N6); soft sediment deformation.	150.3	
						SS		SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, trace coarse, massive, strong to very strong, RQD = 100%, excellent.	152.0	
0		60/ 100%						SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine, massive, slightly deformed bedding from 152.4 to 154 ft bgs, RQD = 100%, excellent.		
						SS			157.0	
0		60/ 100%						SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, massive.		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAE\WNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

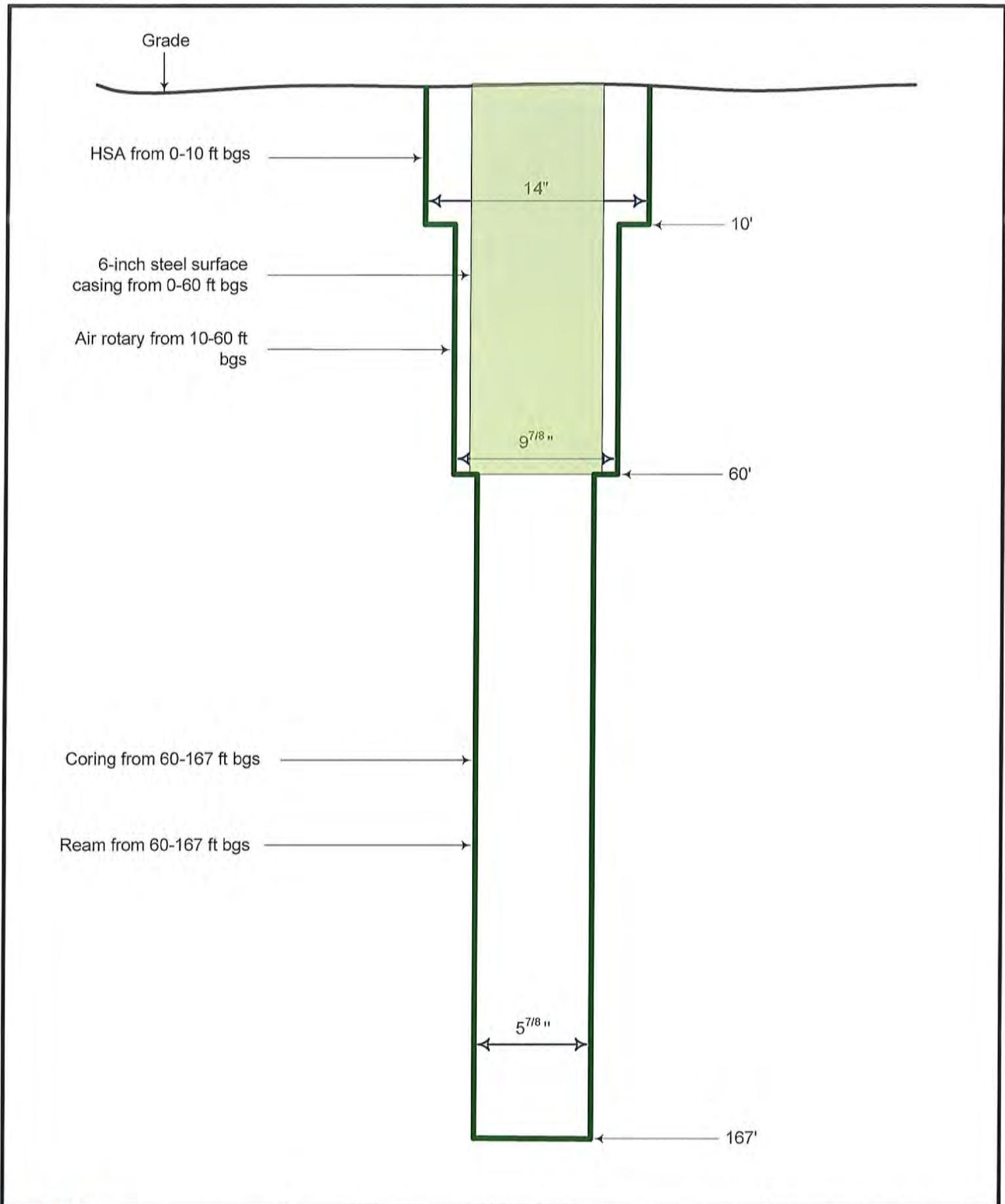
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-140
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/16/16 - 2/23/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		62.4/ 100%			160	SS				
						SH		SHALE: dark gray (N3); laminated, approximately 3/4-inch thick layers, 38° dip, grades to siltstone then fine grained sandstone, RQD = 100%, excellent.	161.6	
						SS		SANDSTONE: dark greenish gray (5G 4/1); grading from fine to medium to fine grained at top of run.	162.4	
						SH		SHALE: gray (N6) to dark greenish gray (5G 4/1); laminated, approximate 20° dip.	163.5	
						SH		SHALE: gray (N6) to dark greenish gray (5G 4/1); laminated, approximate 20° dip.	164.1	
					165	SS		SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, massive.	164.1	
								Total depth of borehole is 167.2 ft bgs. Used 250 gallons of water during drilling; evacuated all water used.	167.2	

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/8/16





111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-141
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 6/21/16 - 6/29/16
 LOCATION Area IV CASING TYPE/DIAMETER 1/4-inch Mild Steel/6-inch ID
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring SCREEN TYPE/SLOT Open Borehole
 SAMPLING METHOD Grab/Coring GRAVEL PACK TYPE Not Applicable
 GROUND ELEVATION (FT MSL) 1762.19 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 TOP OF CASING (FT MSL) 1762.79 DEPTH TO WATER (FT BGS) NA
 LOGGED BY M. Jusayan GROUND WATER ELEVATION (FT MSL) 0.00
 REMARKS _____

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		120						SILTY SAND: dark brown (10YR 3/3); very fine- to medium-grained, trace organics.		
						SM			2.0	
								SANDSTONE: yellowish brown (10YR 5/6); highly weathered, fine-grained.		
					5			Color change to yellowish-gray (5Y 7/2) at 5 ft bgs, and harder drilling.		14-in diameter borehole, grouted (0-10 ft bgs)
										6-in ID x 1/4-in wall mild steel surface casing (0-19.5 ft bgs)
					10					

NEWGINT SSFL_VER09062016.GPJ LAEWNND01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-141

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 6/21/16 - 6/29/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		114				SS				
				G	15			Color change to lt gray (N7) at 15 ft bgs.		
0		24/57%			20			SANDSTONE: m. dark gray (N4); fine- to medium-grained, laminated, pulverized 20-21 ft bgs.	19.5	<p>9-7/8-in borehole (10-19.5 ft bgs)</p> <p>Portland cement/bentonite grout (10-19.5 ft bgs)</p> <p>6-in ID x 1/4-in wall mild steel surface casing (0-19.5 ft bgs)</p> <p>5-7/8-in open borehole (19.5-133 ft bgs)</p>

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-141

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 6/21/16 - 6/29/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/ 100%				SS		At 21.4 ft bgs, becomes massive. At 22.1 ft bgs, near horizontal fracture, extremely narrow aperture, slight oxidation staining along fracture.		
					25					
								At 25.8 ft bgs, near horizontal fracture, extremely narrow aperture, slight oxidation staining along fracture plane.		
						SS		SANDSTONE: 2-in lt olive gray SS, laminated, oxidation staining and horizontal fracture in contact with shale inclusion (1.5 cm [0.6-in]); bedding plane at 40° dip. Several horizontal fractures at 26.6 ft, 26.9 ft, 27.2 ft, 27.3 ft, 27.4 ft bgs.	26.6	
								SANDSTONE: as previous, massive, fine- to coarse-grained.	27.4	
0		61.2/ 102%				SS				
					30			SANDSTONE: laminated, fine-grained.	29.8	
						SS				
								SANDSTONE: same color as previous, fine- to medium-grained.	30.7	
								At 31.8 and 32 ft bgs, near horizontal fractures, very narrow apertures, friable at fracture surfaces, little to no oxidized staining.		

← 5-7/8-in open borehole (19.5-133 ft bgs)

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAE\WNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-141
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 6/21/16 - 6/29/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
		NA						At 32.8 ft bgs, near horizontal fracture, extremely narrow aperture, no staining.		
					35			From 34.5 to 35.3 ft bgs, zone of horizontal fractures, narrow to very narrow apertures, friable at fracture surfaces, little to no staining, appears damp.		← 5-7/8-in open borehole (19.5-133 ft bgs)
								From approx. 36.6 to 36.8 ft bgs, 50° fracture with very narrow aperture, highly friable at fracture surfaces, loose sand grains, no staining, appears damp.		
0		62.4/ 104%						At 39 ft bgs, near horizontal fracture, very narrow aperture, slight iron oxidation staining, dry.		
					40			From 40 to 40.8 ft bgs, fracture zone; intersecting, open fractures, 50° to near vertical; iron oxide staining; highly friable at fracture surfaces; wet with minor seepage.		
								At 41.7 ft bgs, 110° fracture, iron oxide staining and friable at fracture surfaces		
0		58.8/ 98%								

NEWGINT SSFL_VER09062016.GPJ LAEWINN01.GDT 9/8/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-141
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 6/21/16 - 6/29/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		61.2/ 102%			45			<p>From 44.2 to 44.9 ft bgs, fracture zone; intersecting horizontal and near vertical fractures, very narrow apertures, friable at fracture surfaces, loose sand grains, minor seepage.</p> <p>SANDSTONE: as previous.</p> <p>Mechanical breaks at approx. 47, 49.7, and 50.5 ft bgs.</p>		<p>← 5-7/8-in open borehole (19.5-133 ft bgs)</p>
0		69.6/ 116%			50			<p>At 51.2 ft bgs, 60° fracture; moderately wide aperture, loose sand grains.</p> <p>From 52 to 52.3 ft bgs, fracture zone; intersecting horizontal and near vertical fractures; very narrow apertures, friable at fracture surfaces, loose sand grains, slight/minor seepage.</p>		
					55					

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-141
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 6/21/16 - 6/29/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		51.6/ 86%						<p>SANDSTONE: as previous.</p> <p>At 57.4 ft bgs, horizontal fracture, very narrow aperture, dry.</p>		<p>← 5-7/8-in open borehole (19.5-133 ft bgs)</p>
0		61.2/ 102%			60			<p>Mechanical break at 62.2 ft bgs.</p> <p>Mechanical break at approx. 64 ft bgs.</p> <p>From 64.5 to 64.6 ft bgs, open fracture zone; intersecting horizontal and near vertical fractures; friable at fracture surfaces, loose sand grains, iron oxide staining, wet with seepage.</p> <p>From 65.7 to 66 ft bgs, same as previous fracture zone except very narrow aperture.</p> <p>At 66.6 ft bgs, 130° fracture, very narrow aperture, friable surface, loose sand grains, minor seepage.</p>		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEVMN01.GDT 9/16/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-141

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 6/21/16 - 6/29/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		62.4/ 104%						SANDSTONE: as previous, no fractures.		← 5-7/8-in open borehole (19.5-133 ft bgs)
0		61.2/ 102%			70			Mechanical breaks at 73.3 and 73.8 ft bgs.		
0		60/ 100%			75					

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-141
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 6/21/16 - 6/29/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/ 100%			80	SS		SANDSTONE: as previous, no fractures.		<p>5-7/8-in open borehole (19.5-133 ft bgs)</p>
0		54/ 90%			85					
					90					

Continued Next Page

NEWGINT SSFL_VER09052016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-141

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 6/21/16 - 6/29/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		57.6/96%						SANDSTONE: as previous.		
0		57.6/96%			95			At 93.2 ft bgs, near vertical fracture, friable at surfaces, loose sand grains, very slight oxidation.		← 5-7/8-in open borehole (19.5-133 ft bgs)
					100			At 101 ft bgs, 40° fracture, friable surfaces, loose sand grains, very narrow aperture, possible seepage.		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAE\W\N01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-141

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 6/21/16 - 6/29/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		62.4/ 104%						SANDSTONE: as previous, no fractures.		<p>5-7/8-in open borehole (19.5-133 ft bgs)</p>
0		60/ 100%								

Continued Next Page



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-141

PROJECT NAME Santa Susana Field Laboratory

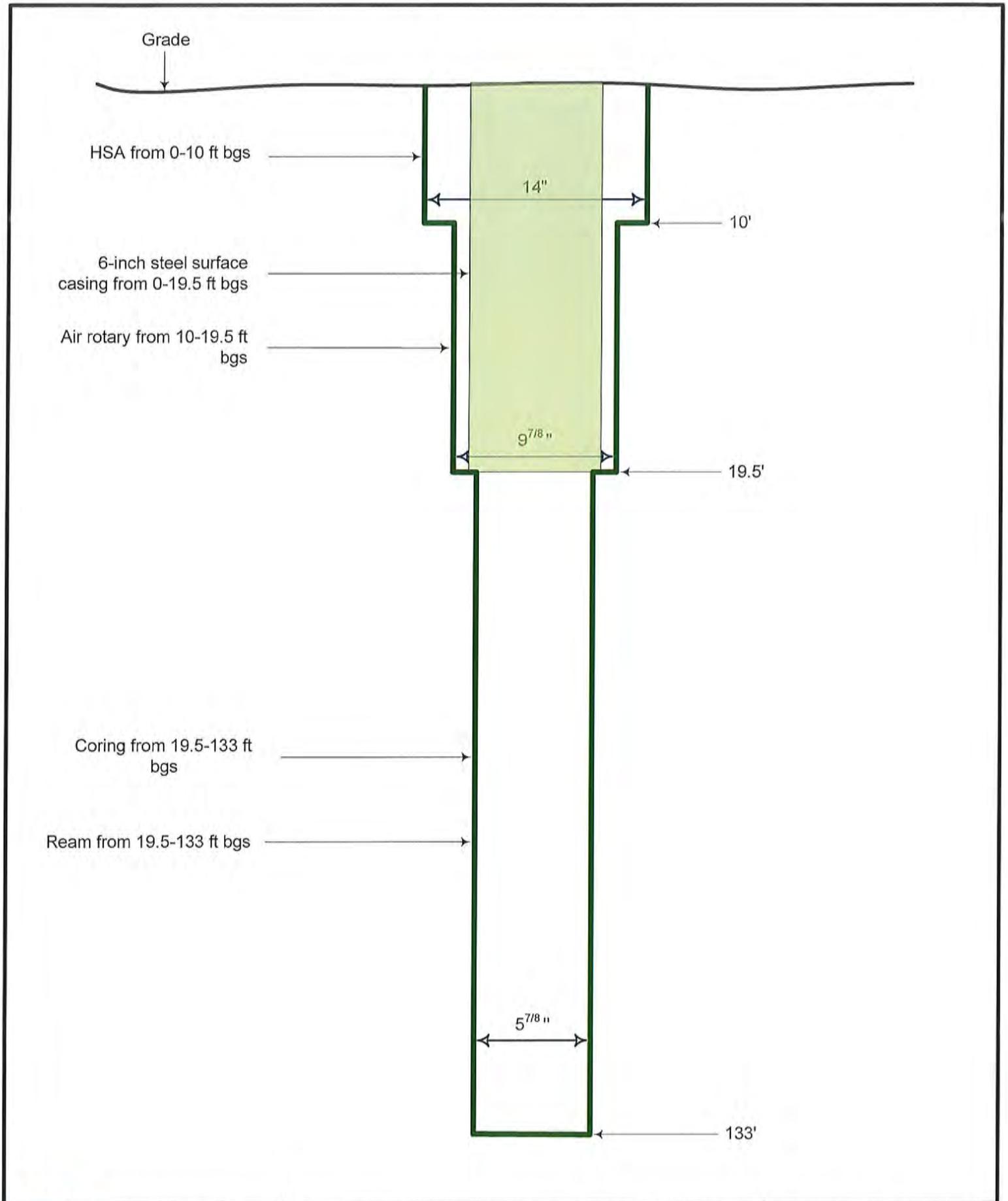
DATE DRILLED 6/21/16 - 6/29/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		56.4/ 94%			125			SANDSTONE: as previous.		
					130			From 130 to 130.2 ft bgs, fracture zone; 30° and horizontal fractures, very narrow apertures, friable at fracture surfaces, loose sand grains, possible seepage.	130.2	
						SH		SHALE: med gray (N5); soft, thinly bedded, weathered (clayey).		
								SANDSTONE: as previous.	132.0	
						SS		From 132 to 132.2 ft bgs, fracture zone.		
								Total depth of borehole is 133 ft bgs.	133.0	

← 5-7/8-in open borehole (19.5-133 ft bgs)

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



Grade

HSA from 0-10 ft bgs

14"

10'

6-inch steel surface casing from 0-19.5 ft bgs

Air rotary from 10-19.5 ft bgs

9 7/8 "

19.5'

Coring from 19.5-133 ft bgs

Ream from 19.5-133 ft bgs

5 7/8 "

133'



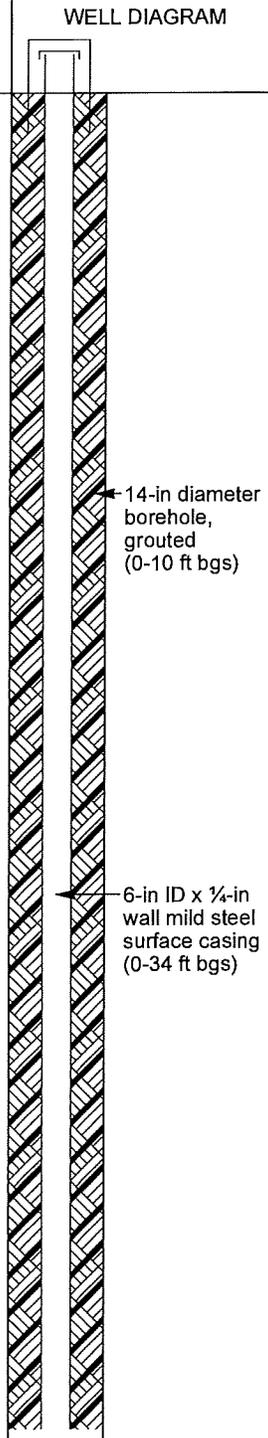
111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory
 LOCATION Area IV
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring
 SAMPLING METHOD Grab/Coring
 GROUND ELEVATION (FT MSL) 1811.59
 TOP OF CASING (FT MSL) 1812.22
 LOGGED BY Mike Hoffman
 REMARKS _____

BORING/WELL NUMBER DD-142
 DATE DRILLED 2/3/16 - 2/5/16
 CASING TYPE/DIAMETER 1/4-inch Mild Steel/6-inch ID
 SCREEN TYPE/SLOT Open Borehole
 GRAVEL PACK TYPE Not Applicable
 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 DEPTH TO WATER (FT BGS) 61.70
 GROUND WATER ELEVATION (FT MSL) 1750.52

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		120						SILTY SAND: dark brown (10YR 3/3); 70% sand, poorly graded, fine to medium, angular to subangular; 30% silt; moist.		
					5	SM				
								SANDSTONE: dark brown (10YR 3/3); pulverized into silty sand by air rotary bit, 70% poorly graded sand, fine to medium, angular to subangular; 30% silt; moist.	6.0	
						SS				
					10					



NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-142

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/3/16 - 2/5/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					15			SANDSTONE: dark brown (10YR 3/3); pulverized into silty sand by air rotary bit, 70% poorly graded sand, fine to medium, angular to subangular; 30% silt; moist.		<p>6-in ID x 1/4-in wall mild steel surface casing (0-34 ft bgs)</p> <p>Portland cement/bentonite grout (10-34 ft bgs)</p> <p>9-7/8-in borehole (10-34 ft bgs)</p>
					20	SS				

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

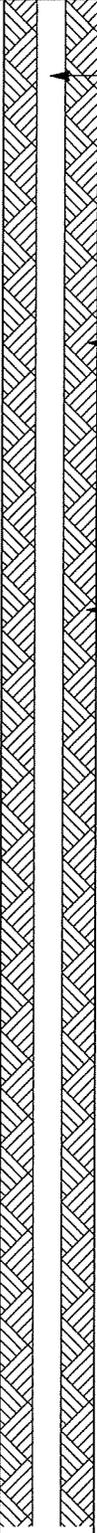
PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-142

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/3/16 - 2/5/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					22.0			SANDSTONE: dark brown (10YR 3/3); pulverized into silty sand by air rotary bit, 70% poorly graded sand, fine to medium, angular to subangular; 30% silt; moist.	22.0	 <p>6-in ID x 1/4-in wall mild steel surface casing (0-34 ft bgs)</p> <p>Portland cement/bentonite grout (10-34 ft bgs)</p> <p>9-7/8-in borehole (10-34 ft bgs)</p>
					25					
						SS				
					30					

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-142
 DATE DRILLED 2/3/16 - 2/5/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		24/ 100%			34.0			SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented. 3/4-inch shale stringer at 35 ft bgs, moderately weathered, 45° dip.	34.0	<p>5-7/8-in open borehole (34-91 ft bgs)</p>
0		54/ 90%			35.0	SS			36.0	
0					36.0	SH		SHALE: yellowish brown (10YR 5/4); moderately weathered, massive, weakly cemented.	36.6	
0					36.6			SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.		
0					40.0	SS				
0		48/ 80%			41.0	SH		SHALE: yellowish brown (10YR 5/4); moderately weathered, laminated, 45° dip, weakly cemented.	41.5	
0					41.5			SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented. Single vertical fracture from 42 to 42.4 ft bgs, 1/16-inch aperture.		
0					42.0	SS				
0					44.2			Shale intrusion at 44 ft bgs, 2 inches thick, 45° dip.		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWIN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-142
 DATE DRILLED 2/3/16 - 2/5/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		57.6/ 96%			45			SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented. Single fracture at 45.5 ft bgs, 45° dip, 1/16-in aperture.		
0		44.4/ 74%			50	SS				
					55				55.7	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWINN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-142
 DATE DRILLED 2/3/16 - 2/5/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		51.6/ 86%						<p>SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.</p> <p>3-in fracture zone at 57 ft bgs, clay intrusion, rock is crushed.</p> <p>SS</p> <p>Fractured from 59.7 to 60.4 ft bgs, four fractures in 0.7 feet. Core completely separated, 0° to 45° fracture planes.</p>		<p>5-7/8-in open borehole (34-91 ft bgs)</p>
0		60/ 100%						<p>SANDSTONE: dark yellowish brown (10YR 4/4); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented. More competent than overlying rock.</p> <p>SS</p> <p>Fracture from 63.8 to 65 ft bgs, high angle fracture plane.</p>	61.0	<p>First water (62 ft bgs)</p>
0		27.6/ 46%						<p>SHALE: dark gray (2.5Y 4/1); moderately weathered, laminated, 45° dip, weakly cemented, highly fractured from 66 to 71.5 ft bgs (sample is crushed).</p>	66.0	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-142
 DATE DRILLED 2/3/16 - 2/5/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/ 100%			70	SH				<p>5-7/8-in open borehole (34-91 ft bgs)</p>
									71.5	
								SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, fractured, weakly cemented. Opposing 45° fractures, 11 fractures over 4.5 ft.		
0		48/ 80%			75	SS				
								At 76 ft bgs, six fractures over 4.5 ft.		
									78.5	

Continued Next Page

NEWGINT SSFL_VER09062D16.GPJ LAEWIND1.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-142
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/3/16 - 2/5/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/100%			80			<p>SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, fractured, weakly cemented.</p>		<p>5-7/8-in open borehole (34-91 ft bgs)</p>
								<p>Fractured from 82 to 84 ft bgs, horizontal and 45° fracture planes, 13 fractures in 2 feet.</p>		
						SS		<p>Two weathered fractures from 85 to 86 ft bgs, 45° fracture planes.</p>		
0		60/100%						<p>Fractured from 86 to 87 ft bgs, 45° fracture planes, 1/16-in aperture.</p>		
					90					

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

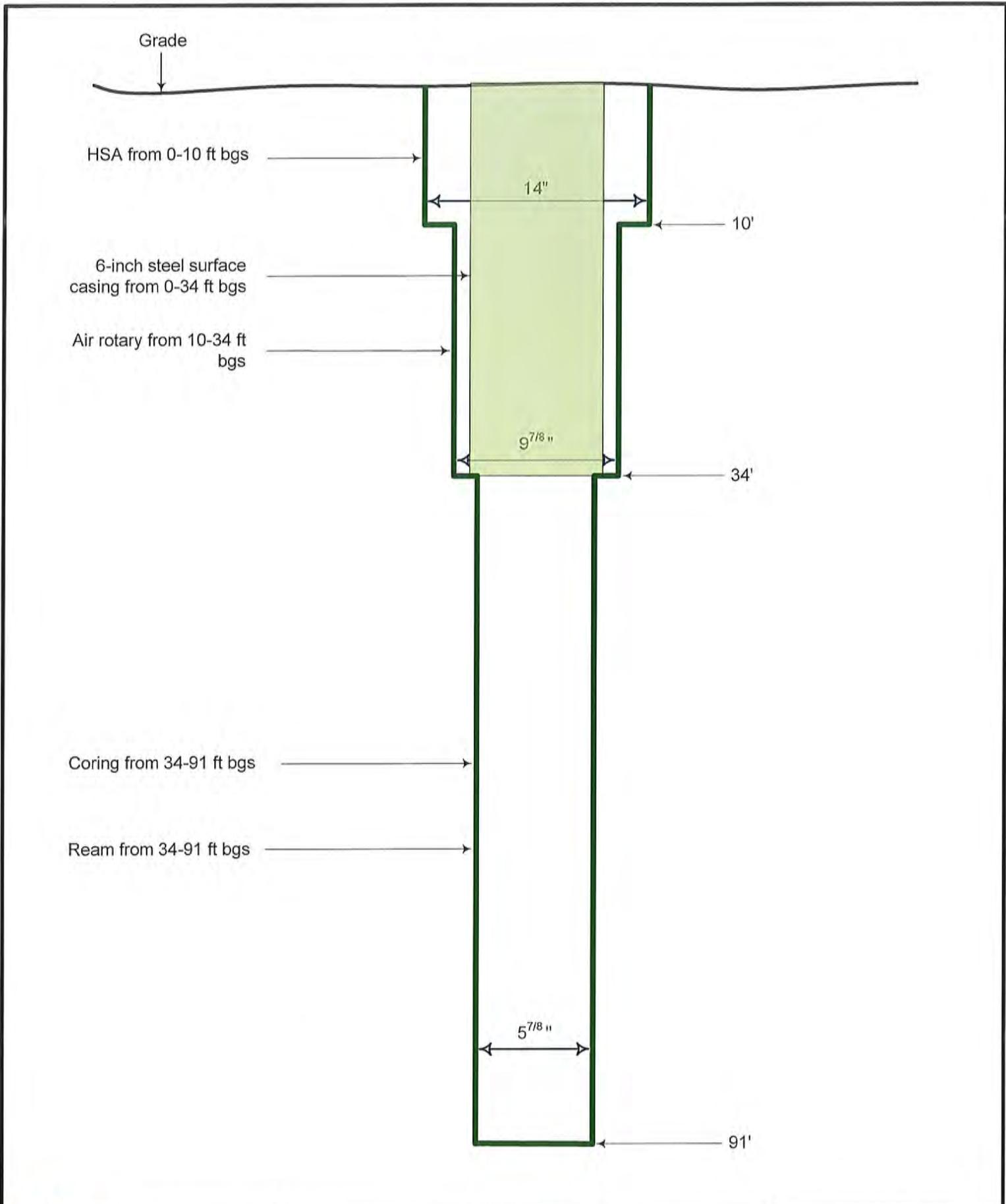
BORING/WELL NUMBER DD-142

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/3/16 - 2/5/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								<p>Total depth of borehole is 91 ft bgs. Used 250 gallons of water during drilling; evacuated all water used.</p>	91.0	





111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory
 LOCATION Area IV
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring
 SAMPLING METHOD Grab/Coring
 GROUND ELEVATION (FT MSL) 1789.14
 TOP OF CASING (FT MSL) 1789.74
 LOGGED BY M. Jusayan/Frank Morris

BORING/WELL NUMBER DD-143
 DATE DRILLED 6/9/16 - 6/15/16
 CASING TYPE/DIAMETER 1/4-inch Mild Steel/6-inch ID
 SCREEN TYPE/SLOT Open Borehole
 GRAVEL PACK TYPE Not Applicable
 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 DEPTH TO WATER (FT BGS) 54.00
 GROUND WATER ELEVATION (FT MSL) 1735.74

REMARKS

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		120						<p>SAND with SILT: strong brown (7.5YR 5/6); very fine-grained, dry to slightly moist, trace rock fragments at 3 ft bgs.</p> <p>SM</p>		<p>14-in diameter borehole, grouted (0-10 ft bgs)</p> <p>6-in ID x 1/4-in wall mild steel surface casing (0-19.7 ft bgs)</p>
							<p>SANDSTONE: lt brown/yellow (10YR 5/4); highly weathered, very fine-grained.</p> <p>Slight color change at 4 ft bgs to lt brown/tan.</p>	3.0		

NEWGINT SSFL_VER09052016.GPJ LAEWNN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-143
 DATE DRILLED 6/9/16 - 6/15/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		116.4								
						SS		At 12 ft bgs, fracture (drill bit drop); pulverized fine to medium sand, same color as previous, very weathered rock fragments.		<p>← 9-7/8-in borehole (10-19.7 ft bgs)</p> <p>← Portland cement/ bentonite grout (10-19.7 ft bgs)</p> <p>← 6-in ID x 1/4-in wall mild steel surface casing (0-19.7 ft bgs)</p>
				G	15					
								Color change at 18.5 ft bgs to lt gray; larger rock chips (indicating harder rock).		
0		33.6/85%			20			SANDSTONE: as previous except medium gray (N5); slightly weathered, weak cementation resulting in several mechanical breaks; 1.5-in diameter shale clast.		<p>← 5-7/8-in open borehole (19.7-100 ft bgs)</p>

NEWGINT SSFL_VER09062016.GPJ LAEWIN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-143

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 6/9/16 - 6/15/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/ 100%							23.0	
					25					
0.2		60/ 100%								
					30					

SANDSTONE: medium dark gray (N4); very fine-grained in contact with overlying fine- to medium-grained SS, grades to fine- to medium-grained SS at 24 ft bgs; Near vertical fracture (95°) from approx 23 to 23.3 ft bgs, perpendicular to bedding plane, extremely narrow aperture, oxidation along fracture surfaces.

At 29 ft bgs, 60° fracture, iron-stained, very narrow aperture.

Approx. 30 ft bgs, becomes fine-grained.

← 5-7/8-in open borehole (19.7-100 ft bgs)

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWAND1.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-143

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 6/9/16 - 6/15/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
1.5		54/ 90%								
						SS		<p>Mechanical break at 34.1 ft bgs.</p> <p>Approx. 35.6 ft bgs, becomes fine- to medium-grained.</p> <p>Approx. 36 ft bgs, becomes massive.</p>		<p>← 5-7/8-in open borehole (19.7-100 ft bgs)</p>
0		62.4/ 104%					<p>SANDSTONE: as previous; 100% RQD.</p> <p>From 38 to 38.5 ft bgs, weak cementation; mechanical break at 38.5 ft bgs.</p> <p>Mechanical break at 39.6 ft bgs.</p>			
0		60/ 100%								

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-143

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 6/9/16 - 6/15/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/ 100%			45					
						SH		At approx. 45.4 ft bgs, bedding plane fracture ~ 1.5-in above contact with shale, narrow aperture. SHALE: parting along bedding plane with shallow dip (~15°), in contact with overlying and underlying fine- to medium SS; interbedded with fine, 1 mm thick sandstone. SANDSTONE: med gray (N5); fine- to medium-grained, laminated, fresh.	45.6 46.3	
								From 47 to 48 ft bgs, fracture zone; multiple fractures, perpendicular to the bedding plane, no staining, friable; may be mechanical breaks due to weak cementation.		← 5-7/8-in open borehole (19.7-100 ft bgs)
								SANDSTONE: as previous, except fine- to coarse-grained, massive. 100% RQD.		
						SS		Mechanical breaks at 50.9 and 51.1 ft bgs. SANDSTONE: as previous except with mottling.		
0		45.6/ 76%						At 53.8 ft bgs, quartz-filled fracture, ~ 120°, moderately healed.		▼ First water (54 ft bgs)
								At 54.9 ft bgs, horizontal fracture.		
								From 55.5 to 56.4 ft bgs, multiple broken fractures, SS is		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWIND1.GDT 9/6/16



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-143
DATE DRILLED 6/9/16 - 6/15/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		48/100%						<p>friable, no staining; part of run was likely pulverized.</p> <p>SANDSTONE: as previous except m. dark gray (N4), fine-to medium-grained.</p> <p>From approx. 57.8 to 58.1 ft bgs, near vertical fracture, no staining.</p> <p>At 58.8 ft bgs, horizontal fracture, little to no staining. Becomes very friable (easily breaks by hand). From approx. 58.9 to 59.2 ft bgs, fracture with ~ 60° dip, no staining; apparent continuous seepage.</p> <p>Mechanical break at 60.6 ft bgs.</p>	56.0	<p>← 5-7/8-in open borehole (19.7-100 ft bgs)</p>
0		7.2/60%					SANDSTONE: as previous, no staining.			
0		42/70%					SANDSTONE: as previous except moderately fractured; fractures along bedding planes, partially healed with silt infilling; highly friable along fracture surfaces.			

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWIN01.GDT 9/6/16



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-143

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 6/9/16 - 6/15/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		62.4/ 130%						<p>From 67.9 to 69.2 ft bgs, intensely fractured zone; open fractures with loose sand grains and rock chips, very friable along fracture surfaces, no staining; apparent continuous seepage.</p> <p>SANDSTONE: color as previous, very friable.</p> <p>At 71 ft bgs, horizontal fracture, no staining.</p> <p>At 71.8 ft bgs, horizontal fracture.</p> <p>At 72.3 ft bgs, horizontal fracture.</p>		<p>← 5-7/8-in open borehole (19.7-100 ft bgs)</p>
0		9.6/ 80%			70			<p>From 73 to 73.9 ft bgs, SANDSTONE as previous, moderately fractured, very friable; intersecting fractures, some near vertical; moderate seepage.</p>		
		64.8/ 108%				SS		<p>At 75.1 ft bgs, horizontal fracture.</p> <p>At 76 ft bgs, horizontal fracture.</p>		
0		61.2/ 102%						<p>From approx. 78 to 83 ft bgs, SANDSTONE as previous except moderately to intensely fractured; massive intersecting fractures which occur every 1- to 6-in</p>		

NEWGINT_SSFL_VER09062016.GPJ_LAEVWNN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-143

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 6/9/16 - 6/15/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/100%			80			throughout core run. Fractures appear to be water-bearing, apparent continuous seepage.		
0		61.2/102%			85			SANDSTONE: as previous except slightly fractured; core relatively dry. 100% RQD. At 84.8 ft bgs, 40° fracture, no staining, friable at surfaces.		← 5-7/8-in open borehole (19.7-100 ft bgs)
0					90			At approx 87.9 ft bgs, fully healed fracture with quartz infilling. From approx. 87.9 to 93 ft bgs, SANDSTONE as previous, unfractured. 100% RQD. Mechanical breaks at 88.6, 90, and 93 ft bgs.		

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

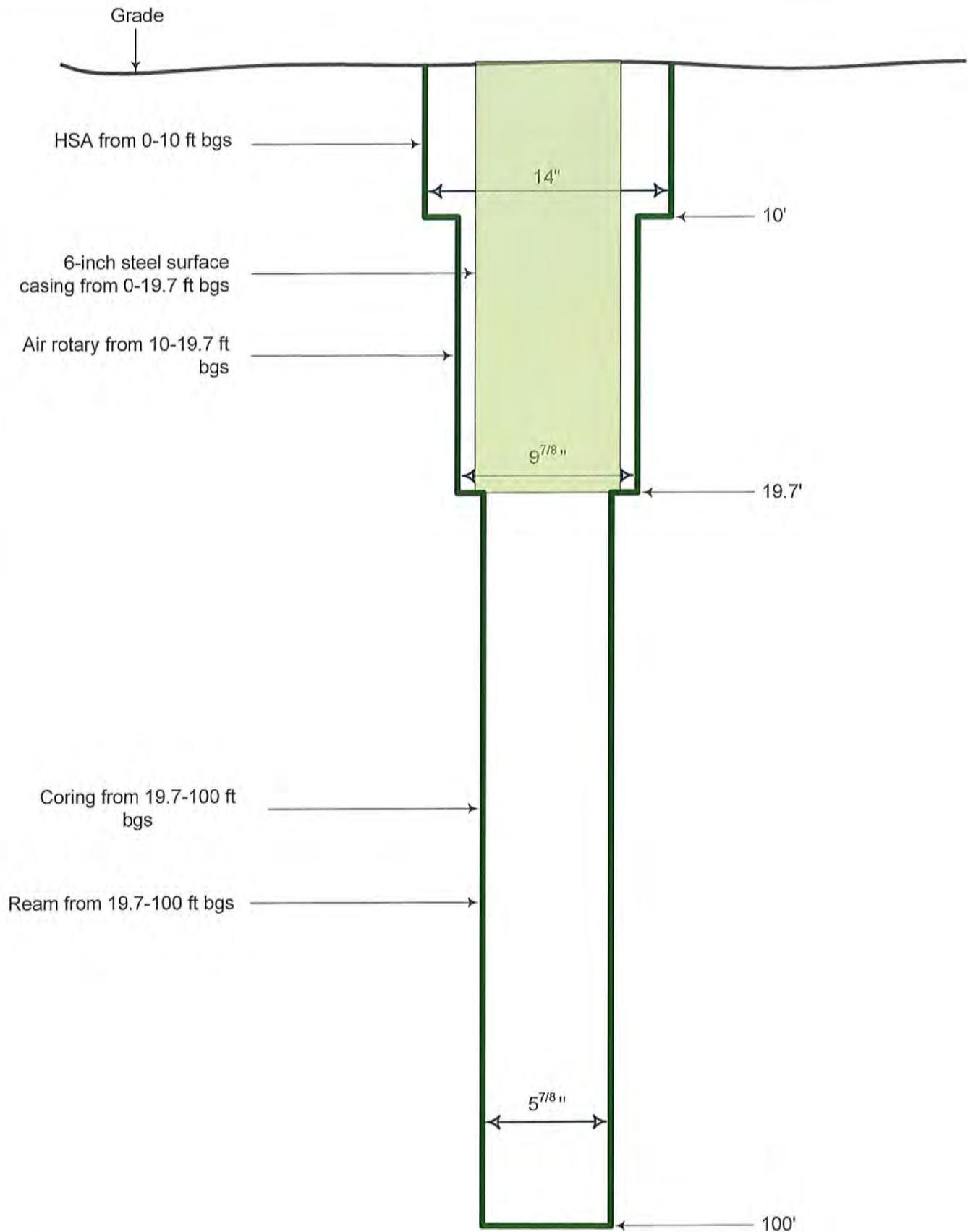
PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-143
 DATE DRILLED 6/9/16 - 6/15/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/ 100%				SH		2-in shale inclusion.	93.0 93.2	<p>5-7/8-in open borehole (19.7-100 ft bgs)</p>
0		NA			95	SS		<p>SANDSTONE: color as previous (N4); fine- to coarse-grained, moderately fractured from approx. 93 to 95 ft bgs, several intersecting fractures, very friable, loose sand grains within fractures, very narrow apertures, apparent continuous seepage.</p> <p>From approx. 94.4 to 94.8, open fracture.</p> <p>Approx. 96 ft bgs, SANDSTONE as previous except fine- to medium-grained.</p> <p>At 97 ft bgs, open fracture, no staining. Fracture in contact with vertical fracture below, from approx. 97 to 98.7 ft bgs; tight aperture, no staining. From approx. 98.5 to 98.7, vertical fracture intersects near horizontal fracture, very narrow aperture, no staining.</p>	100.0	
					100			Total depth of borehole is 100 ft bgs.		

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



CDM Smith Inc.
 555 17th Street, Suite #1100
 Denver, CO 80202
 303-383-2300

DOE Area IV – Santa Susana Field Laboratory

DD-143
 Well Completion Diagram
 (not to scale)



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

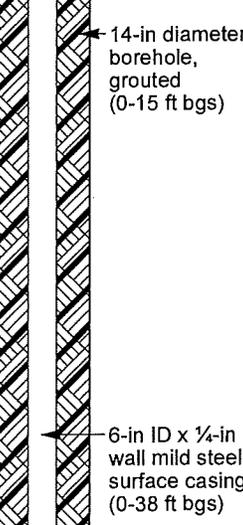
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory
 LOCATION Area IV
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring
 SAMPLING METHOD Grab/Coring
 GROUND ELEVATION (FT MSL) 1809.67
 TOP OF CASING (FT MSL) 1810.69
 LOGGED BY Mike Hoffman

BORING/WELL NUMBER DD-144
 DATE DRILLED 1/29/16 - 2/2/16
 CASING TYPE/DIAMETER 1/4-inch Mild Steel/6-inch ID
 SCREEN TYPE/SLOT Open Borehole
 GRAVEL PACK TYPE Not Applicable
 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 DEPTH TO WATER (FT BGS) 26.50
 GROUND WATER ELEVATION (FT MSL) 1784.19

REMARKS

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		180						SILTY SAND: brown (10YR 4/3); 70% sand, poorly graded, fine, angular to subangular; 30% silt; moist.		
					5	SM				
					7.0			SANDSTONE: dark yellowish brown (10YR 4/3); pulverized into poorly graded sand by auger bit, sand, fine, angular to subangular, moist.		
					10	SS				



Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-144
 DATE DRILLED 1/29/16 - 2/2/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					15	SS		SANDSTONE: dark yellowish brown (10YR 4/3); pulverized into poorly graded sand by air rotary bit, sand, fine, angular to subangular, moist.	21.4	<ul style="list-style-type: none"> 14-in diameter borehole (0-15 ft bgs) 6-in ID x 1/4-in wall mild steel surface casing (0-38 ft bgs) 9-7/8-in borehole (15-38 ft bgs) Portland cement/bentonite grout (15-38 ft bgs)

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-144
 DATE DRILLED 1/29/16 - 2/2/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					25			SANDSTONE: dark yellowish brown (10YR 4/3); pulverized into poorly graded sand by air rotary bit, sand, fine, angular to subangular, moist.		<p>6-in ID x 1/4-in wall mild steel surface casing (0-38 ft bgs)</p> <p>Portland cement/bentonite grout (15-38 ft bgs)</p> <p>First water (26.5 ft bgs)</p> <p>9-7/8-in borehole (15-38 ft bgs)</p>
					30	SS			32.9	

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-144

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 1/29/16 - 2/2/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					35	SS		<p>SANDSTONE: dark yellowish brown (10YR 4/3); pulverized into poorly graded sand by air rotary bit, sand, fine, angular to subangular, moist.</p> <p>At 35 ft bgs, color change to bluish gray (5PB 5/1).</p>		<p>6-in ID x 1/4-in wall mild steel surface casing (0-38 ft bgs)</p> <p>Portland cement/bentonite grout (15-38 ft bgs)</p> <p>9-7/8-in borehole (15-38 ft bgs)</p>
0		16.8/47%						<p>SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.</p>	38.0	<p>5-7/8-in open borehole (38-71 ft bgs)</p>
0		37.2/62%				SS		<p>At 41 ft bgs, color change to brown (10YR 4/3); moderately weathered, fractured horizontally into 1/2 to 3/4-in layers.</p> <p>At 43.6 ft bgs, color change to dark bluish gray (5PB 4/1); slightly weathered, fractured at 43.85 and 44.25 ft bgs.</p>	44.2	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWIN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-144
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 1/29/16 - 2/2/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		24/40%			45			SANDSTONE: brown (10YR 4/3); moderately weathered, poorly graded, fine to medium, angular to subangular, fractured, weakly cemented.		<p>5-7/8-in open borehole (38-71 ft bgs)</p>
						SS		Clay intrusion at 45.1 ft bgs.		
								At 46 ft bgs, massive, weakly cemented.		
0		63.6/106							51.0	
						SS		SANDSTONE: dark bluish gray (5PB 4/1) with brown weathering; moderately weathered, poorly graded, fine to medium, angular to subangular, fractured, 45° fracture planes, weakly cemented.		
								Vertical fracture at 55 ft bgs.	55.7	

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEVNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-144

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 1/29/16 - 2/2/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		36/ 60%						SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, fractured, 45° horizontal fracture planes, weakly cemented.		
0		54/ 150%			60	SS		Brown weathering and fractures around 60 ft bgs.		
0		27.6/ 115%			65			Shale intrusions at 65 ft bgs.		
0		48/ 80%				SH		SHALE: very dark bluish gray (5PB 3/1); slightly weathered, laminated, 45° dip, weak cementation.	65.8	
									67.0	

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

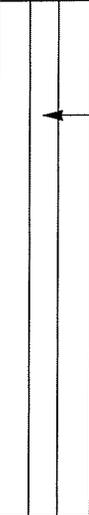
PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-144

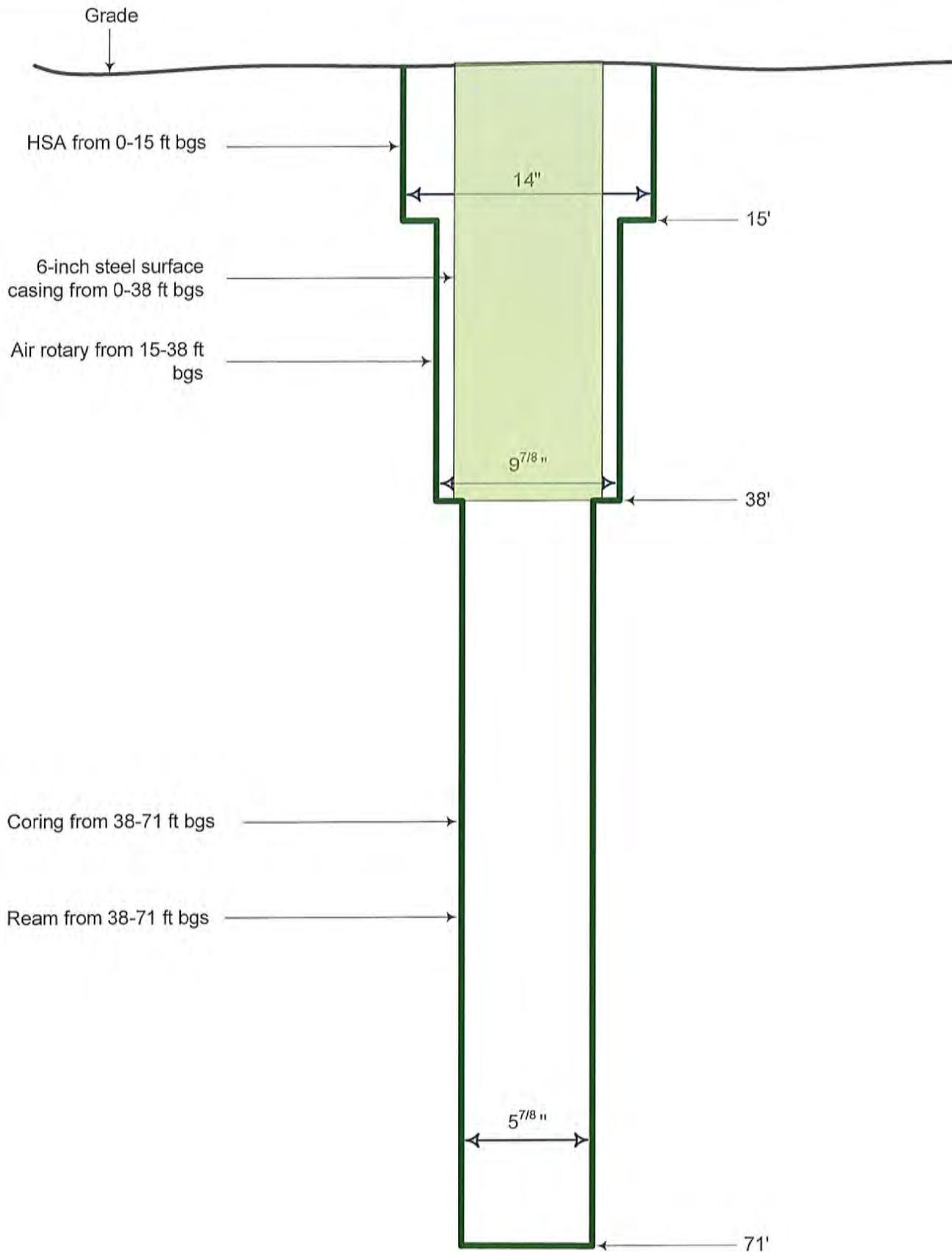
PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 1/29/16 - 2/2/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						SS		SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.		 <p>5-7/8-in open borehole (38-71 ft bgs)</p>
					67.9	SH		SHALE: very dark bluish gray (5PB 3/1); slightly weathered, laminated, 45° dip, weak cementation.	68.1	
						SS		SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented. One-inch shale stringer at 70.7 ft bgs.		
					70					
								Total depth of borehole is 71 ft bgs. Used 250 gallons of water during drilling; evacuated all water used.	71.0	

NEWGINT SSFL_VER09062016.GPJ LAEWNND1.GDT 9/6/16



CDM Smith Inc.
555 17th Street, Suite #1100
Denver, CO 80202
303-383-2300

DOE Area IV – Santa Susana Field Laboratory

DD-144
Well Completion Diagram
(not to scale)



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-145
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/10/16 - 2/12/16
 LOCATION Area IV CASING TYPE/DIAMETER 1/4-inch Mild Steel 6-inch ID
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring SCREEN TYPE/SLOT Open Borehole
 SAMPLING METHOD Grab/Coring GRAVEL PACK TYPE Not Applicable
 GROUND ELEVATION (FT MSL) 1796.16 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 TOP OF CASING (FT MSL) 1798.9 DEPTH TO WATER (FT BGS) 29.50
 LOGGED BY Mike Hoffman GROUND WATER ELEVATION (FT MSL) 1769.40
 REMARKS _____

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		36						SILTY SAND: black (10YR 2/1); 55% sand, poorly graded, fine, angular to subangular; 45% silt; moist.		
						SM		SILTSTONE: black (10YR 2/1); soft, weakly cemented. Pulverized into 1-inch chunks by air rotary bit.	3.0	
					5					
					10					

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DD-145
 DATE DRILLED 2/10/16 - 2/12/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						SS				
0		60/100%			25					
						SH		SHALE: dark bluish gray (5PB 4/1); moderately weathered, laminated, approximate 40° bit, weakly cemented.	27.0	6-in ID x 1/4-in wall mild steel surface casing (0-27 ft bgs) Portland cement/bentonite grout (3-27 ft bgs) 9-7/8-in borehole (3-27 ft bgs)
								SANDSTONE: dark bluish gray (5PB 4/1); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	28.0	5-7/8-in open borehole (27-82 ft bgs)
					30	SS				First water (29.5 ft bgs)
0		56.4/94%						Color change at 32.6 ft bgs to dark yellowish brown (10YR	32.9	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWIND1.GDT 9/6/16



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-145

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/10/16 - 2/12/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		64.8/ 108%			35	SS		<p>4/4). SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.</p> <p>Weathered fracture at 34.5 ft bgs, approximate 42° dip.</p> <p>Color change at 35.5 ft bgs to dark bluish gray (5PB 4/1).</p> <p>Color change at 36.2 ft bgs to dark yellowish brown (10YR 4/4).</p> <p>Color change at 39 ft bgs to dark bluish gray (5PB 4/1).</p>	40.7	<p>← 5-7/8-in open borehole (27-82 ft bgs)</p>
0		55.2/ 92%				SH		<p>SHALE: dark bluish gray (5PB 4/1); moderately weathered, laminated, approximate 25° bit, weakly cemented.</p> <p>Weathered fracture with clay intrusion from 41.5 to 41.8 ft bgs. Rock is crushed.</p>	42.6	
								<p>SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, fractured and crushed, weakly cemented.</p>		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNND1.GDT 9/6/16



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-145

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/10/16 - 2/12/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		48/80%			45	SS		Color change at 45.8 ft bgs to dark bluish gray (5PB 4/1).		<p>5-7/8-in open borehole (27-82 ft bgs)</p>
								Color change at 47 ft bgs back to dark yellowish brown (10YR 4/4).		
						SH		SHALE: dark bluish gray (5PB 4/1); moderately weathered, laminated, approximate 45° dip, weakly cemented.	47.9	
						SS		SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	48.3	
						SH		SHALE: as previous.	49.2	
						SH		SHALE: as previous.	49.7	
					50	SS		SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, fractured and crushed, weakly cemented.		
						SS				
0		45.6/76%				SS		SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, fractured, weakly cemented. Eight fractures over 4 ft, horizontal to approximate 35° dip.	52.0	
						SS				
					55					
									55.7	

Continued Next Page

NEWGINT_SSF_L_VER09062016.GPJ_LAEWIN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DD-145
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/10/16 - 2/12/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		48/ 80%						<p>SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.</p> <p>Vertical fracture from 58.5 to 58.9 ft bgs.</p> <p>Fractured and crushed from 60 to 62 ft bgs.</p>		<p>← 5-7/8-in open borehole (27-82 ft bgs)</p>
0		66/ 110%				SS				

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-145

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/10/16 - 2/12/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		55.2/ 92%								
					70	SH		SHALE: dark bluish gray (5PB 4/1); moderately weathered, laminated, approximate 45° dip, weakly cemented.	69.6 70.0	<p>5-7/8-in open borehole (27-82 ft bgs)</p>
						SS		SANDSTONE WITH INTERBEDDED SHALE: dark bluish gray (5PB 4/1); slightly weathered, weakly cemented, approximate 30° to 40° dip.	71.2	
						SH		SHALE: greenish black (5GY 2.5/1); intensely weathered, almost to clay, laminated, approximate 35° dip.	72.0	
0		57.6/ 96%				SS		SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.		
					75			Intensely weathered at 75 ft bgs. Crumbles when handled.		
						SH		SHALE: greenish black (5GY 2.5/1); intensely weathered, almost to clay, laminated, approximate 35° dip.	76.8 77.0	
0		62.4/ 104%				SS		SANDSTONE: dark bluish gray (5PB 4/1); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented. Fractured from 77.5 to 78 ft bgs, approximate 40° dip intersected by vertical fractures.		

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DD-145

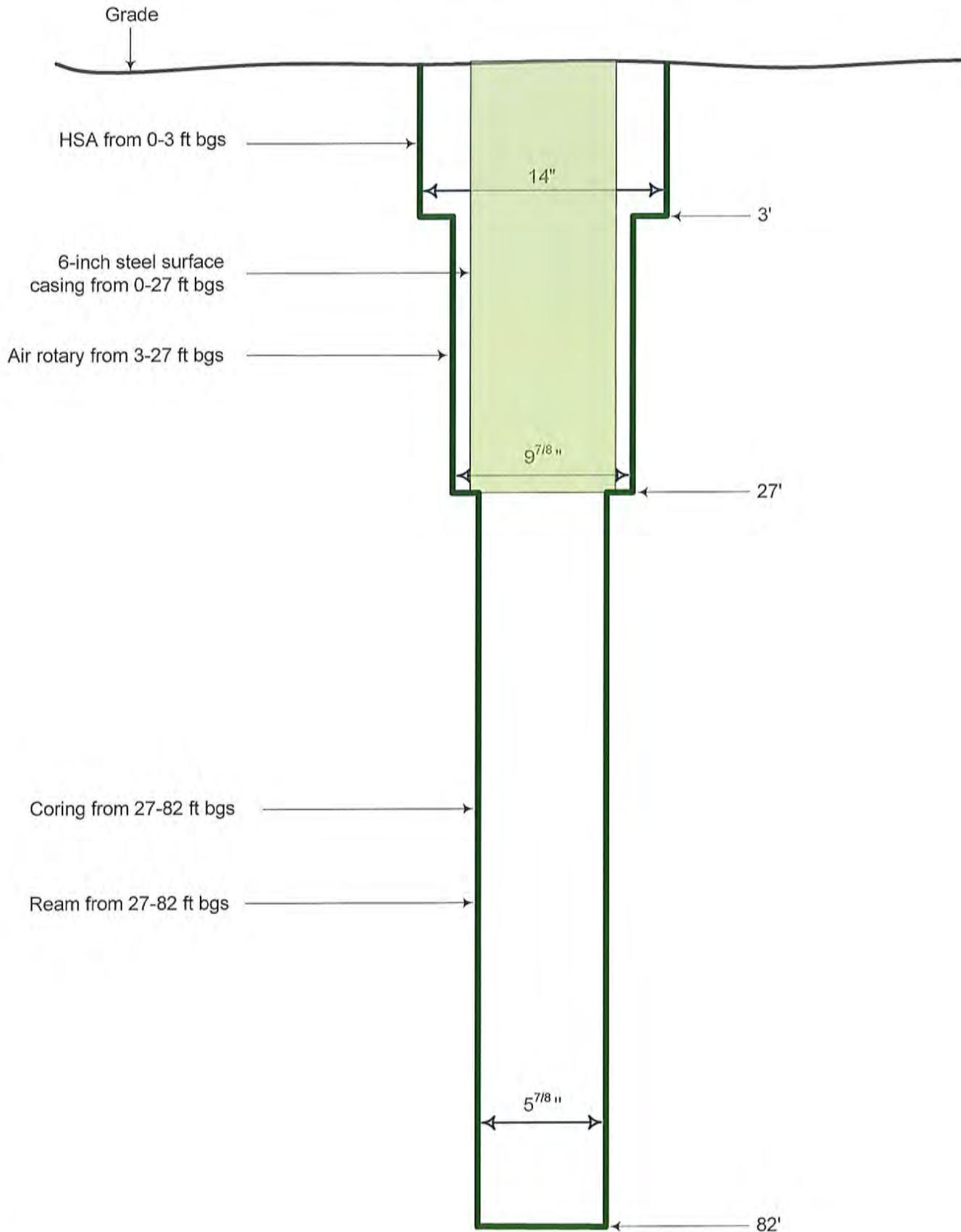
PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/10/16 - 2/12/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					80	SH		SHALE: dark bluish gray (5PB 4/1); moderately weathered, laminated, approximate 30° dip, weakly cemented. SANDSTONE: as previous. Crushed from 80.6 to 81 ft bgs.	79.8	
						SS			80.0	
								Total depth of borehole is 82 ft bgs. Used 250 gallons of water during drilling; evacuated all water used.	82.0	

NEWGINT SSFL_VER09062016.GPJ_LAEWIN01.GDT 9/6/16



CDM Smith Inc.
 555 17th Street, Suite #1100
 Denver, CO 80202
 303-383-2300

DOE Area IV – Santa Susana Field Laboratory

DD-145
 Well Completion Diagram
 (not to scale)

DS WELL LOGS

DS-43, 44, 45,
46, 47



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory
 LOCATION Area IV
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring
 SAMPLING METHOD Grab/Coring
 GROUND ELEVATION (FT MSL) 1809.86
 TOP OF CASING (FT MSL) 1809.52
 LOGGED BY Mike Hoffman
 REMARKS _____

BORING/WELL NUMBER DS-43
 DATE DRILLED 2/8/16 - 2/10/16
 CASING TYPE/DIAMETER 1/4-inch Mild Steel/6-inch ID
 SCREEN TYPE/SLOT Open Borehole
 GRAVEL PACK TYPE Not Applicable
 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 DEPTH TO WATER (FT BGS) 49.00
 GROUND WATER ELEVATION (FT MSL) 1760.52

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
1.3		120						ASPHALT, 6-in thick.	0.5	
						SM		SILTY SAND (FILL): very dark grayish brown (2.5Y 3/2); 60% sand, poorly graded, fine, angular to subangular; 40% silt; moist.		
0.2								SANDSTONE: dark yellowish brown (10YR 4/4); pulverized into silty sand, 60% sand, poorly graded, fine, angular to subangular; 40% silt; moist.	9.0	
						SS			10.0	

NEWGINT SSFL_VER09062016.GPJ LAEWND1.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

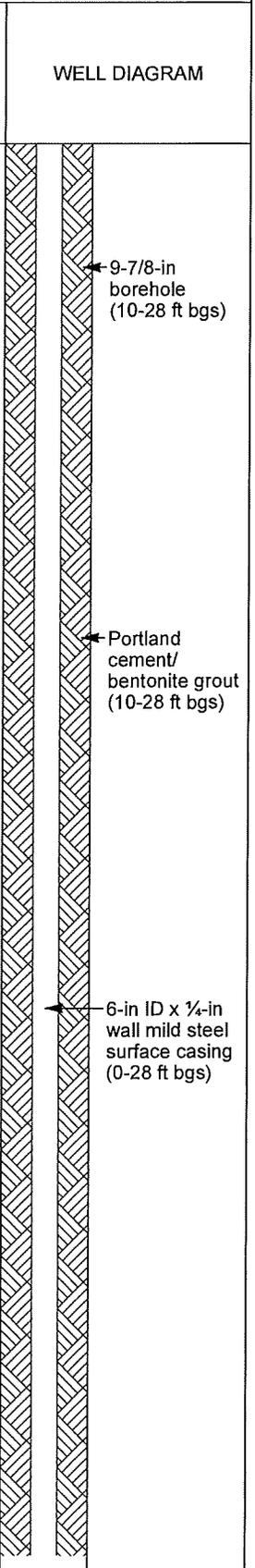
PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-43

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/8/16 - 2/10/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					15	SS		SANDSTONE: dark yellowish brown (10YR 4/4); pulverized into silty sand, 60% sand, poorly graded, fine, angular to subangular; 40% silt; moist.		 <p>← 9-7/8-in borehole (10-28 ft bgs)</p> <p>← Portland cement/bentonite grout (10-28 ft bgs)</p> <p>← 6-in ID x 1/4-in wall mild steel surface casing (0-28 ft bgs)</p>
					20				21.4	

Continued Next Page

NEWGINT SSFL_VER09052016.GPJ LAEWIND1.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-43
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/8/16 - 2/10/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					25			<p>SANDSTONE: dark yellowish brown (10YR 4/4); pulverized into silty sand, 60% sand, poorly graded, fine, angular to subangular; 40% silt; moist.</p>		<p>6-in ID x 1/4-in wall mild steel surface casing (0-28 ft bgs)</p> <p>Portland cement/bentonite grout (10-28 ft bgs)</p> <p>9-7/8-in borehole (10-28 ft bgs)</p>
						SS				
0		42/70%						<p>At 28 ft bgs, SANDSTONE as previous but moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.</p>		
					30					
							SH	<p>SHALE: dark bluish gray (5PB 4/1); slightly weathered, laminated, approx. 45° dip, weakly cemented.</p>	30.8	
							SS		31.3	
							SH	<p>SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.</p>	31.4	
							SH	<p>SHALE: as previous (30.8 to 31.3 ft bgs) but moderately weathered.</p>	31.5	
							SS	<p>SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.</p>	32.8	
										<p>5-7/8-in open borehole (28-84 ft bgs)</p>

Continued Next Page

NEWGINT SSFL_VER0902016.GPJ LAEWN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-43

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/8/16 - 2/10/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/ 100%						SANDSTONE: as previous (31.5 to 32.8 ft bgs) but fresh.		<p>5-7/8-in open borehole (28-84 ft bgs)</p>
					35			Vertical, weathered fractures from 34.7 to 35.5 feet bgs.		
0		48/ 80%				SS		At 38.9 ft bgs, SANDSTONE: dark yellowish brown (10YR 4/4); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.		
					40			At 40.5 ft bgs, SANDSTONE: dark bluish gray (5PB 4/1); fresh, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.		
								At 41.5 ft bgs, SANDSTONE: dark yellowish brown as previous, 38.9 to 40.5 ft bgs.		
0		63/ 105%						SANDSTONE: dark bluish gray (5PB 4/1); fresh, poorly graded, fine to medium, angular to subangular, massive,	43.9	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWIN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-43

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/8/16 - 2/10/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/100%			45			weakly cemented.		5-7/8-in open borehole (28-84 ft bgs)
0		60/100%			50	SS				First water (49 ft bgs)
					55			SHALE stringer at 53.6 feet bgs, 3/4-inch thick, clay filled, 45° dip.		
								At 55 ft bgs, SANDSTONE: dark bluish gray as previous, 43.9 to 55.7 ft bgs except laminated, 45° dip, weakly cemented.	55.7	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-43
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/8/16 - 2/10/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		24/50%						SANDSTONE: dark bluish gray (5PB 4/1); fresh, poorly graded, fine to medium, angular to subangular, massive, weakly cemented. Vertical fractures from 59.2 to 59.8 feet bgs.		
0		57.6/96%			SS					
0		51.6/86%								

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-43

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/8/16 - 2/10/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		58.8/98%						SANDSTONE: dark bluish gray (5PB 4/1); fresh, poorly graded, fine to medium, angular to subangular, massive, weakly cemented. Single fracture at 71.4 feet bgs, 45° fracture plane. Single fracture at 72 feet bgs, 45° fracture plane.	68.0	← 5-7/8-in open borehole (28-84 ft bgs)
0		58.8/98%								
0		60/100%				SS				

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-43

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/8/16 - 2/10/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		48/80%			80					
										5-7/8-in open borehole (28-84 ft bgs)
									83.4	
								SHALE: very dark bluish gray (5PB 3/1); fresh, laminated, approximately 45° dip, weakly cemented.		
					85			Clay filled fracture at 85 ft bgs along dip, 1/8-in aperture.		94-mm core hole (84-93 ft bgs)
						SH				Bentonite pellets (84-93 ft bgs)
0		0.5/10%			90				90.0	

NEWGINT SSFL_VER062016.GPJ_LAEWIN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

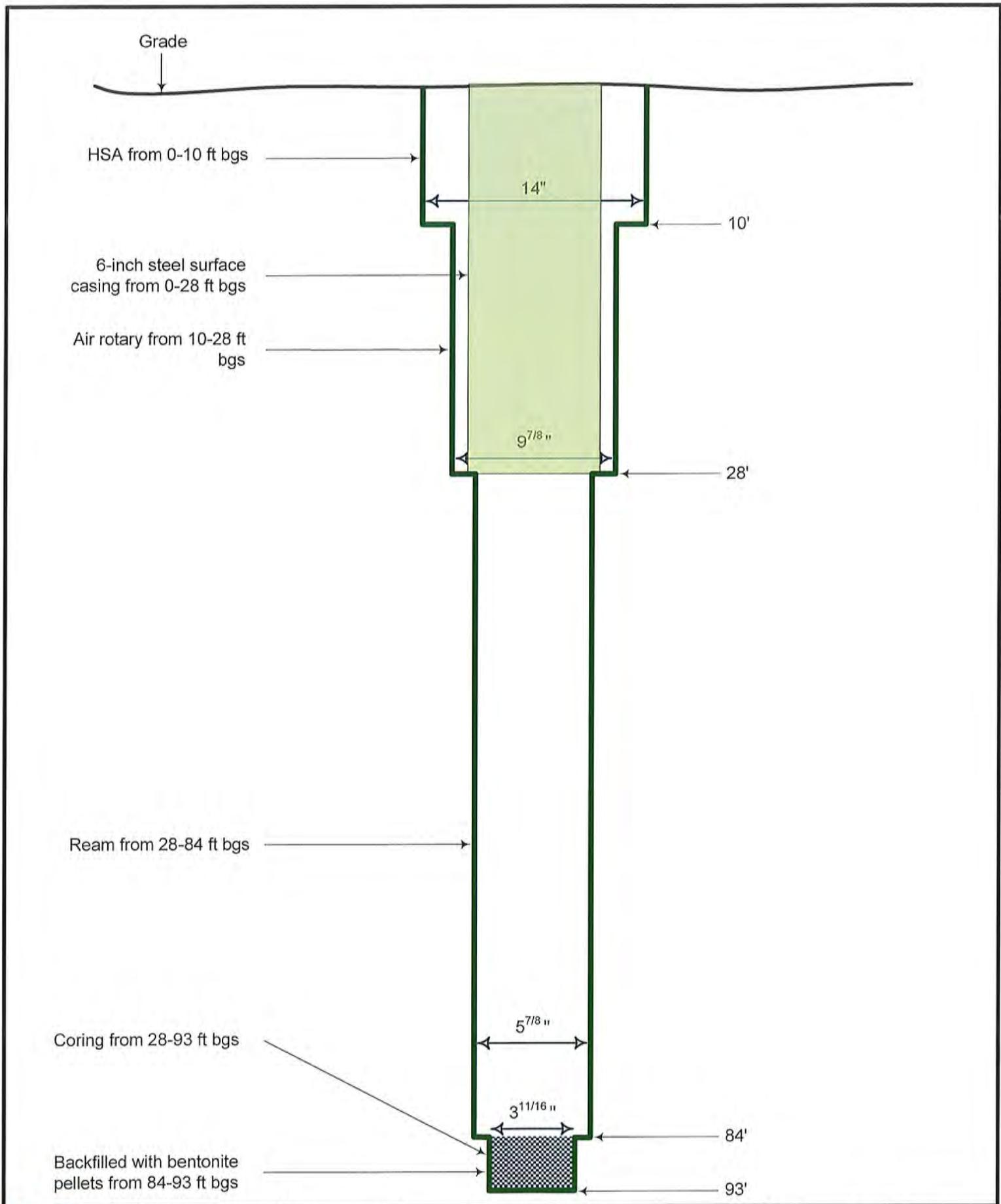
BORING/WELL NUMBER DS-43

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/8/16 - 2/10/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						SH		SHALE: very dark bluish gray (5PB 3/1); fresh, laminated, approximately 45° dip, weakly cemented.	93.0	
								Total depth of borehole is 93 ft bgs. Back filled to 84 ft with bentonite pellets. Used approx. 125 gallons of water during drilling; evacuated all water used.		





111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-44
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 1/14/16 - 1/20/16
 LOCATION Area IV CASING TYPE/DIAMETER 1/4-inch Mild Steel\6-inch ID
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring SCREEN TYPE/SLOT Open Borehole
 SAMPLING METHOD Grab/Coring GRAVEL PACK TYPE Not Applicable
 GROUND ELEVATION (FT MSL) 1849.43 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 TOP OF CASING (FT MSL) 1851.21 DEPTH TO WATER (FT BGS) 74.00
 LOGGED BY Mike Hoffman GROUND WATER ELEVATION (FT MSL) 1777.21
 REMARKS _____

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		120						SILTY SAND: dark yellowish brown (10YR 4/4); 70% sand, poorly graded, fine to medium, angular to subangular; 30% silt; trace gravel, poorly graded, fine, 1/2-inch maximum diameter, angular; moist.		
					5	SM		SAND: yellowish brown (10YR 5/4); 100% sand, poorly graded, fine, angular to subangular; trace gravel; moist.	5.0	<p>14-in diameter borehole, grouted (0-10 ft bgs)</p> <p>6-in ID x 1/4-in wall mild steel surface casing (0-19 ft bgs)</p>
					10	SP			10.0	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-44
 DATE DRILLED 1/14/16 - 1/20/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								SANDSTONE: yellowish brown (10YR 5/4); pulverized sand, poorly graded, fine to medium, angular to subangular, moist.		
					15	SS				
										9-7/8-in borehole (10-19 ft bgs)
										Portland cement/bentonite grout (10-19 ft bgs)
										6-in ID x 1/4-in wall mild steel surface casing (0-19 ft bgs)
0	12/50%					SS		SANDSTONE: dark grayish brown (10YR 4/2); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, approximately 45° dip, weakly cemented.	19.0	
						SH		SHALE: dark bluish gray (10B 4/1); moderately weathered, laminated with rust colored laminae, approximately 45° dip, weakly cemented.	19.2	
						SS		INTERBEDDED SANDSTONE AND SHALE: dark bluish gray (5B 4/1); moderately weathered, laminated, approximately 45° dip, weakly cemented. (19.7 to 21 ft bgs)	19.7	
					20					5-7/8-in open borehole (19-91 ft bgs)
0	60/100%							SANDSTONE: dark grayish brown (10YR 4/2); fresh, poorly graded, fine to medium, angular to subangular,	21.0	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-44

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 1/14/16 - 1/20/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						SS		massive, weakly cemented.		<p>5-7/8-in open borehole (19-91 ft bgs)</p>
						SS		INTERBEDDED SANDSTONE AND SHALE: dark bluish gray (5B 4/1); as previous (19.7 to 21 ft bgs) except fresh.	24.2	
					25	SS		SANDSTONE: dark bluish gray (5PB 4/1) grades to dark grayish brown (10YR 4/2); moderately weathered, poorly graded, fine to medium, angular to subangular, highly fractured on 45° dip, weakly cemented.	24.8	
0		60/100%				SH		SHALE: dark bluish gray (10B 4/1); moderately weathered, laminated, 45° dip, weakly cemented.	26.0	
						SS		SANDSTONE: dark bluish gray (5PB 4/1); fresh, poorly graded, fine to medium, angular to subangular, massive, 45° dip, weakly cemented.	26.3	
						SH		SHALE: dark bluish gray (10B 4/1); moderately weathered, massive, 45° dip, weakly cemented; fracture at 27 ft bgs.	26.9	
						SS		SANDSTONE: dark bluish gray (5PB 4/1); as previous (26.3 to 26.9 ft bgs).	27.8	
						SH		SHALE: dark bluish gray (10B 4/1); slightly weathered, laminated, 45° dip, weakly cemented.	28.3	
						SS		SANDSTONE: dark bluish gray (5PB 4/1); as previous (26.3 to 26.9 and 27.8 to 28.3 ft bgs).	29.0	
						SH		SHALE: dark bluish gray (10B 4/1); as previous (28.3 to 29 ft bgs).	29.5	
					30	SS		SANDSTONE: dark bluish gray (5PB 4/1); as previous (26.3 to 26.9, 27.8 to 28.3, and 29 to 29.5 ft bgs). Shale inclusions from 30.3 to 30.7 ft bgs.	30.0	
0		60/100%				SS		INTERBEDDED SANDSTONE AND SHALE: dark bluish gray (5B 4/1); fresh, laminated, 1/8 to 1 inch thick layers, approximately 45° dip, weakly cemented. (31 to 31.8 ft bgs)	31.0	
						SH		SHALE: dark bluish gray (10B 4/1); slightly weathered, laminated, 45° dip, weakly cemented.	31.8	
						SS		SANDSTONE: dark bluish gray (5PB 4/1); fresh, poorly graded, fine to medium, angular to subangular, massive, 45° dip, weakly cemented.	32.2	

Continued Next Page

NEWGINT SSFL_VER09052016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-44

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 1/14/16 - 1/20/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
									33.2	<p>5-7/8-in open borehole (19-91 ft bgs)</p>
						SS		INTERBEDDED SANDSTONE AND SHALE: dark bluish gray (5B 4/1); fresh, laminated, 1/4 to 2 inch thick layers, approximately 45° dip, weakly cemented.		
					35	SH		SHALE: dark bluish gray (10B 4/1); slightly weathered, laminated, 45° dip, weakly cemented.	35.0	
						SS		SANDSTONE: dark bluish gray (5PB 4/1); as previous (32.2 to 33.2 ft bgs).	35.6	
0		60/100%				SH		SHALE: dark bluish gray (10B 4/1); as previous (35 to 35.6 ft bgs).	36.0	
						SH		SHALE: dark bluish gray (10B 4/1); as previous (35 to 35.6 ft bgs).	36.4	
						SS		SANDSTONE: dark bluish gray (5PB 4/1); as previous (32.2 to 33.2 and 35.6 to 36 ft bgs).		
						SS				
						SH		SHALE: dark bluish gray (10B 4/1); as previous (35 to 35.6 and 36 to 36.4 ft bgs).	38.1	
						SH		SHALE: dark bluish gray (10B 4/1); as previous (35 to 35.6 and 36 to 36.4 ft bgs).	38.6	
						SS		SANDSTONE: dark bluish gray (5PB 4/1); as previous (32.2 to 33.2, 35.6 to 36, and 36.4 to 38.1 ft bgs).	39.0	
						SH		SHALE: dark bluish gray (10B 4/1); as previous (35 to 35.6, 36 to 36.4, and 38.1 to 38.6 ft bgs).	39.3	
					40	SS		SANDSTONE: dark bluish gray (5PB 4/1); as previous (32.2 to 33.2, 35.6 to 36, 36.4 to 38.1, and 38.6 to 39 ft bgs).		
0		60/100%				SS		INTERBEDDED SANDSTONE AND SHALE: dark bluish gray (5B 4/1); fresh, laminated, approximately 45° dip, weakly cemented.	41.0	
						SS		SANDSTONE: dark bluish gray (5PB 4/1); fresh, poorly graded, fine to medium, angular to subangular, massive, 45° dip, weakly cemented.	41.7	
						SS				
						SH		SHALE: dark bluish gray (10B 4/1); slightly weathered, laminated, 45° dip, weakly cemented.	43.8	

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-44
 DATE DRILLED 1/14/16 - 1/20/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/100%			45	SH			45.0	<p>5-7/8-in open borehole (19-91 ft bgs)</p>
					45.5	SS		INTERBEDDED SANDSTONE AND SHALE: dark bluish gray (5B 4/1); fresh, laminated, approximately 45° dip, weakly cemented.	45.5	
					46.3	SS		SANDSTONE: dark bluish gray (5PB 4/1); as previous (41.7 to 43.8 ft bgs).	46.3	
						SH		SHALE: dark bluish gray (10B 4/1); as previous (43.8 to 45 ft bgs).		
0		60/100%			50.2			SANDSTONE: brown (10YR 4/3); fresh, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	50.2	
								Color change at 52 ft bgs to very dark bluish gray (5PB 3/1).		
					55			Coarser grained at 54.6 ft bgs, less fine, greater medium, some coarse.		

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-44

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 1/14/16 - 1/20/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		57/ 95%						Color change at 55.6 ft bgs back to brown (10YR 4/3), then as previous (50.2 to 52 ft bgs).		<p>5-7/8-in open borehole (19-91 ft bgs)</p>
0		51.6/ 86%				SS				
0		60/ 100%			60					
					65					
									67.1	

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-44

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 1/14/16 - 1/20/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		63.6/ 106%						SANDSTONE: very dark bluish gray (5PB 3/1); fresh, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.		<p>5-7/8-in open borehole (19-91 ft bgs)</p> <p>First water (74 ft bgs)</p>
0		63.6/ 106%				SS				

NEWGINT SSFL_VER09052016.GPJ LAEWNND1.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-44

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 1/14/16 - 1/20/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/ 100%			80			Intensely weathered to decomposed fracture zone at 81 ft bgs. Filled with dark brown and rust colored clay. Borehole took approximately 150 gallons of water after hitting this interval.		<p>5-7/8-in open borehole (19-91 ft bgs)</p>
0		57.6/ 96%			85		At 84 ft bgs, SANDSTONE: grayish brown (10YR 5/2); moderately weathered, poorly graded, fine to medium, some coarse, angular to subangular, massive, weakly cemented. Single fracture at 84.2 ft bgs.			
					90			SHALE WITH INTERBEDDED SANDSTONE: very dark bluish gray (5PB 3/1); slightly weathered, laminated, weakly cemented.	89.4	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNND1.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

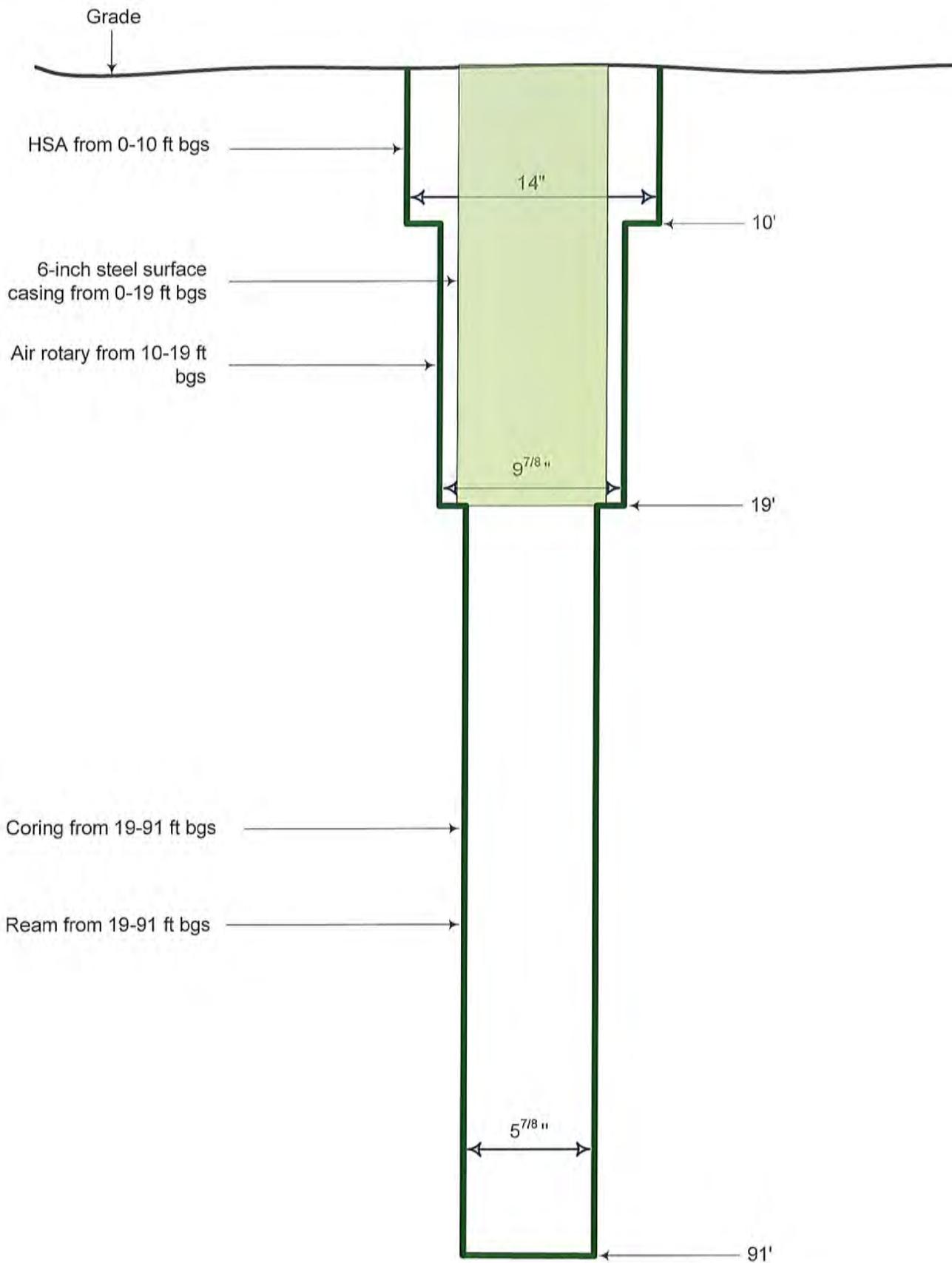
BORING/WELL NUMBER DS-44

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 1/14/16 - 1/20/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						SH		Total depth of borehole is 91 feet bgs. Used 1,000 gallons of water during drilling; evacuated all water used.	91.0	





111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory
 LOCATION Area IV
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring
 SAMPLING METHOD Grab/Coring
 GROUND ELEVATION (FT MSL) 1864.00
 TOP OF CASING (FT MSL) 1866.58
 LOGGED BY Mike Hoffman

BORING/WELL NUMBER DS-45
 DATE DRILLED 1/21/16 - 1/28/16
 CASING TYPE/DIAMETER 1/4-inch Mild Steel/6-inch ID
 SCREEN TYPE/SLOT Open Borehole
 GRAVEL PACK TYPE Not Applicable
 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 DEPTH TO WATER (FT BGS) Dry
 GROUND WATER ELEVATION (FT MSL) 0.00

REMARKS

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		108						SILTY SAND: dark yellowish brown (10YR 4/4); 70% sand, poorly graded, fine to medium, angular to subangular; 30% silt; moist.		
					5	SM			5.0	
0								SAND: yellowish brown (10YR 5/4); 100% sand, poorly graded, fine to medium, angular to subangular, moist.		14-in diameter borehole, grouted (0-9 ft bgs) 6-in ID x 1/4-in wall mild steel surface casing (0-18 ft bgs)
						SP			9.0	
								SANDSTONE: yellowish brown (10YR 5/4); pulverized into sand by air rotary bit, poorly graded, fine to medium, angular to subangular, moist.		9-7/8-in borehole (9-18 ft bgs) 6-in ID x 1/4-in wall mild steel
					10	SS			10.0	

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-45
 DATE DRILLED 1/21/16 - 1/28/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								SANDSTONE: yellowish brown (10YR 5/4); pulverized into sand by air rotary bit, poorly graded, fine to medium, angular to subangular, moist.		
					15	SS				
0		21/58%			18.0	SH		SHALE: yellowish brown (10YR 5/4); moderately weathered, laminated, approximately 45° dip, weakly cemented.	18.0	
					18.3			SANDSTONE: yellowish brown (10YR 5/4); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented. Fractured between shale and sandstone at approximately 20 ft bgs.	18.3	
					20	SS				
0		60/100%			21.3			SHALE: dark bluish gray (5B 4/1); moderately weathered,	21.3	

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-45
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 1/21/16 - 1/28/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								laminated, approximately 45° dip, weakly cemented.		<p>← 5-7/8-in open borehole (18-75 ft bgs)</p>
						SH		Weathered fracture at 22.8 ft bgs.		
					25			Weathered fractures at 25 feet bgs.		
0		58.8/ 98%						SANDSTONE: dark grayish brown (10YR 3/2); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	26.0	
						SS		Color change at 28 ft bgs to dark bluish gray (5PB 4/1).		
					30					
0		54.6/ 91%						SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	31.0	
						SS				

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEIWN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-45
 DATE DRILLED 1/21/16 - 1/28/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		62.4/ 104%			35			SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	33.0	
0		57.6/ 96%			40	SS				

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-45
 DATE DRILLED 1/21/16 - 1/28/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		63.6/ 106%			45			SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	45.0	← 5-7/8-in open borehole (18-75 ft bgs)
						SS				
0		63.6/ 106%						SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to coarse, mostly medium to coarse; subangular to subrounded, massive, weakly cemented.	54.0	
						SS				
					55				55.7	

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-45
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 1/21/16 - 1/28/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		63.6/ 106%						<p>SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.</p> <p>Fractured at 56.5 ft bgs.</p>		<p>← 5-7/8-in open borehole (18-75 ft bgs)</p>
0		57.6/ 96%				SS	<p>Laminated at 62.1 ft bgs, 1/16 to 1/8 layers dipping approximately 45°.</p> <p>Massive at 62.8 ft bgs.</p> <p>Shale inclusions from 63.7 to 63.9 ft bgs.</p>			
0		61.2/ 102%								

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-45
 DATE DRILLED 1/21/16 - 1/28/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
		0/0%			80	SH		SHALE: dark bluish gray (5B 4/1); slightly weathered, massive, approximately 45° dip, weakly cemented. Stop drilling after 2-foot run, plugged with clay (79.2 ft bgs).	80.0	<p>← 94-mm core hole (75-95 ft bgs)</p> <p>← Bentonite pellets (75-95 ft bgs)</p>
		0/0%			85	NR		No Recovery at 85 ft bgs. Small amount of fine sand coming up with drilling fluid.	90.0	
					90					

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16



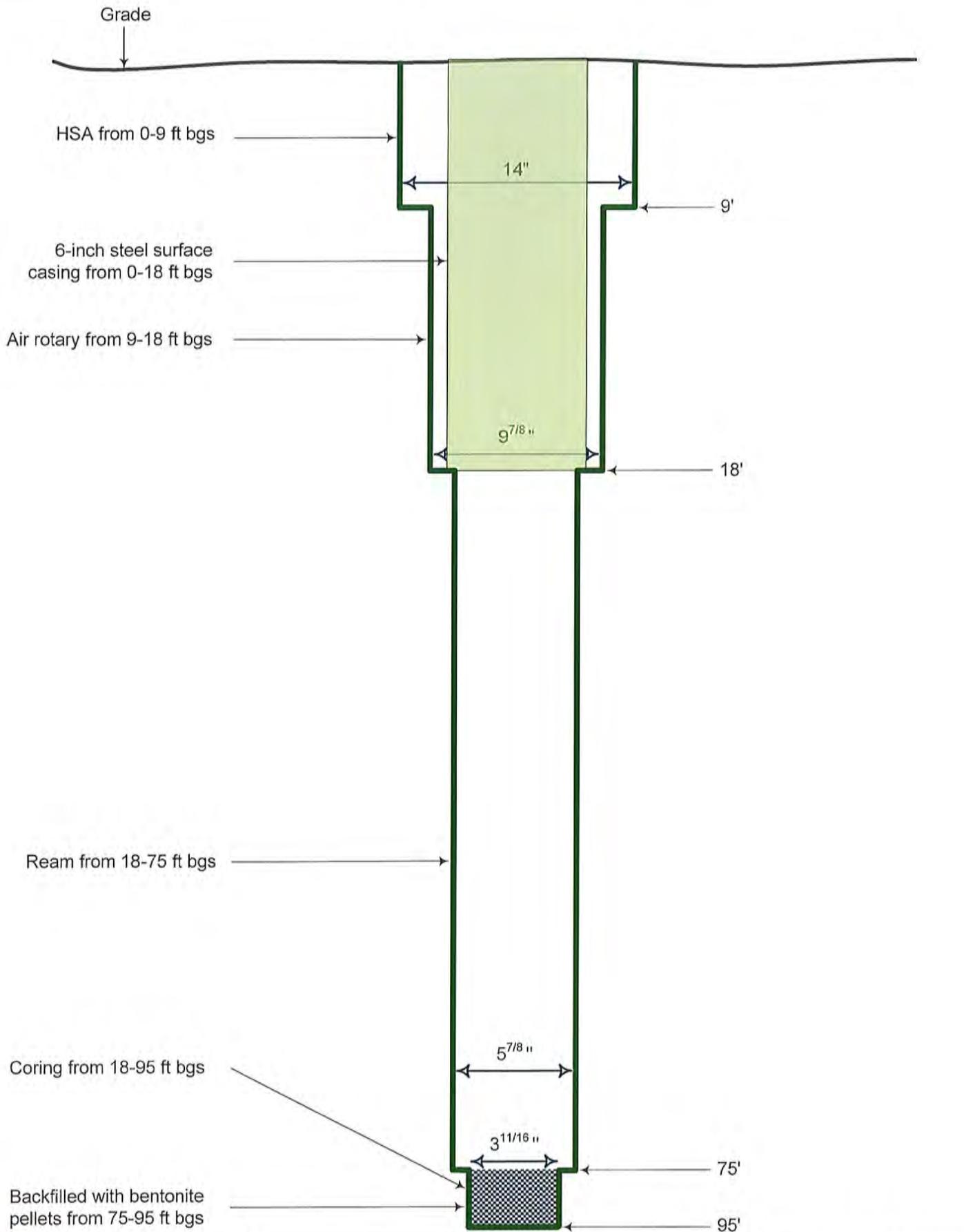
111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-45
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 1/21/16 - 1/28/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		7.2/ 12%						No recovery, 90 to 94.4 ft bgs.		<p>94-mm core hole (75-95 ft bgs) Bentonite pellets (75-95 ft bgs)</p>
						NR				
					95	SS		SANDSTONE: dark bluish gray (5PB 4/1); fresh, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	94.4	
								Total depth of borehole is 95 ft bgs. Back filled to 75 ft with bentonite pellets. Used 350 gallons of water during drilling; evacuated all water used.	95.0	



CDM Smith Inc.
 555 17th Street, Suite #1100
 Denver, CO 80202
 303-383-2300

DOE Area IV – Santa Susana Field Laboratory

DS-45
 Well Completion Diagram
 (not to scale)

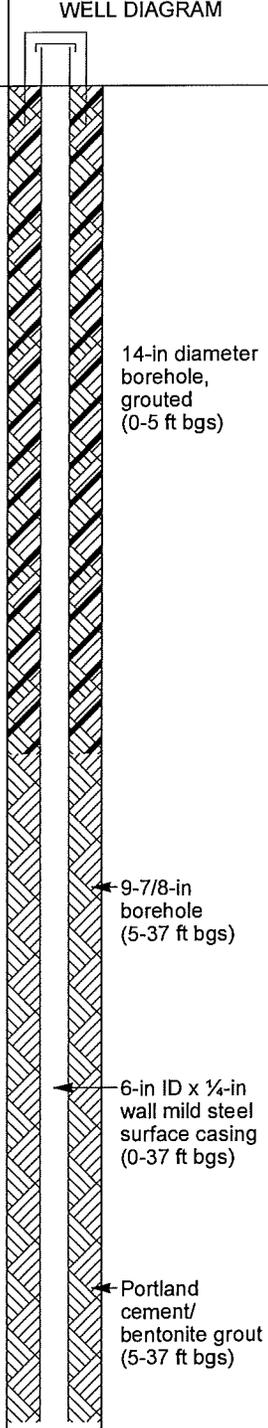


111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-46
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 2/15/16 and 2/24/16
 LOCATION Area IV CASING TYPE/DIAMETER 1/4-inch Mild Steel/6-inch ID
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring SCREEN TYPE/SLOT Open Borehole
 SAMPLING METHOD Grab/Coring GRAVEL PACK TYPE Not Applicable
 GROUND ELEVATION (FT MSL) 1795.51 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 TOP OF CASING (FT MSL) 1797.79 DEPTH TO WATER (FT BGS) 38.90
 LOGGED BY Frank Morris GROUND WATER ELEVATION (FT MSL) 1758.89
 REMARKS _____

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60						SILTY SAND: dark reddish brown (2.5YR 3/3); fine, trace organics, moist.		
						SM			3.0	
					5			SANDSTONE: brown (10YR 4/2); highly weathered, pulverized into 1/4-inch fragments by augers.		
						SS				
					10				10.0	



Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNNO1.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-46

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/15/16 and 2/24/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					15			SANDSTONE: brown (10YR 4/2); highly weathered, pulverized into 1/4-inch fragments by air rotary bit.		<p>6-in ID x 1/4-in wall mild steel surface casing (0-37 ft bgs)</p> <p>Portland cement/bentonite grout (5-37 ft bgs)</p> <p>9-7/8-in borehole (5-37 ft bgs)</p>
					20					

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-46
 DATE DRILLED 2/15/16 and 2/24/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					25	SS				<p>6-in ID x 1/4-in wall mild steel surface casing (0-37 ft bgs)</p> <p>Portland cement/bentonite grout (5-37 ft bgs)</p> <p>9-7/8-in borehole (5-37 ft bgs)</p>
					30			Color change at 27 ft bgs to bluish gray (5PB 5/1).		
					32.8					

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

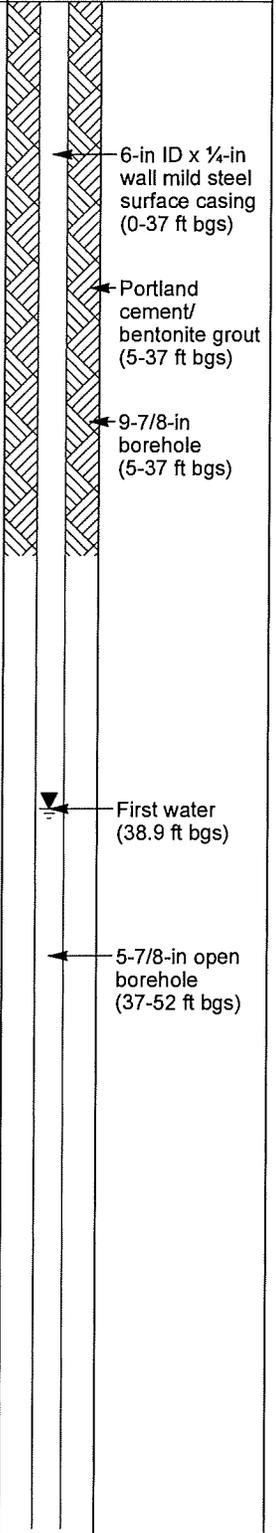
BORING/WELL NUMBER DS-46

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/15/16 and 2/24/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								SANDSTONE: bluish gray (5PB 5/1); highly weathered, pulverized into 1/4-inch fragments by air rotary bit.		
					35	SS				
0		32.4/ 54%						SANDSTONE: dark greenish gray (5G 4/1); poorly graded, fine to medium, massive, RQD = 100%, excellent.	37.0	
						SS		Color change at 38.6 ft bgs to pale yellowish brown (10YR 6/2) at 38.6 ft bgs, weathered, friable.		
								Intersecting fractures with bedding plane at 39.2 ft bgs, 45° dip, water bearing, iron staining, brownish yellow (10YR 6/6).		
					40			SANDSTONE: greenish gray (5G 6/1); poorly graded, fine to medium, massive, RQD = 98%, excellent. Fracture at 40 ft bgs with overlying core sample.	40.0	
0		63.6/ 106%								



NEWGINT SSFL_VER09062016.GPJ_LAEWIND1.GDT_9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-46

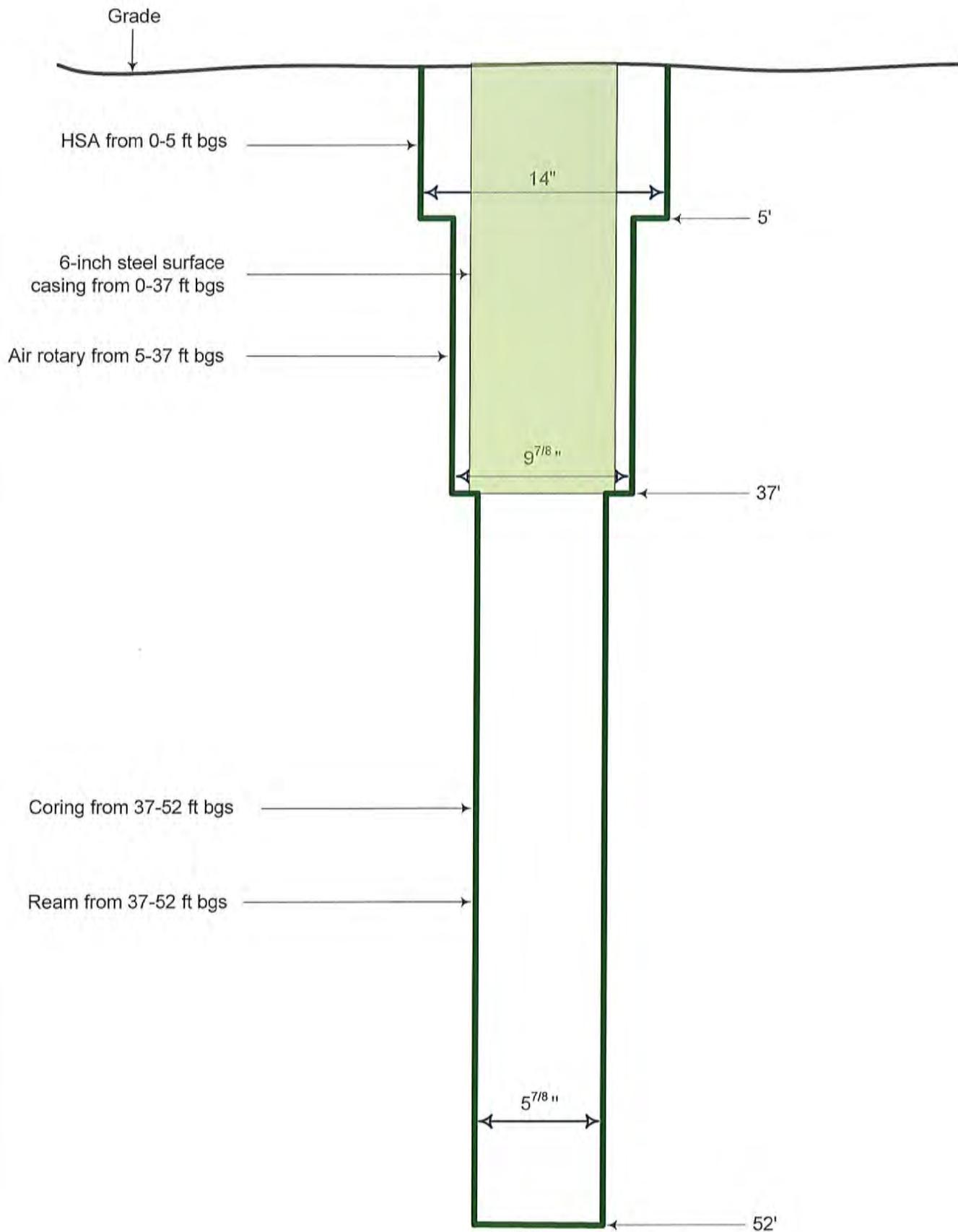
PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 2/15/16 and 2/24/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		63.6/ 133%			45	SS				
										5-7/8-in open borehole (37-52 ft bgs)
					50					
								Last foot drilled by air rotary bit.		
								Total depth of borehole is 52 ft bgs.	52.0	

NEWGINT SSFL_VER09062016.GPJ LAEWIND1.GDT 9/6/16



CDM Smith Inc.
 555 17th Street, Suite #1100
 Denver, CO 80202
 303-383-2300

DOE Area IV – Santa Susana Field Laboratory

DS-46
 Well Completion Diagram
 (not to scale)



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-47
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 3/15/16 - 3/17/16
 LOCATION Area IV CASING TYPE/DIAMETER 1/4-inch Mild Steel/6-inch ID
 DRILLING METHOD Hollow Stem Auger/Air Rotary/HQ Coring SCREEN TYPE/SLOT Open Borehole
 SAMPLING METHOD Grab/Coring GRAVEL PACK TYPE Not Applicable
 GROUND ELEVATION (FT MSL) 1865.81 GROUT TYPE/QUANTITY Portland Cement with Bentonite Grout
 TOP OF CASING (FT MSL) 1867.94 DEPTH TO WATER (FT BGS) NA
 LOGGED BY Frank Morris/Mike Hoffman (20-90' from DS-45) GROUND WATER ELEVATION (FT MSL) 0.00
 REMARKS _____

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		120						FILL; sandstone boulder (1' size) @ 0.5 ft bgs.		
								SILTY SAND (alluvium): dark brown (10YR 3/3).		
						SM				
								SANDSTONE: yellowish brown (10YR 5/6); weathered, loose, slightly moist.	4.0	14-in diameter borehole, grouted (0-10 ft bgs)
0					5					6-in ID x 1/4-in wall mild steel surface casing (0-19.4 ft bgs)
						SS				
								SANDSTONE: as previous but becoming harder at 7.5 ft bgs, broken pieces (1-in +).		
					10				10.0	

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWIN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-47
 DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		120						SANDSTONE: yellowish brown (10YR 5/6); slightly weathered, pulverized (heavy chatter), dry.		<p>9-7/8-in borehole (10-19.4 ft bgs)</p> <p>6-in ID x 1/4-in wall mild steel surface casing (0-19.4 ft bgs)</p> <p>Portland cement/ bentonite grout (10-19.4 ft bgs)</p>
0		840			20	SS		<p>* Predominantly pulverized SANDSTONE from 20-90 ft bgs - core from DS-45 used for detail from ~20-90 ft bgs. SANDSTONE: yellowish brown (10YR 5/4); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented. Fractured between shale and sandstone at approximately 20 ft bgs.</p> <p>SHALE: dark bluish gray (5B 4/1); moderately weathered,</p>	20.0	<p>5-7/8-in open borehole (19.4-145 ft bgs)</p>
									21.3	

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-47
 DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								laminated, approximately 45° dip, weakly cemented.		
								Weathered fracture at 22.8 ft bgs.		
						SH		Weathered fractures at 25 ft bgs.		
					25					
								SANDSTONE: dark grayish brown (10YR 3/2); moderately weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	26.0	
								Color change at 28 ft bgs to dark bluish gray (5PB 4/1).		
						SS				
					30					
								SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	31.0	
						SS				

← 5-7/8-in open borehole (19.4-145 ft bgs)

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ_LAEWIND1.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-47
 DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	33.0	
					35					
						SS				
					40					

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEVWNN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-47
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					45			SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	45.0	← 5-7/8-in open borehole (19.4-145 ft bgs)
						SS				
					50			SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to coarse, mostly medium to coarse; subangular to subrounded, massive, weakly cemented.	54.0	
						SS				
					55				55.7	

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-47
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								<p>SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.</p> <p>Fractured at 56.5 ft bgs.</p>		<p>← 5-7/8-in open borehole (19.4-145 ft bgs)</p>
					60			<p>Laminated at 62.1 ft bgs, 1/16 to 1/8 layers dipping approximately 45°.</p> <p>Massive at 62.8 ft bgs.</p> <p>Shale inclusions from 63.7 to 63.9 ft bgs.</p>		
						SS				
					65					

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-47

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Fractured between sandstone and shale, about 68.3 ft bgs.		
					68.3	SH		SHALE: dark bluish gray (5B 4/1); slightly weathered, massive, approximately 45° dip, weakly cemented.	68.3	
					68.8	SS		SANDSTONE: dark bluish gray (5PB 4/1); slightly weathered, poorly graded, fine to medium, angular to subangular, massive, weakly cemented.	68.8	
					69.1	SH		SHALE: dark bluish gray (5B 4/1); as previous (68.3 to 68.8 ft bgs).	69.1	
					69.5	SS		SANDSTONE: dark bluish gray (5PB 4/1); as previous (68.8 to 69.1 ft bgs).	69.5	
					70	SS		2-inch shale stringer at 71.3 ft bgs dipping approximately 30°.		
					72.1	SH		SHALE: dark bluish gray (5B 4/1); slightly weathered, massive, approximately 45° dip, weakly cemented. Stop drilling after 2-foot run, plugged with clay.	72.1	
					73.0			No recovery around 73 ft bgs.		
					75	NR		No recovery around 75 ft bgs. Borehole took approximately 200 gallons of water from 75 to 90 ft bgs.		
					78.5					

← 5-7/8-in open borehole (19.4-145 ft bgs)

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWNN01.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-47

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					80	SH		SHALE: dark bluish gray (5B 4/1); slightly weathered, massive, approximately 45° dip, weakly cemented. Stop drilling after 2-foot run, plugged with clay (79.2 ft bgs).	80.0	<p>5-7/8-in open borehole (19.4-145 ft bgs)</p>
					85	NR		No Recovery at 85 ft bgs. Small amount of fine sand coming up with drilling fluid.		
					90				90.0	

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEWANN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM
 PROJECT NAME Santa Susana Field Laboratory

BORING/WELL NUMBER DS-47
 DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		4.8/ 20%						SANDSTONE: medium gray (N5); fine to medium, minor shale laminae (90-90.2 ft bgs), slightly broken/fractured, rough; RQD for 90 to 95 ft bgs = less than 50%.		
0		48/ 133%				SS		Coarse interval from 92.5-92.6 ft bgs.	92.6	
						SH		SHALE: dark gray (N3); thinly bedded (0.3 ft).	92.9	
						SS		SANDSTONE: medium gray (N5); fine to medium, weak/broken at very thin shale partings, shale inclusions.		← 5-7/8-in open borehole (19.4-145 ft bgs)
0		2.4/ 10%			95			SILTSTONE/SHALE(?); 1-2 ft missing	95.1	
						NR				
0		64.8/ 108%						SANDSTONE: medium gray (N5); poorly graded, medium grained, broken, RQD for 97 to 102 ft = 50-60%.	97.0	
						SS				
					100					
						SH		SHALE: dark gray (N3); highly broken and fractured.	100.6	

Continued Next Page

NEWGIN1 SSFL_VER09062016.GPJ LAEWN01.GDT 9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM BORING/WELL NUMBER DS-47
 PROJECT NAME Santa Susana Field Laboratory DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		14.4/40%						1-2 ft missing around 102 ft bgs.	102.0	
						NR				
								SANDSTONE: medium gray (N5); medium to coarse, strong, consolidated.	103.8	
						SS				
0		44.4/74%			105			SHALE WITH INTERBEDDED SANDSTONE: dark gray (N3); contact with sandstone, thinly bedded (0.3 ft), dip varies 70° to 30°s.	105.0	← 5-7/8-in open borehole (19.4-145 ft bgs)
										← Water (106 ft bgs)
						SS		SANDSTONE: coarse layer at 107.2 ft bgs, 0.3 ft thick.	107.5	
						SH		SHALE WITH INTERBEDDED SANDSTONE: dark gray (N3); contact with sandstone, thinly bedded (0.3 ft), dip varies 70° to 30°s.		
						SH				
								Shale, highly fractured and broken at 108.7 ft bgs; then ~1.3 ft missing (lost circulation while core drilling, approx. 105-110 ft bgs).	108.8	
						NR				
0		60/100%			110			SHALE: dark gray (N3); fine siltstone laminae <= 1 mm, some soft sediment deformation.	110.1	
						SH		SANDSTONE: light to medium gray (N6); fine, iron stained fracture along bedding plane at shale contact.	110.4	
						SS				
								SHALE: dark gray (N3); 30° dip to bedding, broken at silty partings, thin to laminated bedding.	111.6	
						SH				

Continued Next Page

NEWGINT_SSFL_VER09062016.GPJ_LAEVWNO1.GDT_9/6/16



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-47

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/100%			115			<p>SANDSTONE: light olive gray (5Y 5/2); poorly graded, fine to medium, consolidated, strong, unfractured.</p> <p>RQD for 115 to 120 ft bgs = 98%, excellent.</p> <p>Slight color change at 116.1 ft bgs to medium gray (N5).</p> <p>Lost circulation, approx. 117 ft bgs (added 100+ gallons water).</p>	113.2	<p>5-7/8-in open borehole (119.4-145 ft bgs)</p>
0		60/100%			120	SS	<p>Mechanical break at 119.7 ft bgs.</p> <p>RQD for 120 to 125 ft bgs = 99%.</p> <p>Mechanical break at 120.4 ft bgs.</p>			

NEWGINT SSFL_VER09062016.GPJ LAEWIND1.GDT 9/6/16

Continued Next Page



111 Academy, Suite 150
 Irvine, CA 92617
 (949) 752-5452
 (949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-47

PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		60/100%			125			SANDSTONE: light olive gray (5Y 5/2); fine to medium, consolidated, strong, unfractured. RQD for 125 to 130 ft bgs = 100%	125.0	
								Fracture at 126.8 ft bgs along bedding plane, 30° dip, aperture extremely narrow, tight, no staining.		
										← 5-7/8-in open borehole (19.4-145 ft bgs)
0		60/100%			130					
						SS				
								Color change at 134 ft bgs to light olive gray (5Y 5/2). Possible water bearing zone at 134 ft bgs.		
0		60/100%			135			Vertical (~90°) fracture, approximately 134.2-135.7 ft bgs, open with loose, medium grained sand in fracture, slight yellowish brown staining.		

Continued Next Page

NEWGINT SSFL_VER09062016.GPJ LAEWNN01.GDT 9/6/16



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 94489.1204.009.909.09092.GWFIM

BORING/WELL NUMBER DS-47

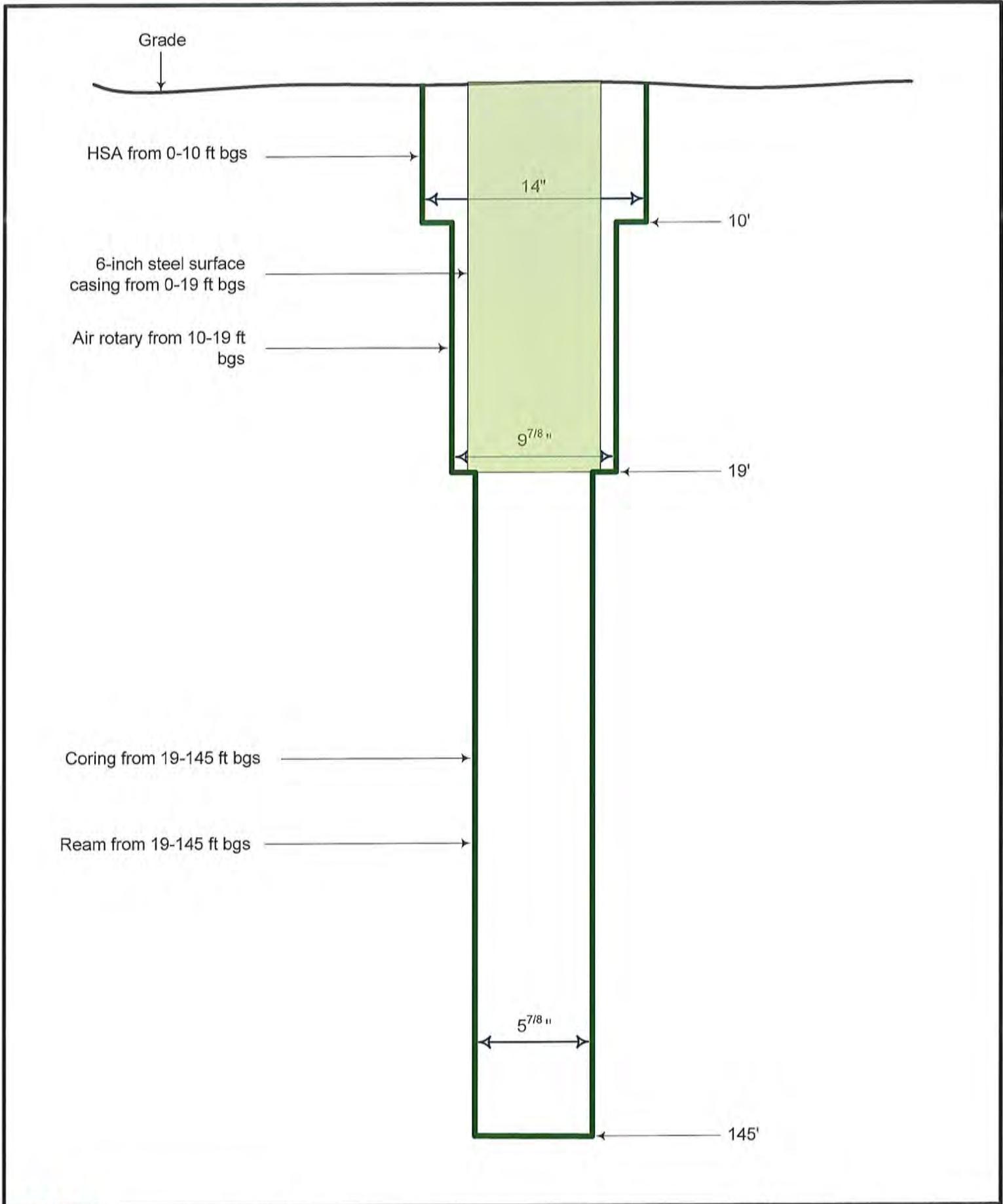
PROJECT NAME Santa Susana Field Laboratory

DATE DRILLED 3/15/16 - 3/17/16

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		27.6/46%			140			<p>Broken at 136.1 ft bgs.</p> <p>Broken at 136.8 ft bgs.</p> <p>Broken at 138.4 ft bgs, highly stained fracture 80° from horizontal, loose sand present to 140 ft bgs (red/yellow).</p> <p>Very weak sandstone at 139.6 ft bgs, highly friable. Broken at 140 ft bgs.</p> <p>SANDSTONE: loose sand in upper portion of core run (140 to 145 ft bgs) and 1.5 ft sandstone; 2.7 ft missing from washout, wet to saturated?</p>	140.0	<p>← 5-7/8-in open borehole (19.4-145 ft bgs)</p>
						SS				
									143.3	
							NR	<p>Hammer not working at 143.3 ft bgs and during end of run while reaming 5-7/8-in borehole.</p>		
					145			<p>Total depth of borehole is 145 ft bgs.</p>	145.0	

NEWGINT SSFL_VER062016.GPJ LAEWIND1.GDT 9/6/16



CDM Smith Inc.
 555 17th Street, Suite #1100
 Denver, CO 80202
 303-383-2300

DOE Area IV – Santa Susana Field Laboratory

DS-47
 Well Completion Diagram
 (not to scale)

ES-31

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-74

LITHOLOGIC LOG OF WELL ES-31

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 5	CLAYEY SANDY SILT (ALLUVIUM)	Dark brown, slightly moist.
5 - 6	SANDY SILTY CLAY (ALLUVIUM)	Light brown, fast penetration.
6 - 18	SILTY SANDSTONE (CHATSWORTH FORMATION)	Light brown, slow penetration.
18 - 25	SANDY SHALE (CHATSWORTH FORMATION)	Light grey, fissile, slow penetration.

TOTAL DEPTH OF BOREHOLE: 25 feet

GROUNDWATER RESOURCES CONSULTANTS, INC.

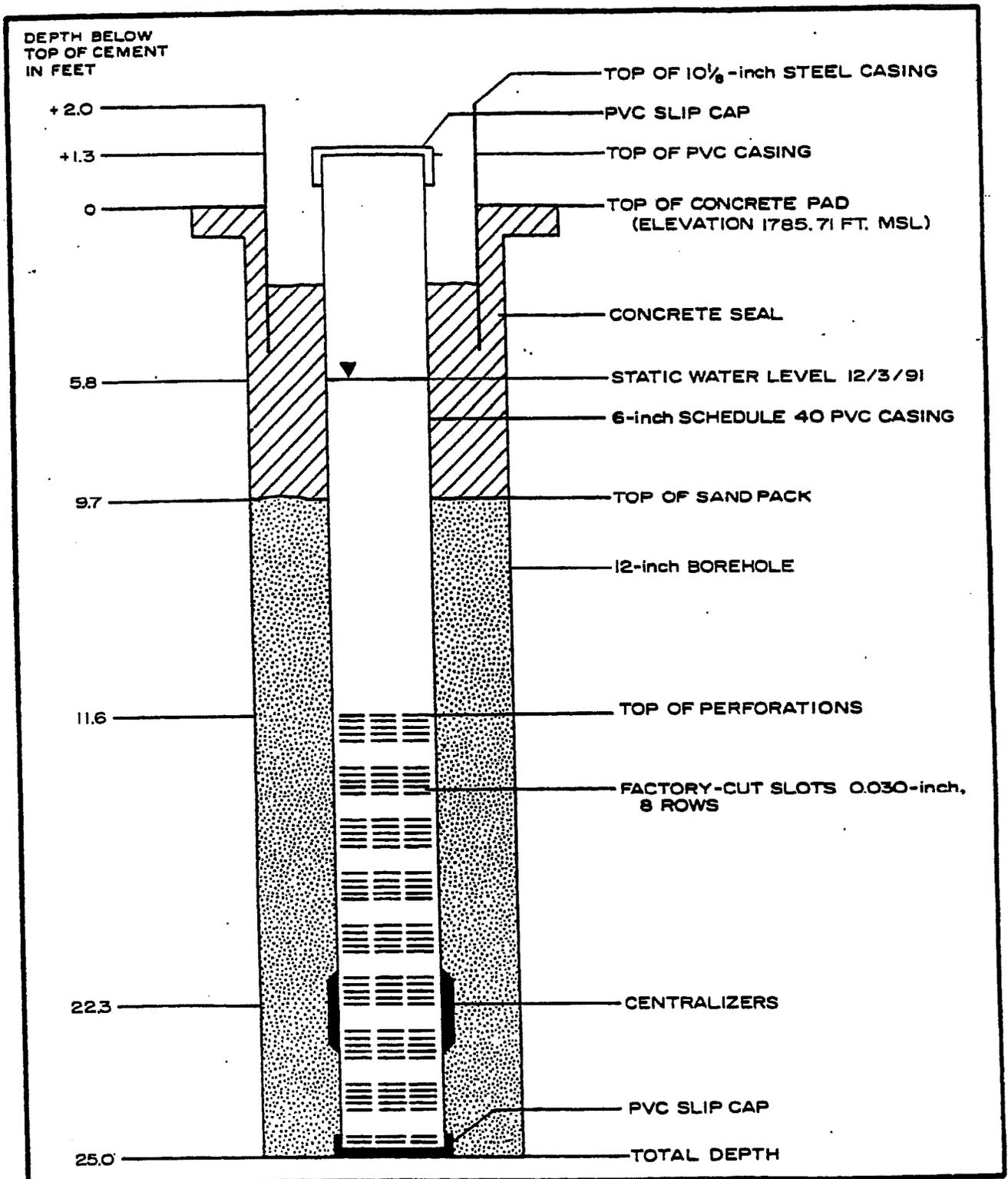


FIGURE D-31
SCHEMATIC DIAGRAM OF WELL ES-31

OS WELL LOGS

OS-03

OS-04

OS-05

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-181

LITHOLOGIC LOG OF WELL OS-3

(Log obtained from State of California
Department of Water Resources)

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
0 - 7	Sand, gravel & boulders.
7 - 53	Shale
53 - 250	Sandstone

TOTAL DEPTH OF BOREHOLE: 250 feet

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-182

LITHOLOGIC LOG OF WELL OS-4

(Log obtained from State of California
Department of Water Resources)

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
0 - 6	Fill
6 - 15	Sandy clay
15 - 50	Grey sandstone
50 - 60	Coarse gravel
60 - 100	Quartzite

TOTAL DEPTH OF BOREHOLE: 100 feet

TABLE 3
(continued)
WELL CONSTRUCTION DATA

OFF-SITE PRIVATE WELLS OR SPRINGS	EFFECTIVE BOREHOLE DEPTH (feet)	BOREHOLE		CASING		SEALED INTERVAL (feet)	PERFORATED INTERVAL (feet)	MEASURING POINT ELEVATION (ft MSL)	DATE DRILLING COMPLETED
		Diameter (inches)	Interval (feet)	Inside Diameter (inches)	Interval (feet)				
OS-1	288	NR	NR	10 ---	0 - 52 ---	NR	OPEN HOLE	1310.34	NR
OS-2	700	NR	NR	10 ---	0 - 17 ---	0 - 17	OPEN HOLE	1237.01	03-18-59
OS-3	100	Drilled With Cable Tools		8-1/4 ---	0 - 59 ---	0 - 30	30 - 80 OPEN HOLE	1298.15	06-12-50
OS-4	Well Construction Data Unresolved Or Not Available							1334.00	
OS-5	Well Construction Data Unresolved Or Not Available							1312.08	
OS-8(S)									
OS-10	600	18 12	0 - 10 10 - 600	12-1/8 ---	0 - 10 ---	0 - 10	OPEN HOLE	1016.97	12-54
OS-12(S)									
OS-13(S)									
OS-15	218	Drilled With Cable Tools		8-1/4 ---	0 - 40 ---	0 - 40	OPEN HOLE	1404.86	08-27-60
OS-16	Well Construction Data Unresolved Or Not Available							1785.05	
OS-17	Well Construction Data Unresolved Or Not Available							1564.07	
OS-21	Well Construction Data Unresolved Or Not Available							1900.39	
OS-24	515	10 6	0 - 40 40 - 515	6-1/4 ---	0 - 40 ---	0 - 40	OPEN HOLE	1947.16	12-02-87
OS-25	515	10 6	0 - 38 38 - 515	6-1/4 ---	0 - 38 ---	0 - 38	OPEN HOLE	2043.48	12-10-87
OS-26	515	10 6	0 - 40 40 - 515	6-1/4 ---	0 - 40 ---	0 - 40	OPEN HOLE	2080.33	11-16-87

8640M-89C GWRC

Depth/intervals are measured in feet below land surface.

(—) = No casing installed over the borehole interval specified; open hole.

NR = Not reported in drillers log.

(S) = Spring; Construction data not applicable.

PZ WELL LOGS

PZ-005, 041, 051,
052, 055, 056, 097,
098, 099, 100, 101,
102, 103, 104, 105,
106, 107, 108, 109,
110, 111, 112, 113,
114, 115, 120, 121,
122, 124

TABLE A-2a
CONSTRUCTION DETAILS OF PIEZOMETER MONITORING SYSTEMS
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

PIEZOMETER ID	LOCATION					PIEZOMETER DESIGN DETAILS						
	Area	SWMU	Northing	Easting	MP Elevation	Date Drilled	Total Depth	Screened Interval	Sand Interval	Bentonite Interval	Grout Interval	Concrete Interval
			[feet]	[feet]	[feet]	[m/d/y]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]
PZ-001A	II	RD-9 Area	268546.6	1789711.3	1768.50	10/31/2000	N/A	5.75-6.25	5-7	2-5	N/A	0-2
PZ-001B	II	RD-9 Area	268546.6	1789711.3	1768.50	10/31/2000	N/A	17.75-18.25	17-19	7-17	N/A	N/A
PZ-001C	II	RD-9 Area	268546.6	1789711.3	1768.50	10/31/2000	N/A	29.75-30.25	29-31	19-29	N/A	N/A
PZ-001D	II	RD-9 Area	268546.6	1789711.3	1768.50	10/31/2000	N/A	38.25-38.75	37.5-39.2	31-37.5	N/A	N/A
PZ-001E	II	RD-9 Area	268546.6	1789711.3	1768.50	10/31/2000	N/A	51.75-52.25	51-53	39.2-51	N/A	N/A
PZ-001F	II	RD-9 Area	268546.6	1789711.3	1768.50	10/31/2000	58.0	57.75-58.25	56.8-60	53-56.8	N/A	N/A
PZ-002A	I	CTL-III N	265543.1	1792828.1	1780.25	11/1/2000	N/A	5.75-6.25	5-7	2-5	N/A	0-2
PZ-002B	I	CTL-III N	265543.1	1792828.1	1780.25	11/1/2000	N/A	14.75-15.25	14-16	7-14	N/A	N/A
PZ-002C	I	CTL-III N	265543.1	1792828.1	1780.25	11/1/2000	N/A	26.75-27.25	26-28	16-26	N/A	N/A
PZ-002D	I	CTL-III N	265543.1	1792828.1	1780.25	11/1/2000	N/A	36.75-37.25	36-38	28-36	N/A	N/A
PZ-002E	I	CTL-III N	265543.1	1792828.1	1780.25	11/1/2000	N/A	51.75-52.25	51-53	38-51	N/A	N/A
PZ-002F	I	CTL-III N	265543.1	1792828.1	1780.25	11/1/2000	N/A	64.75-65.25	64-66	53-64	N/A	N/A
PZ-002G	I	CTL-III N	265543.1	1792828.1	1780.25	11/1/2000	82.0	79 ^a	78-81	66-78	N/A	N/A
PZ-003	I	APTF	Destroyed 6/18/2010									
PZ-004A	II	Delta / PLF	264973.5	1787246.6	1716.00	12/13/2000	16.0	5-15	4-16	2-4	N/A	0-2
PZ-004B	II	Delta / PLF	264969.6	1787241.5	1715.89	12/13/2000	36.0	20-30	18-31.5	15-18	2-15	0-2
PZ-005	IV	Central Area IV	266634.9	1784877.3	1800.97	11/7/2000	45.0	15-25	11.5-26.5	8.5-11.5	2-8.5	0-2
PZ-006A	III	ECL	266669.3	1786868.4	1765.82	11/7/2000	N/A	5.75-6.25	5-7	2-5	N/A	0-2
PZ-006B	III	ECL	266669.3	1786868.4	1765.82	11/7/2000	N/A	13.75-14.25	13-15	7-13	N/A	N/A
PZ-006C	III	ECL	266669.3	1786868.4	1765.82	11/7/2000	N/A	17.75-18.25	17-19	15-17	N/A	N/A
PZ-006D	III	ECL	266669.3	1786868.4	1765.82	11/7/2000	N/A	23.75-24.25	23-25	19-23	N/A	N/A
PZ-006E	III	ECL	266669.3	1786868.4	1765.82	11/7/2000	36.5	34.75-35.25	34-36.5	25-34	N/A	N/A
PZ-007A	II	RD-9 Area	268474.7	1789593.8	1771.84	11/7/2000	N/A	5.75-6.25	5-7	2-5	N/A	0-2
PZ-007B	II	RD-9 Area	268474.7	1789593.8	1771.84	11/7/2000	N/A	10.75-11.25	10-12	7-10	N/A	N/A
PZ-007C	II	RD-9 Area	268474.7	1789593.8	1771.84	11/7/2000	N/A	15.75-16.25	15-17	12-15	N/A	N/A
PZ-007D	II	RD-9 Area	268474.7	1789593.8	1771.84	11/7/2000	N/A	24.75-25.25	24-26	17-24	N/A	N/A
PZ-007E	II	RD-9 Area	268474.7	1789593.8	1771.84	11/7/2000	N/A	30.75-31.25	30-32	26-30	N/A	N/A
PZ-007F	II	RD-9 Area	268474.7	1789593.8	1771.84	11/7/2000	N/A	35.75-36.25	35-37	32-35	N/A	N/A
PZ-007G	II	RD-9 Area	268474.7	1789593.8	1771.84	11/7/2000	46.0	45 ^a	42.6-46	37-42.6	N/A	N/A
PZ-008A	I	LETF / CTL-I	267305.5	1794332.0	1836.12	11/8/2000	N/A	8.75-9.25	8-10	5-8	2-5	0-2
PZ-008B	I	LETF / CTL-I	267305.5	1794332.0	1836.12	11/8/2000	N/A	19.75-20.25	19-21	10-19	N/A	N/A
PZ-008C	I	LETF / CTL-I	267305.5	1794332.0	1836.12	11/8/2000	N/A	31.75-32.25	31-33	21-31	N/A	N/A

TABLE A-2a
CONSTRUCTION DETAILS OF PIEZOMETER MONITORING SYSTEMS
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

PIEZOMETER ID	LOCATION					PIEZOMETER DESIGN DETAILS						
	Area	SWMU	Northing	Easting	MP Elevation	Date Drilled	Total Depth	Screened Interval	Sand Interval	Bentonite Interval	Grout Interval	Concrete Interval
			[feet]	[feet]	[feet]	[m/d/y]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]
PZ-008D	I	LETF / CTL-I	267305.5	1794332.0	1836.12	11/8/2000	N/A	39.75-40.25	39-41	33-39	N/A	N/A
PZ-008E	I	LETF / CTL-I	267305.5	1794332.0	1836.12	11/8/2000	N/A	46.75-47.25	46-48	41-46	N/A	N/A
PZ-008F	I	LETF / CTL-I	267305.5	1794332.0	1836.12	11/8/2000	N/A	62.75-63.25	61-64	48-61	N/A	N/A
PZ-008G	I	LETF / CTL-I	267305.5	1794332.0	1836.12	11/8/2000	72.0	70 ^a	69-71	64-69	N/A	N/A
PZ-009A	II	RD-9 Area	268649.2	1789768.5	1761.44	11/14/2000	N/A	5.75-6.25	5-7	2-5	N/A	0-2
PZ-009B	II	RD-9 Area	268649.2	1789768.5	1761.44	11/14/2000	N/A	10.75-11.25	10-12	7-10	N/A	N/A
PZ-009C	II	RD-9 Area	268649.2	1789768.5	1761.44	11/14/2000	N/A	18.25-18.75	17.5-19.5	12-17.5	N/A	N/A
PZ-009D	II	RD-9 Area	268649.2	1789768.5	1761.44	11/14/2000	N/A	22.75-23.25	22-24	19.5-22	N/A	N/A
PZ-009E	II	RD-9 Area	268649.2	1789768.5	1761.44	11/14/2000	N/A	30.25-30.75	29.5-31.5	24-29.5	N/A	N/A
PZ-009F	II	RD-9 Area	268649.2	1789768.5	1761.44	11/14/2000	36.0	34.75-35.25	34-36	31.5-34	N/A	N/A
PZ-010A	II	RD-9 Area	268595.8	1789646.3	1767.80	11/14/2000	N/A	7.75-8.25	7-9	5-7	2-5	0-2
PZ-010B	II	RD-9 Area	268595.8	1789646.3	1767.80	11/14/2000	N/A	13.75-14.25	13-15	9-13	N/A	N/A
PZ-010C	II	RD-9 Area	268595.8	1789646.3	1767.80	11/14/2000	N/A	19.75-20.25	19-21	15-19	N/A	N/A
PZ-010D	II	RD-9 Area	268595.8	1789646.3	1767.80	11/14/2000	N/A	25.75-26.25	22-27	21-25	N/A	N/A
PZ-010E	II	RD-9 Area	268595.8	1789646.3	1767.80	11/14/2000	N/A	29.75-30.25	29-31	27-29	N/A	N/A
PZ-010F	II	RD-9 Area	268595.8	1789646.3	1767.80	11/14/2000	N/A	38.25-38.75	36.5-39.5	31-36.5	N/A	N/A
PZ-010G	II	RD-9 Area	268595.8	1789646.3	1767.80	11/14/2000	45.0	43 ^a	42-44.5	39.5-42	N/A	N/A
PZ-011A	I	IEL	268086.1	1796133.0	1914.48	11/14/2000	N/A	15.75-16.25	15-17	12-15	2-12	0-2
PZ-011B	I	IEL	268086.1	1796133.0	1914.48	11/14/2000	N/A	24.75-25.25	24-26	17-24	N/A	N/A
PZ-011C	I	IEL	268086.1	1796133.0	1914.48	11/14/2000	N/A	30.75-31.25	30-32	26-30	N/A	N/A
PZ-011D	I	IEL	268086.1	1796133.0	1914.48	11/14/2000	N/A	40.75-41.25	39-42	32-39	N/A	N/A
PZ-011E	I	IEL	268086.1	1796133.0	1914.48	11/14/2000	N/A	46.25-46.75	44.5-47.5	42-44.5	N/A	N/A
PZ-011F	I	IEL	268086.1	1796133.0	1914.48	11/14/2000	N/A	51.25-51.75	50.5-52.5	47.5-50.5	N/A	N/A
PZ-011G	I	IEL	268086.1	1796133.0	1914.48	11/14/2000	58.0	56 ^a	55-58	52.5-55	N/A	N/A
PZ-012A	I	LETF S	266871.1	1794033.3	1827.69	11/16/2000	N/A	4.75-5.25	4-6	2-4	N/A	0-2
PZ-012B	I	LETF S	266871.1	1794033.3	1827.69	11/16/2000	N/A	10.75-11.25	10-12	6-10	N/A	N/A
PZ-012C	I	LETF S	266871.1	1794033.3	1827.69	11/16/2000	N/A	16.75-17.25	16-18	12-16	N/A	N/A
PZ-012D	I	LETF S	266871.1	1794033.3	1827.69	11/16/2000	N/A	21.25-21.75	20.5-22.5	18-20.5	N/A	N/A
PZ-012E	I	LETF S	266871.1	1794033.3	1827.69	11/16/2000	N/A	26.75-27.25	25-28	22.5-25	N/A	N/A
PZ-012F	I	LETF S	266871.1	1794033.3	1827.69	11/16/2000	37.0	34.75-35.25	34-37	28-34	N/A	N/A
PZ-013A	III	Comp A	266008.7	1786153.4	1739.89	11/17/2000	N/A	5.75-6.25	5-7	2-5	N/A	0-2
PZ-013B	III	Comp A	266008.7	1786153.4	1739.89	11/17/2000	N/A	14.75-15.25	13-16	7-13	N/A	N/A

TABLE A-2a
CONSTRUCTION DETAILS OF PIEZOMETER MONITORING SYSTEMS
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

PIEZOMETER ID	LOCATION					PIEZOMETER DESIGN DETAILS						
	Area	SWMU	Northing	Easting	MP Elevation	Date Drilled	Total Depth	Screened Interval	Sand Interval	Bentonite Interval	Grout Interval	Concrete Interval
			[feet]	[feet]	[feet]	[m/d/y]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]
PZ-013C	III	Comp A	266008.7	1786153.4	1739.89	11/17/2000	N/A	20.75-21.25	20-22	16-20	N/A	N/A
PZ-013D	III	Comp A	266008.7	1786153.4	1739.89	11/17/2000	N/A	28.75-29.25	27-30	22-27	N/A	N/A
PZ-013E	III	Comp A	266008.7	1786153.4	1739.89	11/17/2000	N/A	39.75-40.25	39-41	30-39	N/A	N/A
PZ-013F	III	Comp A	266008.7	1786153.4	1739.89	11/17/2000	56.4	53.75-54.25	53-56.4	41-53	N/A	N/A
PZ-014A	III	Comp A	265865.4	1786275.4	1728.12	11/18/2000	N/A	5.75-6.25	5-7	2-5	N/A	0-2
PZ-014B	III	Comp A	265865.4	1786275.4	1728.12	11/18/2000	N/A	13.25-14.75	13.5-15.5	7-13.5	N/A	N/A
PZ-014C	III	Comp A	265865.4	1786275.4	1728.12	11/18/2000	N/A	19.75-20.25	19-21	15.5-19	N/A	N/A
PZ-014D	III	Comp A	265865.4	1786275.4	1728.12	11/18/2000	N/A	29.25-29.75	28.5-30.5	21-28.5	N/A	N/A
PZ-014E	III	Comp A	265865.4	1786275.4	1728.12	11/18/2000	42.0	38.75-39.25	37.8-41	30.5-37.8	N/A	N/A
PZ-015A	III	STL-IV	265687.4	1785844.7	1740.56	11/19/2000	N/A	5.75-6.25	5-7	2-5	N/A	0-2
PZ-015B	III	STL-IV	265687.4	1785844.7	1740.56	11/19/2000	N/A	13.75-14.25	13-15	7-13	N/A	N/A
PZ-015C	III	STL-IV	265687.4	1785844.7	1740.56	11/19/2000	N/A	24.25-24.75	23.5-25.5	15-23.5	N/A	N/A
PZ-015D	III	STL-IV	265687.4	1785844.7	1740.56	11/19/2000	N/A	32.75-33.25	31-34	25.5-31	N/A	N/A
PZ-015E	III	STL-IV	265687.4	1785844.7	1740.56	11/19/2000	N/A	37.75-38.25	37-39	34-37	N/A	N/A
PZ-015F	III	STL-IV	265687.4	1785844.7	1740.56	11/19/2000	N/A	43.25-43.75	42.5-44.5	39-42.5	N/A	N/A
PZ-015G	III	STL-IV	265687.4	1785844.7	1740.56	11/19/2000	49.5	48 ^a	47-49.5	44.5-47	N/A	N/A
PZ-016A	I	Canyon	266960.8	1794388.2	1854.34	11/20/2000	N/A	8.75-9.25	8-10	5-8	2-5	0-2
PZ-016B	I	Canyon	266960.8	1794388.2	1854.34	11/20/2000	N/A	18.25-18.75	17.5-19.5	10-17.5	N/A	N/A
PZ-016C	I	Canyon	266960.8	1794388.2	1854.34	11/20/2000	N/A	25.75-26.25	24-27	19.5-24	N/A	N/A
PZ-016D	I	Canyon	266960.8	1794388.2	1854.34	11/20/2000	N/A	33.75-34.25	33-35	27-33	N/A	N/A
PZ-016E	I	Canyon	266960.8	1794388.2	1854.34	11/20/2000	N/A	44.25-44.75	42.5-45.5	35-42.5	N/A	N/A
PZ-016F	I	Canyon	266960.8	1794388.2	1854.34	11/20/2000	N/A	56.75-57.25	56-58	45.5-56	N/A	N/A
PZ-016G	I	Canyon	266960.8	1794388.2	1854.34	11/20/2000	68.0	64.5 ^a	63.5-68	58-63.5	N/A	N/A
PZ-017A	II	Coca	265169.9	1788794.1	1837.83	11/21/2000	18.0	7-17	6-18	4-6	2-4	0-2
PZ-017B	II	Coca	265168.4	1788789.1	1837.20	11/21/2000	31.0	20-30	18-31	15-18	2-15	0-2
PZ-018A	III	EEL	266278.3	1785963.5	1760.71	11/21/2000	N/A	5.75-6.25	5-7	2-5	N/A	0-2
PZ-018B	III	EEL	266278.3	1785963.5	1760.71	11/21/2000	N/A	11.25-11.75	10.5-12.5	7-10.5	N/A	N/A
PZ-018C	III	EEL	266278.3	1785963.5	1760.71	11/21/2000	N/A	15.75-16.25	15-17	12.5-15	N/A	N/A
PZ-018D	III	EEL	266278.3	1785963.5	1760.71	11/21/2000	N/A	19.75-20.25	19-20.8	17-19	N/A	N/A
PZ-018E	III	EEL	266278.3	1785963.5	1760.71	11/21/2000	26.0	24.75-25.25	22.5-25.5	20.8-22.5	N/A	N/A
PZ-019	II	RD-9 Area	268481.9	1789765.7	1776.77	11/29/2000	31.5	19-29	17-29.3	14-17	2-14	0-2
PZ-020	II	RD-9 Area	268428.3	1789492.8	1776.44	11/27/2000	31.5	19-29	17-29.5	14-17	2-14	0-2

TABLE A-2a
CONSTRUCTION DETAILS OF PIEZOMETER MONITORING SYSTEMS
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

PIEZOMETER ID	LOCATION					PIEZOMETER DESIGN DETAILS						
	Area	SWMU	Northing	Easting	MP Elevation	Date Drilled	Total Depth	Screened Interval	Sand Interval	Bentonite Interval	Grout Interval	Concrete Interval
			[feet]	[feet]	[feet]	[m/d/y]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]
PZ-021	II	RD-9 Area	268740.7	1789818.0	1759.26	11/27/2000	29.5	18-28	16-29.5	13-16	2-13	0-2
PZ-022	II	RD-9 Area	268636.1	1789594.0	1774.44	11/30/2000	29.5	19-29	17-29.5	14-17	2-14	0-2
PZ-023	III	ECL	266415.7	1786832.4	1758.96	11/30/2000	25.0	6-16	5-22	2-5	N/A	0-2
PZ-024	III	ECL	266485.1	1786749.6	1770.30	12/4/2000	25.0	14-24	12-24.5	9-12	2-9	0-2
PZ-025	III	ECL	266637.0	1786700.5	1780.27	12/4/2000	27.0	13-23	11-25.5	8-11	2-8	0-2
PZ-026	III	ECL	266453.2	1786996.3	1755.75	12/5/2000	24.2	14-24	12-24.2	9-12	2-9	0-2
PZ-027	III	ECL	266694.7	1786974.5	1773.06	12/5/2000	23.0	12-22	9.75-22.5	7-9.75	2-7	0-2
PZ-028	III	ECL	266445.3	1786539.9	1788.47	12/6/2000	44.0	25-35	20-35.5	17-20	2-17	0-2
PZ-029	III	EEL / Comp A	266350.5	1786105.8	1771.83	12/6/2000	31.0	19-29	17-31	14-17	2-14	0-2
PZ-030	III	EEL / Comp A	266264.1	1786177.7	1765.98	12/7/2000	32.5	17-27	12-32.5	9-12	2-9	0-2
PZ-031	III	EEL / Comp A	266198.9	1786234.0	1763.97	12/7/2000	30.0	13-23	9-24	6-9	2-6	0-2
PZ-032	III	Comp A	266044.9	1786345.0	1739.75	12/7/2000	22.0	10-20	5-22	2-5	N/A	0-2
PZ-033	III	Comp A	265757.3	1786439.6	1721.73	12/8/2000	29.0	11-21	9-22	6-9	2-6	0-2
PZ-034	III	Comp A	265907.5	1786529.6	1714.68	12/8/2000	12.0	5-12	4-12	2-4	N/A	0-2
PZ-035	III	Comp A	265633.6	1786446.9	1712.96	12/11/2000	24.0	10-20	7-22.3	5-7	2-5	0-2
PZ-036	III	STL-IV	265656.6	1785404.9	1759.07	12/11/2000	28.9	15-25	10-28.9	7-10	2-7	0-2
PZ-037	III	STL-IV	265410.3	1785632.1	1749.29	12/12/2000	28.5	18-28	15-28.5	12-15	2-12	0-2
PZ-038	III	Comp A	265905.6	1785847.4	1752.31	12/12/2000	32.0	17-27	14-31.5	11-14	2-11	0-2
PZ-039	III	STL-IV	265797.1	1785695.9	1753.97	12/13/2000	29.0	18-28	14-29	11-14	2-11	0-2
PZ-040	III	STL-IV	264963.2	1785695.2	1704.54	12/13/2000	31.5	16.5-26.5	11-27	8-11	2-8	0-2
PZ-041	IV	PDU	267315.8	1785662.0	1809.10	1/16/2001	29.6	19-29	17-29.6	14-17	2-14	0-2
PZ-042	II	Delta / PLF	265103.3	1787397.2	1729.25	12/13/2000	40.5	19.5-29.5	17-31	14-17	2-14	0-2
PZ-043	II	Coca Rd W	265377.0	1787987.3	1776.63	12/13/2000	45.0	30-40	25-41	22-25	2-22	0-2
PZ-044	II	Coca Rd W										
PZ-045	II	Coca	265228.7	1788459.0	1828.55	12/15/2000	45.0	30-40	28-43.5	25-28	2-25	0-2
PZ-046	II	Coca	265321.9	1788500.8	1826.87	12/18/2000	35.0	24-34	22-34.5	19-22	2-19	0-2
PZ-047	II	Coca	265152.5	1788645.8	1835.51	12/18/2000	40.4	26-36	23-40.4	20-23	2-20	0-2
PZ-048	II	Coca	265150.4	1788984.1	1847.11	12/19/2000	49.0	9-19	7-20	4-7	2-4	0-2
PZ-049	II	Alfa	267506.9	1790363.0	1884.75	12/19/2000	34.0	6-16	4-17	2-4	N/A	0-2
PZ-050	III	EEL	266207.4	1785733.7	1765.50	12/14/2000	24.0	6-16	4-17	2-4	N/A	0-2
PZ-051	IV	EEL	266485.8	1785857.0	1770.87	12/14/2000	27.0	5-15	3-16	2-3	N/A	0-2
PZ-052	IV	Eastern Area IV	266742.1	1786103.7	1790.72	12/15/2000	30.0	18.9-28.9	17-30	14-17	2-14	0-2

TABLE A-2a
CONSTRUCTION DETAILS OF PIEZOMETER MONITORING SYSTEMS
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

PIEZOMETER ID	LOCATION					PIEZOMETER DESIGN DETAILS						
	Area	SWMU	Northing	Easting	MP Elevation	Date Drilled	Total Depth	Screened Interval	Sand Interval	Bentonite Interval	Grout Interval	Concrete Interval
			[feet]	[feet]	[feet]	[m/d/y]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]
PZ-053	II	R-2 Pond	265235.0	1786682.0	1701.72	12/15/2000	29.0	16-26	11-29	8-11	2-8	0-2
PZ-054	II	R-2 Pond North	265476.9	1786676.9	1702.11	12/18/2000	28.0	5-15	3.8-16	2-4	N/A	0-2
PZ-055	IV	Eastern Area IV	267253.6	1787421.3	1818.40	1/2/2001	29.5	19-29	17-29.5	14-17	2-14	0-2
PZ-056	IV	OCY S	268068.7	1788028.0	1805.86	12/19/2000	28.0	17-27	13-28	10-13	2-10	0-2
PZ-057	III	SPA	267455.0	1788156.6	1812.19	12/19/2000	32.5	12-22	8-24	5-8	2-5	0-2
PZ-058	III	SPA	267430.1	1787892.5	1784.63	12/20/2000	16.0	5-15	4-15.5	2-4	N/A	0-2
PZ-059	II	Bravo	266997.0	1789649.2	1836.67	12/20/2000	24.0	12-22	8-24	5-8	2-5	0-2
PZ-060	II	Alfa	267465.3	1790039.2	1868.90	12/20/2000	49.0	38-48	36-49	33-36	2-33	0-2
PZ-061	II	Alfa	267329.7	1789461.4	1832.05	1/16/2001	25.0	5-15	4-17	2-4	N/A	0-2
PZ-062	I	LOX	268955.3	1792144.7	1716.57	1/3/2001	27.3	14-24	12-27.3	9-12	2-9	0-2
PZ-063	I	IEL	268679.9	1796093.9	1882.86	1/3/2001	50.0	36-46	34-50	31-34	2-31	0-2
PZ-064	I	IEL	268571.9	1796392.5	1912.20	1/8/2001	60.0	46-56	44-60	41-44	2-41	0-2
PZ-065	I	IEL	268197.0	1795785.4	1904.93	1/9/2001	45.0	29-39	27-40	24-27	2-24	0-2
PZ-066	I	IEL	268141.4	1795531.1	1897.19	1/9/2001	55.0	44-54	42-55	39-42	2-39	0-2
PZ-067A	I	B359	267889.7	1795614.1	1909.66	1/12/2001	40.0	28-38	26-40	23-26	2-23	0-2
PZ-067B	I	B359	267892.5	1795607.5	1909.06	1/15/2001	65.0	48-58	46-59	43-46	2-43	0-2
PZ-068	I	Area I Landfill Upper	267959.1	1795304.9	1894.02	1/17/2001	55.0	44-54	42-54.8	39-42	2-39	0-2
PZ-069	I	APTF	267826.0	1795001.2	1885.33	1/18/2001	49.8	39-49	37-49.8	34-37	2-34	0-2
PZ-070	II	Bravo	267188.8	1789392.0	1834.61	12/20/2001	43.0	13-23	11-24	8-11	2-8	0-2
PZ-071	II	SPA	267577.3	1788785.5	1817.94	12/21/2000	31.5	18-28	15-31	11.9-15	2-11.9	0-2
PZ-072	III	Silvermale	266807.7	1787590.8	1768.19	1/2/2001	20.0	8.5-18.5	6.5-19	2-6.5	N/A	0-2
PZ-073	UDL	ELV Drainage	269435.8	1788107.5	1760.54	1/3/2001	55.0	41-51	35-55	30.5-35	2-30.5	0-2
PZ-074	I	Happy Valley	266110.3	1796300.5	1772.73	1/8/2001	25.0	10-20	8.5-24	5-8.5	2-5	0-2
PZ-075	I	IEL	268540.9	1795877.3	1893.10	1/8/2001	45.0	33-43	27-45	24.5-27	2-24.5	0-2
PZ-076	I	CTL-III	264309.1	1792921.1	1767.09	1/9/2001	60.0	36-46	32-47	28-32	2-28	0-2
PZ-077	I	Perimeter Pond	264396.8	1792351.4	1753.42	1/10/2001	37.0	15-25	12-26	9-12	2-9	0-2
PZ-078	I	Perimeter Pond / CTL-III	264578.0	1792341.9	1755.77	1/11/2001	48.0	15-25	12-26	9.5-12	2-9.5	0-2
PZ-079	I	CTL-III	265305.8	1792641.4	1776.66	1/11/2001	35.0	15-25	12-26	9.4-12	2-9.4	0-2
PZ-080	I	R-1 Pond	266375.7	1793364.4	1813.15	1/16/2001	50.0	19-29	5-31	2-5	N/A	0-2
PZ-081	I	LETF / CTL-I	267450.6	1794405.9	1841.67	1/19/2001	49.0	38.5-48.5	36.5-49	33.5-36.5	2-33.5	0-2
PZ-082	I	R-1 Pond	265999.5	1793220.6	1798.08	1/17/2001	45.0	10-20	8-21	5-8	2-5	0-2
PZ-083	I	LETF / CTL-I	267256.1	1794099.0	1833.45	1/22/2001	50.0	20-30	18-31	15-18	2-15	0-2

TABLE A-2a
CONSTRUCTION DETAILS OF PIEZOMETER MONITORING SYSTEMS
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

PIEZOMETER ID	LOCATION					PIEZOMETER DESIGN DETAILS						
	Area	SWMU	Northing	Easting	MP Elevation	Date Drilled	Total Depth	Screened Interval	Sand Interval	Bentonite Interval	Grout Interval	Concrete Interval
			[feet]	[feet]	[feet]	[m/d/y]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]
PZ-084	I	Bowl	265902.5	1793977.1	1836.00	1/18/2001	33.0	21-31	17-33	13.5-17	2-13.5	0-2
PZ-085A	I	Bowl	265753.4	1793796.9	1816.79	1/23/2001	31.0	20-30	17-31	14-17	2-14	0-2
PZ-085B	I	Bowl	265754.9	1793803.5	1816.81	1/22/2001	60.0	37-47	34-48	31-34	2-31	0-2
PZ-086	I	LETf / CTL-I	267235.1	1794239.4	1833.44	1/18/2001	35.0	16-26	14-27	11-14	2-11	0-2
PZ-087A	I	Bowl	265919.9	1793555.7	1817.15	1/24/2001	22.5	11-21	7-22.5	4.5-7	2-4.5	0-2
PZ-087B	I	Bowl	265915.2	1793549.9	1816.23	1/23/2001	55.0	41.5-51.5	36-55	34-36	2-34	0-2
PZ-088	I	LETf / CTL-I	267598.6	1794688.4	1859.54	1/19/2001	45.0	32-42	27-43	24-27	2-24	0-2
PZ-089	I	APTF	267716.1	1794950.5	1876.64	1/22/2001	20.0	6-16	4.5-18	2-4.5	N/A	0-2
PZ-090	I	CTL-III N	265525.4	1792702.2	1780.01	1/12/2001	45.0	16-26	13-28	10-13	2-10	0-2
PZ-091	I	CTL-III N	265700.0	1792877.1	1788.84	1/15/2001	55.0	26-36	23.5-40	20-23.5	2-20	0-2
PZ-092	I	B359	267813.6	1795369.1	1897.59	1/22/2001	34.5	19-29	17-31	14-17	2-14	0-2
PZ-093	I	LETf S	266764.7	1793696.6	1821.79	1/23/2001	40.0	24.5-34.5	22-35	19-22	2-19	0-2
PZ-094	Offsite	Sage Ranch	269025.4	1795857.2	1857.76	1/25/2001	34.0	13-23	10-24	8-10	2-8	0-2
PZ-095	I	LOX	269117.2	1792686.5	1760.02	2/14/2001	37.5	14-24	11-26	8-11	2-8	0-2
PZ-096	II	Coca Rd W	265475.3	1787620.7	1766.30	4/21/2001	45.0	33.5-43.5	31-45	28-31	2-28	0-2
PZ-097	UDL	FSDf	267048.9	1783400.3	1761.87	10/15/2001	44.5	33-43	31-44.5	11.5-28	2-11.5	0-2
PZ-098	IV	FSDf	266788.9	1783488.8	1797.78	10/16/2001	37.5	24-34	21.5-37.5	19-21.5	2-19	0-2
PZ-099	IV	FSDf	Abandoned in place in 2006									
PZ-100	IV	FSDf	266078.3	1782962.2	1870.11	10/17/2001	16.5	5.67-15.67	4.67-16.5	2-4.67	N/A	0-2
PZ-101	IV	FSDf	266057.5	1783090.6	1869.71	10/17/2001	27	10-20	7-27	5-7	1.75-5	0-1.75
PZ-102	IV	Central Area IV	267080.8	1784684.4	1827.78	10/18/2001	59.2	48.5-59.2	45-59.2	43-45	2-43	0-2
PZ-103	IV	Central Area IV	266281.2	1784400.9	1815.93	10/22/2001	39	28.5-38.5	26-39	23.5-26	2-23.5	0-2
PZ-104	IV	Central Area IV	266270.2	1784924.2	1797.47	10/22/2001	38.5	18-28	16-30	13-16	2-13	0-2
PZ-105	IV	Central Area IV	265935.5	1784787.9	1803.87	10/23/2001	28	17-27	15-28	12-15	2-12	0-2
PZ-106	IV	EEL	266411.9	1785469.6	1784.17	10/23/2001	35	18-28	16-30.5	12.75-16	2-12.75	0-2
PZ-107	IV	Eastern Area IV	266876.4	1785822.0	1793.62	10/24/2001	11	5-10	4-11	2-4	N/A	0-2
PZ-108	IV	HMSA	268032.6	1785076.3	1763.01	10/24/2001	30	16-26	13-28.5	10-13	2-10	0-2
PZ-109	IV	Central Area IV	267332.4	1785248.2	1809.36	10/25/2001	36.5	25-35	22-36.5	19-22	2-19	0-2
PZ-110	IV	Eastern Area IV	267204.0	1786209.6	1818.90	10/25/2001	17.5	7-17	5-17.5	2-5	N/A	0-2
PZ-111	IV	Eastern Area IV	266948.4	1786433.9	1794.90	10/26/2001	20.0	7.5-17.5	5-20	N/A	N/A	N/A
PZ-112	IV	Eastern Area IV	267435.9	1786720.8	1829.14	10/26/2001	35.0	24-34	22-35	19-22	2-19	0-2
PZ-113	IV	Eastern Area IV	267682.9	1787367.8	1823.68	10/29/2001	15.0	7-15	5-15	2-5	N/A	0-2

TABLE A-2a
CONSTRUCTION DETAILS OF PIEZOMETER MONITORING SYSTEMS
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

PIEZOMETER ID	LOCATION					PIEZOMETER DESIGN DETAILS						
	Area	SWMU	Northing	Easting	MP Elevation	Date Drilled	Total Depth	Screened Interval	Sand Interval	Bentonite Interval	Grout Interval	Concrete Interval
			[feet]	[feet]	[feet]	[m/d/y]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]	[feet bgs]
PZ-114	IV	Old Con Yard S	268304.0	1787913.1	1818.19	10/30/2001	48.2	37-47	35-48.2	32-35	2-32	0-2
PZ-115	IV	Eastern Area IV	268006.8	1787536.5	1817.81	10/30/2001	40	25.5-37.5	25-40	22-25	2-22	0-2
PZ-116	UDL	RMHF	266501.1	1783693.0	1827.78	10/31/2001	34	22-32	20-34	17-20	2-17	0-2
PZ-117	I	Happy Valley	266712.9	1796184.6	1763.01	11/1/2001	25.5	14.5-24.5	12.5-25.5	9.5-12.5	2-9.5	0-2
PZ-118	I	B-1 Area	269389.4	1796988.7	1907.84	11/2/2001	30.0	19.5-29.5	16.5-30	13.5-16.5	2-13.5	0-2
PZ-119	Offsite	Sage Ranch	269025.4	1795863.3	1857.64	11/2/2001	44	33-43	30-44	27-30	2-27	0-2
PZ-120	IV	HMSA / SCTI	267230.1	1785009.7	1810.96	3/18/2003	26	15-25	12-26	9-12	2-9	0-2
PZ-121	IV	HMSA / SCTI	267491.6	1785120.7	1808.98	3/19/2003	33	15-25	12-28	8.4-12; 28-33	1.5-8.4	0-1.5
PZ-122	IV	HMSA / SCTI	267091.9	1785176.5	1810.80	3/19/2003	27.5	15.5-25.5	12-27.5	9-12	2-9	0-2
PZ-123	UDL	Happy Valley	264643.9	1797304.3	1610.81	3/20/2003	23.5	11.5-21.5	8.7-23.5	5.7-8.7	1-5.7	0-1
PZ-124	IV	B056 Landfill	267166.7	1784015.9	1764.11	3/21/2003	31	14.7-24.7	11.3-31	8.3-11.3	1-8.3	0-1
PZ-125	II	RD-9 Area	268357.1	1789379.4	1783.91	3/24/2003	41	23.5-33.5	20-34	16.5-20; 34-38	1.5-16.5	0-1
PZ-126	II	Coca	265095.8	1789222.8	1853.62	4/30/2003	21	10.5-21	7-20.5	1.5-7; 21-50	N/A	1-1.5
PZ-127	I	Canyon	266957.1	1794827.5	1877.19	4/24/2003	66	55.25-62.25	49-65.5	43-49	1-43	0-1

Notes:

The difference between the total depth and the bottom of the sand interval was filled with sloughed native material and/or bentonite.

^a The screen for this port is perpendicular to the well casing and covers the open bottom end; therefore, the screened section is a discrete depth.

bgs - Below ground surface

MP - Measuring point

UDL - undeveloped land

PZ WELL LOGS

PZ-150 (SRE-NS-W)

PZ-160 (SRE-NS-E)

PZ-161 (SRE-NS-N)

TABLE A-2c
CONSTRUCTION DETAILS OF PIEZOMETER MONITORING SYSTEMS
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Well ID	Northing (feet)	Easting (feet)	Surface Elevation (feet amsl)	TOC Elevation (feet amsl)	Depth to Screen Top (feet bgs)	Depth to Screen Bottom (feet bgs)	Total Depth (feet bgs)	Total Depth Drilled (feet bgs)	Borehole Diameter (inches)	Casing Diameter (inches)	Screen Material	Screen Slot Size (inches)	Casing Material	Filter Pack Grade	Filter Pack Top (feet bgs)	Filter Pack Bottom (feet bgs)	Drilling Method	Driller	Annular Seal Material	Annular Seal Top (feet bgs)	Annular Seal Bottom (feet bgs)	Wellhead Completion
PZ-149	268980.544	1790277.591	1712.32	1715.19	26	36	36.5	47	8	2	SCH40 PVC	0.02	SCH40 PVC	#3	20	36.5	Hollow Stem Auger	WDC	Bentonite Chips	10	20	Monument
PZ-150	268281.654	1786086.776	1849.92	1852.23	17.5	27.5	27.5	27.5	10 5/8	4	SCH40 PVC	0.020	SCH40 PVC	#3	14.5	27.5	Air Rotary	WDC	Cement-Bentonite Grout	11	14.5	Monument
PZ-151	268743.1285	1787988.758	1860.4	1862.60	69.5	79.5	80	82	8	2	SCH40 PVC	0.02	SCH40 PVC	#3	64	80	CME-85 HAS/HQ w/carbide bit	WDC	Cement-Bentonite Grout Bentonite chips # 60 Sand Bentonite	2 52 62 80	52 62 64 82	Monument
PZ-152	268541.5223	1788231.608	1881.1	1880.80	26.1	36.1	36.6	47	8	2	SCH40 PVC	0.02	SCH40 PVC	#3	23	36.6	CME-85 HAS/HQ w/carbide bit	WDC	Cement-Bentonite Grout Bentonite chips # 60 Sand Bentonite	2 11 21 36.6	11 21 23 47	Flush-mount
PZ-153	267496.9893	1790701.028	1908.5	1908.10	55.0	64.9	65.4	70	8	2	SCH40 PVC	0.02	SCH40 PVC	#3	51	65.45	CME-85 HAS/HQ w/carbide bit	WDC	Cement-Bentonite Grout Bentonite chips # 60 Sand Bentonite	2 38 48 65.45	38 48 51 70	Flush-mount
PZ-154	267589.45	1790451.038	1899.9	1902.30	50.0	60.0	60.5	61	8	2	SCH40 PVC	0.02	SCH40 PVC	#3	46	61	CME-85 HAS/HQ w/carbide bit	WDC	Cement-Bentonite Grout Bentonite chips # 60 Sand Bentonite	2 34 44	34 44 46	Monument
PZ-155	267068.2506	1789414.183	1829.7	1831.90	51.5	61.5	62.0	62	8	2	SCH40 PVC	0.02	SCH40 PVC	#3	46	62	CME-85 HAS/HQ w/carbide bit	WDC	Cement-Bentonite Grout Bentonite chips # 60 Sand Bentonite	2 34 44	34 44 46	Monument
PZ-156	267141.728	1788999.05	1849.8	1849.40	104	114	116	140	8	2	SCH40 PVC	0.02	SCH40 PVC	#3	101	116	CME-85 HAS/HQ w/carbide bit	WDC	Cement-Bentonite Grout Bentonite chips # 60 Sand Bentonite	2 89 99 116	89 99 101 140	Flush-mount

TABLE A-2c
CONSTRUCTION DETAILS OF PIEZOMETER MONITORING SYSTEMS
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Well ID	Northing (feet)	Easting (feet)	Surface Elevation (feet amsl)	TOC Elevation (feet amsl)	Depth to Screen Top (feet bgs)	Depth to Screen Bottom (feet bgs)	Total Depth (feet bgs)	Total Depth Drilled (feet bgs)	Borehole Diameter (inches)	Casing Diameter (inches)	Screen Material	Screen Slot Size (inches)	Casing Material	Filter Pack Grade	Filter Pack Top (feet bgs)	Filter Pack Bottom (feet bgs)	Drilling Method	Driller	Annular Seal Material	Annular Seal Top (feet bgs)	Annular Seal Bottom (feet bgs)	Wellhead Completion
PZ-157	267917.6295	1788242.536	1807.4	1809.80	22.3	32.3	32.8	45	8	2	SCH40 PVC	0.02	SCH40 PVC	#3	17	32.78	CME-85 HAS/HQ w/carbide bit	WDC	Cement-Bentonite Grout Bentonite chips # 60 Sand Bentonite	2 5 15 32.78	5 15 17 45	Monument
PZ-158	267307.2187	1788012.877	1795.4	1797.40	12.2	22.2	22.7	32	8	2	SCH40 PVC	0.02	SCH40 PVC	#3	7	22.74	CME-85 HAS/HQ w/carbide bit	WDC	Cement-Bentonite Grout Bentonite chips # 60 Sand Bentonite	2 3 6 22.74	3 6 7 32	Monument
PZ-159	267632.0562	1788806.35	1814.7	1814.20	8.8	18.8	23	41	8	2	SCH40 PVC	0.02	SCH40 PVC	#3	7	23	CME-85 HAS/HQ w/carbide bit	WDC	Cement-Bentonite Grout Bentonite chips # 60 Sand Bentonite	2 3 6 23	3 6 7 41	Flush-mount
PZ-160	268345.039	1786286.124	1849.14	1851.41	17.0	27.0	27	27	10 5/8	4	SCH40 PVC	0.020	SCH40 PVC	#3	14	27	Air Rotary	WDC	Cement-Bentonite Grout	1	14	Monument
PZ-161	268418.806	1786132.353	1850.00	1852.23	18	28	28	28	10 5/8	4	SCH40 PVC	0.020	SCH40 PVC	#3	15	28	Air Rotary	WDC	Cement-Bentonite Grout	1	15	Monument

Notes:

Northing and Easting Coordinates are in State Plane NAD 27, US Feet.

Abbreviations:

- amsl - above mean sea level
- bgs - below ground surface
- SCH - schedule
- PVC - polyvinyl chloride
- TOC - top of casing
- NM - not measured

TABLE I
WELL CONSTRUCTION DATA
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Chatsworth Formation Wells	Area No.	Effective Borehole Depth (feet)	Borehole		Casing			Sealed Interval (feet)	Perforated Interval (feet)	Measuring Point Elevation (feet MSL) ¹	Completion Date
			Diameter (inches)	Interval (feet)	Diameter (inches)	Interval (feet)	Interval (feet)				
SRE-NS-N PZ-161	IV	28	10 5/8	0 - 28	4	0 - 28	0 - 15	18 - 28	1852.23	6/6/2008	
SRE-NS-E PZ-160	IV	27	10 5/8	0 - 27	4	0 - 27	0 - 14	17 - 27	1851.41	6/9/2008	
SRE-NS-W PZ-150	IV	27.5	10 5/8	0 - 27.5	4	0 - 27.5	0 - 14.5	17.5 - 27.5	1852.23	6/11/2008	

MSL = Above Mean Sea Level
¹ = Measured at top of casing



326 S. Wilmot #A200
Tucson, Az 85711
Phone 520.326.1898
Fax 520.747.3491

P2-150

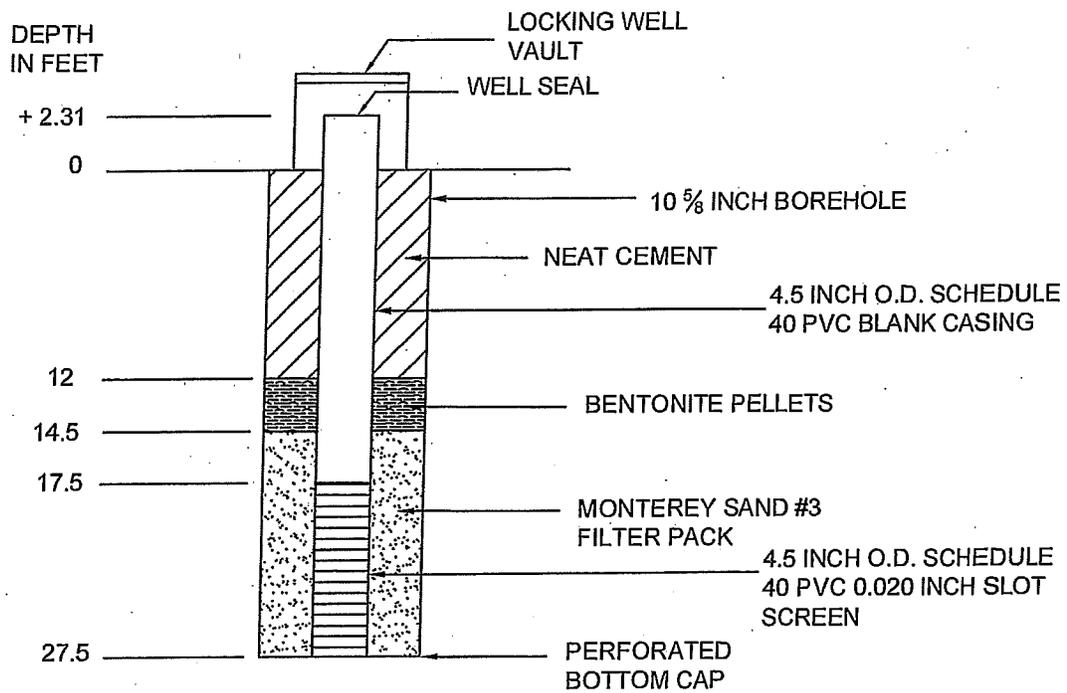
CORE DRILLING DATA
Boeing Santa Susana Field Laboratory

Logged By: J. Raucci Client: Boeing- SSFL Page 1 of 2
Boring Number/Location: SRE-NS-W Drilling Co: WDC Job No: 20060-139
Length, Kelly: Rods: Collars: 0 Subs: Bit: Height of K.B.: Date Started: 6/10/2008
Type/Diameter of Bit: 10 5/8" down-hole hammer, 94 mm core barrel, 2" split spoon Drilling Fluid: None/Air Rig Type: Star 30K Date Finished: 6/11/2008

Depth (feet)	Split-Spoon Blow Counts		Color	Moisture Content (Air Rotary)	Split Spoon Sample	Description	Fracture Profile	Analytical Sample	Particle Size Distribution %					Sorting			Grain Shape			Apparent Density			Plasticity			Reaction with HCL										
	Blow Count	Inches							Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High	Odor Gas, etc (Air Rotary)	None	Weak	Moderate	Strong		
0-1.5	23	6	10yr5/4	DRY	X	Sand, medium yellowish brown, medium-grained, hard, compacted					100				X			X	X													X				
	50	4																																		
1.5-3	50	6	10yr5/4	LOW	X	Sand, medium yellowish brown, fine- to coarse-grained, micaceous, slightly moist					3	97			X	X		X			X													X		
3-4.5	42	6	10yr5/4	LOW	X	Similar to above, increased coarse sand					10	90			X	X		X			X													X		
	50	3																																		
4.5-6	50	4		LOW	X	Poor recovery, appears as cemented, friable micaceous sandstone					100				X		X	X			X														X	
6-7.5	50	4	10yr5/4	LOW	X	Sandstone, medium yellowish brown, coarse-grained, slightly moist					100				X		X	X			X														X	
7.5-9	50	5.5	10yr5/4	LOW	X	Sandstone, texture as above, color mottled medium yellow-brown, pale yellow-brown and olive gray					100				X		X	X			X														X	
			10yr6/2																																	
			5y5/2																																	

Total Depth of Borehole (feet): 28
Groundwater, Depth Encountered: Groundwater not encountered
Static: Dry

G:\GRA\PHICS\PROJECTS\26472 - BOEING ROCKETDYNEWELL_CONSTRUCTION\20080-139-0001-SRE-NS-WWELL-SCHEMATIC.DWG



NOT TO SCALE

HALEY & ALDRICH

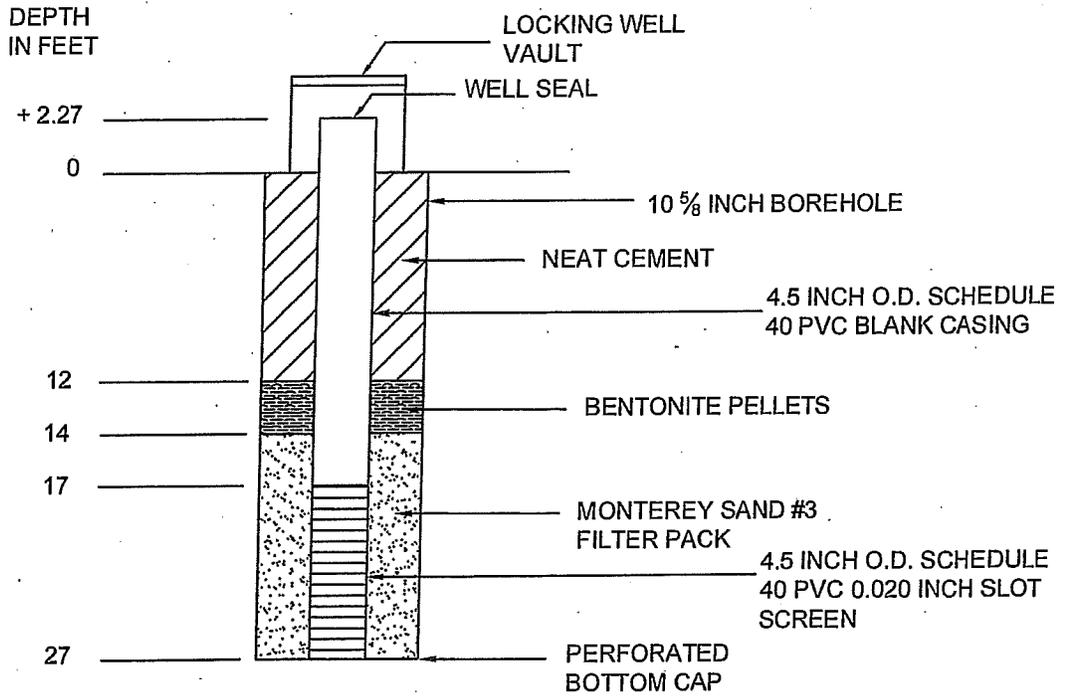
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

P2-150
SRE-NS-W WELL SCHEMATIC

SCALE: NOT TO SCALE
AUGUST 2008

FIGURE 4

G:\GRAPHICS\PROJECTS\6472 - BOEING ROCKETDYNEWELL_CONSTRUCTION\20080-139-0001-SRE-NS-E-WELL-SCHEMATIC.DWG



NOT TO SCALE

HALEY & ALDRICH

THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

P2-160
SRE-NS-E WELL SCHEMATIC

SCALE: NOT TO SCALE
AUGUST 2008

FIGURE 2



326 S. Wilmot #A200
Tucson, Az 85711
Phone 520.326.1898
Fax 520.747.3491

P2-161

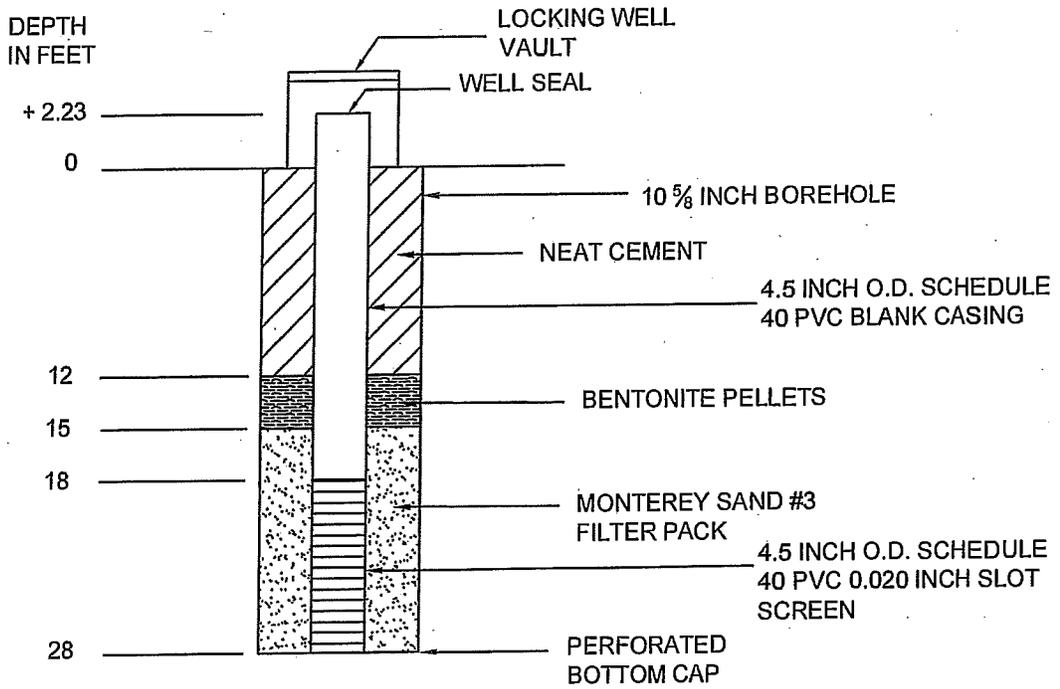
ROTARY BORING DATA
Boeing Santa Susana Field Laboratory

Logged By: J. Raucci
Boring Number/Location: SRE-NS-N Client: Boeing - SSFL
Length, Kelly: Rods: Collars: 0 Drilling Co: WDC Page 1 of 1
Type/Diameter of Bit: Down-hole hammer, 10 5/8" Subs: Bit: Height of K.B.: Date Started: 6/6/2008
Drilling Fluid: Air Rig Type: Star 30K Date Finished: 6/6/2008

Depth (feet)	Time		Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution %					Sorting			Grain Shape			Apparent Density			Plasticity			Reaction with HCl							
	Begin	End						Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High	Odor Gas, etc (Air Rotary)	None	Weak	Moderate
0-3	0815		10yr6/2	DRY		Sand w/silt, pale yellowish-brown, fine-grained -Unconsolidated Fill				85	15	X				X	X	X												X		
3-18			10yr5/4	LOW		Sandstone, medium yellowish-brown, fine- to medium-grained w/ trace coarse grained, micaceous, very slightly moist -Chatsworth Formation	0.125			95	5	X		X	X															X		
18-21			N7	LOW		Sandstone, light gray, fine- to medium-grained, slightly micaceous	0.04			95	5	X			X															X	X	
21-28	0917		10yr5/4	LOW		Sandstone, medium yellowish-brown, fine- to medium-grained w/ trace coarse grained, micaceous, very slightly moist. Interbeds of gray sandstone, similar to above but coarser (medium-grained)	0.125			95	5	X		X	X															X		

Total Depth of Borehole (feet): 28
Groundwater, Depth Encountered: Groundwater not encountered
Static: Dry

G:\GRAPHICS\PROJECTS\26472 - BOEING ROCKETDYNEWELL_CONSTRUCTION\20080-199-0001-SRE-NS-NWELL-SCHEMATIC.DWG



NOT TO SCALE

HALEY & ALDRICH

THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

P2-161
SRE-NS-N WELL SCHEMATIC

SCALE: NOT TO SCALE
AUGUST 2008

FIGURE 3

RD WELL LOGS

RD-07, 13, 14, 15, 16, 17,
18, 19, 20, 21, 22, 23, 24,
25, 27, 28, 29, 30, 33A,
33B, 33C, 34A, 34B, 34C,
50, 54A, 54B, 54C, 57,
59A, 59B, 59C, 63, 64, 65,
74, 85, 86, 87, 88, 89, 90,
91, 92, 93, 94, 95, 96, 97,
98, 102, 150, 151, 152, 153,
154, 155, 156

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-84

LITHOLOGIC LOG OF WELL RD-7

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 8	CLAYEY SILT (Fill)	Brown, with some gravel
8 - 300	SANDSTONE	Alternating zones of medium brown and light grey, very fine to medium grained with some silt, with fissile siltstone interbeds

NOTE: Driller noted fractures at 120'
and 250'.

TOTAL DEPTH OF BOREHOLE: 300 feet

GROUNDWATER RESOURCES CONSULTANTS, INC.

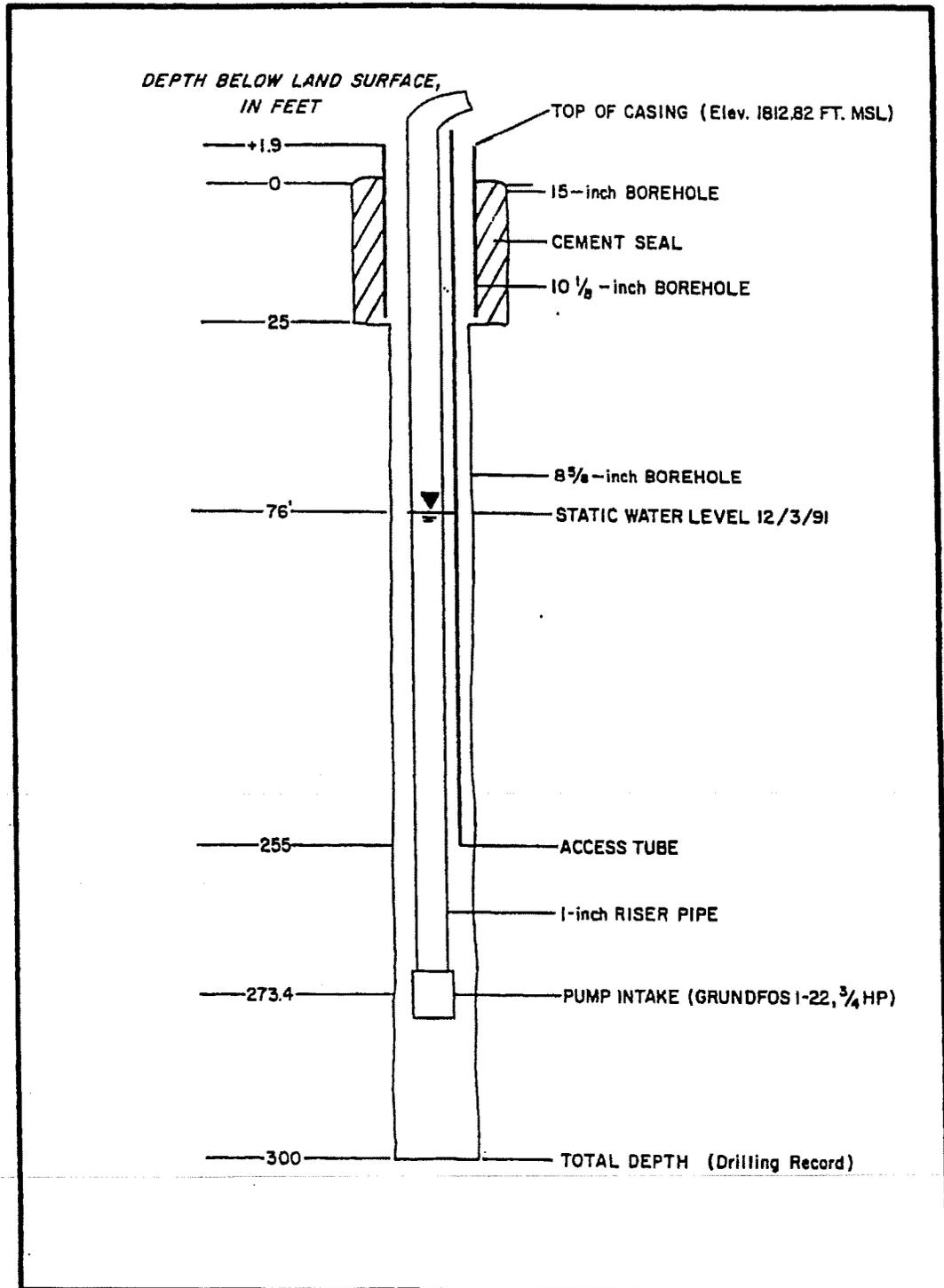


FIGURE E-9 SCHEMATIC DIAGRAM OF WELL RD-7

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-90

LITHOLOGIC LOG OF MONITOR WELL RD-13

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 17	SANDY CLAY	Medium brown, firm, low plasticity, sand is fine-grained, very slightly moist, no odor. At 7 feet, moist. From 7 to 9 feet, less sand.
17 - 39	SANDSTONE	Yellow-brown, weathered to 20 feet, fine-grained, non-calcareous, no odor, dry.
39 - 160	SILTSTONE	Blue-grey, with interbedded fine sandstone, calcareous, firm, slightly moist, no odor. From 86 to 87.5 feet, yellow-brown well sorted sandstone interlayer. From 88 to 160 feet, blue-grey and calcareous. At 137 feet, wet. At 150 feet, hole making approximately 1 gpm.

TOTAL DEPTH OF BOREHOLE: 160 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

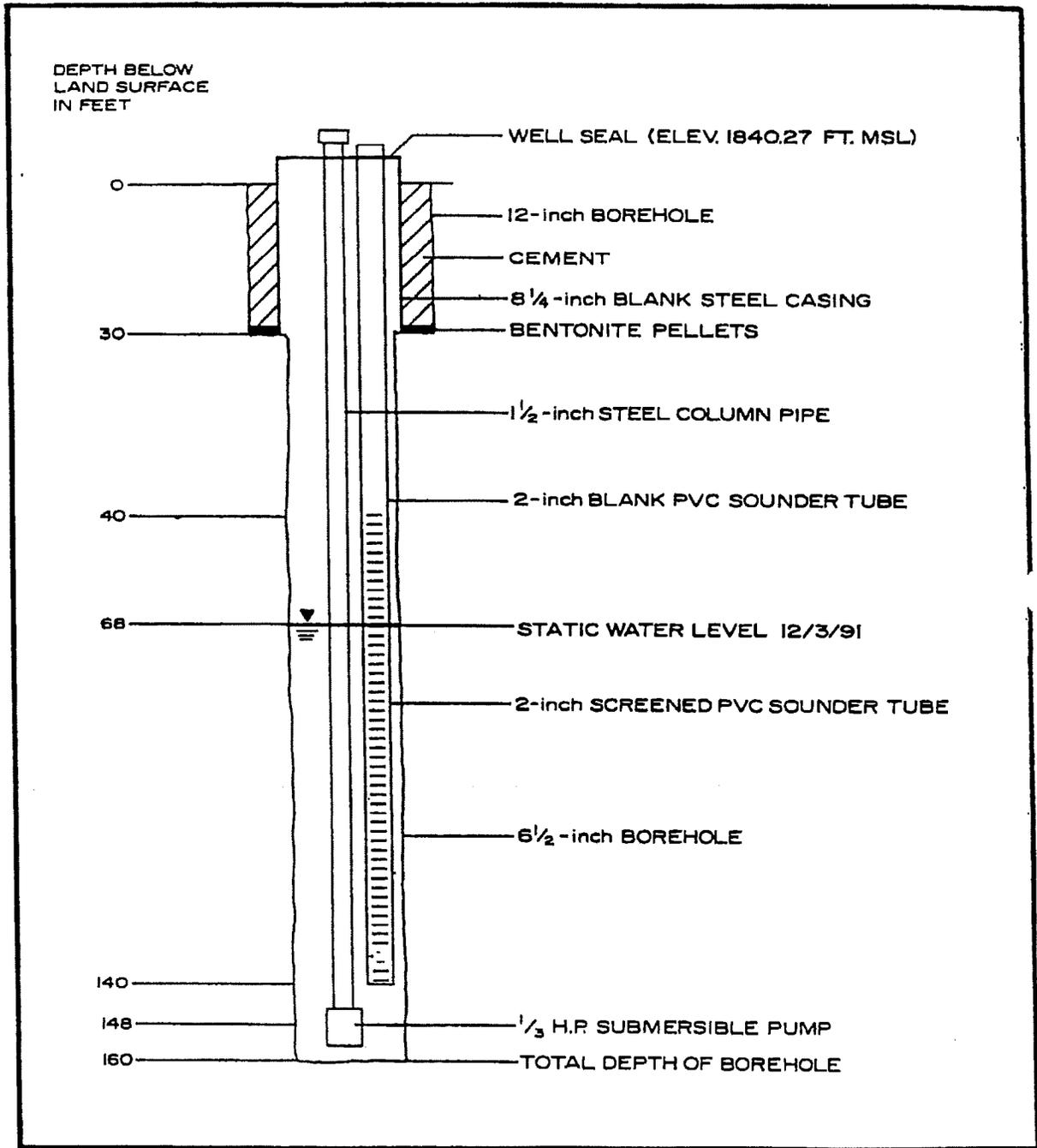


FIGURE E-15
SCHEMATIC DIAGRAM OF MONITOR WELL RD-13

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-91

LITHOLOGIC LOG OF MONITOR WELL RD-14

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 2	CLAYEY SAND	Light brown, fine-grained, slight plasticity, slightly moist, no odor.
2 - 64	SANDSTONE	Yellow-brown, fine-grained, well sorted, non-calcareous, dry, no odor. At 10 feet, slightly moist. At 48 feet, moist.
64 - 125	SILTSTONE	Grey-blue calcareous, contains fine sandstone, slightly moist, no odor. From 70 to 72 feet, yellow-brown sandstone. From 78 to 79 feet, yellow-brown sandstone. From 103 to 106 feet, yellow-brown sandstone. At 115 feet, encountered groundwater.

TOTAL DEPTH OF BOREHOLE: 125 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

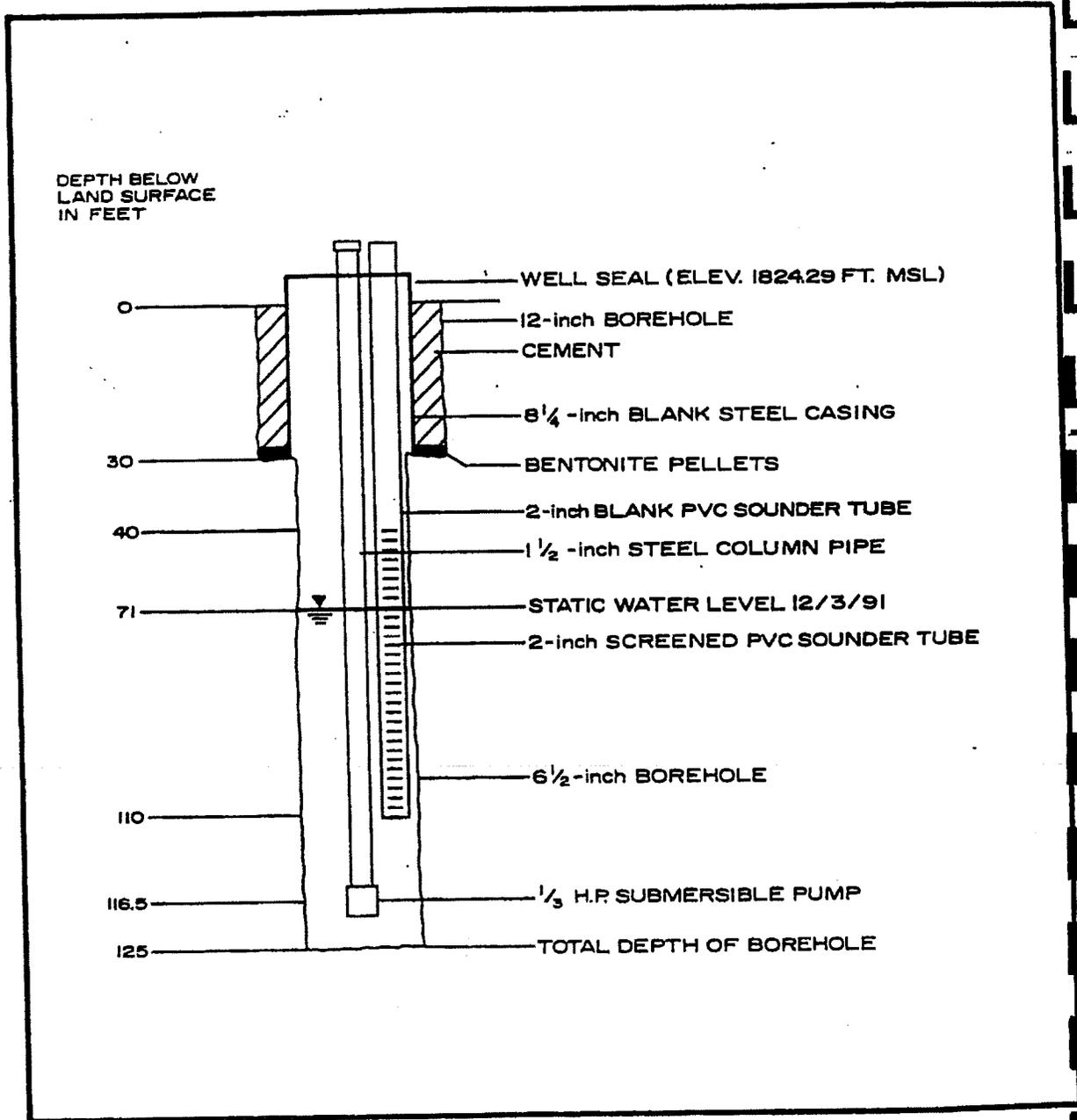


FIGURE E-16
SCHEMATIC DIAGRAM OF MONITOR WELL RD-14

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-92

LITHOLOGIC LOG OF MONITOR WELL RD-15

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 1	CLAYEY SAND	Light brown, trace gravel, slight plasticity, slightly moist, no odor.
1 - 45	SANDSTONE	Yellow-brown, fine-grained, well sorted, moderate cementation, dry, no odor. From 1 to 3 feet, weathered. At 15 feet, slightly moist.
45 - 48	SILTSTONE	Blue-grey, calcareous, contains some sandstone.
48 - 65	SANDSTONE	Yellow brown, fine-grained, well sorted. From 61 to 62 feet, blue-grey siltstone.
65 - 152	SILTSTONE	Blue-grey, calcareous, contains fine sandstone interlayers, slightly moist. From 71 to 72 feet, yellow-brown sandstone. At 95 feet, moist. At 120 feet, wet.

TOTAL DEPTH OF BOREHOLE: 152 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

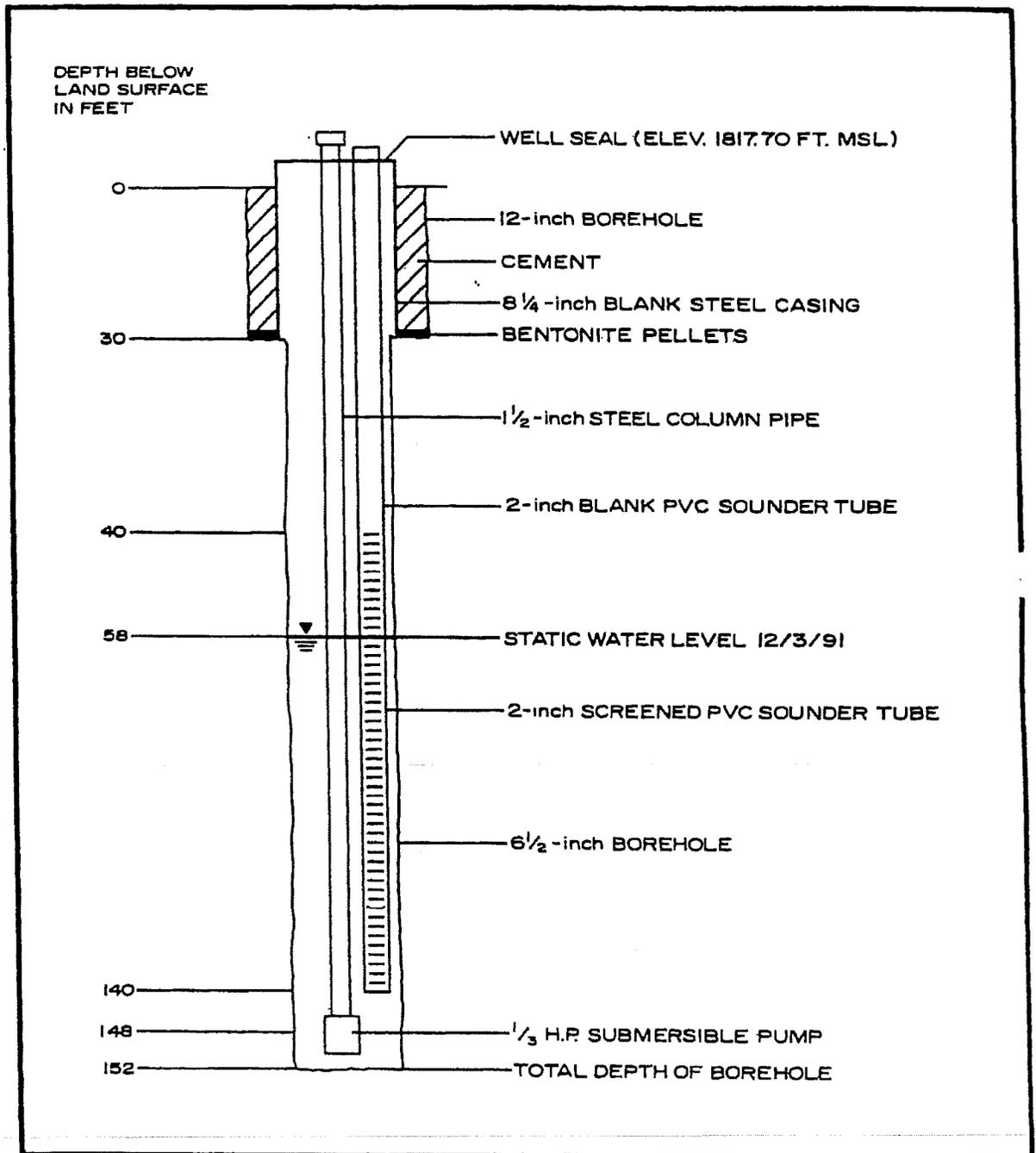


FIGURE E-17
SCHEMATIC DIAGRAM OF MONITOR WELL RD-15

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-93

LITHOLOGIC LOG OF MONITOR WELL RD-16

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 2	SILTY SAND	Brown, fine-grained, loose, slightly moist, no odor.
2 - 28	SANDSTONE	Yellow brown, fine-grained, well sorted, non-calcareous, dry, no odor. At 15 feet, some calcareous cement. At 19 feet, calcareous cementation increasing, color change to grey-brown.
28 - 176	SILTSTONE	Blue-grey, calcareous, with fine sandstone interlayers, slightly moist, no odor. From 47 to 48 feet, yellow brown sandstone. At 110 feet, moist.
176 - 220	SHALE	Grey, minor amount of fine-grained sandstone, moder? cemented. At 190 feet, increasing proportion of sandstone.

TOTAL DEPTH OF BOREHOLE: 220 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

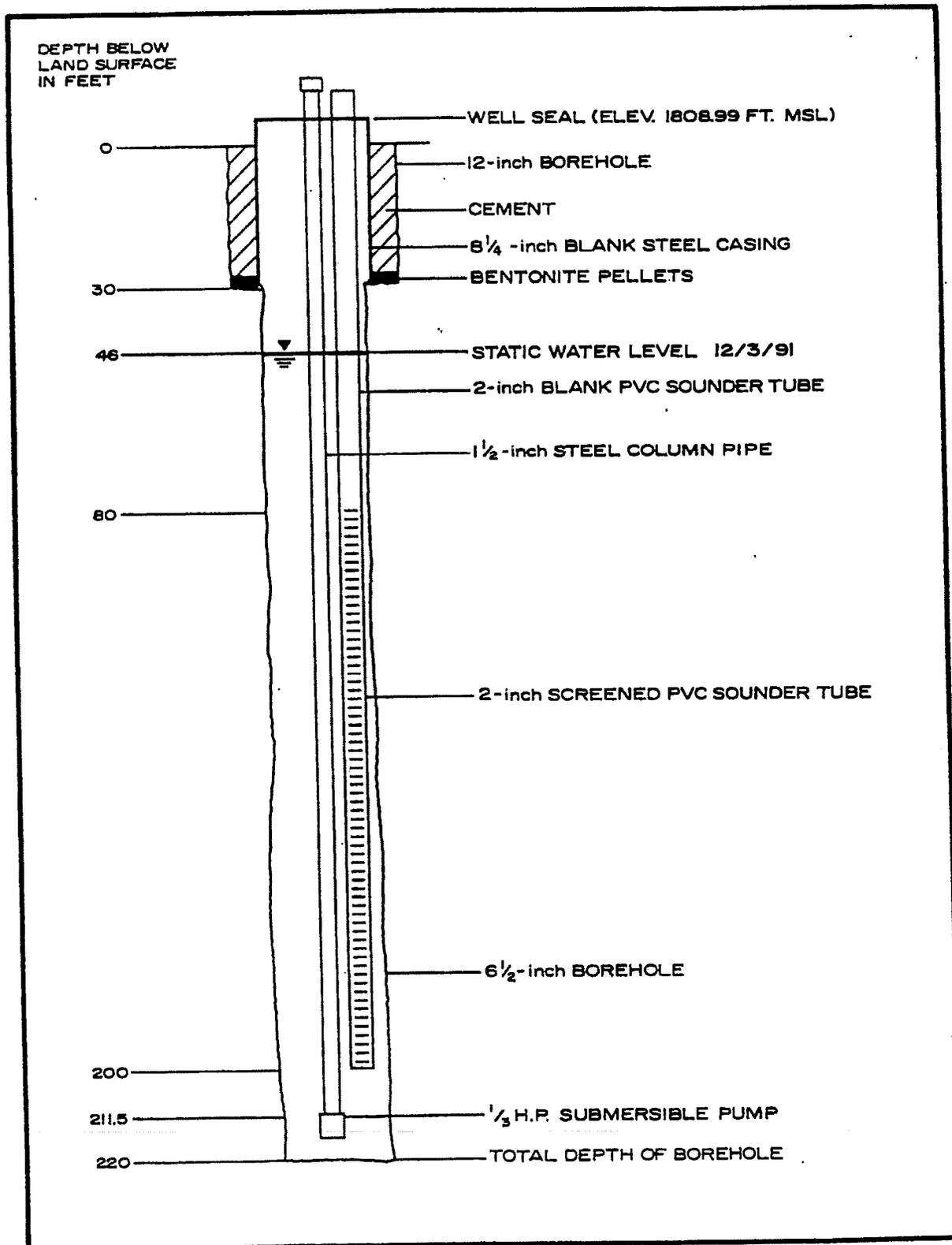


FIGURE E-18
SCHEMATIC DIAGRAM OF MONITOR WELL RD-16

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-94

LITHOLOGIC LOG OF MONITOR WELL RD-17

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 2	SILTY SAND	Medium brown, fine-grained, slightly moist.
2 - 16	SANDSTONE	Yellow-brown, fine-grained, well sorted, non-calcareous, moist.
16 - 30	SILTSTONE	Blue-grey, calcareous, contains some fine-grained sandstone, slightly moist, no odor.
30 - 50	SANDSTONE	Grey, fine-grained, moderately to well sorted, subangular to subrounded, calcareous, moderately cemented.
50 - 55	SILTSTONE	Grey, calcareous, moderately cemented.
55 - 125	SANDSTONE	Grey, fine-grained, moderately to well sorted, subangular to subrounded calcareous, moderately cemented.
		At 107 feet, encountered groundwater.

TOTAL DEPTH OF BOREHOLE: 125 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

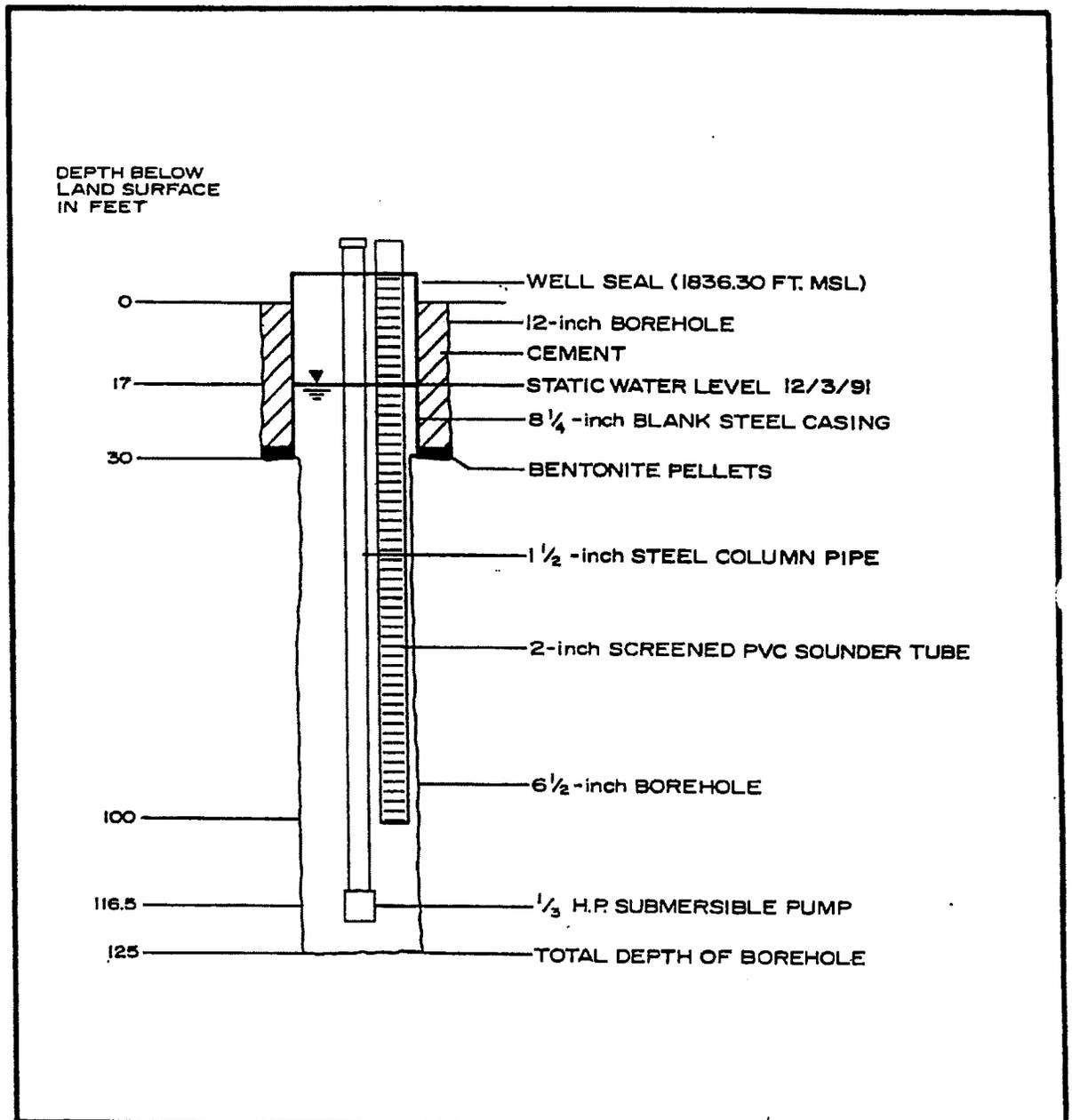


FIGURE E-19
SCHEMATIC DIAGRAM OF MONITOR WELL RD-17

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-95

LITHOLOGIC LOG OF MONITOR WELL RD-18

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 2	SILTY SAND	Medium brown, trace gravel, fine-grained, loose, very slightly moist, no odor.
2 - 24	SANDSTONE	Yellow-brown, fine-grained, well sorted, non-calcareous, dry, no odor.
		From 8 to 13 feet, moist.
		Below 13 feet, very slightly moist.
		From 16 to 17 feet, gray claystone interlayer.
		At 23 feet, moist, perched on claystone.
24 - 41	CLAYSTONE	Grey, firmly cemented, calcareous.
		From 31 to 32 feet, yellow-brown sandstone interlayers.
		From 34 to 35 feet, yellow-brown sandstone interlayers.
41 - 72	SANDSTONE	Yellow-brown, fine-grained, well sorted, non-calcareous, slightly moist, no odor.
		From 57 to 58 feet, blue-grey siltstone interlayers.
		From 61 to 62 feet, blue-grey siltstone interlayers.
72 - 201	SILTSTONE	Blue-grey, with fine sandstone, calcareous, moist, no odor, remains consistent with depth.
		At 155 feet, very moist.
201 - 240	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular calcareous, moderately cemented, high moisture content.

TOTAL DEPTH OF BOREHOLE: 240 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

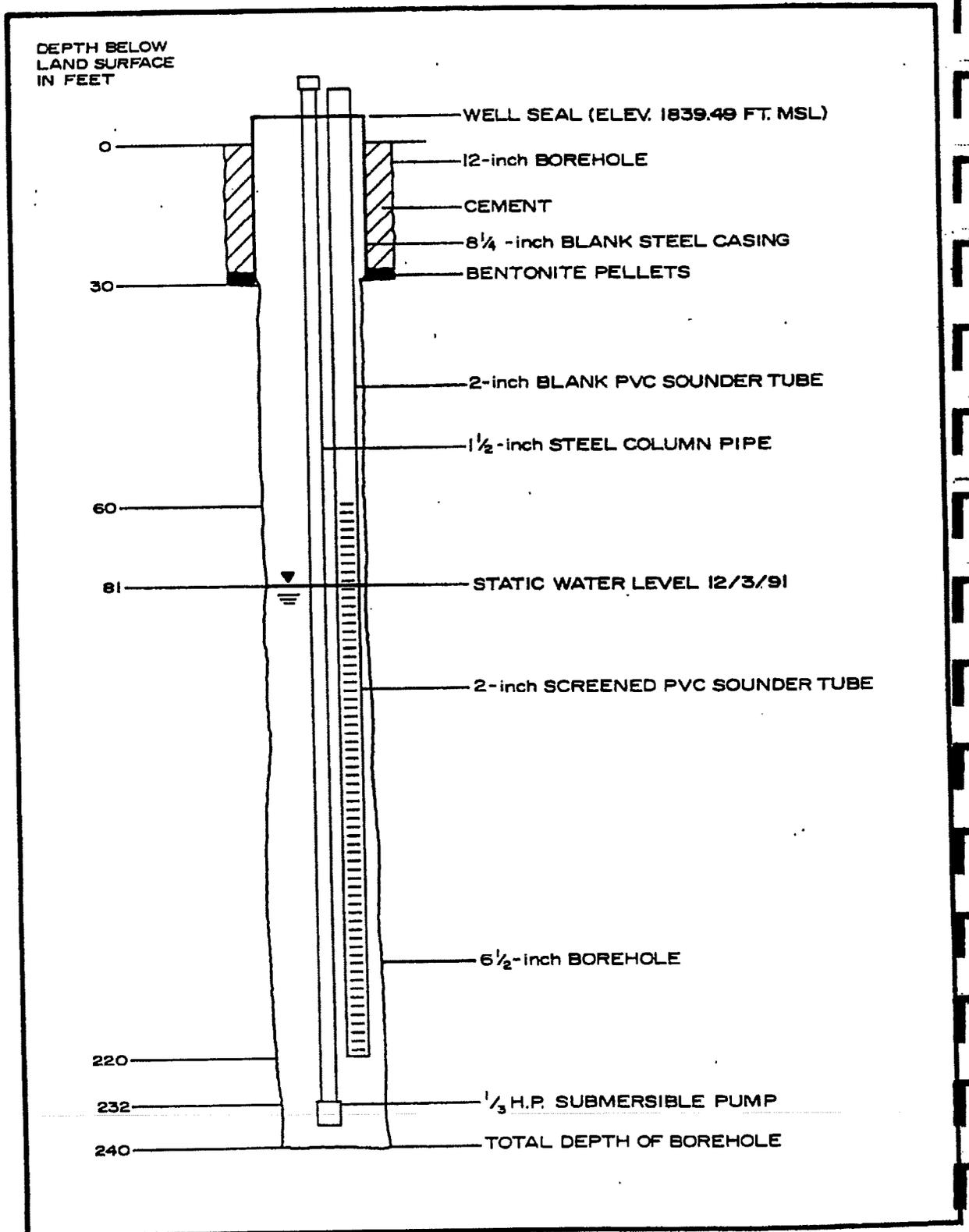


FIGURE E-20
SCHEMATIC DIAGRAM OF MONITOR WELL RD-18

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-96

LITHOLOGIC LOG OF MONITOR WELL RD-19

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 4	SILTY SAND	Light brown, fine-grained, some gravel, very slightly moist, no odor.
4 - 61	SANDSTONE	<p>Yellow-brown, fine-grained, well sorted, poorly cemented, friable, slightly moist.</p> <p>From 17 to 19 feet, fracture containing silt and tree roots.</p> <p>From 35 to 37 feet, shale lens, grey, fine grained.</p> <p>At 40 feet, moisture content increases.</p> <p>From 52 to 53 feet, shale lens.</p>
61 - 135	SILTSTONE	<p>Blue-grey, slightly moist, no odor, contains yellow brown sandstone interbeds.</p> <p>From 81 to 84 feet, sandstone interbed.</p> <p>At 100 feet, encountered groundwater.</p>

TOTAL DEPTH OF BOREHOLE: 135 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

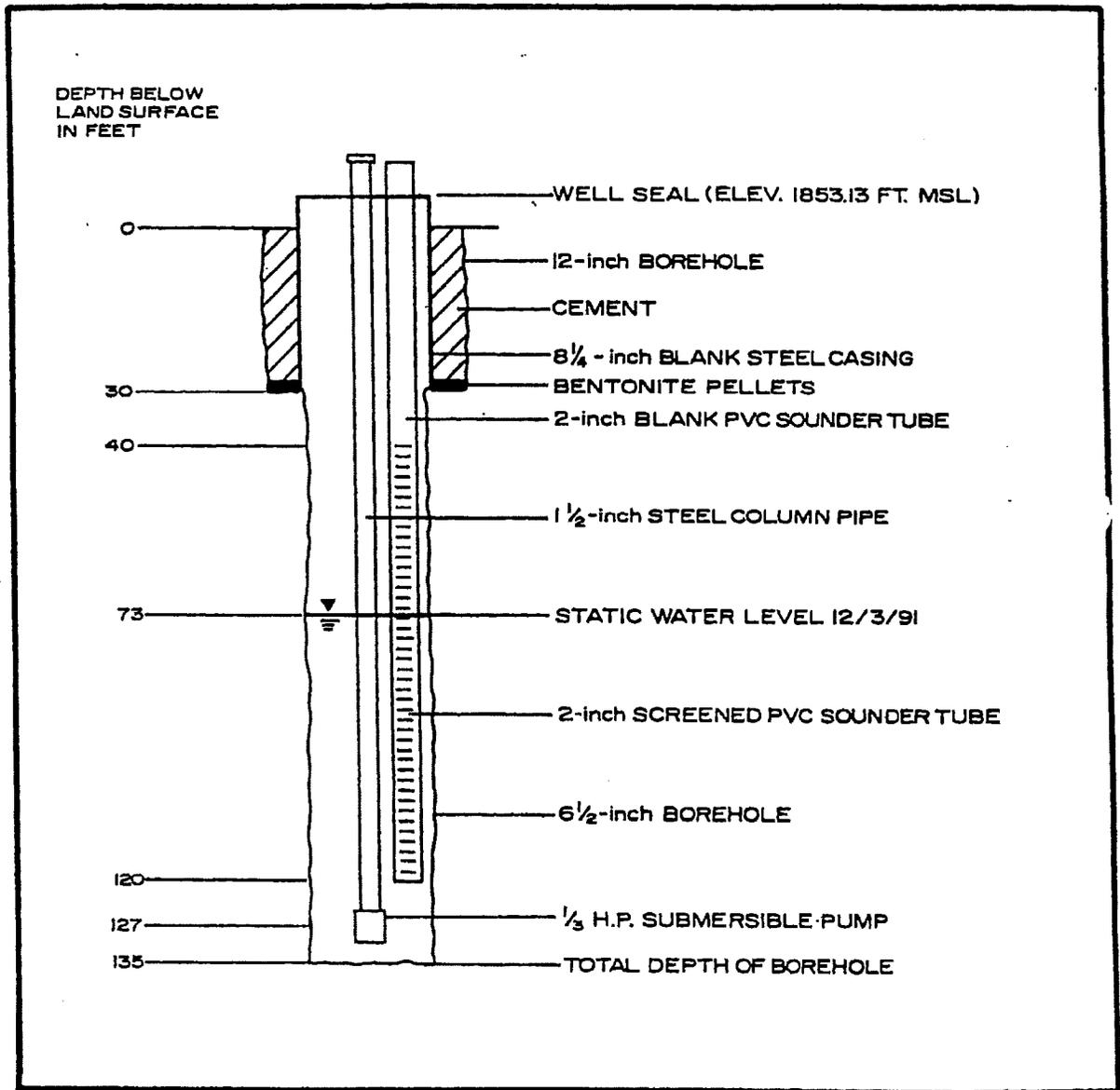


FIGURE E-21
SCHEMATIC DIAGRAM OF MONITOR WELL RD-19

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-97

LITHOLOGIC LOG OF MONITOR WELL RD-20

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 4	SANDY CLAY	Medium brown, slight to low plasticity, sand is fine-grained, slightly moist, no odor.
4 - 42	SANDSTONE	Yellow-brown, fine-grained, well sorted, moderate cementation, non-calcareous, slightly moist, no odor. From 26 to 28 feet, some thin claystone interlayers.
42 - 127	SILTSTONE	Grey-blue, calcareous with interlayers of fine-grained sandstone, slightly moist. At 73 feet, wet. From 106 to 107 feet, yellow-brown sand. At 120 feet, well producing approximately 1 gpm.

TOTAL DEPTH OF BOREHOLE: 127 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

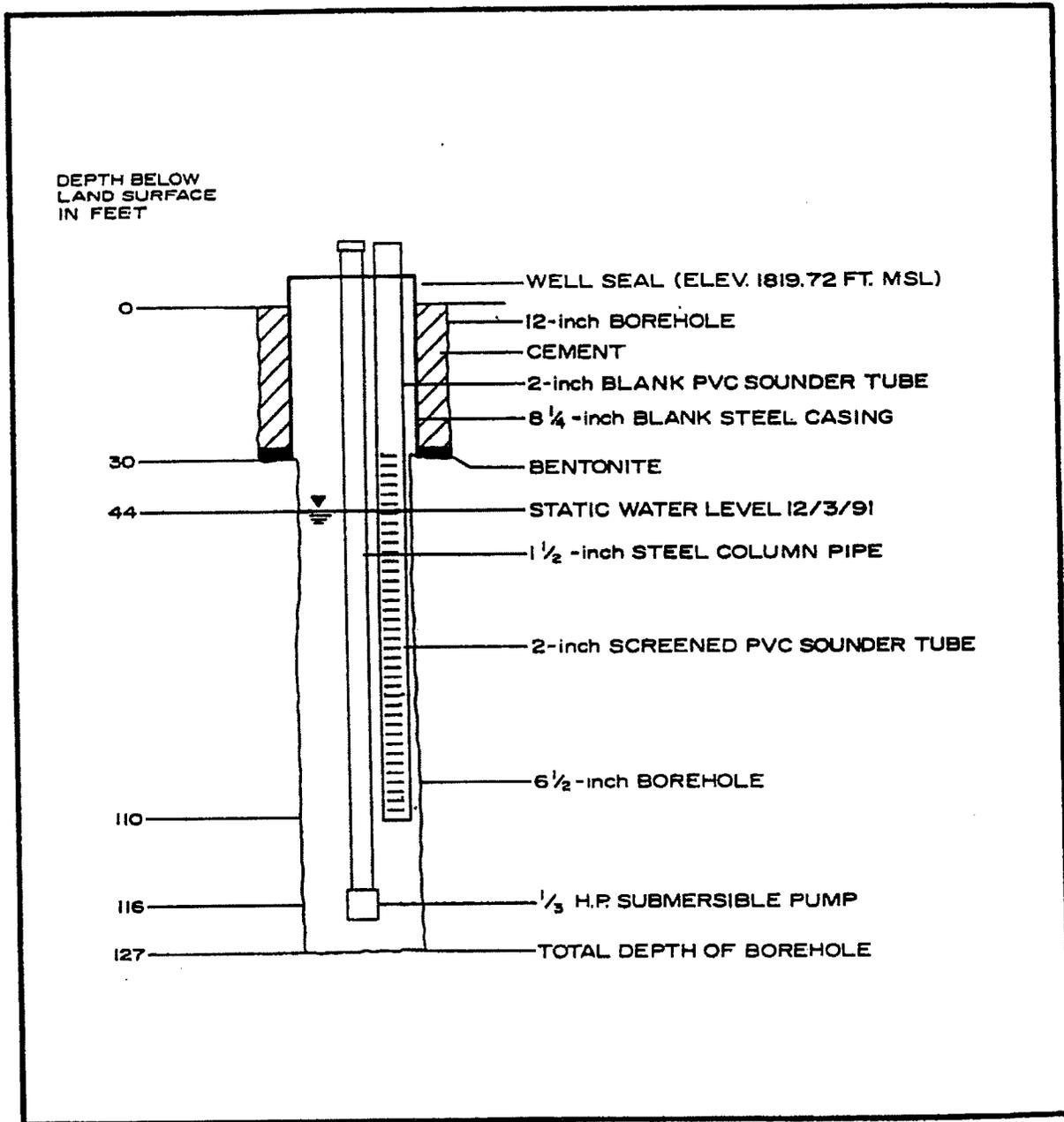


FIGURE E-22
SCHEMATIC DIAGRAM OF MONITOR WELL RD-20

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-98

LITHOLOGIC LOG OF MONITOR WELL RD-21

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 5	SANDY CLAY	Dark brown, low plasticity, very slightly moist, no odor.
5 - 27	SANDSTONE	Yellow-brown, fine-grained, well sorted, non-calcareous, slightly moist, no odor. From 9 to 15 feet, trace fine gravel.
27 - 30	SILTSTONE	Blue-grey with calcareous cement, with fine-grained sandstone, slightly moist, no odor.
30 - 100	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, slightly moist. At 45 feet, gray and brown. At 50 feet, primarily brown. At 60 feet, moderately moist, no calcite cement, continued brown. At 70 feet, slightly fine-grained. At 75 feet, grey and brown. At 80 feet, grey. At 95 feet, brown.
100 - 110	SHALE	Grey and brown, some siltstone, moderate moisture. At 105 feet, higher moisture.
110 - 175	SANDSTONE	Grey, fine-grained, some siltstone and shale, moderately to well sorted, subrounded to subangular, moderate moisture.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-98
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-21

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
110 - 175 cont'd	At 120 feet, dark grey, high moisture content.
	At 140 feet, well producing approximately 1 gpm.

TOTAL DEPTH OF BOREHOLE: 175 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

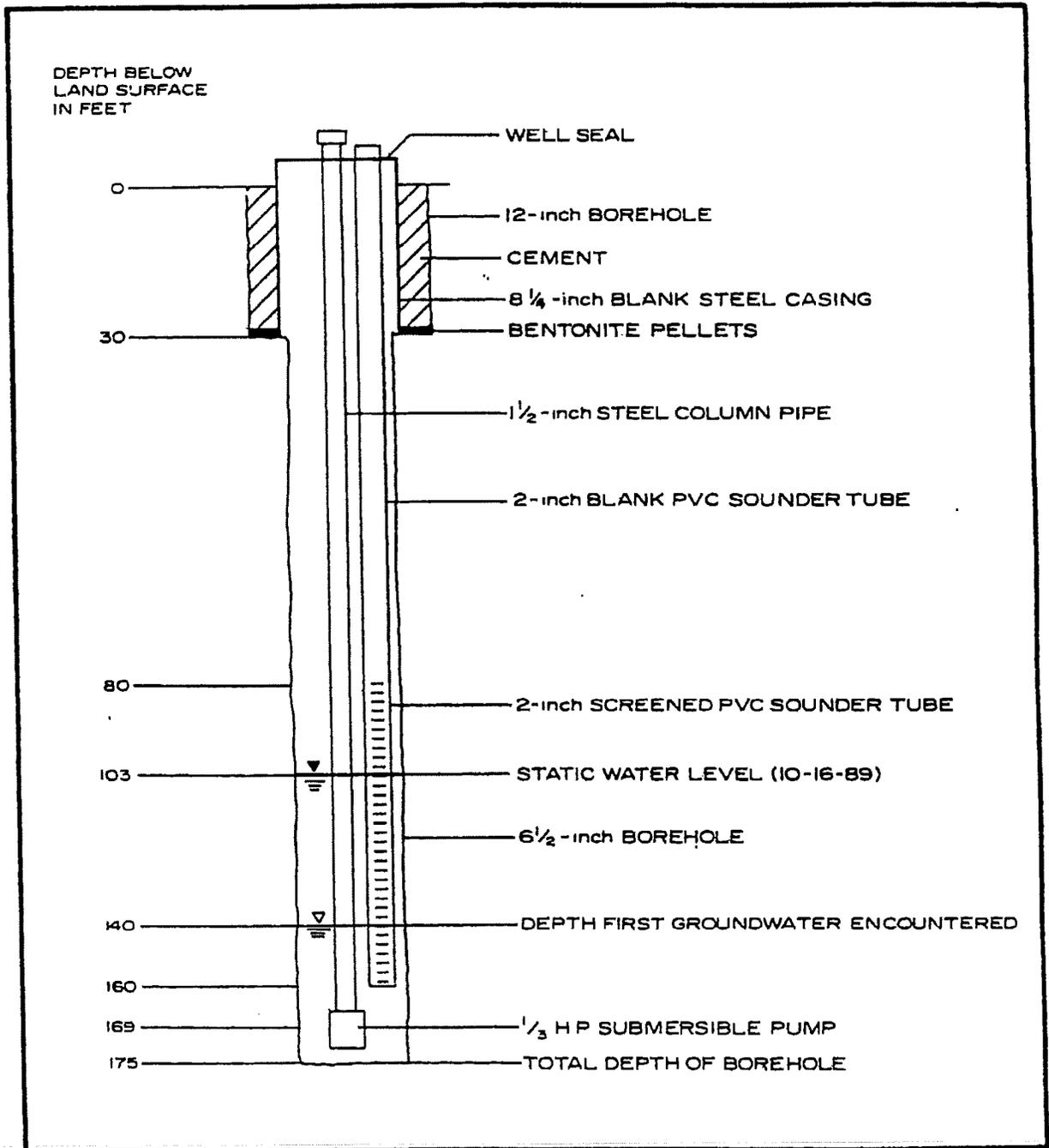


FIGURE E-23
SCHEMATIC DIAGRAM OF MONITOR WELL RD-21

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-99

LITHOLOGIC LOG OF MONITOR WELL RD-22

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 4	SILTY SAND	Light brown, fine-grained, very slightly moist, no odor.
4 - 330	SANDSTONE	<p>Yellow-brown, fine-grained, well sorted, moderate cementation, non-calcareous, very slightly moist, no odor.</p> <p>At 15 feet, slightly moist.</p> <p>At 30 feet, buff, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, dry.</p> <p>At 35 feet, slight increase in moisture.</p> <p>At 45 feet, slightly finer-grained, with siltstone.</p> <p>At 65 feet, grey, fine-grained sandstone moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture.</p> <p>From 125 to 130 feet, some siltstone.</p> <p>From 155 to 180 feet, some siltstone.</p>
330 - 340	SHALE	Grey, moderately cemented, moderate moisture content.
340 - 350	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, moderate moisture content.
350 - 360	SHALE	<p>Grey, moderately cemented, moderate moisture content.</p> <p>At 355 feet, increasing amount of sandstone.</p>

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-99
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-22

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
360 - 385	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, moderate moisture content. At 380 feet, medium-grained sandstone.
385 - 400	SHALE	Grey, moderately cemented, moderate moisture content.
400 - 440	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, high moisture content. At 400 feet, water accumulating in hole.

TOTAL DEPTH OF BOREHOLE: 440 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

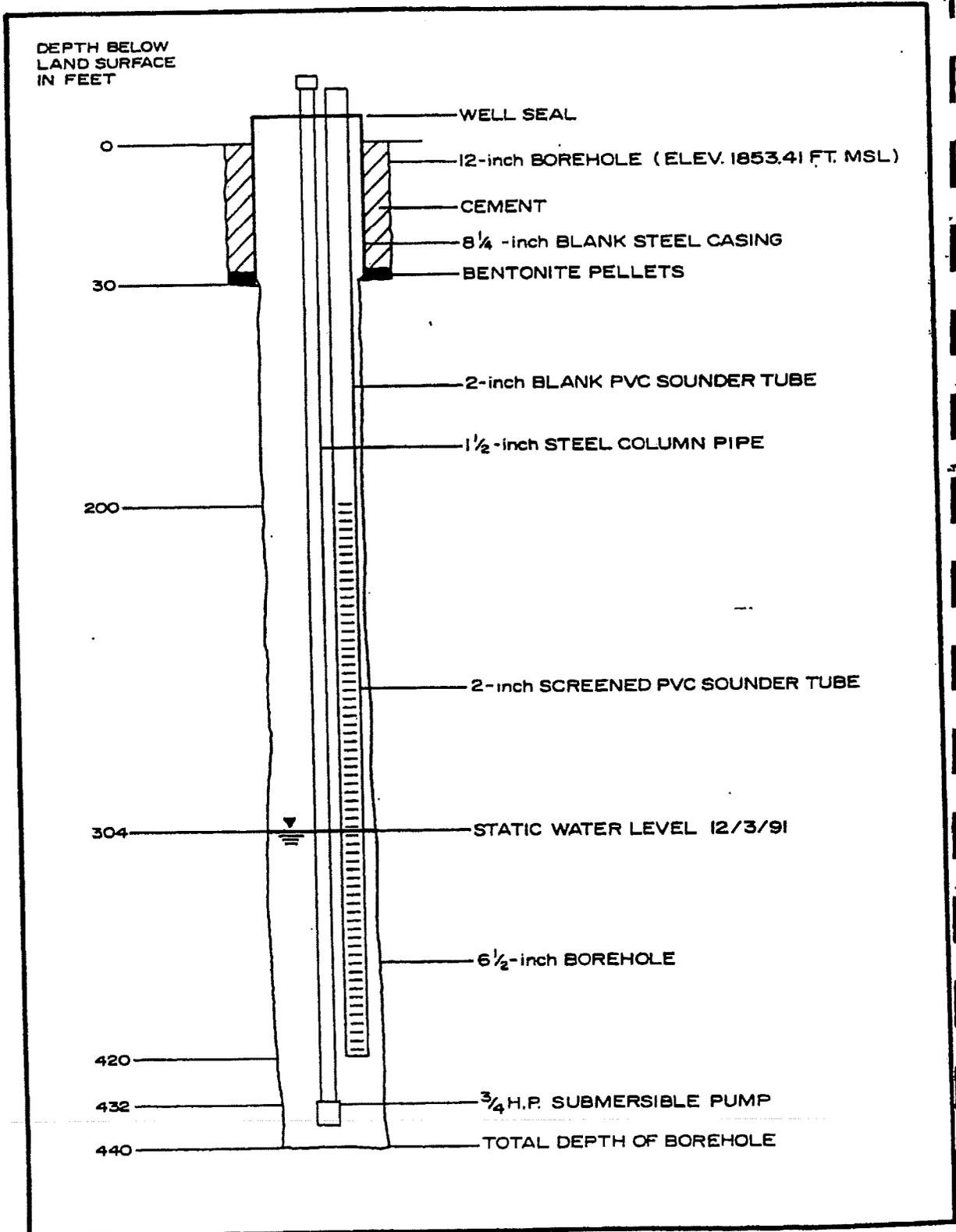


FIGURE E-24
SCHEMATIC DIAGRAM OF MONITOR WELL RD-22

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-100

LITHOLOGIC LOG OF MONITOR WELL RD-23

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 4	SANDY CLAY	Medium brown, low plasticity, fine-grained, very slightly moist, no odor.
4 - 9	SANDSTONE	Yellow-brown, fine-grained, well sorted, non-calcareous, slightly moist, no odor.
9 - 30	SILTSTONE	Blue-grey with calcareous cement, with fine sand interlayers, slightly moist, no odor.
30 - 140	SANDSTONE	<p>From 11 to 15 feet, yellow-brown sandstone.</p> <p>Grey, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture content.</p> <p>From 60 to 65 feet, some siltstone.</p> <p>From 115 to 140 feet, some siltstone.</p> <p>At 130 feet, increased moisture.</p>
140 - 160	SILTSTONE	Grey, moderately cemented, moderate to high moisture content.
160 - 210	SANDSTONE	<p>Grey, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, moderate to high moisture content.</p> <p>From 209 to 210 feet, possible fracture, brown, clayey, high moisture content.</p>
210 - 225	SHALE	<p>Grey-brown, moderately cemented, moderate moisture content.</p> <p>At 220 feet, color changes to grey.</p>
225 - 415	SANDSTONE	<p>Grey, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, moderate moisture content.</p> <p>From 270 to 280 feet, some siltstone.</p>

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-100
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-23

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
225 - 415 (con't)		From 340 to 345 feet, slightly coarser.
		From 380 to 385 feet, some shale, moderate to high moisture content.
415 - 420	SHALE	Dark grey, calcareous, moderately cemented, moderate moisture content.
420 - 440	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture content.

TOTAL DEPTH OF BOREHOLE: 440 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

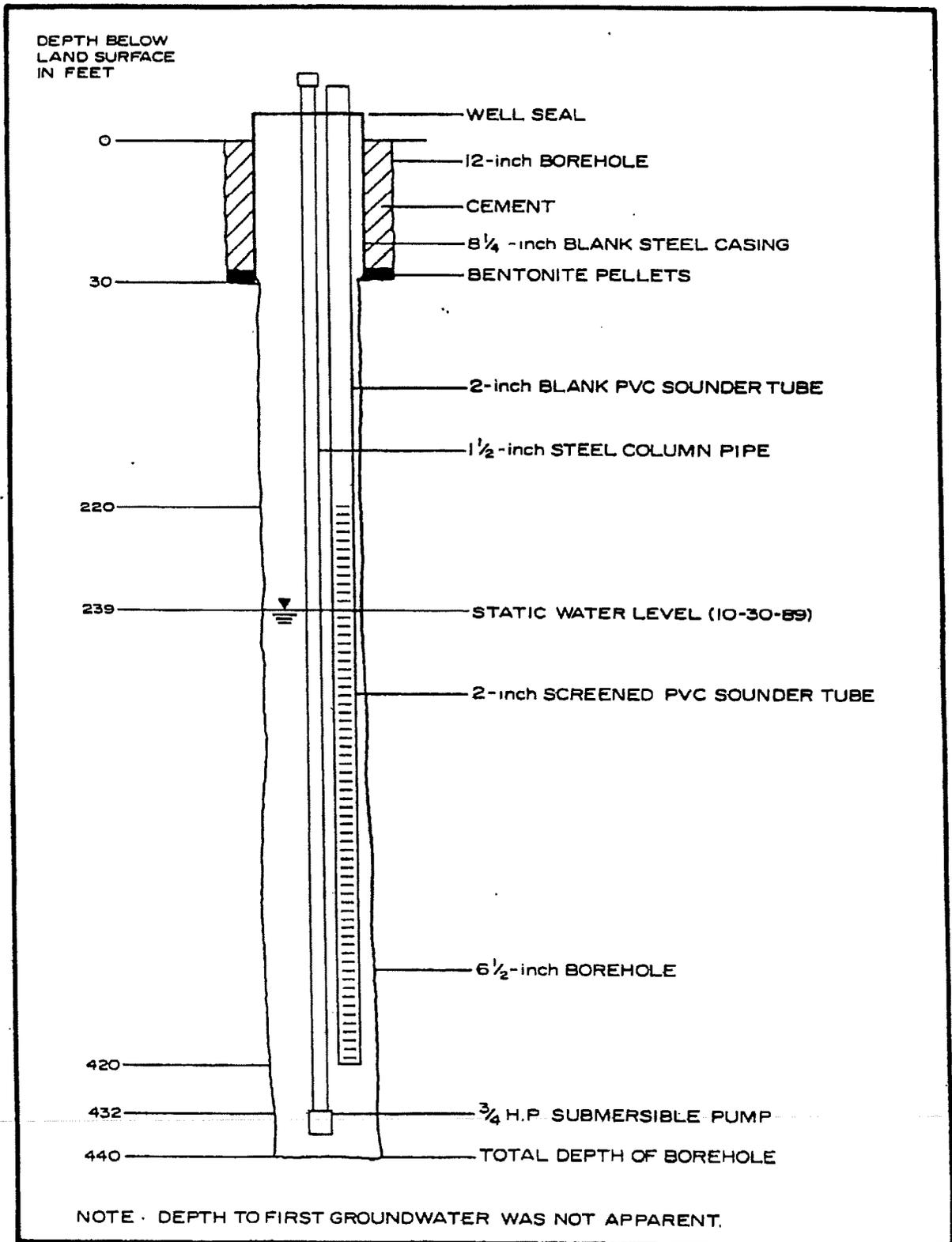


FIGURE E-25
SCHEMATIC DIAGRAM OF MONITOR WELL RD-23

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-101

LITHOLOGIC LOG OF MONITOR WELL RD-24

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 1	ASPHALT CONCRETE & AGGREGATE SUB-BASE	
1 - 10	SAND	Dark grey, trace clay and silt, fine-grained, probably fill, moist, no odor. From 6 to 10 feet, wet.
10 - 150	SANDSTONE	Yellow-brown, fine-grained, well sorted, non-calcareous, slightly moist, no odor. At 30 feet, brown, fine-grained, moderately to well sorted, subrounded to subangular, moderate moisture content. At 40 feet, abundant carbonate cement. At 75 feet, begin color change to grey. At 80 feet, grey sandstone. From 90 to 130 feet, some siltstone. At 100 feet, slight increase in moisture. At 125 feet, water accumulating in hole.

TOTAL DEPTH OF BOREHOLE: 150 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

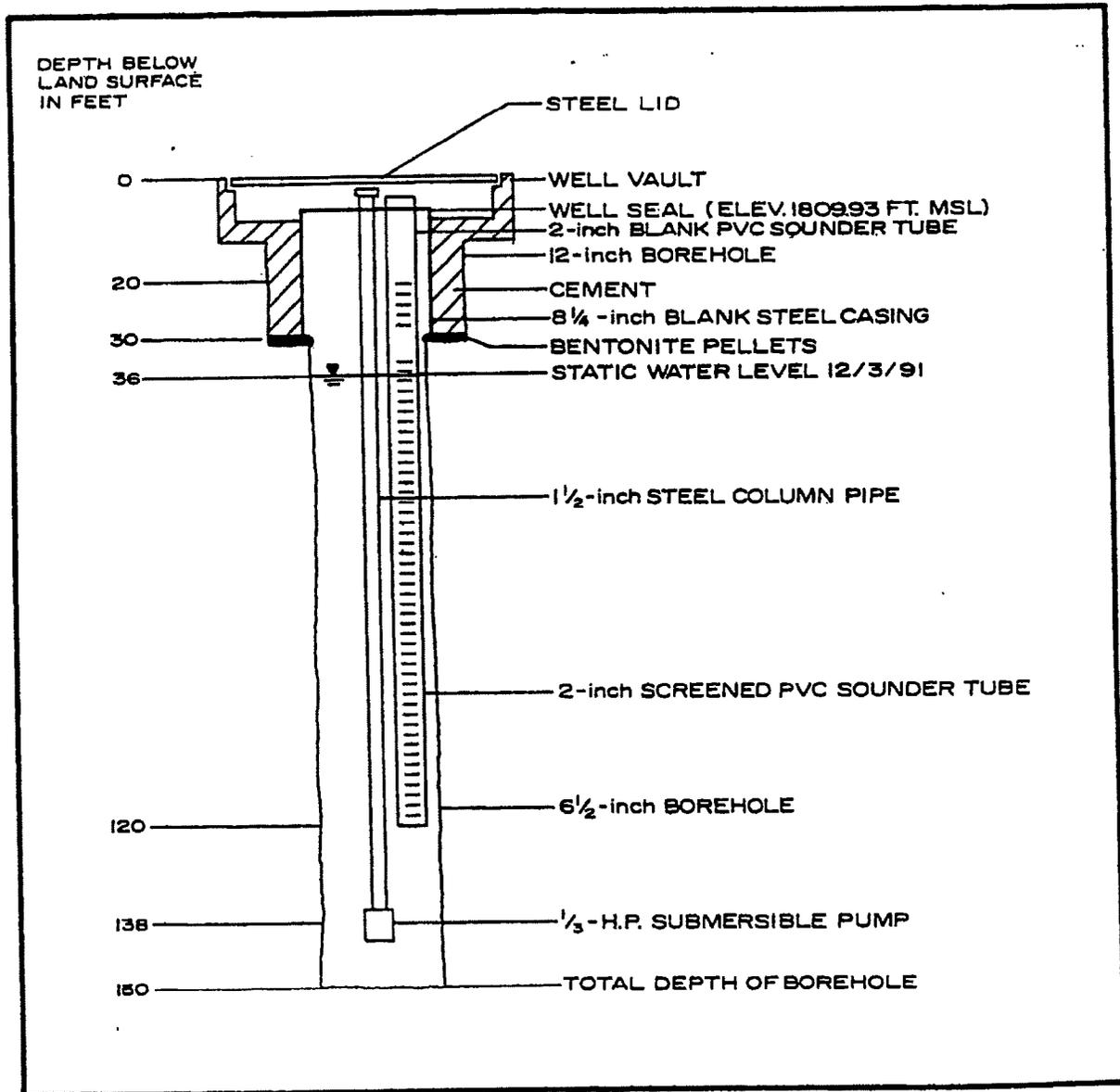


FIGURE E-26
SCHEMATIC DIAGRAM OF MONITOR WELL RD-24

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-102

LITHOLOGIC LOG OF MONITOR WELL RD-25

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 1	ASPHALT CONCRETE & AGGREGATE SUB-BASE	
1 - 2	SILTY SAND	Light brown, fine-grained, slightly moist, no odor.
2 - 90	SANDSTONE	<p>Yellow-brown, fine-grained, well sorted, non-calcareous, slightly moist, no odor.</p> <p>At 30 feet, light brown, fine-grained, moderately to well sorted, subrounded to subangular, low moisture content.</p> <p>At 60 feet, moderate moisture.</p> <p>From 65 to 90 feet, some siltstone.</p> <p>From 85 to 90 feet, color changes to grey.</p>
90 - 105	SHALE	Grey, calcareous, moderate moisture content, some siltstone.
105 - 175	SANDSTONE	<p>Grey, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture content.</p> <p>At 120 feet, color changes to dark grey, encountered groundwater, low yield.</p>

TOTAL DEPTH OF BOREHOLE: 175 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

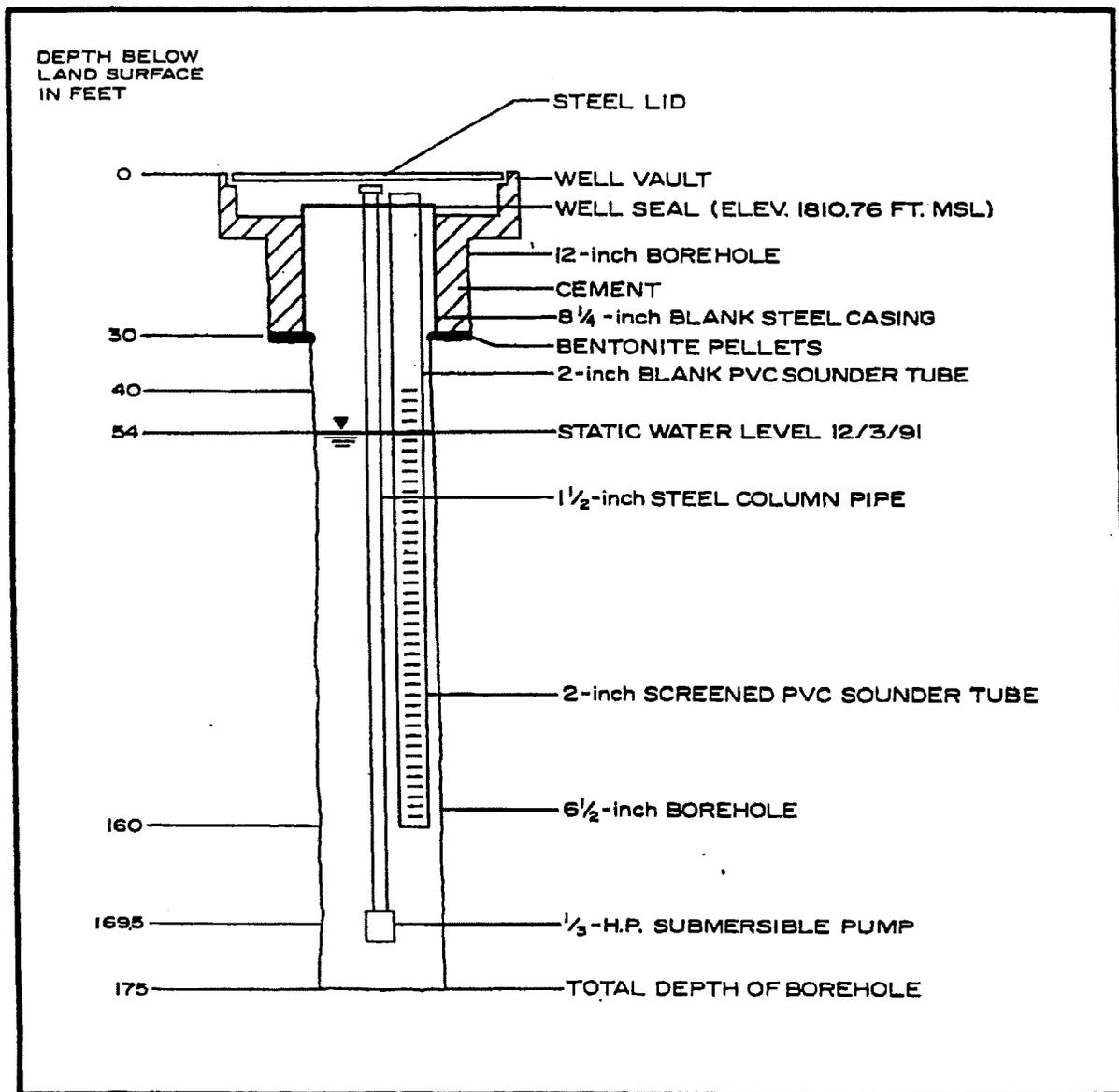


FIGURE E-27
SCHEMATIC DIAGRAM OF MONITOR WELL RD-25

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-104

LITHOLOGIC LOG OF MONITOR WELL RD-27

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 1	ASPHALT CONCRETE & AGGREGATE SUB-BASE	
1 - 21	SANDSTONE	Yellow-brown, fine to coarse, poorly sorted, dry, with thin siltstone interbeds.
21 - 30	SILTSTONE	Blue-grey with yellow sandstone interbeds.
		From 25 to 27 feet, yellow sandstone interbed, slightly fine-grained, well sorted, slightly moist.
		From 29 to 30 feet, yellow sandstone interbed, slightly fine-grained, well sorted, slightly moist.
30 - 50	SANDSTONE	Grey and brown, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture content.
50 - 55	SHALE	Grey and brown, calcareous, moderate moisture content.
55 - 100	SANDSTONE	Brown, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, moderate moisture content.
		From 70 to 80 feet, color changes to grey.
		From 80 to 95 feet, carbonate cement increases.
100 - 110	SHALE	Dark grey, moderately cemented, moderate moisture content, some siltstone.
110 - 150	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture content.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-104
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-27

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
110 - 150 (con't)	At 120 feet, color is dark grey, high moisture content.
	At 125 feet, very high moisture content.
	At 126 feet, encountered groundwater, approximately 4-5 gpm.

TOTAL DEPTH OF BOREHOLE: 150 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

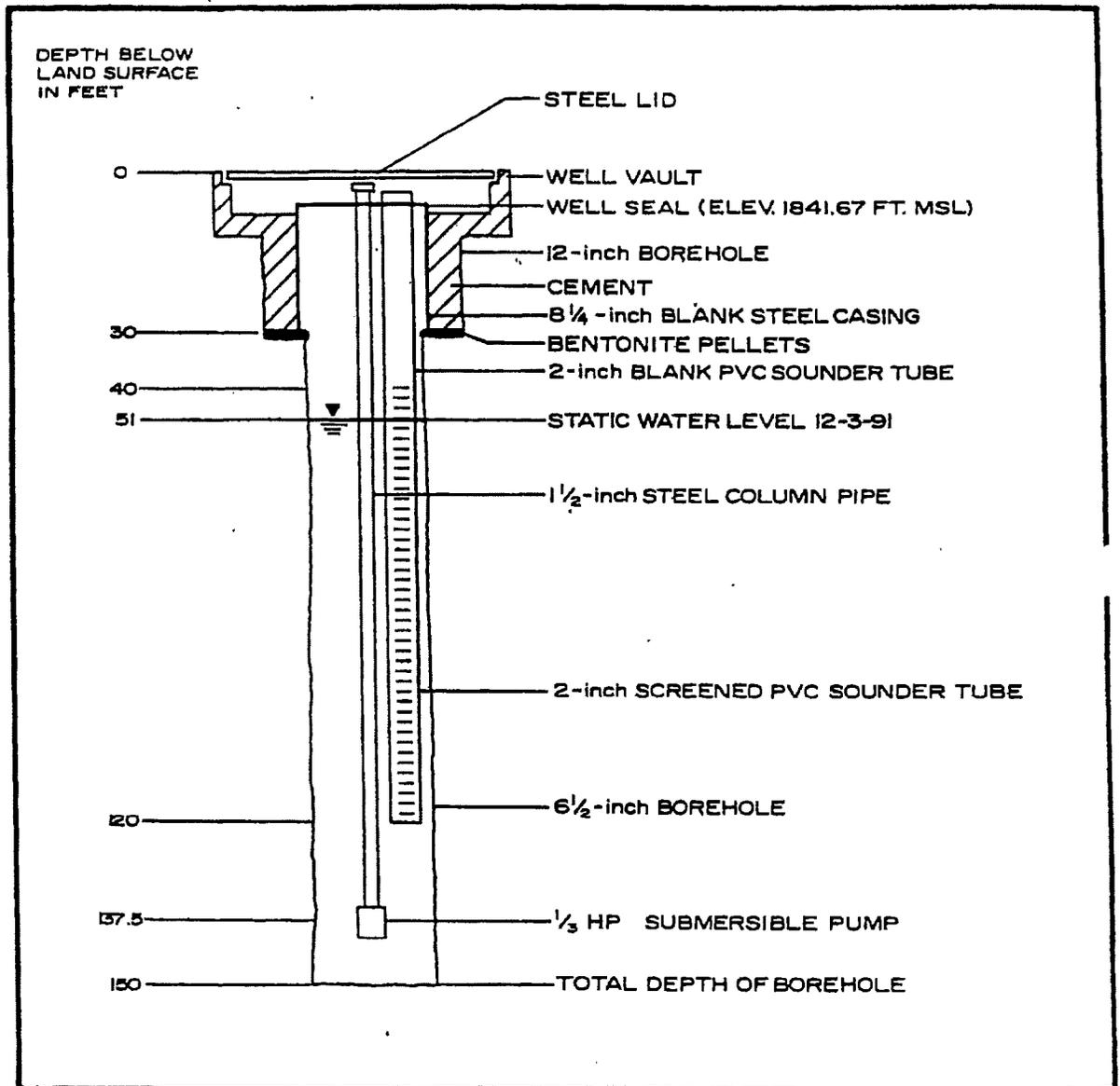


FIGURE E-29
SCHEMATIC DIAGRAM OF MONITOR WELL RD-27

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-105

LITHOLOGIC LOG OF MONITOR WELL RD-28

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 0.5	ASPHALT CONCRETE & AGGREGATE SUB-BASE	
0.5- 2.5	FILL	Silt, medium brown, clayey, fine grained well sorted, slightly moist, no odor.
2.5- 3	FILL	Sand, yellow-brown, fine to medium grained, moderately well sorted, slightly moist, no odor.
3 - 6	FILL	Clay, dark brown, silty, firm, slightly moist.
6 - 14	FILL	Clay, reddish brown, stiff, slightly moist, no odor, very slow penetration, clay just packs down. At 7 feet, color changes to dark brown.
14 - 20	SILTY SANDSTONE	Grey-brown, fine-grained, moderately sorted, slightly moist, no odor.
20 - 150	SANDSTONE	Yellowish-brown, clean fine-grained, well sorted, slightly moist, no odor. At 30 feet, brown, fine-grained, moderately to well sorted, subrounded to subangular, moderate moisture content. From 35 to 50 feet, carbonate cement. At 100 feet, color changes to grey, carbonate cement abundant, moderate to high moisture content. At 110 feet, moderate moisture content. At 125 feet, encountered groundwater, low yield.

TOTAL DEPTH OF BOREHOLE: 150 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

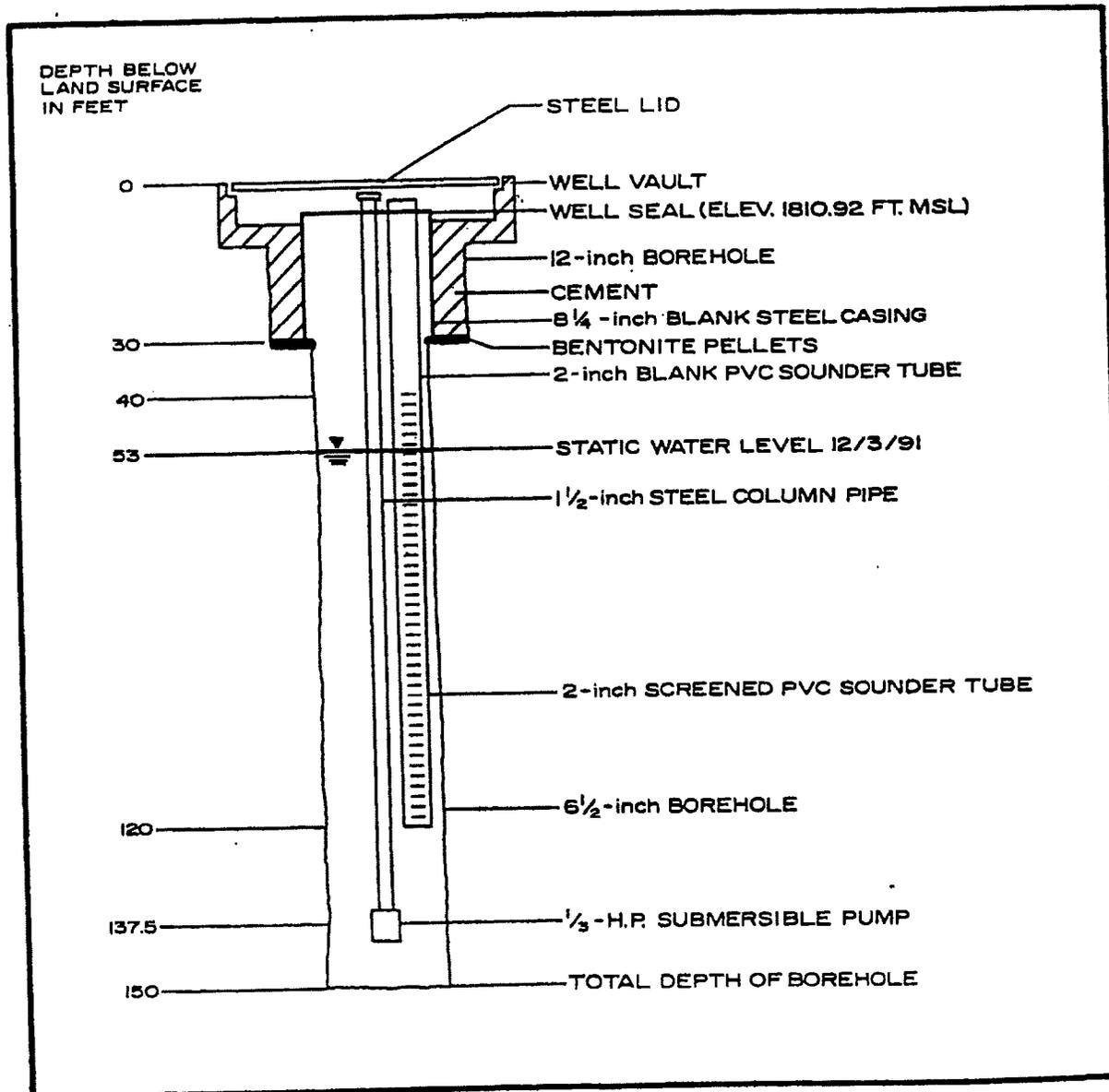


FIGURE E-30
SCHEMATIC DIAGRAM OF MONITOR WELL RD-28

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-106

LITHOLOGIC LOG OF MONITOR WELL RD-29

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 0.5	ASPHALT	
0.5 - 6	SANDY SILT	Medium brown, alluvium and fill, slightly moist, no odor, clay content increasing with depth.
6 - 13	SILTY SANDSTONE	Yellow-brown, poorly sorted, slightly moist, no odor.
		From 11 to 11.5 feet, siltstone interbed, grey brown, slightly moist.
		From 13 to 15 feet, siltstone interbed.
13 - 27	SILTSTONE	Grey, dry, no odor, some thin yellow sandstone interbeds.
27 - 30	SILTSTONE	Blue-grey, slightly moist, no odor.
30 - 75	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture content.
		From 40 to 50 feet, grey and brown sandstone.
		At 45 feet, very high moisture content.
		At 46 feet, encountered groundwater.
75 - 85	SHALE	Grey, moderately cemented.
85 - 100	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular.

TOTAL DEPTH OF BOREHOLE: 100 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

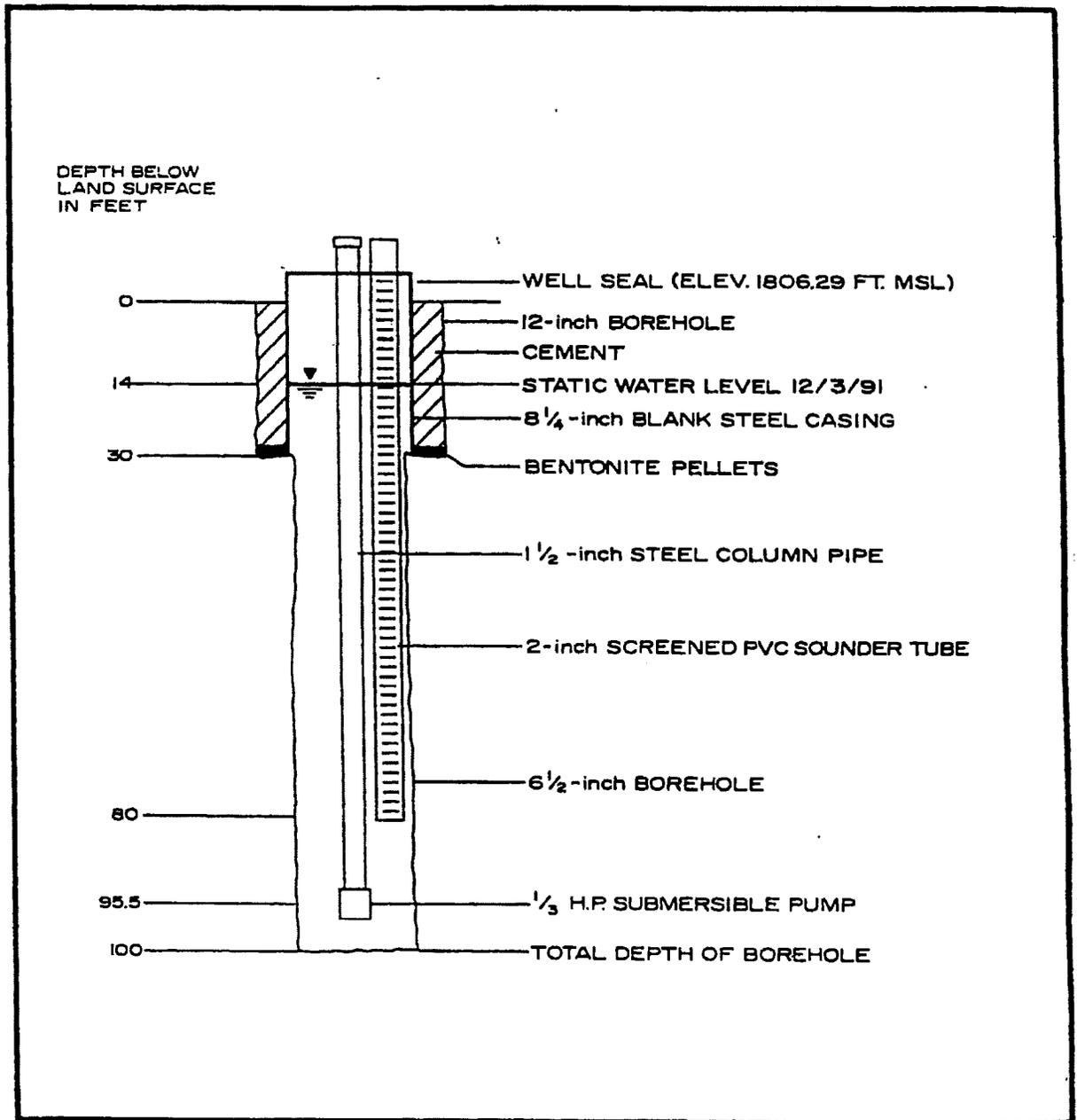


FIGURE E-31
SCHEMATIC DIAGRAM OF MONITOR WELL RD-29

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-107

LITHOLOGIC LOG OF MONITOR WELL RD-30

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 4	SAND	Brown, fine-grained, sand, loose, low plasticity, moderate moisture content.
4 - 75	SANDSTONE	Brown, fine-grained, moderately to well sorted, subrounded to subangular, weakly cemented, moderate moisture content. At 20 feet, high moisture content. At 25 feet, very high moisture content. At 30 feet, encountered groundwater, approximately 1-2 gpm. At 40 feet, increasingly grey. At 55 feet, grey sandstone.

TOTAL DEPTH OF BOREHOLE: 75 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

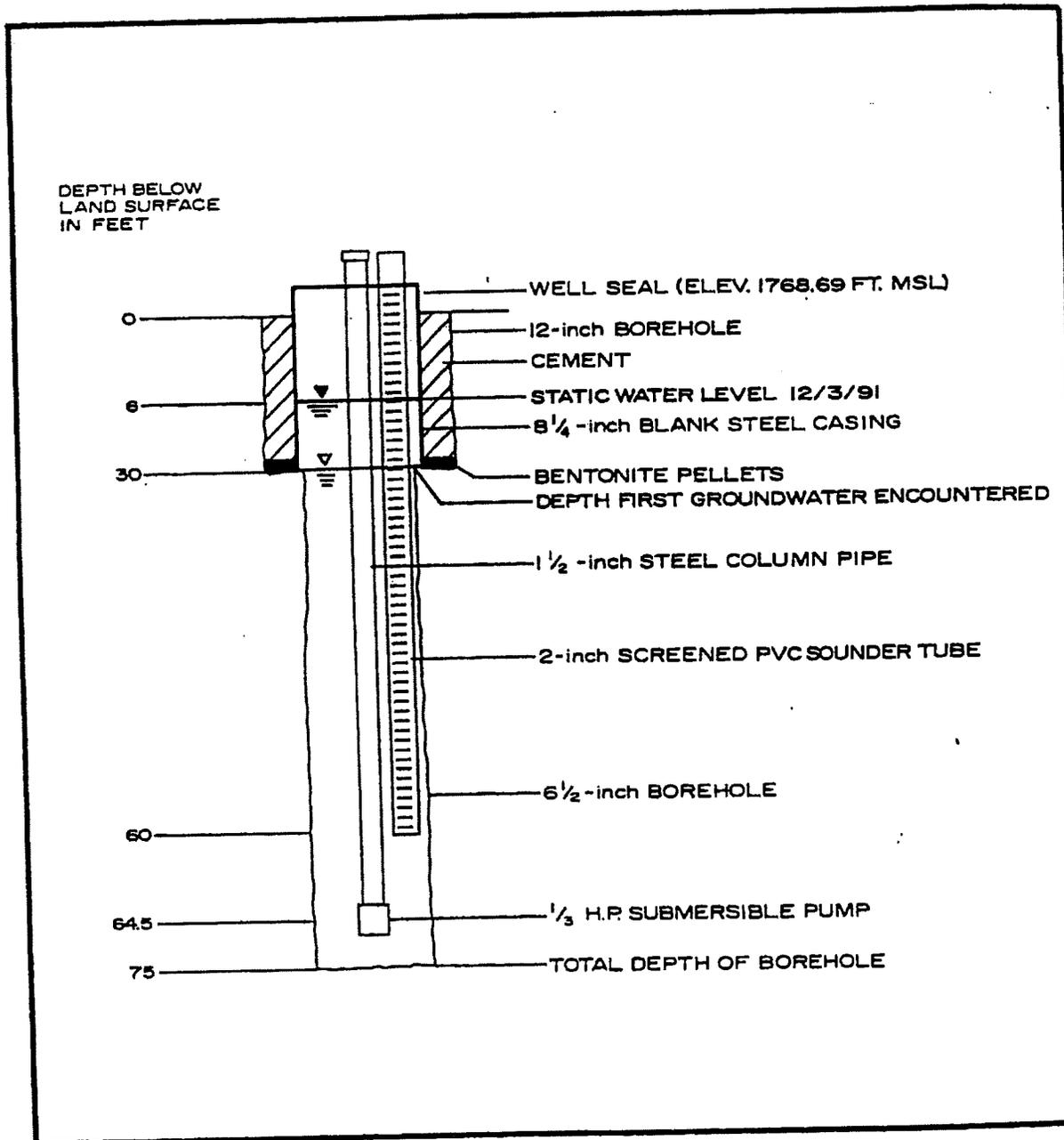


FIGURE E-32
SCHEMATIC DIAGRAM OF MONITOR WELL RD-30

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-110

LITHOLOGIC LOG OF MONITOR WELL RD-33A

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 3	SILTY SAND	Brown, trace clay, medium grained, moderately sorted, subangular, to subrounded, loose, slight plasticity, no cementation, dry, no odor.
3 - 30	SANDSTONE	Buff, trace silt, fine grained, moderate to well sorted, dense, non-calcareous, weak to moderate cementation, dry, no odor. From 3 to 5 feet weathered. At 10 feet moderate cementation.
30 - 320	SANDSTONE	Grey, some silt, trace clay, fine to medium grained, moderately sorted, subangular to subrounded, dense, calcareous, moderate to strong cementation, dry, no odor. At 35 feet color change to blue grey, strong calcareous cementation. At 85 feet slight increase in grain size, color change to grey. At 105 feet cementation decreases to moderate. From 125-130 feet color change to brown. At 130 feet color change to grey. From 140 to 145 feet some black claystone layers. From 155 to 160 feet some interbedded claystone. At 170 feet cementation becomes weak. From 170 to 180 feet some black claystone layers. At 180 feet slight increase in grain size.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-110
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-33A

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
30 - 320 cont'd	SANDSTONE	<p>From 185 to 190 feet some interbedded claystone.</p> <p>From 210 to 215 feet some brown sandstone.</p> <p>At 235 feet cementation becomes moderate, some coarse sand present.</p> <p>At 275 feet moisture content increases to slightly moist, some black claystone present.</p> <p>At 285 feet moisture content increases to moist.</p> <p>At 295 feet moisture content increases to wet.</p> <p>From 315 to 320 feet some clay present.</p>
<hr/> TOTAL DEPTH OF BOREHOLE: 320 FEET <hr/>		

GROUNDWATER RESOURCES CONSULTANTS, INC.

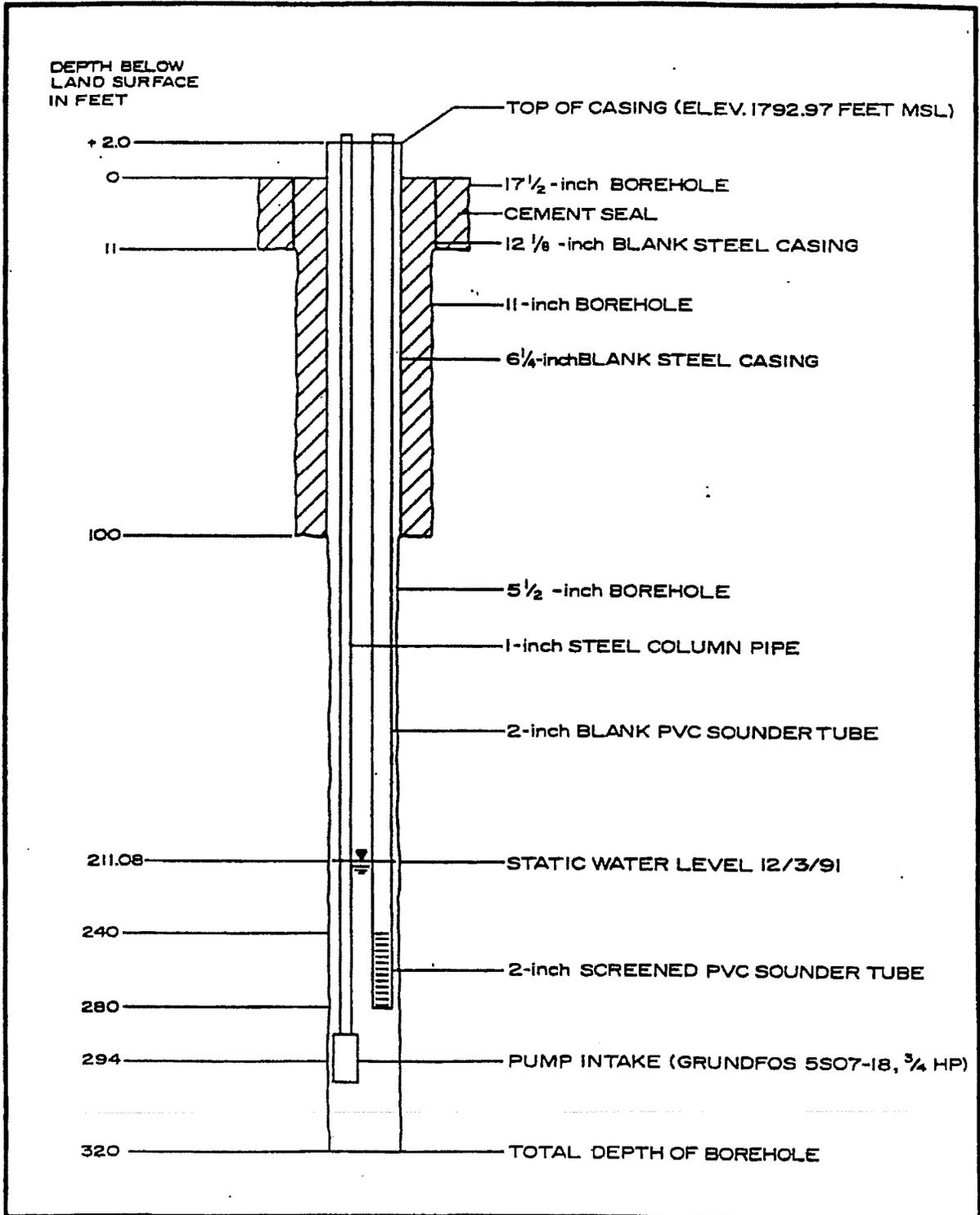


FIGURE E-35
SCHEMATIC DIAGRAM OF MONITOR WELL RD-33A

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-111

LITHOLOGIC LOG OF MONITOR WELL RD-33B

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 2	SILTY SAND	Brown, trace clay, medium grained, moderately sorted, subangular, to subrounded, loose, slight plasticity, no cementation, dry, no odor.
2 - 38	SANDSTONE	Buff, trace silt, fine grained, moderate to well sorted, dense, non-calcareous, weak to moderate cementation, dry, no odor. Below 18 feet some medium and coarse grains. At 22 feet color change to light brown, moisture content increases to slightly moist. At 30 feet color change to grey brown.
38 - 455	SANDSTONE	Grey, some silt, trace clay, fine to medium grained, moderately sorted, subangular to subrounded, compact, calcareous, moderate cementation, slightly moist, no odor. At 82 feet becomes dry. At 85 feet strongly calcareous, cementation becomes strong. At 102 feet color change to brown, moderately calcareous cementation decreases to moderate. At 108 feet color change to grey-brown. At 128 feet predominantly fine-grained. At 140 feet strongly calcareous. At 150 feet color change to blue-grey. At 170 feet color change to grey-brown. At 175 feet color change to blue-grey.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-111
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-33B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
38 - 455 cont'd	SANDSTONE	<p>From 175 to 180 feet some claystone present.</p> <p>At 232 feet silt and clay content increasing.</p> <p>At 260 feet slightly moist.</p> <p>From 282 to 283 feet water bearing fracture, producing 1 to 2 gpm on airlift, formation becomes wet.</p> <p>From 300 to 310 feet interlayers of brown clayey sandstone.</p> <p>At 320 feet cementation weak to moderate.</p> <p>Below 335 feet black claystone beds begin to appear.</p> <p>Below 345 feet white dolomitic vein filling.</p> <p>At 380 feet becomes finer grained.</p> <p>Below 395 feet cementation decreases to weak.</p>
455 - 475	CLAYSTONE	<p>Black, some interbedded sandstone, low to moderate plasticity, dense, non-calcareous, moderate cementation, wet, no odor.</p>
475 - 495	SANDSTONE	<p>At 470 feet sandstone content increasing.</p> <p>Blue-grey, some black claystone interlayers, fine to medium grained, well sorted, subangular, compact, non-calcareous, moderate cementation, wet, no odor.</p>

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-111
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-33B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
495 - 508	SANDSTONE WITH CLAYSTONE	<p>Grey, with black claystone interlayers, fine-grained, moderately sorted, subangular, dense, non-calcareous, moderate cementation, wet, no odor.</p> <p>From 501 to 502 feet large water bearing fracture, yielding 75 to 100 gpm on airlift.</p> <p>At 505 feet sandstone content increasing, claystone interlayers decreasing.</p>
508-678	SANDSTONE	<p>Grey, some interbedded black claystone, fine to medium grained, moderately sorted, subangular, very dense, non-calcareous, moderate to strong cementation, wet, no odor.</p> <p>Below 518 feet claystone interbeds decreasing.</p> <p>At 521 feet fracture present.</p> <p>At 522 feet cementation decreases to moderate.</p> <p>Below 535 feet slight increase in grain size.</p> <p>From 605 to 610 feet some very fine to fine gravel present.</p> <p>From 620 to 630 feet some black claystone interlayers.</p> <p>At 645 feet small fracture.</p> <p>From 660 to 665 feet some black claystone interlayers.</p>

TOTAL DEPTH OF BOREHOLE: 678 FEET^{1/}

^{1/} Borehole was cemented back to 415 feet during well completion

GROUNDWATER RESOURCES CONSULTANTS, INC.

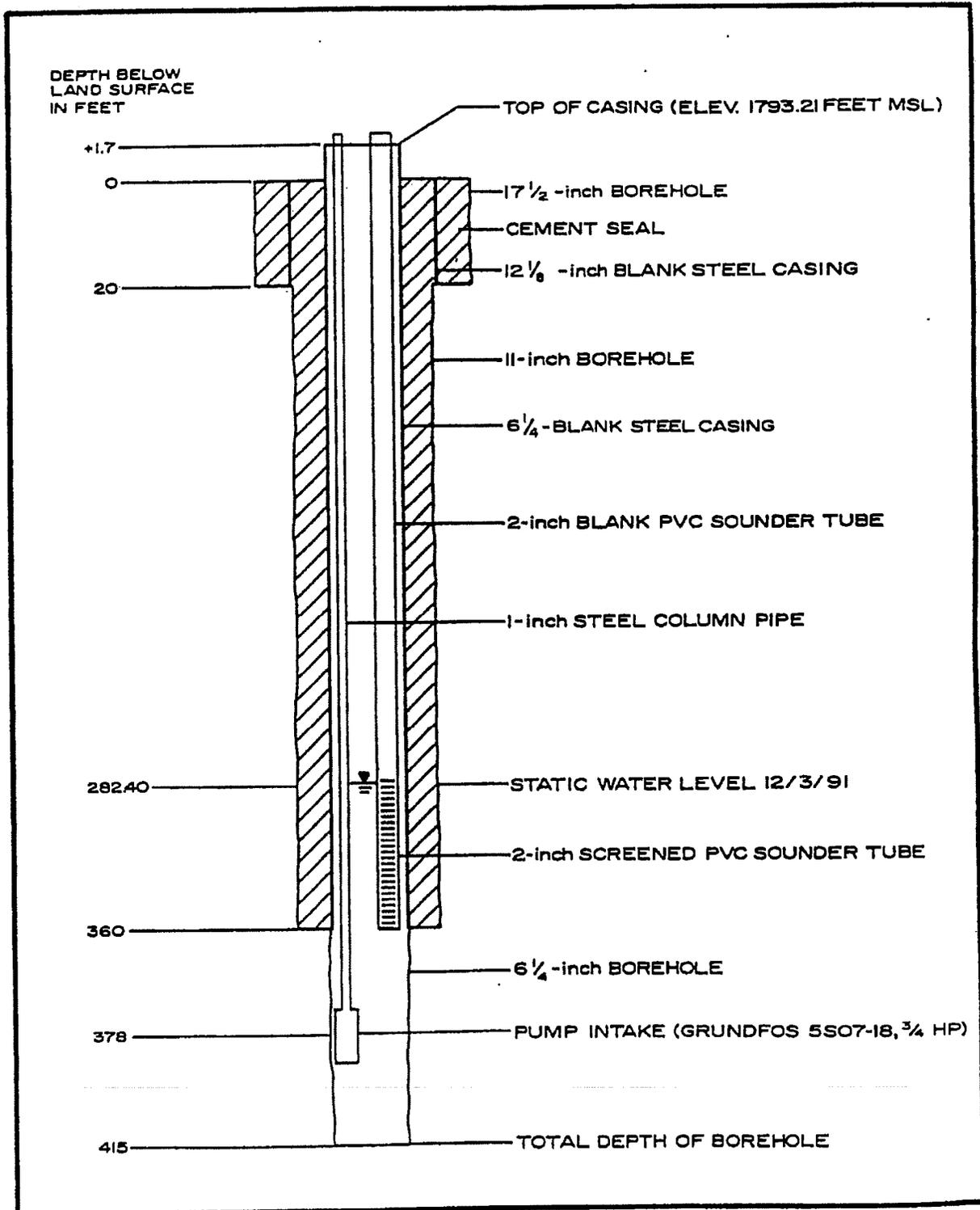


FIGURE E-36
SCHEMATIC DIAGRAM OF MONITOR WELL RD-33B

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-112

LITHOLOGIC LOG OF MONITOR WELL RD-33C

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 3	SILTY SAND	Light brown, trace clay, fine to medium grained, moderately sorted, subangular, to subrounded, loose, slight plasticity, no cementation, dry, no odor.
3 - 25	SANDSTONE	Buff, trace silt, fine grained moderate to well sorted, compact, non-calcareous, weak cementation, dry, no odor.
		From 3 to 5 feet weathered.
		At 5 feet cementation becomes moderate.
25 - 350	SANDSTONE	Grey-brown, some silt, trace clay, fine to medium grained, moderately sorted, subangular, dense, calcareous, moderate to strong cementation, dry, no odor.
		At 50 feet slight increase in grain size, moderate cementation
		At 60 feet color change to blue grey, becomes strong, calcareous.
		At 82 feet moderate to strong cementation.
		From 100 to 115 feet slightly moist.
		From 115 feet becomes dry.
		From 125 to 130 feet color change to light brown, slight decrease in cementation.
		From 185-195 feet color change to light brown, decrease in cementation.
		From 240 to 250 feet very fine grained.
		At 302 feet water bearing fracture.
		Below 310 feet some thin claystone beds are present.

GROUNDWATER RESOURCES CONSULTANTS, INC.

**TABLE A-112
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-33C**

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
		Below 340 feet some coarse sand and very fine gravel is present.
350 - 370	SANDSTONE	Grey black, with interbedded claystone, trace gravel, medium grained, poorly sorted, subangular, moderate to strong cement, non-calcareous, wet, no odor.
		Below 365 feet claystone content decreases.
370 - 520	SANDSTONE	Grey, trace very fine gravel, fine to medium grained, well sorted, subrounded, compact, moderate cementation, non-calcareous, wet, no odor.
		At 375 feet cementation becomes weak.
		At 380 feet grain size becomes very fine to fine.
		At 415 feet cementation increases to moderate.
		At 422 feet water bearing fracture, doubles flow rate.
		At 430 feet becomes fine to medium grained.
		At 480 feet becomes finer grained, silty and calcareous.
		From 480 to 485 feet color change to brown.
		At 499 feet small fracture bearing water.
		At 505 feet becomes medium grained.

TOTAL DEPTH OF BOREHOLE: 520 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

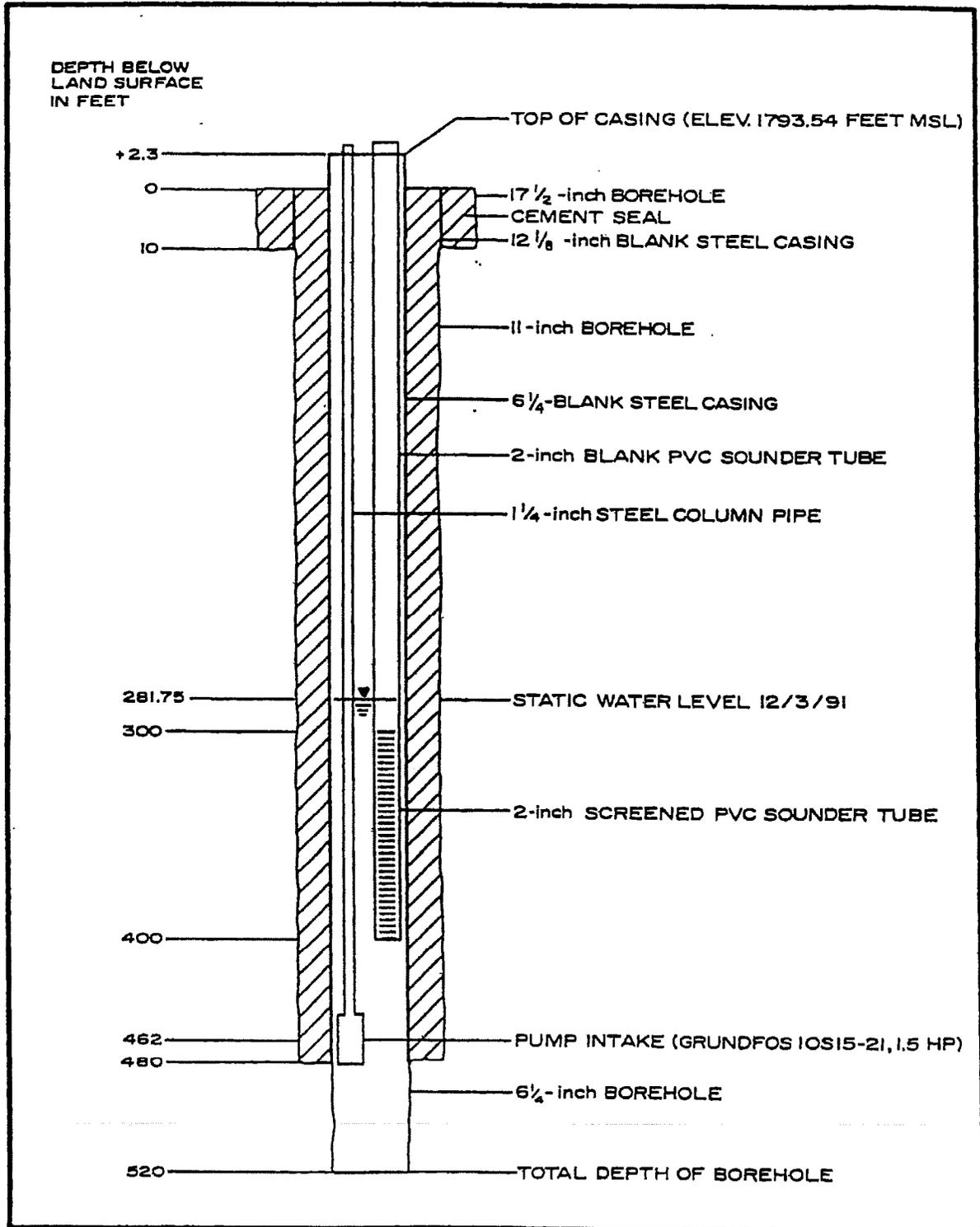


FIGURE E-37
SCHEMATIC DIAGRAM OF MONITOR WELL RD-33C

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-113

LITHOLOGIC LOG OF MONITOR WELL RD-34A

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 8	CLAYEY SAND	Light brown, trace gravel, fine to coarse sand, poorly sorted, subangular, loose, slight plasticity, no cementation, dry, no odor.
8 - 32	SANDSTONE	Buff, some silt, trace very fine gravel fine-grained, moderately sorted, subrounded, compact, upper five feet weathered, weakly cemented, non-calcareous, dry, no odor. At ten feet becomes slightly moist. At twelve feet unweathered. At 18 feet becomes moist. At 27 feet cementation increases to moderate.
32 - 60	SANDSTONE	Blue-grey, very fine to fine grained, trace silt, moderate sorted, subrounded, compact, strongly cemented, calcareous, slightly moist, no odor. From 42-43 feet buff non-calcareous sandstone interlayers. From 47-48 feet buff non-calcareous sandstone interlayer. At 49 feet becomes wet, probable fracture zone 49 to 51 feet.

TOTAL DEPTH OF BOREHOLE: 60 FEET

DEPTH BELOW
LAND SURFACE
IN FEET

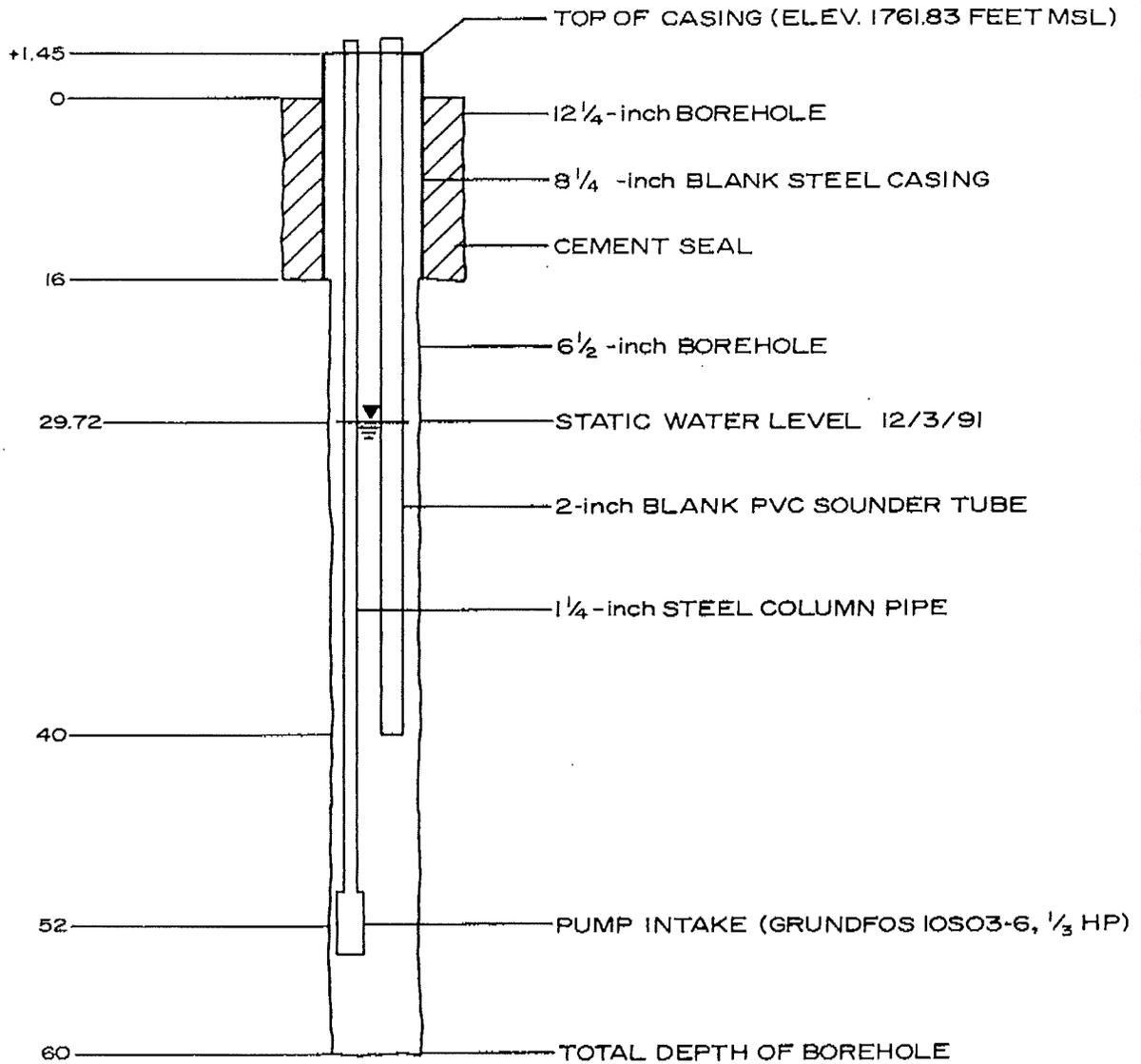


FIGURE
SCHEMATIC DIAGRAM OF MONITOR WELL RD-34A

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-114

LITHOLOGIC LOG OF MONITOR WELL RD-34B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 8	CLAYEY SAND	Light brown, fine to medium sand, moderately sorted, subangular, loose, slight plasticity, no cementation, wet, no odor. At two feet moist.
8 - 22	SANDSTONE	Buff, some silt, trace very fine gravel, fine-grained, well sorted, subrounded, compact, upper four feet weathered, weakly cemented, non-calcareous, slightly moist, no odor. At twelve feet unweathered, moderately cemented. At 18 feet becomes dry.
22 - 230	SANDSTONE	Blue-grey, some silt, very fine to fine grained, moderate to well sorted, subrounded, very dense, moderately cemented, calcareous, dry, no odor. At 30 feet color change to grey, becomes moist. From 40 to 60 feet cementation becomes weak, very slightly calcareous. From 55 to 60 feet some claystone interlayers. At 60 feet calcareous cement increases. At 71 feet possible fracture. At 92 feet water is present, increasing with depth. At 101 feet possible fracture.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-114
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-34B

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
22 - 230 (cont'd)	SANDSTONE	<p>Below 102 feet grain size increases, some coarse sand and fine gravel present.</p> <p>Below 120 feet some thin black claystone beds appear.</p> <p>From 173 to 175 feet possible fractures.</p> <p>From 175 to 180 feet white, calcareous, vein filling.</p> <p>From 200-215 large amount of white calcareous vein filling.</p> <p>From 215-220 possible small fractures.</p>
230 - 240	SANDSTONE/ CLAYSTONE	Dark grey, fine grained sandstone interbedded with black claystone, compact, weak to moderate cement, non-calcareous.

TOTAL DEPTH OF BOREHOLE: 240 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

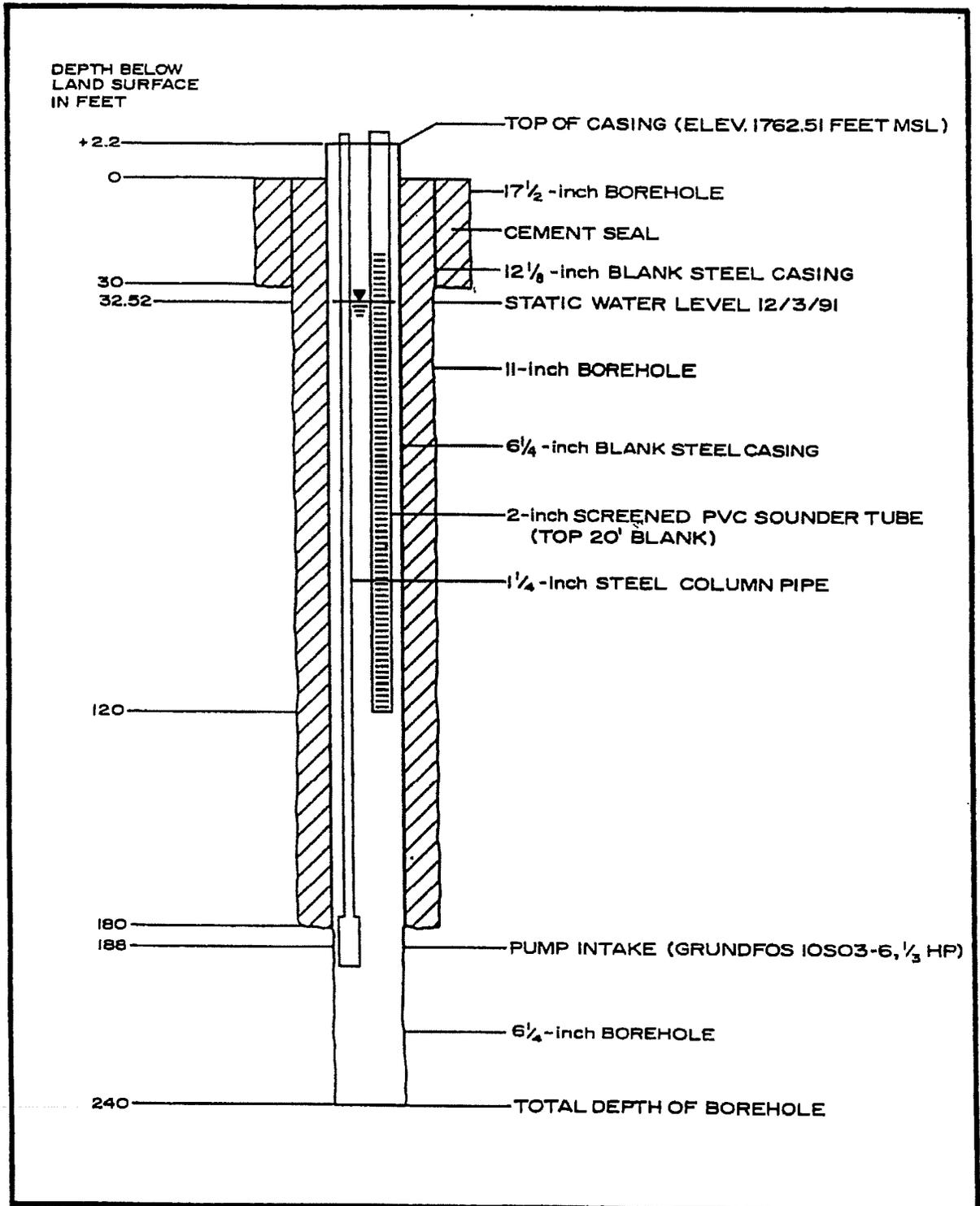


FIGURE E-39
SCHEMATIC DIAGRAM OF MONITOR WELL RD-34B

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-115

LITHOLOGIC LOG OF MONITOR WELL RD-34C

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 7	CLAYEY SAND	Light brown, trace gravel, fine to coarse sand, poorly sorted, subangular, loose, slight plasticity, no cementation, slightly moist, no odor.
7 - 22	SANDSTONE	Buff, some silt, very fine to fine-grained, well sorted, subrounded, compact, upper two feet weathered, weakly cemented, non-calcareous, dry, no odor. At nine feet unweathered, moderately cemented.
22 - 32	SANDSTONE	From 18 to 19 feet some very coarse sand and very fine gravel present. Blue-grey, fine to medium grained, moderately sorted, subrounded, very dense, strongly cemented, highly calcareous, dry, no odor.
32 - 60	SILTY SANDSTONE	Brown, some clay, medium grained, moderately, sorted, subrounded, compact, slight plasticity, weak to moderate cement, non-calcareous, moist, no odor. At 38 feet wet.
60 - 220	SANDSTONE	From 45 to 55 feet interbedded dark claystone layers are present. Blue-grey, some silt and clay, fine to medium grained, well sorted, subrounded, very dense, moderately cemented, calcareous, wet, no odor. From 74 to 75 feet fracture. From 77 to 79 feet some claystone interlayers. From 107 to 110 feet several fractures. From 115 to 117 feet some calcite.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-115
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-34C

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
60 - 220 (cont'd)	SANDSTONE	<p>Below 120 feet slight grain size increase to medium - coarse.</p> <p>At 137 feet fracture.</p> <p>Below 140 feet some fine gravel present.</p> <p>From 150 to 160 feet gravelly interbeds present.</p> <p>Below 182 feet cementation increases to strong.</p> <p>From 183 to 186 feet some grey claystone interlayers.</p> <p>From 200 to 205 feet some brown clayey sandstone interlayers.</p> <p>From 205 to 210 feet some gravel and claystone claystone increasing with depth.</p>
220 - 258	SANDSTONE	<p>Grey-black, with claystone interlayers, fine grained, moderately sorted, subrounded, compact, moderate cementation, calcareous, wet, no odor.</p> <p>From 228 to 232 feet fractured.</p> <p>Below 245 feet claystone interlayers decrease.</p>
258 - 450	SANDSTONE	<p>Blue-grey, trace silt, occasional claystone interlayers, very fine to fine-grained, well sorted, subrounded, dense, moderate cementation, calcareous, wet, no odor.</p> <p>From 282 to 285 feet claystone interlayers.</p> <p>From 300 to 305 feet cementation is weak.</p>

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-115
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-34C

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
258 - 450 (cont'd)	SANDSTONE	<p>From 317 to 326 feet some claystone interlayers.</p> <p>From 330 to 345 feet fractured, hole making more water.</p> <p>Below 370 feet calcareous cement decreasing.</p> <p>From 378 to 395 feet cementation increases to hard.</p> <p>From 388 to 390 feet some brown clayey sandstone interlayers.</p> <p>Below 395 feet cementation decreases to moderate.</p> <p>From 400 to 412 feet some black claystone interlayers.</p> <p>Below 425 feet cementation increases to hard.</p> <p>From 430 to 440 feet some black claystone and brown clayey sandstone interlayers.</p>

TOTAL DEPTH OF BOREHOLE: 450 FEET

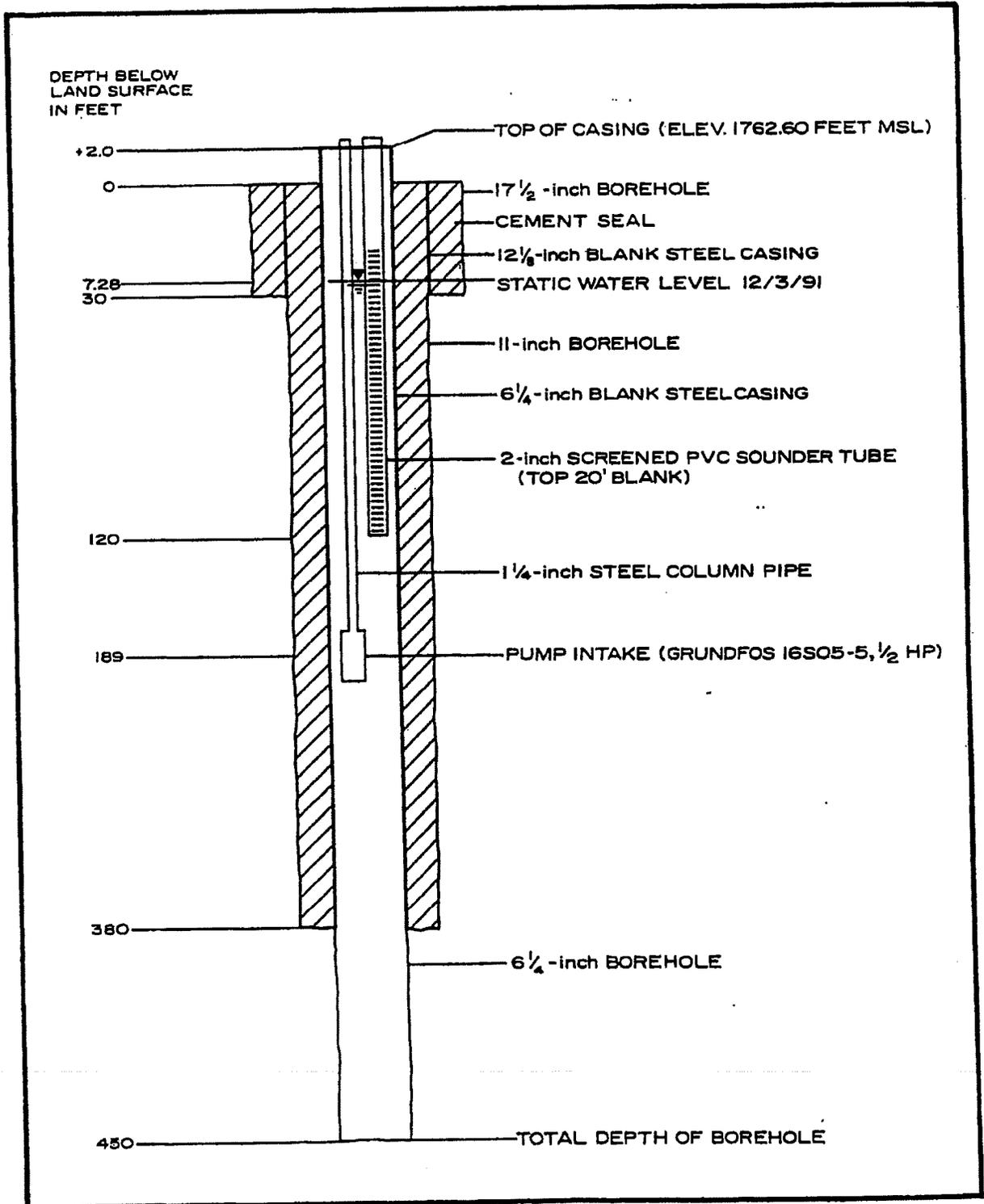


FIGURE E-40
SCHEMATIC DIAGRAM OF MONITOR WELL RD-34C

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-143

LITHOLOGIC LOG OF MONITOR WELL RD-50

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 4	SANDY CLAY	Dark brown, trace fine-grained sand, loose, low plasticity, slightly moist.
4 - 10	SILTY CLAY	Reddish brown, trace sand, compact, moderate plasticity, slightly moist.
10 - 195	SANDSTONE	<p>Buff, trace silt, fine-grained, very slightly calcareous, poorly graded, subrounded, compact, weak cementation, slightly moist.</p> <p>@ 14' dense, moderate cementation.</p> <p>@ 22' grey brown, very calcareous, moderate to strong cementation, dry.</p> <p>@ 35' light brown, slightly calcareous.</p> <p>@ 56' slightly moist.</p> <p>@ 58' dry.</p> <p>@ 64' non-calcareous, silty.</p> <p>@ 82' grey brown, decreasing silt content, slightly coarser.</p> <p>@ 114' blue grey, very calcareous, strong cementation.</p> <p>@ 145' wet (first groundwater, 5-10 gpm).</p> <p>@ 160' groundwater production increases with depth.</p> <p>@ 168' cementation increasing.</p> <p>@ 190-193' weak cementation.</p>

TOTAL DEPTH OF BOREHOLE = 195 FEET

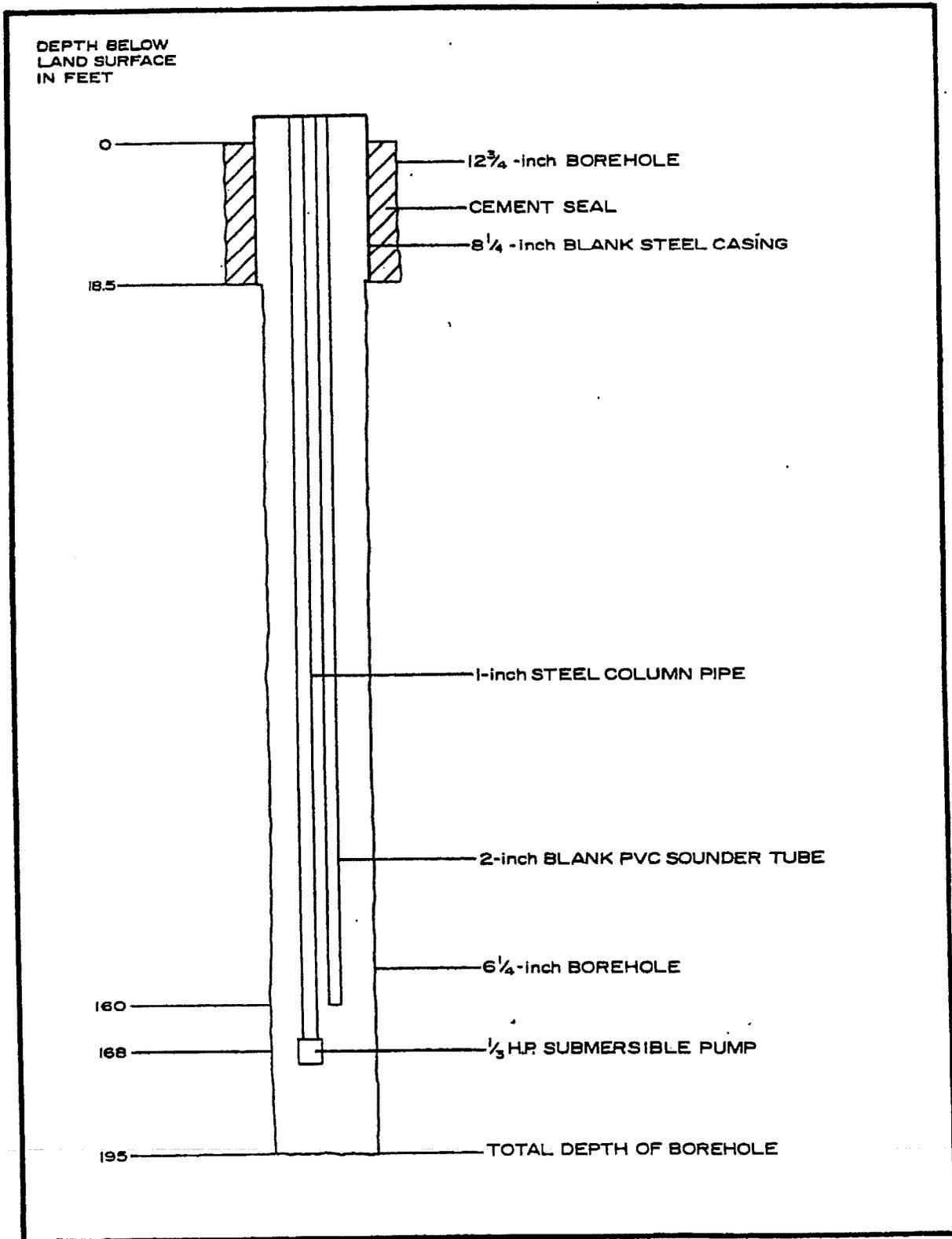


FIGURE E-68
SCHEMATIC DIAGRAM OF MONITOR WELL RD-50

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-151

LITHOLOGIC LOG OF MONITOR WELL RD-54A

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 12	SANDSTONE	Brown, some silt and clay, poorly graded, subrounded, compact, moderate cementation, slightly calcareous, dry. @ 4' blue grey, dense, moderate to strong cementation.
12 - 14	CLAYSTONE	Brown, some sand, compact, low plasticity, weak cementation, noncalcareous, dry.
14 - 278	SANDSTONE	Blue grey, some silt and clay, fine to medium grained, poorly graded, rounded, dense, moderate to strong cementation, slightly calcareous, dry. @ 16' slightly moist. @ 26' clay content decreasing, becoming more calcareous. @ 32' dry. @ 36' light grey. @ 44' fine grained. @ 52' moist. @ 64' slightly moist. @ 75'-90' clayey. @ 96' dry. @ 120' slightly moist. @ 142' dry. @ 148' blue grey, very calcareous, fine grained, strong cementation. @ 176' slightly moist. @ 180' dry. @ 216'-217' thin, yellow brown bed. @ 218' blue grey.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-151
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-54A

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
14 - 278 (cont'd)	SANDSTONE	@ 237' fracture. @ 238' moist. @ 246' slightly moist. @ 270'-278' fine to medium grained.

TOTAL DEPTH OF BOREHOLE = 278 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

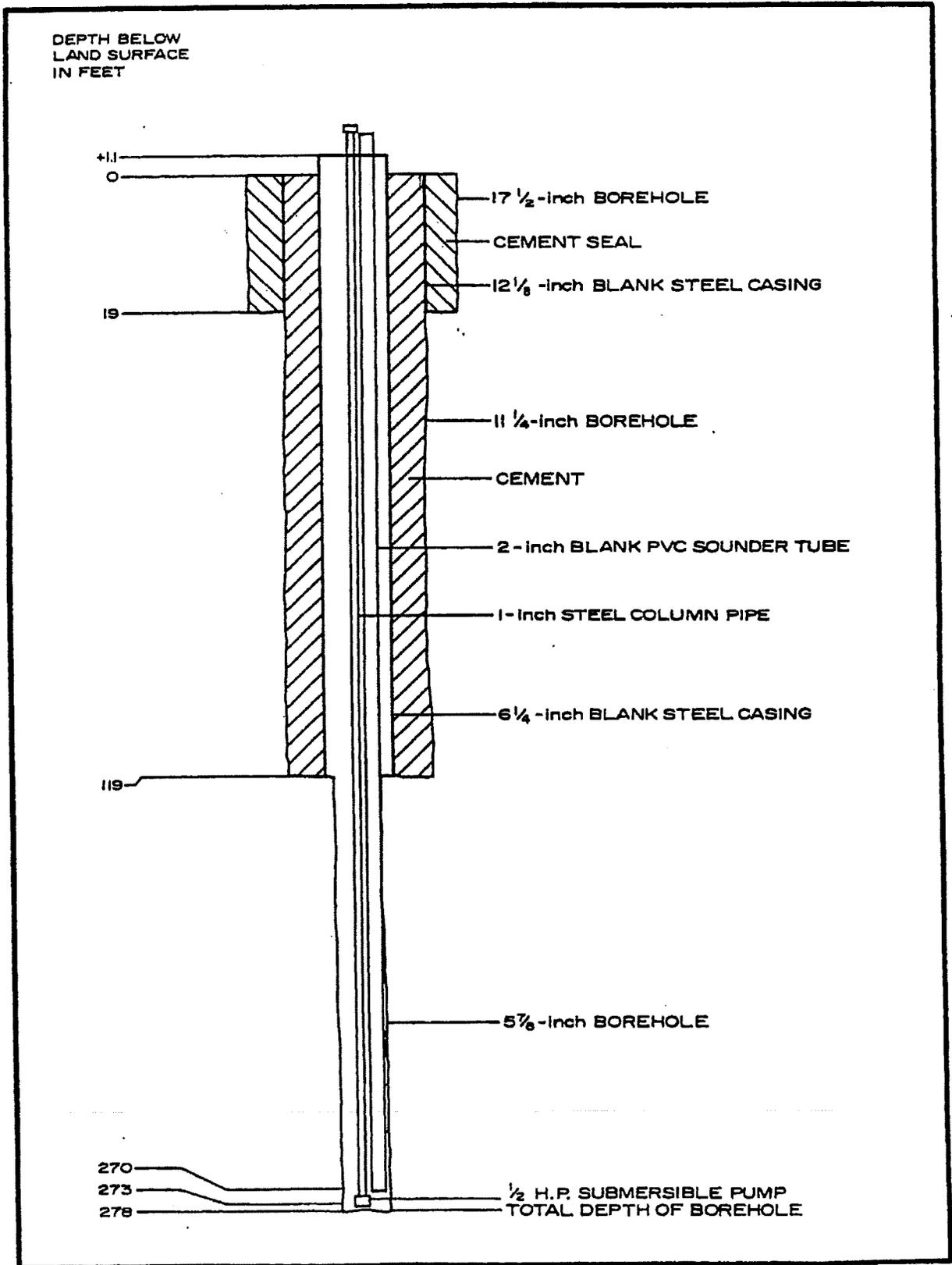


FIGURE E-76
SCHEMATIC DIAGRAM OF MONITOR WELL RD-54A

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-152

LITHOLOGIC LOG OF MONITOR WELL RD-54B

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 158	SANDSTONE	<p>Light brown, some silt, fine to medium grained, some coarse sand, moderately to poorly graded, subrounded, compact, weak cementation, slightly calcareous, slightly moist.</p> <p>@ 4' grey, poorly graded, dense, moderate cementation, dry.</p> <p>@ 8-9' brownish grey, fractured, moist.</p> <p>@ 14' blue grey, moderate to strong cementation, moderately calcareous, moist.</p> <p>@ 18' olive grey, fine grained, subangular and subrounded, moist.</p> <p>@ 23' medium grey, very moist.</p> <p>@ 24' dense to very dense.</p> <p>@ 27' light grey, compact to dense, moderate cementation, slightly moist to moist.</p> <p>@ 32' slightly moist.</p> <p>@ 38' weak cementation.</p> <p>@ 48' moderate to poorly graded, some medium grained sand.</p> <p>@ 60' some silt.</p> <p>@ 84' none to weak cementation, dry to slightly moist.</p> <p>@ 90' weak cementation.</p> <p>@ 98' dry</p> <p>@ 102' dry to slightly moist.</p> <p>@ 108' none to weak cementation.</p> <p>@ 124' weak cementation.</p> <p>@ 128' weak to moderate cementation, slightly moist</p> <p>@ 134' silty, fine grained sand, poorly graded.</p> <p>@ 138' moderate to strong cementation.</p>

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-152
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-54B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 158 (cont'd)	SANDSTONE	<p>@ 144' some silt, strong cementation, dry to slightly moist</p> <p>@ 148' moderate to strong cementation, slightly moist to moist.</p> <p>@ 154' moderately to poorly graded, weak to moderate cementation, dry to slightly moist.</p> <p>@ 156' loose to compact.</p>
158 - 164	SILTSTONE	<p>Light olive grey, sandy, clayey, fine grained sand, poorly graded, compact to dense, moderate cementation, slightly moist.</p>
164 - 206	SANDSTONE	<p>Light grey, medium grained, moderately to poorly graded subangular and subrounded, compact to dense, weak cementation, dry.</p> <p>@ 168' dry to slightly moist.</p> <p>@ 178' weak to moderate cementation, slightly moist.</p> <p>@ 184' none to weak cementation, dry to slightly moist</p> <p>@ 188' weak cementation</p> <p>@ 194' no cementation</p> <p>@ 198' fine grained, poorly graded, weak cementation, slightly moist.</p> <p>@ 205.5-206' fracture</p>
206 - 218	SILTY SANDSTONE	<p>Olive grey, clayey, very fine grained, compact, moderate to strong cementation, moist.</p> <p>@ 208' light olive grey, strong cementation, moist to slightly moist.</p> <p>@ 204' some clay</p>
218 - 437	SANDSTONE	<p>Silty, very fine grained, moderate cementation, moist</p> <p>@ 228' some silt, strong cementation.</p> <p>@ 238' wet</p>

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-152
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-54B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
218 - 437 (cont'd)	SANDSTONE	<p>@ 240' fine grained, some silt, scattered medium grained sand.</p> <p>@ 244' increasing silt content.</p> <p>@ 246-278' no cuttings returned, no water in return.</p> <p>@ 278' olive grey, moderately to poorly graded, subangular and angular, compact, weak to moderate cementation, moist.</p> <p>@ 282' slightly clayey, strong cementation.</p> <p>@ 288' olive grey to light olive grey, fine grained, poorly graded.</p> <p>@ 300.5' very moist</p> <p>@ 305' olive grey, silty, slightly clayey.</p> <p>@ 308' no clay, less silt, moderately cemented.</p> <p>@ 312' loose to compact.</p> <p>@ 314' light olive grey to grey, compact, strong cementation, moist.</p> <p>@ 324' olive grey, slightly clayey.</p> <p>@ 358' moist to very moist.</p> <p>@ 368' moist</p> <p>@ 374' moist to very moist.</p> <p>@ 384' small increase in clay content, moist.</p> <p>@ 388' moist to very moist.</p> <p>@ 394' clay content decreases slightly.</p> <p>@ 398' dense, moderate to strong cementation, moist.</p>

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-152
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-54B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
218 - 437 (cont'd)	SANDSTONE	@ 404' more clay, compact to dense, strong cementation. @ 418' light olive grey, minor to no clay, moderate to strong cementation, slightly moist. @ 428' olive grey, trace clay, slightly moist to moist. @ 436' slightly moist to dry.

TOTAL DEPTH OF BOREHOLE = 437 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

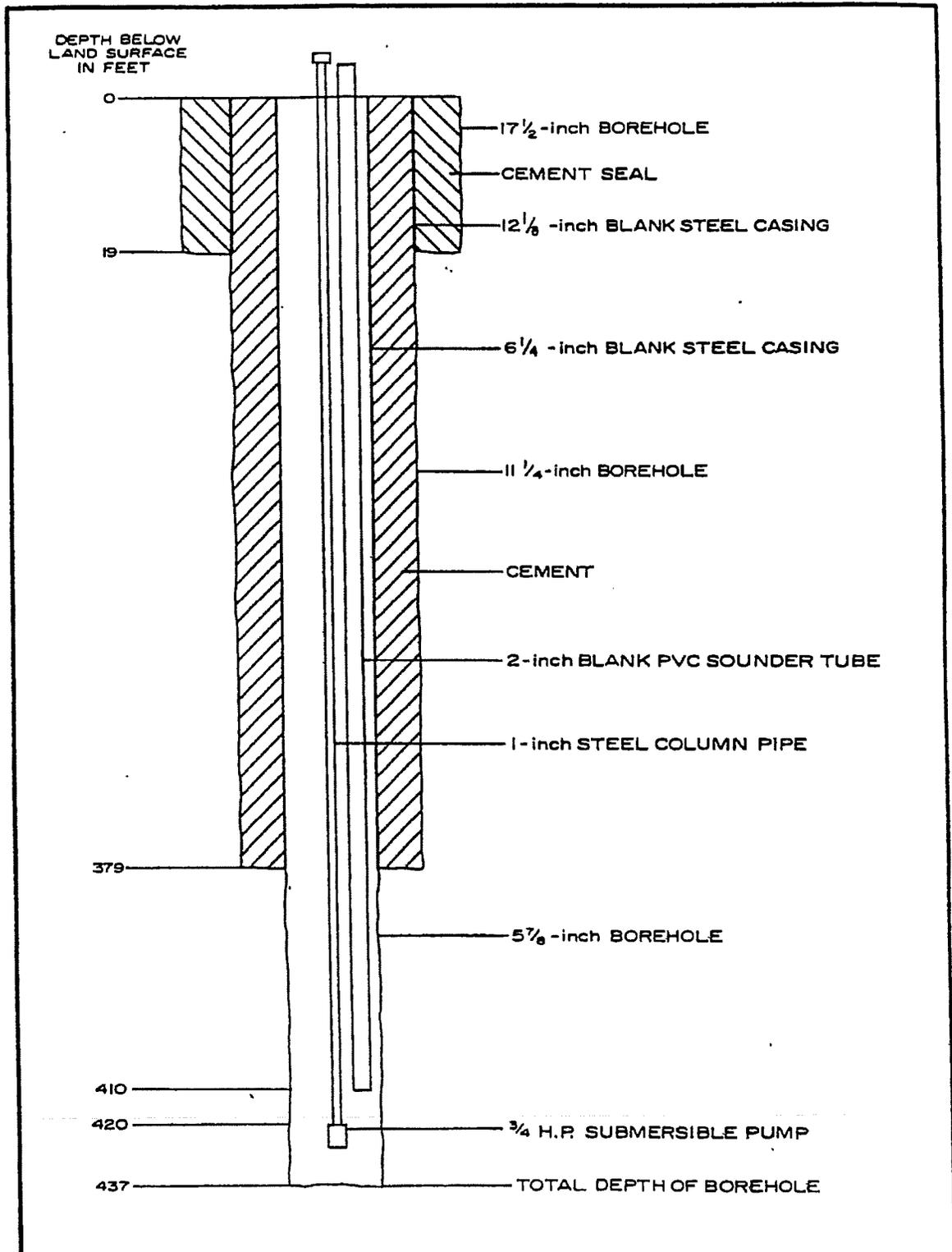


FIGURE E-77
SCHEMATIC DIAGRAM OF MONITOR WELL RD-54B

TABLE A-153
 (continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-54C

LITHOLOGY		FRACTURES			COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)		TYPE
		TOP	BOTTOM			
0 - 620	SANDSTONE @ 540' slight increase in moisture, noticeable decrease in dust. @ 548' silty matrix. @ 580' increase in clay/silt content. @ 583' increase in moisture. @ 596' borehole producing 1-2 gpm during drilling operations. @ 607' increase in moisture. @ 620' decrease in silt/clay content.					
TOTAL DEPTH OF BOREHOLE: 620 FEET		TOTAL VIDEO LOG DEPTH: 597 FEET				

NOTE: Sandstone throughout borehole is predominately massive and fine to medium grained.

The initial video log of the RD-54C borehole was conducted on July 16. The log was relatively clear and the static water level was 187 feet. Unfortunately, the logging contractor's tape system malfunctioned and a copy of the video log tape could not be reproduced. However, detailed notes describing lithology and fractures were compiled during the video logging. After completion of packer testing, the borehole was video logged again on July 18. Unfortunately, the second log was not as clear as the initial log below a depth of 250 feet. The video log summary presented was developed from field notes prepared during the initial video logging and from review of the upper 250 feet of the second video log.

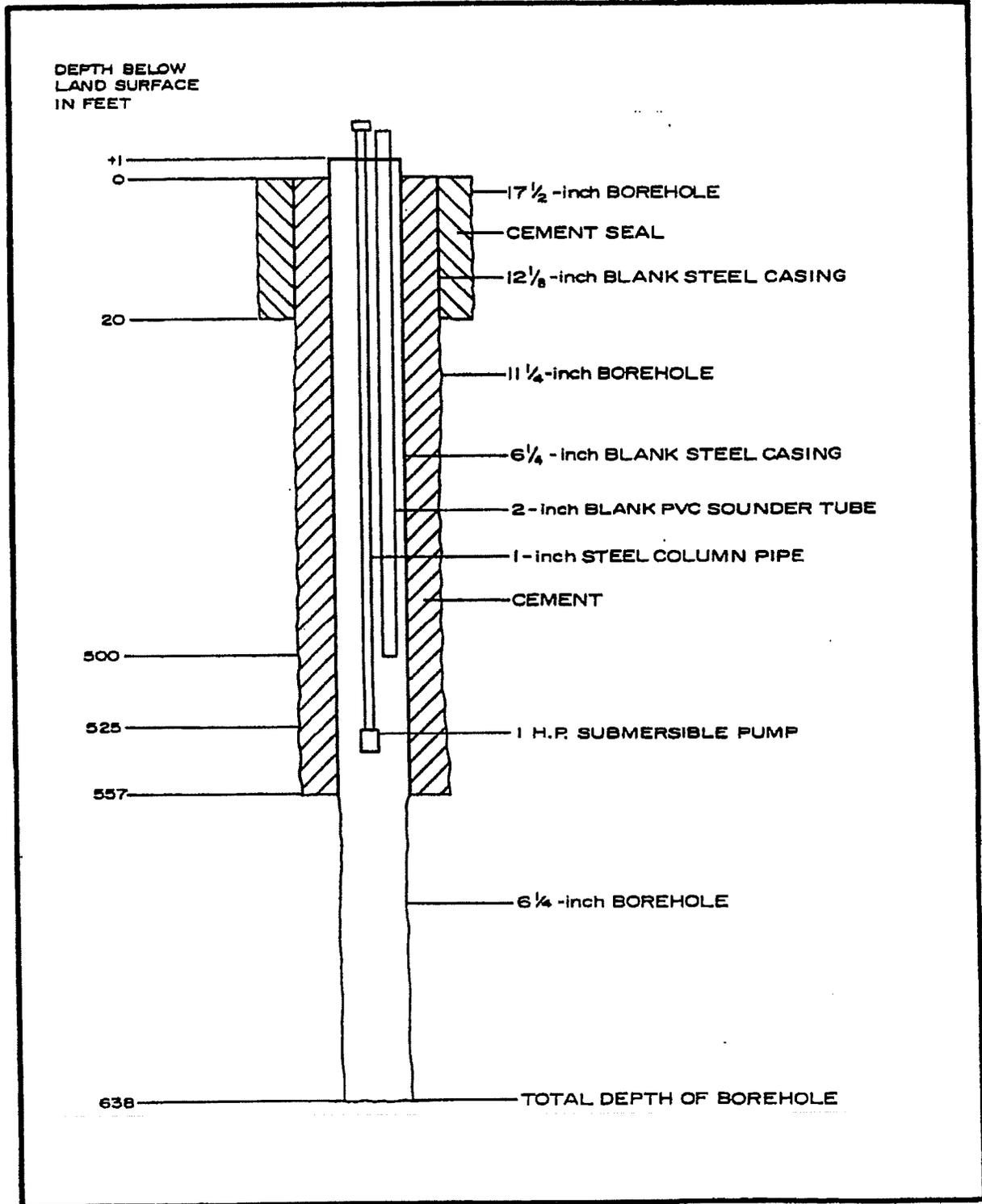


FIGURE E-78
SCHEMATIC DIAGRAM OF MONITOR WELL RD-54C

TABLE A-157

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57

LITHOLOGY		FRACTURES				COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (Inches)	TYPE		
		TOP	BOTTOM				
3-380	Silty Sandstone	Light yellow brown, fine grained, some medium grained, slightly micaceous, moderately graded, dense to very dense, moderate cementation, non-calcareous, slightly moist.	24			bedding plane?	
			26			bedding plane	
			27			bedding plane	
			28			bedding plane	
			29			bedding plane	
			44			bedding plane	
		@ 10' moderately to well graded.	64.1	64.6	1/8	structural?	
		@ 16' moderately graded, dense.	64.9	85.4	1/16	structural	
			69.7	70.0		bedding plane?	
		@ 18' some coarse sand, well graded, moderately to strongly calcareous.	70.5	70.9	1/16 - 1/8	structural?	
			84.6	85.1	1/8	structural?	
			87.6	93.9	0 - 1/8	structural	fracture zone
		@ 20' fine grained, poorly graded, slightly clayey, low plasticity, non-calcareous to weakly calcareous, moderate cementation, slightly moist to moist.	101.5	101.8	0 - 1/16	structural	fracture zone
			108.6	111.1	0 - 1/8	structural	fracture zone
			114.3	115.0	0 - 1/16	structural	fracture zone
			123.4	124.2	0 - 3/16	structural	fracture zone
			136.4	137.1	closed	structural	
		@ 28' No clay, moderately to poorly graded, moderately calcareous, slightly moist.	150.6	151.17	1/8	structural	
			152.4	154.4	0 - 3/16	structural	fracture zone
			179.5	180.1	closed	structural?	
		@ 31' very silty, poorly graded.	207.8	208.6	1/16 - 1/4	structural	fracture zone
			209.7	211.0	0 - 1/16	structural?	fracture zone?
		@ 32' very fine grained, very silty, clayey, moderate plasticity, moderate to strong cementation, strongly calcareous, harder, dry.	211.3	212.7	1/16 - 1/8	structural	fracture zone
			213.3	213.7	1/8 - 3/4	structural	largest fracture
			217.3	218	0 - 1/16	structural?	
			231.4			bedding plane?	
		@ 41' very pale brown, clay absent or minor, no plasticity, moderate to strong cementation.	232.4	233.6	1/16	structural	
			238.1	240.0		stratigraphic	blebs
			242.8	244.3		bedding plane?	
		@ 46' light yellow brown.	249.0			bedding plane?	
	267.4	269.1		bedding plane?			
@ 50' moderate cementation, moderately to strongly calcareous, slightly moist.	270.1			bedding plane?			
	270.5	272.5	0 - 1/4	structural	fracture zone		
	273.6	274.4		stratigraphic	blebs or bedding		
@ 55' moderate to strong cementation, strongly calcareous, damp.	281.4	281.9	closed	structural			
	283.4	283.77	closed	structural			
	285			bedding plane?			
@ 58' very pale brown, predominantly fine grained, some medium grained, moderately to poorly graded, dry.	286.2	287.0	closed	structural?			
	296.8	297.3	closed	structural			
	308.2	308.6		bedding plane?			

TABLE A-157
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57

LITHOLOGY		FRACTURES			COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (Inches)		TYPE
		TOP	BOTTOM			
3-380 cont'd	Silty Sandstone	@ 72' slightly moist to moist.	314.4	314.7		bedding plane
			322.0	322.3		bedding plane?
		@ 74' light grey, some medium grained sand, moderately to poorly graded, dense to very dense, strong cementation, slightly moist.	329.1	329.5		bedding plane?
			330.5	330.8		bedding plane?
			332.7	333.2		bedding plane?
			336.8	337.1	0 - 1/16	structural
		@ 78' light brown grey, no to low plasticity.	343.2	343.8	0 - 1/16	structural
			347.0	347.4		bedding plane
		@ 82' light grey, no clay, poorly graded, dense, no plasticity, moderate cementation.	349.47	351.87	1/16 - 1/8	structural
			352.6	352.9	0 - 1/16	structural
			355.77	356.6	1/16	structural
		@ 89' light yellow brown, moist.	360.1			bedding plane?
			360.9	361.3		bedding plane?
		@ 91' light grey, minor clay, no to low plasticity.				
			363.0		0 - 1/16	structural?
		@ 96' no clay, no plasticity, moderate to strong cementation.	364.3		0 - 1/16	structural
			364.6			bedding plane
		@ 97' slightly moist to moist.	365.8	366.47	0 - 1/16	structural
			366.9	367.2	0 - 1/16	structural
		@ 102' slightly moist.	368			
@ 109' dry.						
@ 114.5' light yellow brown, slightly clayey, compact to dense, low plasticity, moderate cementation, slightly moist to moist.						
@ 120' light grey, dense, no plasticity, moderate to strong cementation.						
@ 122' slightly harder, dense to very dense.						
@ 130' slight increase in moisture.						
@ 141' moisture decreases.						
@ 149' very strongly calcareous, strong cementation, dry.						

TABLE A-157
 (continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57

LITHOLOGY		FRACTURES			COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (Inches)		TYPE
		TOP	BOTTOM			
3-380 cont'd	<p>@ 154' grey, slightly moist to moist.</p> <p>@ 156' slightly clayey, low plasticity.</p> <p>@ 160' less silty, moderately to strongly calcareous, dense, no plasticity, moist.</p> <p>@ 188' strongly calcareous.</p> <p>@ 180' slightly moist.</p> <p>@ 181' moist.</p> <p>@ 190' trace of clay, no to low plasticity, moderately calcareous.</p> <p>@ 193' slight decrease in moisture.</p> <p>@ 198' no clay, some medium grained sand, moderately to poorly graded, no plasticity, strongly calcareous.</p> <p>@ 200' light grey, very fine grained, very silty, minor clay, poorly graded, no to low plasticity, moderately calcareous.</p> <p>From 204 to 205.5' clayey, strongly calcareous, dry.</p> <p>@ 205.5' slightly moist.</p> <p>@ 210' grey.</p> <p>@ 217' dry, no plasticity.</p> <p>@ 219' slightly moist, no to low plasticity.</p> <p>@ 228' damp, no plasticity.</p> <p>@ 230' slightly moist.</p>					

TABLE A-157
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57

LITHOLOGY		FRACTURES			COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)		TYPE
		TOP	BOTTOM			
3-380 cont'd	<p>@ 236' clayey, low to medium plasticity, damp.</p> <p>@ 240' no to low plasticity.</p> <p>@ 243' dry.</p> <p>@ 250' damp, no plasticity.</p> <p>@ 256' slightly moist.</p> <p>@ 270' slightly moist to moist.</p> <p>@ 272' moist.</p> <p>@ 274' damp.</p> <p>@ 275' slightly moist, low plasticity.</p> <p>@ 308' no to low plasticity, moderate cementation, moderately to strongly calcareous, slightly moist to moist.</p> <p>@ 316' moderately calcareous, no plasticity.</p> <p>@ 326' moderately to strongly calcareous.</p> <p>@ 340' moderate to strong cementation, strongly calcareous.</p> <p>@ 350' moderate cementation, moderately to strongly calcareous.</p> <p>From 357 to 359' fractures.</p> <p>From 357 to 358' dry.</p> <p>@ 358' slightly moist to moist.</p> <p>From 365 to 375' no cutting returns.</p>					

TABLE A-157
(continued)

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57

LITHOLOGY		FRACTURES			COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)		TYPE
		TOP	BOTTOM			
380-419	<p>Sandstone</p> <p>Fine to medium grained, slightly silty, moderately graded, subangular and subrounded, dense, weak to moderate cementation, weakly calcareous, damp.</p> <p>@ 388' very silty, fine grained only, poorly graded, clayey, moderate cementation, moderately to strongly calcareous, slightly moist.</p> <p>@ 390' strongly calcareous.</p> <p>@ 396' moderate plasticity.</p> <p>@ 400' some medium grained sand, trace of coarse, possibly less silt, weakly to moderately calcareous.</p> <p>@ 406' non-calcareous to weakly calcareous.</p> <p>From 410 to 415' some silty and sandy claystone layers.</p>	381 390.8 412 415.5 417.2	391.3		<p>bedding plane?</p> <p>stratigraphic</p> <p>bedding plane?</p>	<p>visibility decreases</p> <p>bit marks?</p> <p>blobs</p> <p>bottom</p>
TOTAL DEPTH OF BOREHOLE: 419				TOTAL VIDEO LOG DEPTH: 419		

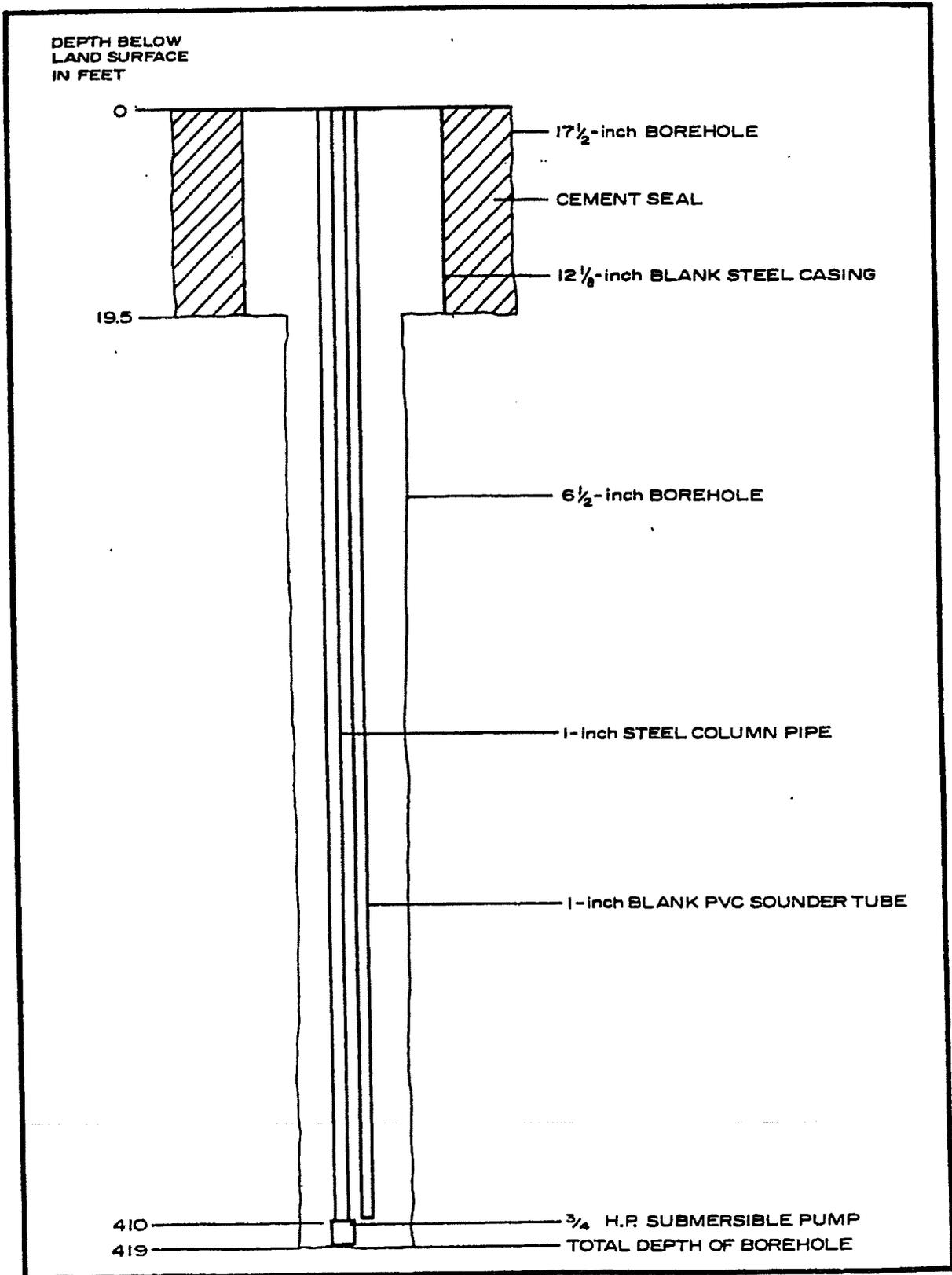


FIGURE E-82
SCHEMATIC DIAGRAM OF MONITOR WELL RD-57

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-161

LITHOLOGIC LOG OF MONITOR WELL RD-59A

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 2	TOPSOIL - CLAYEY SAND	Dark brown, fine grained, silty, poorly graded, subangular, subrounded, compact, high plasticity, slightly moist.
2 - 58	CLAYEY SANDSTONE	<p>Yellow brown, very fine grained, poorly graded, subangular, subrounded, compact to dense, medium to high plasticity, strongly calcareous cementation, laminated.</p> <p>@ 10' light brown grey, fine grained, minor medium grains, poorly to moderately graded, dense, medium plasticity, weak calcareous cementation, dry.</p> <p>@ 20' light grey, siltier, increased percentage of fine and very fine grains, poorly graded, low to medium plasticity.</p> <p>@ 22' dark grey to dark grey brown, no calcareous cementation, very moist.</p> <p>@ 26' brown, fine to very fine grained, trace medium grained, medium plasticity, moist to slightly moist.</p> <p>@ 29' strong calcareous cementation.</p> <p>@ 30' light grey to light brown grey, very fine grained, medium to high plasticity.</p> <p>@ 35' moderate calcareous cementation.</p> <p>From 38' to 41.5', no cuttings return, wet.</p> <p>@ 43' dark grey, fine grained, medium plasticity, moist to slightly moist.</p> <p>@ 45' grey.</p> <p>@ 48.5' dense to very dense, moderate calcareous cementation.</p> <p>@ 50' medium to high plasticity.</p> <p>@ 52' fine to very fine grained.</p>

TOTAL DEPTH OF BOREHOLE: 58 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

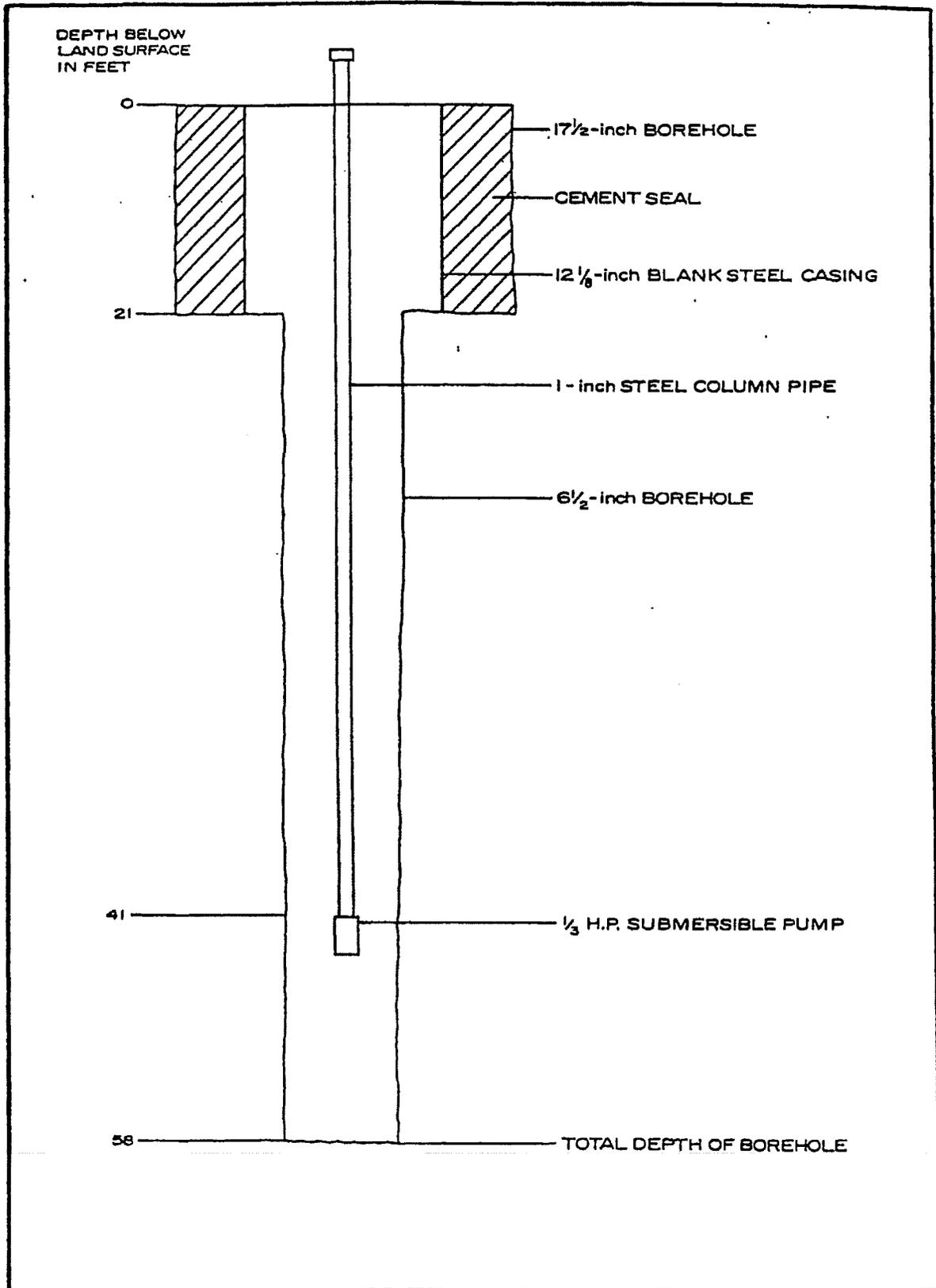


FIGURE E-86
SCHEMATIC DIAGRAM OF MONITOR WELL RD-59A

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-162

LITHOLOGIC LOG OF MONITOR WELL RD-59B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 15	SILTSTONE/ CLAYSTONE	Olive brown, fine grained, some fine sandstone, poorly graded, compact to dense, medium to high plasticity, laminated, uncemented, slightly moist. @ 10' olive brown to light yellow brown, interbedded siltstone/claystone and fine grained sandstone, subangular and subrounded, dense, weak, calcareous cementation.
15 - 53	CLAYEY SANDSTONE	Light yellow brown, very fine grained, some siltstone/claystone, high plasticity, strong calcareous cementation, moist. @ 20' dark grey brown, slightly moist. @ 24' one-half foot thick claystone bed. @ 27' moderate to strong calcareous cementation, slightly moist to moist. @ 30' grey. @ 32' increase in fines. @ 38.5' very moist. @ 40' dark grey brown, fine to very fine grained, very dense, strong calcareous cementation. @ 41.5' decrease in fines, dense. @ 44' wet. @ 47' grey and brown clayey sandstone and shale/claystone sandstone, sandstone strongly calcareous, shale weakly calcareous. @ 51' predominantly clayey sandstone, some siltstone/claystone and shale.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-162
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-59B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
53 - 214	<p>SILTY SANDSTONE</p> <p>Fine grained, trace medium grained, some clay, low plasticity, weak to no calcareous cementation.</p> <p>@ 55' very fine grained, continued interbedded siltstone/claystone.</p> <p>@ 61' Grey, very fine grained, silty, poorly graded, subangular and subrounded, dense, medium plasticity, moderate calcareous cementation.</p> <p>@ 77' fine to very fine grained.</p> <p>@ 80' very fine to medium grained, trace coarse grained, well graded, angular to subangular and subrounded, strong calcareous cementation.</p> <p>@ 84' less coarse grained, moderately graded, moderate calcareous cementation.</p> <p>@ 88' fine to very fine grained, trace medium, poorly graded.</p> <p>@ 100' increase in medium grains, moderately to poorly graded, some shaley partings.</p> <p>@ 108' grey brown sandstone, very fine grained, poorly graded, strong calcareous cementation, interbedded with dark grey shale.</p> <p>@ 115' less shale.</p> <p>@ 122' grey silty clayey sandstone, very fine grained, some fine grained.</p> <p>From 136-138' dark grey shale, brown claystone and sandy clay, dense to very dense.</p> <p>From 138-138.5' very dense.</p> <p>@ 139' dense to very dense.</p> <p>From 146-146.5' dark grey shale.</p> <p>@ 150' fine to very fine grained.</p> <p>@ 155' dense.</p>

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-162
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-59B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
53 - 214 (cont'd)	<p>SILTY SANDSTONE</p> <p>From 171-171.5' dark grey shale and brown clay, moderate to strong calcareous cementation.</p> <p>@ 175' some medium grained sand, moderately to poorly graded.</p> <p>From 180-182' beds of dark grey and brown shale and clay, strong calcareous cementation.</p> <p>@ 185' moderate to strong calcareous cementation.</p> <p>@ 192' fine to very fine grained, poorly graded, strong calcareous cementation.</p> <p>@ 200' moderate to strong calcareous cementation.</p> <p>@ 205' some fine grained.</p> <p>@ 213' fracture.</p>

TOTAL DEPTH OF BOREHOLE: 214 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

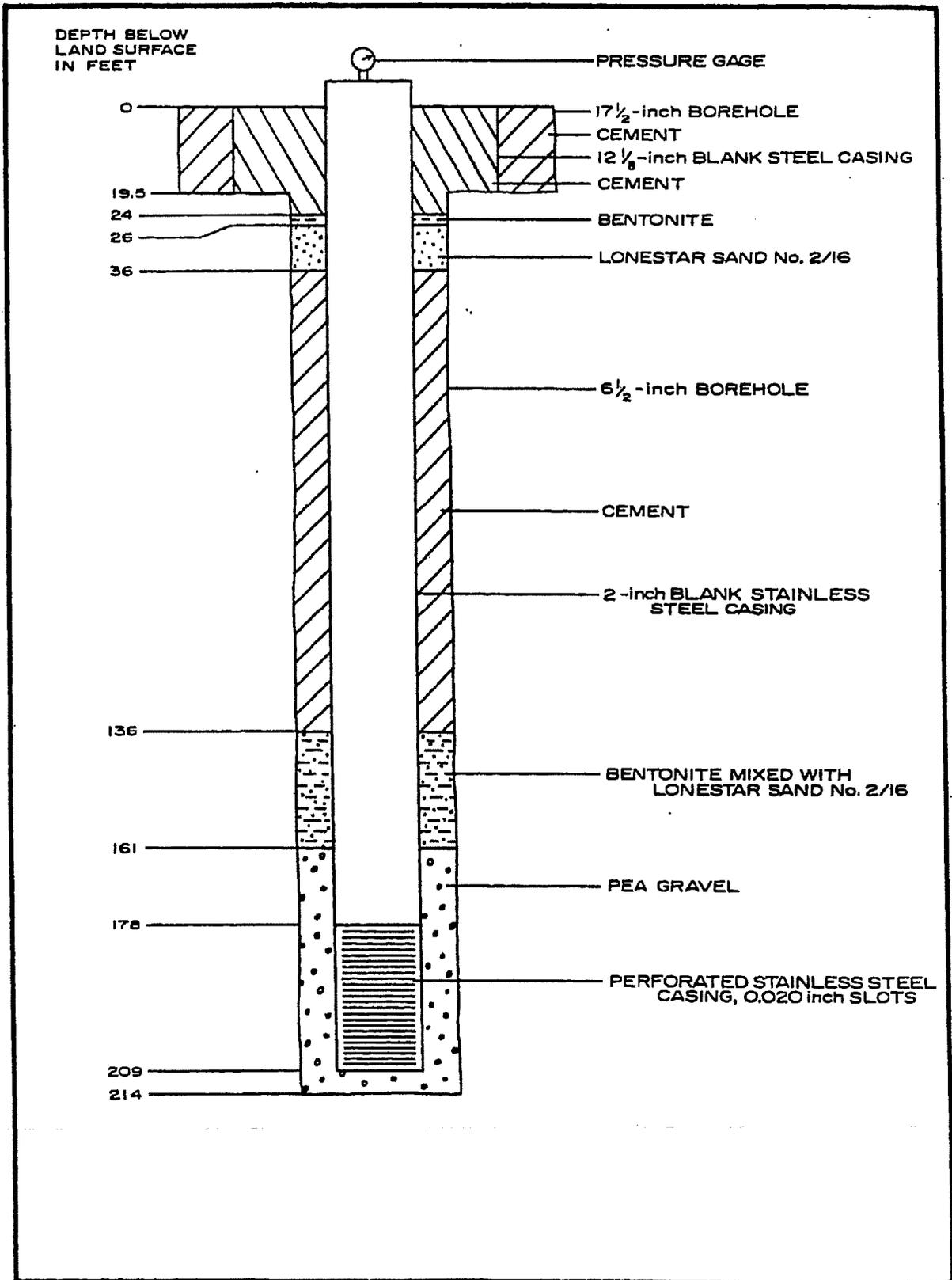


FIGURE E-87
SCHEMATIC DIAGRAM OF MONITOR WELL RD-59B

TABLE A-163

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-59C

LITHOLOGY		FRACTURES				COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE		
		TOP	BOTTOM				
0 - 90	Sandstone/ Clayey Sandstone	<p>Light yellow brown, silty, very fine grained, poorly graded, angular to subangular and subrounded, dense, medium plasticity, weak to no calcareous cementation, laminated locally, micaceous, slightly moist.</p> <p>@ 8' some dark brown siltstone (thin beds).</p> <p>@ 11' light grey, harder, fine to very fine grained, trace of medium grains, moderately to poorly graded, subangular and subrounded, dense to very dense, moderate to strong calcareous cementation.</p> <p>@ 15' low plasticity.</p> <p>@ 19' grey brown, poorly graded, high plasticity, moderate calcareous cementation, wet to moist.</p> <p>@ 25' clayey sandstone, very fine with trace of fine grained.</p> <p>@ 31' hard, very dense.</p> <p>@ 39' light grey, increase in fines, very fine grained, poorly graded, medium to high plasticity, moderate to strong calcareous cementation, slightly moist.</p> <p>@ 43' increase in fines.</p> <p>@ 64' decrease in fines, some fine grained, medium plasticity.</p> <p>@ 67' strong calcareous cementation.</p> <p>@ 78' wet.</p> <p>@ 85' grey, fine to medium grained, moderately graded, moderate calcareous cementation.</p>	24	25	1/16 - 1/4	Bedding	<p>Multiple bedding planes?</p> <p>Multiple fractures, highly fractured zone</p> <p>Possible bedding plane fractures</p> <p>Two fractures</p> <p>Multiple fractures, partially filled</p>
			30	31	1/16 - 1	Structural	
			45	---	?	Bedding	
			54	55	1/16 - 1/8	Structural	
			58	59	1/16 - 1/8	Structural	
			65	66	filled	Structural	
			75	76	1/16 - 1/8	Structural	
			84	85	filled	Structural	
			88	90	1/16 - filled	Structural	

TABLE A-163
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-59C

LITHOLOGY			FRACTURES			COMMENTS		
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (Inches)	TYPE			
		TOP	BOTTOM					
90 - 93	Silty Sandstone	Low to no plasticity, very moist.		92	97	1/16 - filled	Structural	Multiple fractures
93 - 110	Silty and Clayey Sandstone	<p>Dark gray, fine to very fine grained, poorly to moderately graded, medium to high plasticity, moderate to strong calcareous cementation, moist.</p> <p>@ 95' trace medium grained, some rounded, poorly graded.</p> <p>@ 98' strong calcareous cementation.</p> <p>@ 99' some clayey siltstone/shale, dense, no calcareous cementation.</p> <p>@ 104' clayey siltstone/shale plug, wet.</p> <p>@ 108' very dense.</p>		108	---	1/16	Structural	Bisecting fractures, low angle
110 - 135	Clayey Siltstone/ Shale and Clayey Sandstone	<p>Dark grey and grey, predominantly very fine to fine grained, trace medium grained, dense, weak to no calcareous cementation, wet.</p> <p>@ 114' very dense.</p> <p>@ 120' dense.</p> <p>@ 122' moderate to strong calcareous cementation.</p> <p>@ 125' strong calcareous cementation.</p>		119 127	120 ---	1/4 - 1/2 1/16	Bedding? ?	Fracture zone, irregular

TABLE A-163
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-59C

LITHOLOGY		FRACTURES				COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE		
		TOP	BOTTOM				
135 - 398	Clayey Silty Sandstone	Grey, fine to very fine grained, medium plasticity.	135	135.5	1/16	Bedding	Weak zone (1-2 inches) Weak zone (1/2-inch) Weak zone (8-inches) possibly bedding plane fractures Multiple fractures, bedding/structural Horizontal Multiple fractures Multiple fractures Multiple fractures Large void, highly fractured zone Large void, highly fractured zone
		@ 138' dense to very dense.	138	138.5	1/16 - 1/4	Bedding	
		@ 142' trace medium gravel.	142	143	?	Bedding	
		@ 145' trace medium gravel.	148.5	149	?	Bedding	
		@ 147' very fine to medium grained, poorly to moderately graded.	158	158.5	?	Bedding?	
		@ 152' fine to very fine grained, poorly graded.	171	?	?	Bedding	
		@ 162' few shaley partings.	178	178.5	1/16	Structural	
		@ 174' increase in very fine grained sand.	179	180	1/8 - 1/4	?	
		@ 180' few thin clay beds.	185	186	1/16 - 1/4	?	
		@ 206.5' fracture.	189	---	1/2	Structural	
		@ 224' decrease in very fine grained sand, very fine to medium grained, moderately poorly graded.	190.5	194	1/16 - 1/2	Structural	
		@ 225' fine to very fine grained, moderate calcareous cementation.	197	198	1/16	Structural	
		@ 230' predominantly very fine grained, poorly graded.	198	199	filled - 1/16	Structural	
		@ 241' harder, very dense, strong calcareous cementation.	200	201	1/16 - 1/4	Structural	
		@ 244' shaley partings.	213.5	214	1/16 - 1/4	Structural	
		@ 248' increase in very fine grained, low to medium plasticity.	217	220	large void	Structural	
		@ 250' fine to very fine grained, trace medium grained.	225	227	large void	Structural	
		@ 252' no medium grained, moderate calcareous cementation.					

TABLE A-163
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-59C

LITHOLOGY			FRACTURES			COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (Inches)	TYPE	
		TOP	BOTTOM			
135 - 398 (cont'd)	Clayey Silty Sandstone					
	<p>From 266.5-267' increased clay content, medium plasticity.</p> <p>@ 274.5' possible fracture.</p> <p>@ 299.5' possible fracture.</p> <p>@ 325' moderate to strong calcareous cementation.</p> <p>@ 335' weak to moderate calcareous cementation.</p> <p>@ 340' strong calcareous cementation.</p> <p>@ 355' increase in fines, medium plasticity.</p> <p>From 360-365' shaley partings.</p> <p>@ 368' decreasing fines, low to medium plasticity.</p> <p>@ 370' moderate calcareous cementation.</p> <p>@ 375' moderate to strong calcareous cementation.</p> <p>@ 383.75' possible fracture.</p> <p>@ 387' possible fracture.</p> <p>@ 390' increasing fines, medium plasticity.</p> <p>@ 392' decrease in fines, low to medium plasticity.</p> <p>@ 395' weak to moderate calcareous cementation.</p>					

TOTAL DEPTH OF BOREHOLE: 398 FEET

TOTAL VIDEO LOG DEPTH: 227 FEET

NOTE: Unsafe to video log below 227 feet due to potential falling rock.

GROUNDWATER RESOURCES CONSULTANTS, INC.

GROUNDWATER RESOURCES CONSULTANTS, INC.

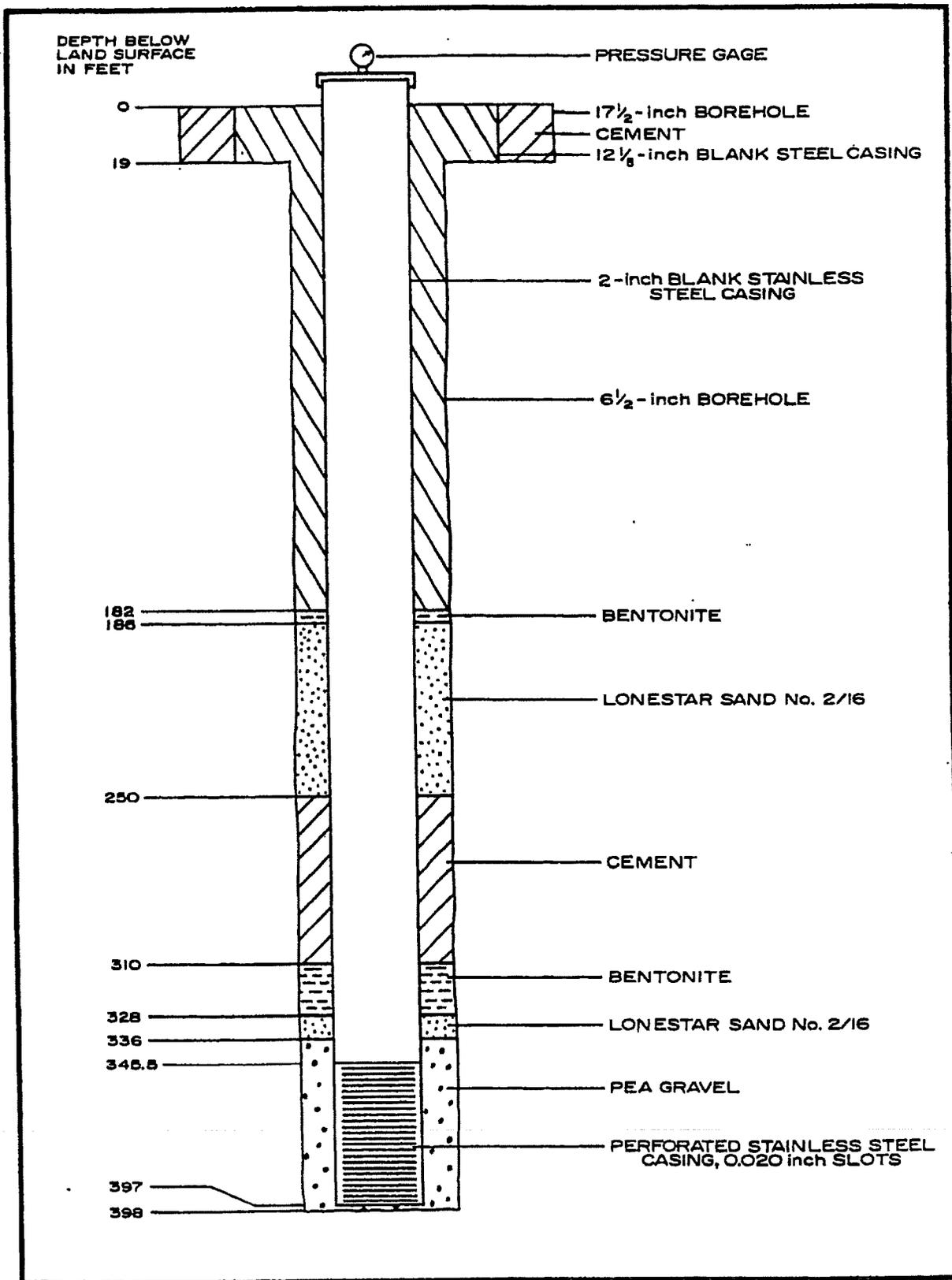


FIGURE E-88
SCHEMATIC DIAGRAM OF MONITOR WELL RD-59C

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-167

LITHOLOGIC LOG OF MONITOR WELL RD-63

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 46	SILTY SANDSTONE	<p>Yellow brown, fine to very fine grained, trace medium grained, very weathered, clayey, poorly graded, subangular to angular and subrounded, compact, non-calcareous, moist.</p> <p>@ 3' moderate plasticity.</p> <p>@ 5' light yellow brown.</p> <p>@ 8' compact to dense, slightly moist to moist.</p> <p>@ 18.5' wet.</p> <p>@ 20' moist.</p> <p>@ 24' weakly to moderately calcareous.</p> <p>@ 25' grey and brown grey, strongly calcareous.</p> <p>@ 33' increased percentage of fines, very fine grained sand.</p> <p>@ 36' brown and grey brown, very moist.</p> <p>@ 36.5' fracture.</p> <p>@ 37' fine and medium grained, moderately graded.</p> <p>@ 42' yellow brown, moderately calcareous.</p>
46 - 50	CLAYEY SANDSTONE	<p>Very fine grained, increased percentage of clay fines, poorly graded, high plasticity.</p> <p>@ 48' wet.</p>
50 - 115	SANDSTONE	<p>Dark grey and dark yellow brown, fine grained, dense, weakly to moderately calcareous.</p> <p>@ 51' no to low plasticity.</p> <p>@ 66' yellow brown and dark grey brown.</p> <p>@ 70' dark grey, dark yellow brown, grey and yellow brown.</p> <p>@ 80' predominantly grey, some yellow brown.</p>

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-167
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-63

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
50 - 115 (cont'd)	SANDSTONE	<p>@ 85' strongly calcareous.</p> <p>@ 90' grey.</p> <p>@ 100' grey and yellow brown, weakly to strongly calcareous.</p> <p>@ 103' grey.</p> <p>From 108 to 109.5' very dense, strongly calcareous.</p> <p>@ 109.5' some medium and coarse grained sand, moderately to well graded, dense, moderately calcareous.</p>
115 - 140	SILTY SANDSTONE	<p>Fine grained, some medium grained, very micaceous, clayey, poorly to moderately graded, high plasticity, weakly to moderately calcareous.</p> <p>@ 120' strongly calcareous.</p> <p>@ 121' possible fracture, poorly graded.</p> <p>From 126.5 to 127' harder.</p> <p>@ 127' softer, low to moderate plasticity.</p> <p>@ 130' weakly to moderately calcareous.</p>
140 - 141.5	SILTSTONE/ CLAYSTONE	Black, non-calcareous.
141.5 - 181	SILTY SANDSTONE	<p>Light grey to grey.</p> <p>@ 151.5' possible small fracture.</p> <p>@ 175' fine to medium grained, moderately calcareous.</p>
181 - 188.5	SILTSTONE/ CLAYSTONE	Black, some fractures, compact to dense, non-calcareous.
188.5 - 190	SILTY SANDSTONE	Dense.
190 - 191	SILTSTONE/ CLAYSTONE	Black, compact to dense.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-167
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-63

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
191 - 230	SILTY SANDSTONE	Grey, fine grained, dense, moderately to strongly calcareous. @ 219' strongly calcareous. @ 225' moderately to strongly calcareous. @ 227.5' fracture.

TOTAL DEPTH OF BOREHOLE: 230 FEET

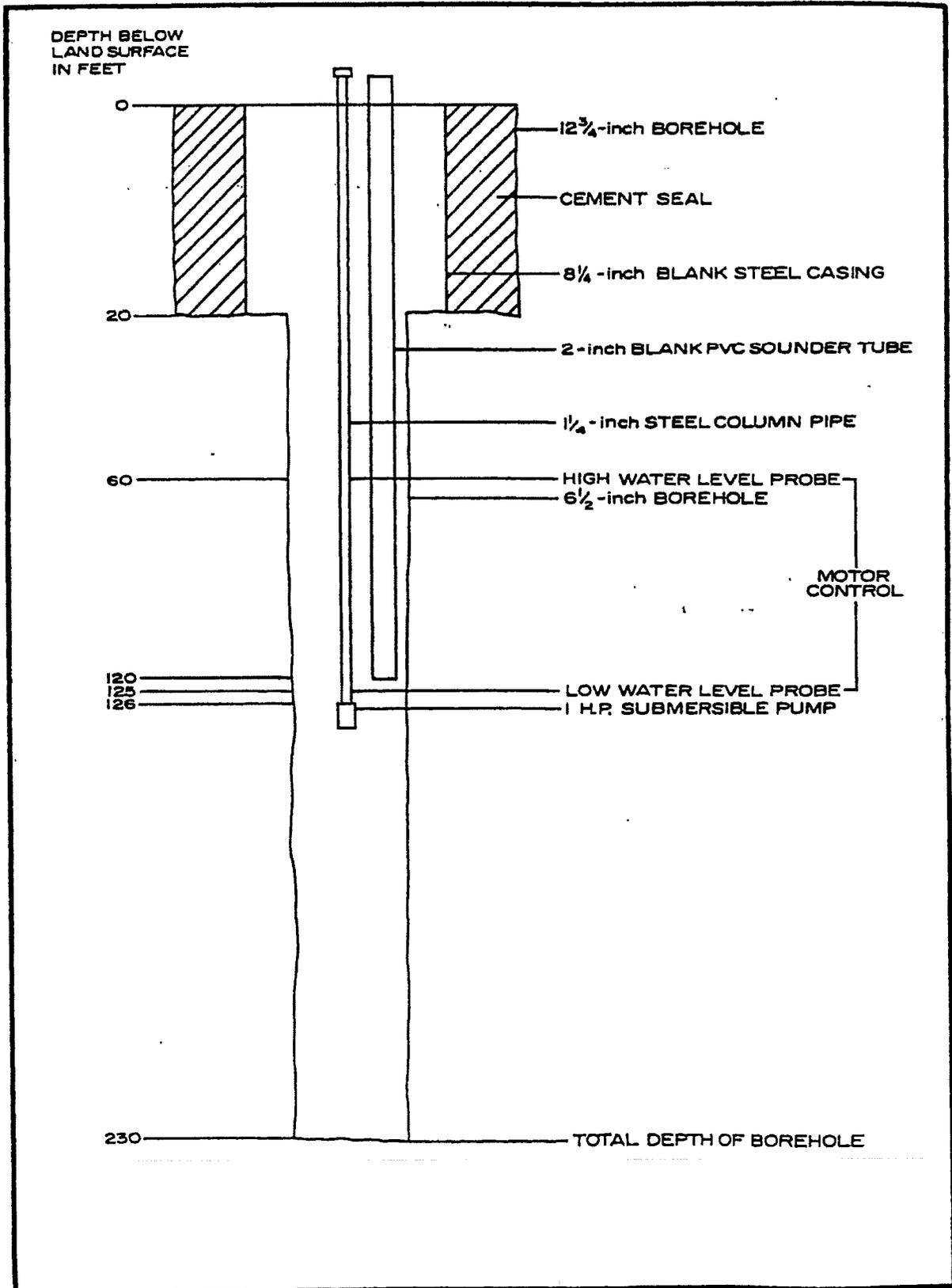


FIGURE E-92
SCHEMATIC DIAGRAM OF MONITOR WELL RD-63

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-168

LITHOLOGIC LOG OF MONITOR WELL RD-64

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 5	CLAYEY SAND	Dark brown, fine to medium grained sand, compact, low plasticity, no cementation, moist.
5 - 21	SILTY SANDSTONE (weathered)	<p>Tan, fine-grained, some medium to coarse grained, moderately graded, dense, no plasticity, weak to moderate calcareous cementation, slightly moist.</p> <p>@ 13' dry, color changing to yellowish grey and grey, density increasing, slightly calcareous.</p> <p>@ 15' grey, moderately graded, dense to very dense, no plasticity, moderate cementation, slightly calcareous dry.</p> <p>@ 19' yellow grey, slightly moist.</p>
21 - 398	SILTY SANDSTONE	<p>Medium grey, dry, fine grained, dense to very dense, contains some medium and coarse grained sand.</p> <p>@ 37' light grey, slight increase in grain size, calcareous.</p> <p>@ 45' possible fractures.</p> <p>@ 50' coarse sand to gravel sized clasts, very dense.</p> <p>@ 68' coarse sand.</p> <p>@ 70' finer grained.</p> <p>@ 82' slightly coarser grained, calcareous.</p> <p>From 111 to 113', very dense, hard.</p> <p>From 132 to 140', very light grey, very dense and hard, calcareous.</p> <p>@ 140' light grey, slightly calcareous.</p> <p>@ 160' some very coarse sand grains.</p> <p>From 166 to 173', possible fracture zone.</p> <p>@ 172' very slightly moist.</p> <p>From 182 to 184', light grey, very coarse sand, some fine gravel clasts, slightly moist.</p>

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-168
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-64

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
21 - 398 (cont'd)	<p>SILTY SANDSTONE</p> <p>@ 188' very fine to fine grained.</p> <p>@ 196' dry.</p> <p>From 201 to 206', decreased density.</p> <p>@ 248' very dense and hard, calcareous.</p> <p>@ 255' very light grey, fine to medium grained, very slightly moist.</p> <p>@ 264' possible fracture.</p> <p>@ 270' light grey, increased silt content.</p> <p>@ 273' Yellowish grey, fine to medium grained, calcareous.</p> <p>@ 276' light grey.</p> <p>@ 294' very dense and hard.</p> <p>@ 360' slightly moist.</p> <p>@ 370' dry.</p> <p>@ 375' very dense and hard.</p> <p>@ 380' increase to medium grained, slightly moist.</p> <p>@ 382' possible fracture.</p> <p>@ 386' dry.</p> <p>@ 390' very light grey, very fine to fine grained.</p> <p>@ 398' dry.</p>

TOTAL DEPTH OF BOREHOLE: 398 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

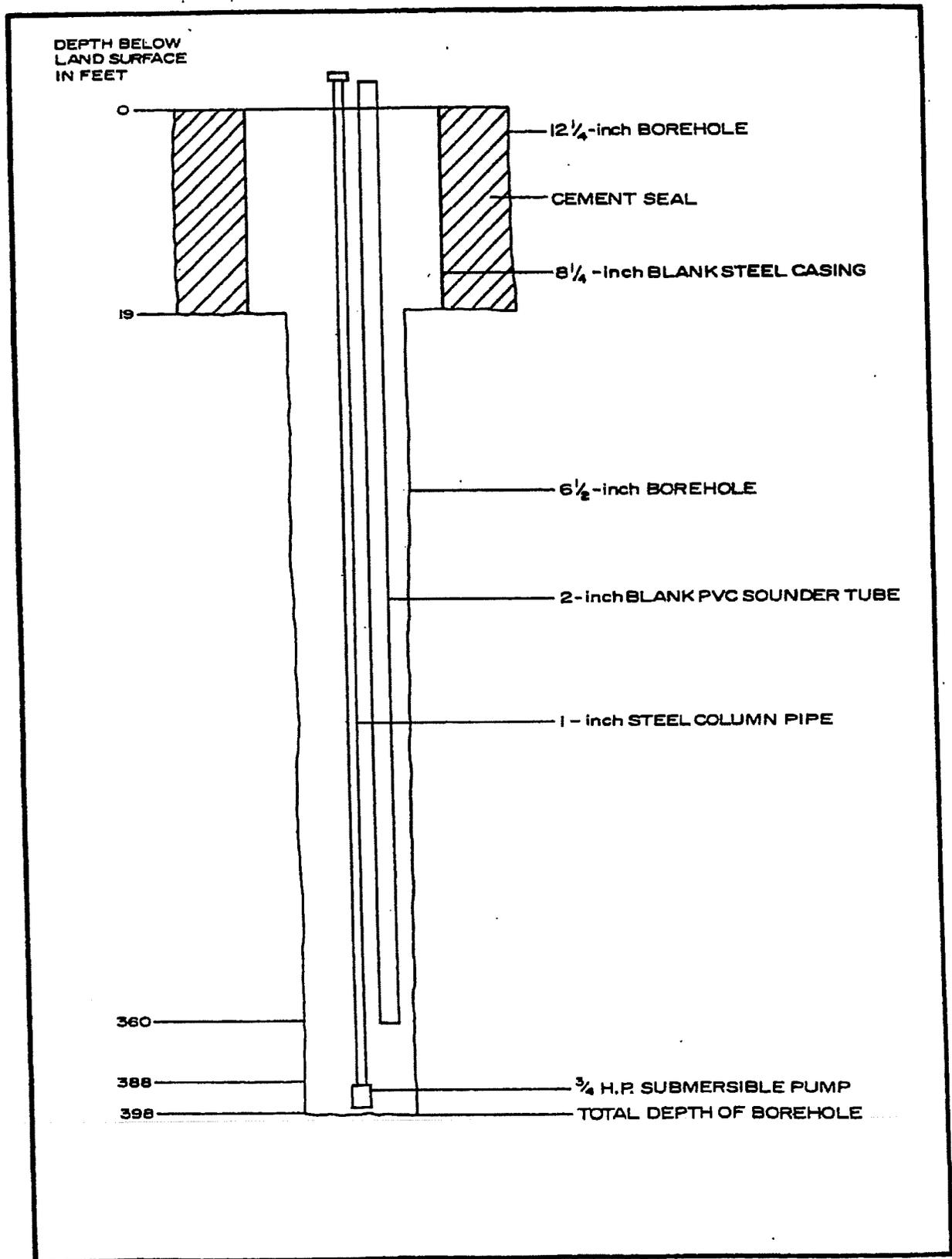


FIGURE E-93
SCHEMATIC DIAGRAM OF MONITOR WELL RD-64

TABLE A-169

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-65

LITHOLOGY		FRACTURES				COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (Inches)	TYPE	
		TOP	BOTTOM			
0 - 5	SANDY CLAY	Dark brown, firm, dry.				
5-397	SANDSTONE	28.5	27.5	0 - 1/8	Structural	Borehole walls muddy to 212 feet.
	Light yellow brown, dry, fine to very coarse grained, dense, noncalcareous.	28.9			Bedding?	
	@ 20' some very light grey sandstone, harder.	36.0	36.5		?	
		38.0			Bedding	
	@ 23' dense.	42.0			Bedding?	
		45.1			?	
	@ 24' very dense, hard, light grey, calcareous.	59.3		0 - 1/16	Structural	Fracture?
		62.6			?	
	@ 40' calcareous to noncalcareous.	63.9			Bedding	
		74.5			Structural?	Small open fractures? or mud cake cracks.
	@ 43' some yellow brown sandstone with mudstone partings.	102.2			Structural?	Small open fractures? or mud cake cracks.
		114.7			Bedding?	
	@ 45' very coarse grained, noncalcareous.	116.6			Bedding	
		158.8	159.2	0 - 1/16	Structural	Fracture?
	@ 47' light grey and light yellow brown, very fine to fine grained, silty.	159.5	160.0	0 - 1/8	Structural	Fracture?
		163.1		0 - 1/16	Structural	
	@ 50' light grey, calcareous, dense.					
	@ 63' medium to coarse grained; trace of mudstone.					
	From 71-75' light yellow brown, fine to medium grained.					
	@ 75' very light grey, very fine to fine grained, but some medium to coarse grained grains, contains some very dense, calcareous, very fine to fine grained silty sandstone.					
	@ 104' very fine to coarse grained.					
	@ 112' very fine to fine grained, silty.					

TABLE A-169
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-65

LITHOLOGY		FRACTURES				COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE		
		TOP	BOTTOM				
5-397 cont'd	SANDSTONE	@ 125' very calcareous.	184.3	164.6	0 - 1/16	Structural	Fracture?
		@ 142' fine to medium grained, calcareous, dense to very dense, very slightly moist.	169.3 170.5 172.1 190.4	172.5	0 - 1/16	Bedding? Bedding? Structural ?	Fracture? @ 185' walls mud-caked. Mud cake cracks? Fracture parallel to bedding.
		@ 156' dry.	196.5 207.5		0 - 1/16	Structural	
		@ 158' very coarse to coarse grained.	207.6 209.5		0 - 1/8	Structural	Fracture or reworking parallel to bedding.
		@ 159' soft zone (6"), moist.	210.7 211	217	0 - 1/16	Structural Bedding	As above. @ 212' borehole walls cleaner. @ 218' borehole walls muddy.
		From 160-161' possible fracture, moist, very fine to medium grained.	218.2 219 229.4	219.8 230 ±	0 - 1/16	Bedding Bedding Structural?	
		@ 163' very slightly moist, fine to medium grained, silty.	250 276.2 277.3		0 - 1/8 0 - 1/8	Structural? Structural Structural	
		@ 166' dry.	285.2 310.5			Structural? Structural?	Small cavity?
		From 171 to 172' sandy mudstone, brown grey, very fine to fine grained sand, calcareous.	312.2 313.0 314.3	315.2	0 - 1/4	Structural?	Fracture or reworking parallel to bedding.
		@ 172' sandstone, very light grey, dense, very fine to coarse grained.	315.5 317.1 319.5		0 - 1/16 0 - 1/8 0 - 1/16	Structural Structural? Structural	Fracture or mud cake cracks.
		@ 178' medium to coarse grained.	335.6 340.2		0 - 1/16 0 - 1/16	Structural Structural?	Fracture or mud cake crack.
		@ 185' very hard and dense, fine to very coarse grained, noncalcareous.					
		@ 190' noncalcareous to slightly calcareous.					
		@ 197' calcareous.					
		@ 204' very fine to fine grained, silty.					
		From 207 to 208' silty interbed grades to mudstone, soft.					

TABLE A-169
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-65

LITHOLOGY			FRACTURES			COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (Inches)	TYPE	
		TOP	BOTTOM			
5-397 cont'd	SANDSTONE	<p>From 209 to 210' soft zone or possible fracture; sandy mudstone, medium brown grey, slightly moist to moist.</p> <p>@ 211' silty sandstone, light grey, very fine to fine grained, dense, dry.</p> <p>@ 216' sandstone, light grey, very fine to coarse grained, calcareous, very dense.</p> <p>From 220' to 222' mudstone interbed, brown grey, trace of black asphalt or tarry.</p> <p>@ 222' sandstone, fine to coarse grained, light grey, very dense, calcareous.</p> <p>@ 228' predominantly medium grained.</p> <p>@ 248' slightly moist to very slightly moist.</p> <p>@ 258' moist, fine to medium grained, dense.</p> <p>@ 270' slightly moist.</p> <p>From 274.5 to 277.5' soft, possibly a fracture zone, moist.</p> <p>@ 279' some thin interbeds of brown grey mudstone partings or interbeds; sandstone is very fine to fine grained, medium light grey, calcareous, some silt, slightly moist.</p> <p>@ 292' very slightly moist to slightly moist.</p> <p>@ 299' coarse to medium grained.</p> <p>From 305 to 305.5' soft zone, possibly a fracture or silt interbed, slightly moist.</p>				

TABLE A-169
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-65

LITHOLOGY		FRACTURES			COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)		TYPE
		TOP	BOTTOM			
5-397 cont'd	<p>SANDSTONE</p> <p>From 316 to 317' possible fracture, moist, soft zone, very fine to medium grained, increase in silt, moist.</p> <p>From 319 to 322' very dense and hard, fine to coarse grained, vary slightly moist to dry.</p> <p>@ 323' slight increase in moisture, decrease in grain size, decrease in density.</p> <p>@ 325' increase in density, dry to very slightly moist.</p> <p>@ 338' slightly moist.</p> <p>@ 345' very dense and hard.</p> <p>@ 354' very slightly moist to dry.</p> <p>@ 369' dense and hard.</p> <p>@ 378' dry.</p> <p>@ 383' fine to coarse grained.</p>					@ 348.1' static water level. Camera did not log beneath water level. No visibility below.
TOTAL DEPTH OF BOREHOLE: 397'				TOTAL VIDEO LOG DEPTH: 348.2'		

GROUNDWATER RESOURCES CONSULTANTS, INC.

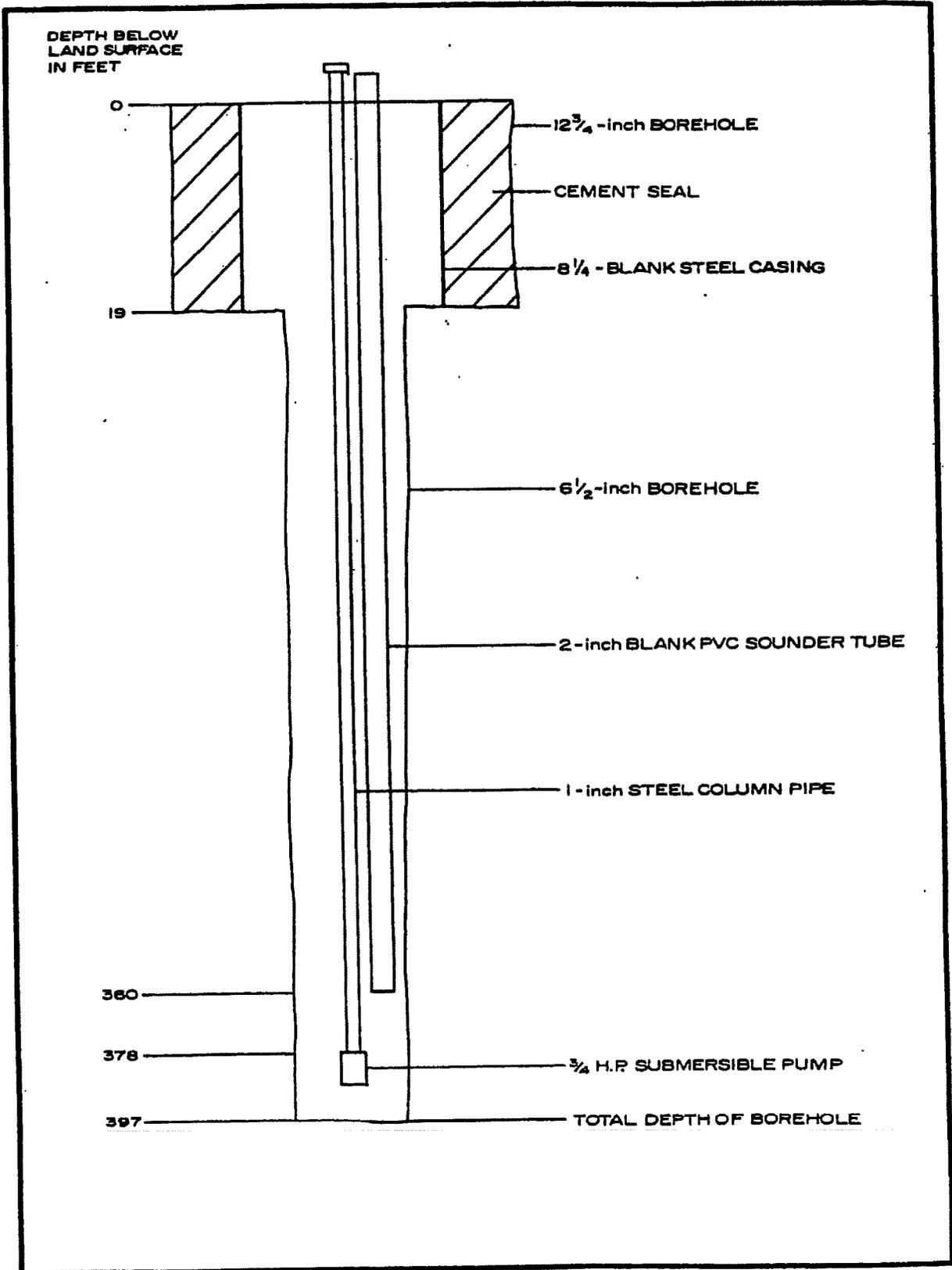


FIGURE E-94
SCHEMATIC DIAGRAM OF MONITOR WELL RD-65

TABLE 2

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-74

LITHOLOGY		FRACTURES				COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE	
		TOP	BOTTOM			
0 - 4	FILL	Dark yellow-brown; silty sand, slightly moist to moist, clayey sand, silty clay, asphalt and granite rock fragments, hard, well graded, compact, dense, low to medium plasticity.				
4 - 30	CHATSWORTH FORMATION SANDSTONE	Yellow brown, fine grained sand, hard, angular, subangular to subrounded grains, dense.				
		@ 7.5 - 8.5' dark brown to yellow-brown, moist to slightly moist, clayey, sandy siltstone or clayey and sandy silt (soil?).				
		@ 8.5' light olive brown sandstone, fine grained, weathered (oxidized), hard, some silt, less clay, weak reaction to HCl.				
		@ 15' fine to medium grained sand, medium gradation, weak reaction to HCl.				
		@ 20' fine grained, poor gradation, no reaction to HCl.				
		@ 25' fine to medium grained, medium gradation, no reaction to HCl.				
		@ 26 - 26.5' clayey siltstone, dark brown to light olive brown, moist to slightly moist.				
		@ 28 - 28.5' clayey siltstone, dark brown to light olive brown, moist to slightly moist.				
30 - 101	SANDSTONE	@ 30' fine grained sandstone, light olive brown to yellow brown, poor gradation, no reaction to HCl, moist from cementing?				At 29' bottom of 12" surface casing. Hole washed out below surface casing.
						Cobbles fallen in from fill above.
		31.5	32	0 - 1/8	Structural?	
		32	---			
		33	33.5	1/8 - 1/2	Structural	
		34	---	0 - 1/8	Bedding?	

TABLE 2

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-74

***** LITHOLOGY *****		***** FRACTURES *****				COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE		
		TOP	BOTTOM				
30 - 101 (cont'd)	SANDSTONE	@ 35' yellow brown, moist, fine grained, no reaction to HCl.	35.3	35.8	0 - 1/16	Structural	
			36	--	0 - 1/8	Bedding?	
			37	?	1/8 - 1/4	Structural? High angle	
			38	--	0 - 1/8	Low angle	
			38.5	--	0 - 1/8	Low angle	
			39.5	--	0 - 1/8	Bedding	
			39.8	--	0 - 1/8	Bedding	
		@ 40' no reaction to HCl.	40.1	40.5	0 - 1/8		
			42.5	--	0 - 1/16	Bedding	
			43	--	1/16	Low angle	
		@ 45' no reaction to HCl.	43.9	45	0 - 1/8	Bedding, multiple fractures, low angle	
			46.1	46.5	1/8	Structural	
			46.5	--	1/16	Structural	
			47.5	--	1/8	Low angle	
			48	--	1/16	Low angle	
			48.5	--	1/16	Low angle	
			48.6	--	1/16	Low angle	
		@ 50' no reaction to HCl.	49.3	--	1/16	Low angle	@ 50' water level in-video, poor visibility below water level.
		@ 53' very fine grained, silty and clayey, no reaction to HCl.	53.9	--	0 - 1/16	Low angle	
			54.8	--	0 - 1/16	Low angle	
	55.5	55.7	0 - 1/16	Structural			

TABLE 2

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-74

LITHOLOGY		FRACTURES				COMMENTS	
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE		
		TOP	BOTTOM				
30 - 101 (cont'd)	SANDSTONE		56	---	Sealed	Structural	
			57	---	1/8 - Sealed	Structural	
			58.8	---	1/8 - Sealed		
		@ 60' yellow brown, moist, silty and clayey, no reaction to HCl.	59	60.5	Sealed	Structural	
			61	63	Sealed - 1/16	Structural, high angle	
		@ 64' cuttings "clumping" - increase in moisture? no reaction to HCl.	63	65	1/16 - 1/8	Filled structural (multiple fractures)	
			66	66.9	1/16	Structural	
			---	69	Sealed	Structural	
			70.5	---	0 - 1/16	Structural, high angle	
			70.7	72.5	0 - 1/16	Structural, high angle	
			71	---	0 - 1/16	Structural, high angle	
		@ 75' light olive brown, no reaction to HCl.					
		@ 77' color change to light grey brown, less fines.	78.2	79	0 - 1/16	Bedding?	
		@ 80' light yellow brown, silty, less fines, no reaction to HCl.					
		@ 84' light olive brown.					
		@ 86 - 87' fracture.	85.5	86.3	6 (partially filled)	Calcite in-filled, vein-like	
		@ 87' increase in clay, very clayey, compact.	89	---	0	Low angle	
@ 91' some coarse sand to fine gravel in water, granitic, metamorphic, subrounded to subangular claystone fragments, olive brown water, wet.					First groundwater encountered during drilling, <1 gpm, not continuous.		
@ 94'					Less than 1 gpm of water being produced during drilling.		

TOTAL DEPTH OF BOREHOLE: 101 FEET

TOTAL VIDEO LOG DEPTH: 94 FEET

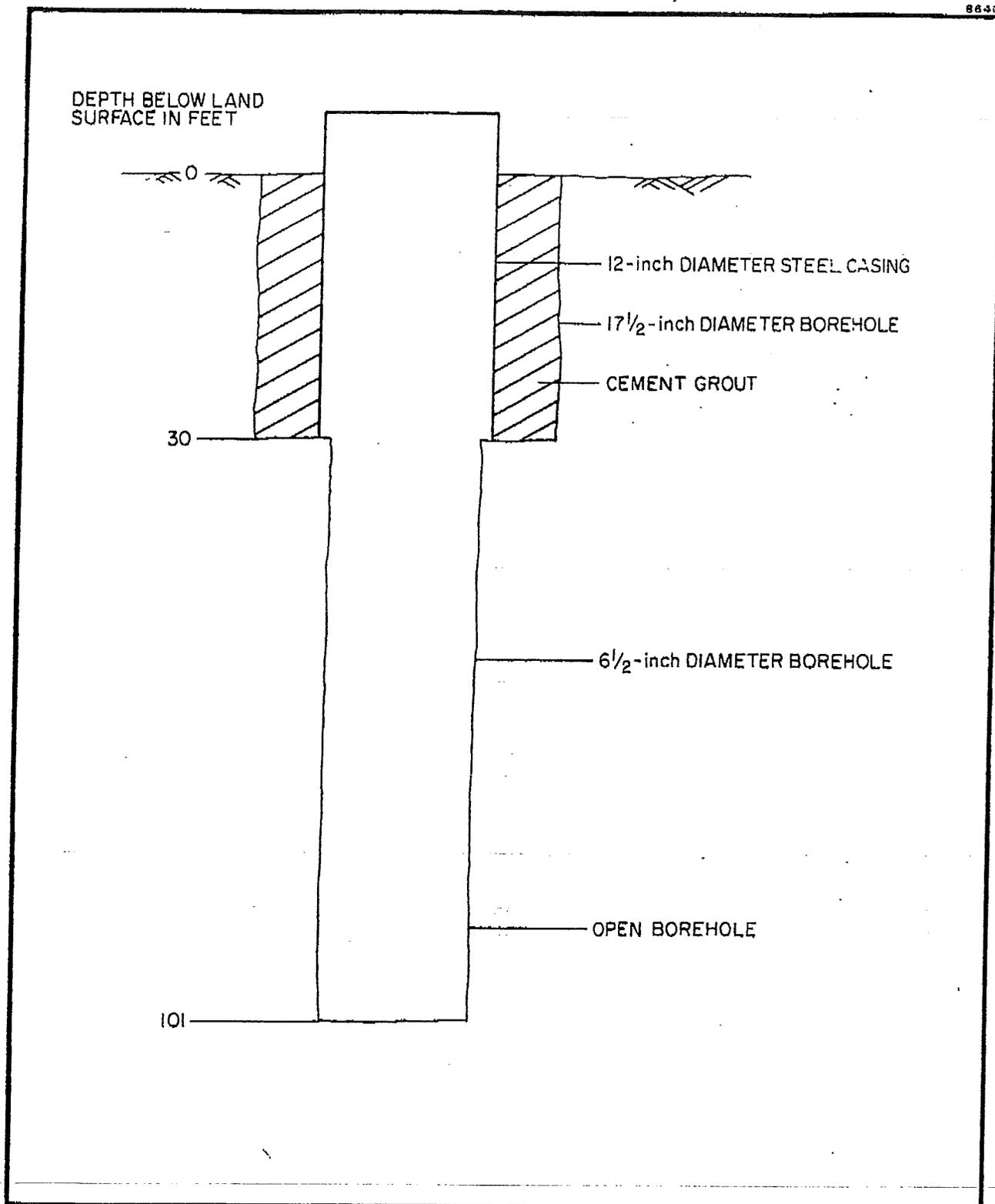
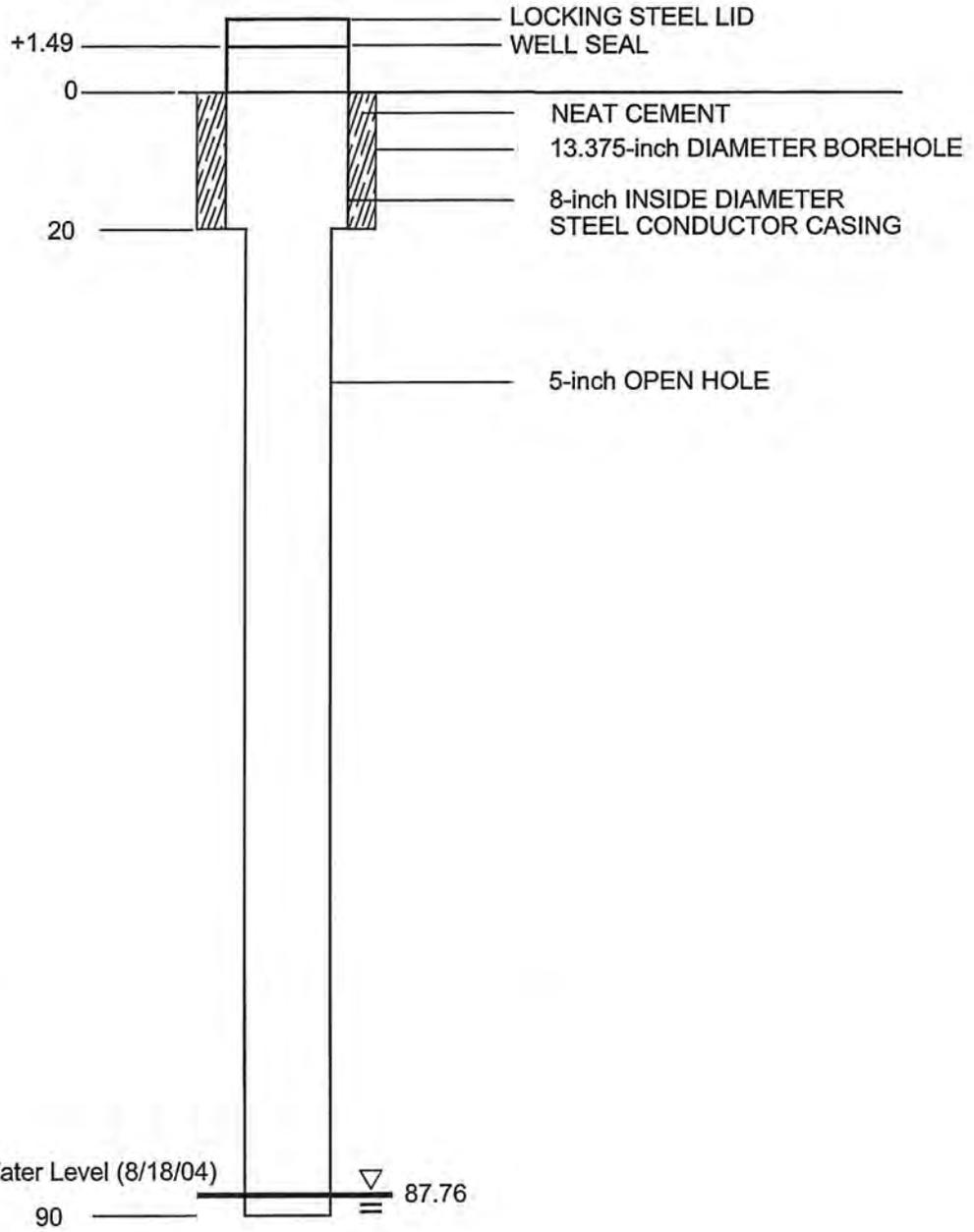


FIGURE 2
CONSTRUCTION SCHEMATIC WELL RD-74

DEPTH BELOW LAND SURFACE (IN FEET)



26473-024 A68

HALY & ALDRICH

THE BOEING COMPANY
ROCKETDYNE PROPULSION AND POWER
SANTA SUSANA FIELD LABORATORY

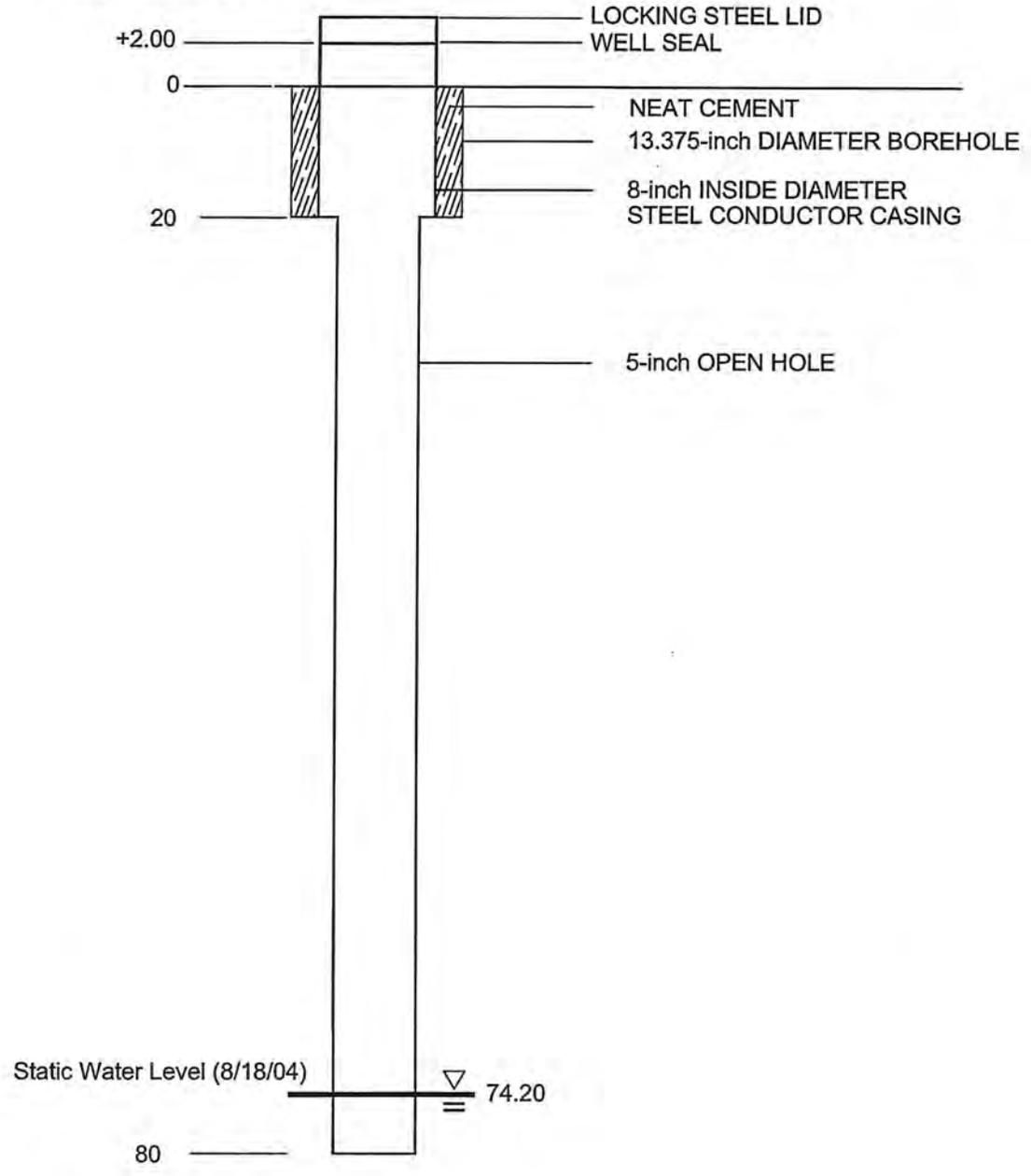
WELL SCHEMATIC
FOR RD-85

NOT TO SCALE

NOVEMBER 2004

FIGURE B-1

DEPTH BELOW LAND SURFACE (IN FEET)



26473-024 A69



THE BOEING COMPANY
ROCKETDYNE PROPULSION AND POWER
SANTA SUSANA FIELD LABORATORY

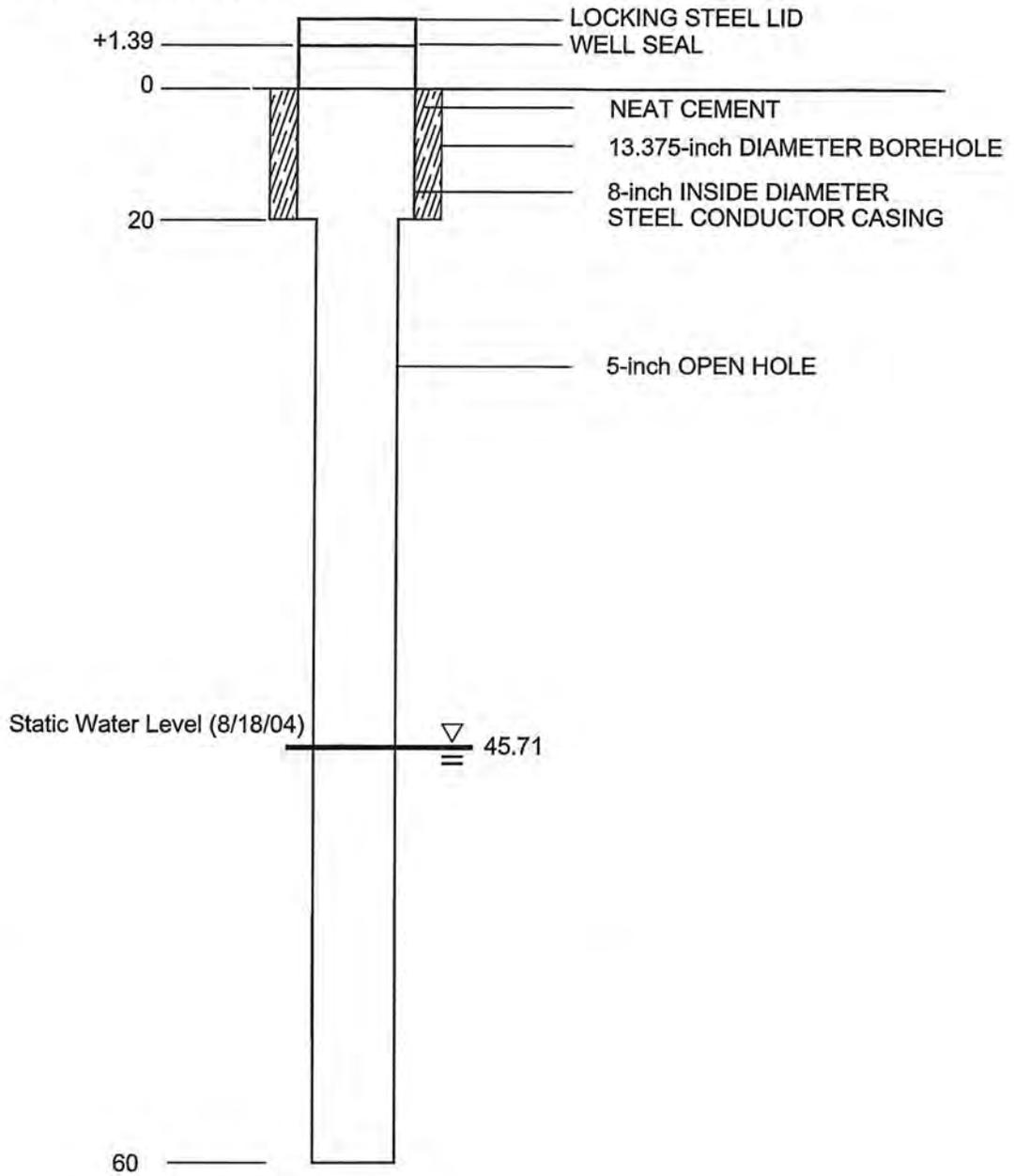
WELL SCHEMATIC
FOR RD-86

NOT TO SCALE

NOVEMBER 2004

FIGURE B-2

DEPTH BELOW LAND SURFACE (IN FEET)



26473-024 A70



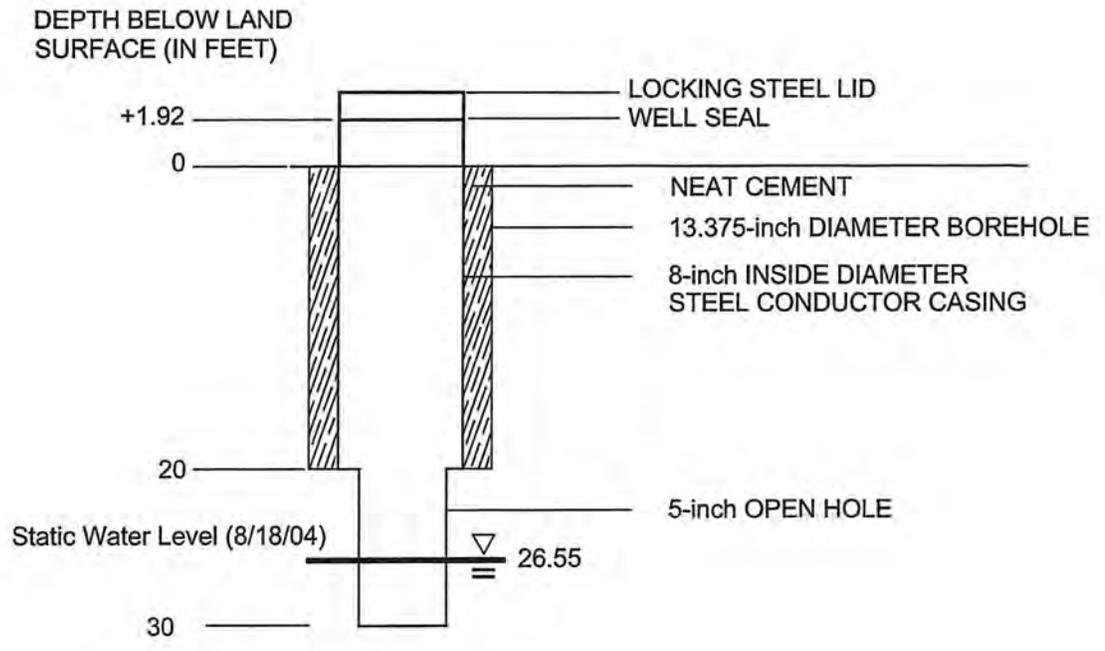
THE BOEING COMPANY
ROCKETDYNE PROPULSION AND POWER
SANTA SUSANA FIELD LABORATORY

WELL SCHEMATIC
FOR RD-87

NOT TO SCALE

NOVEMBER 2004

FIGURE B-3



26473-024 A71



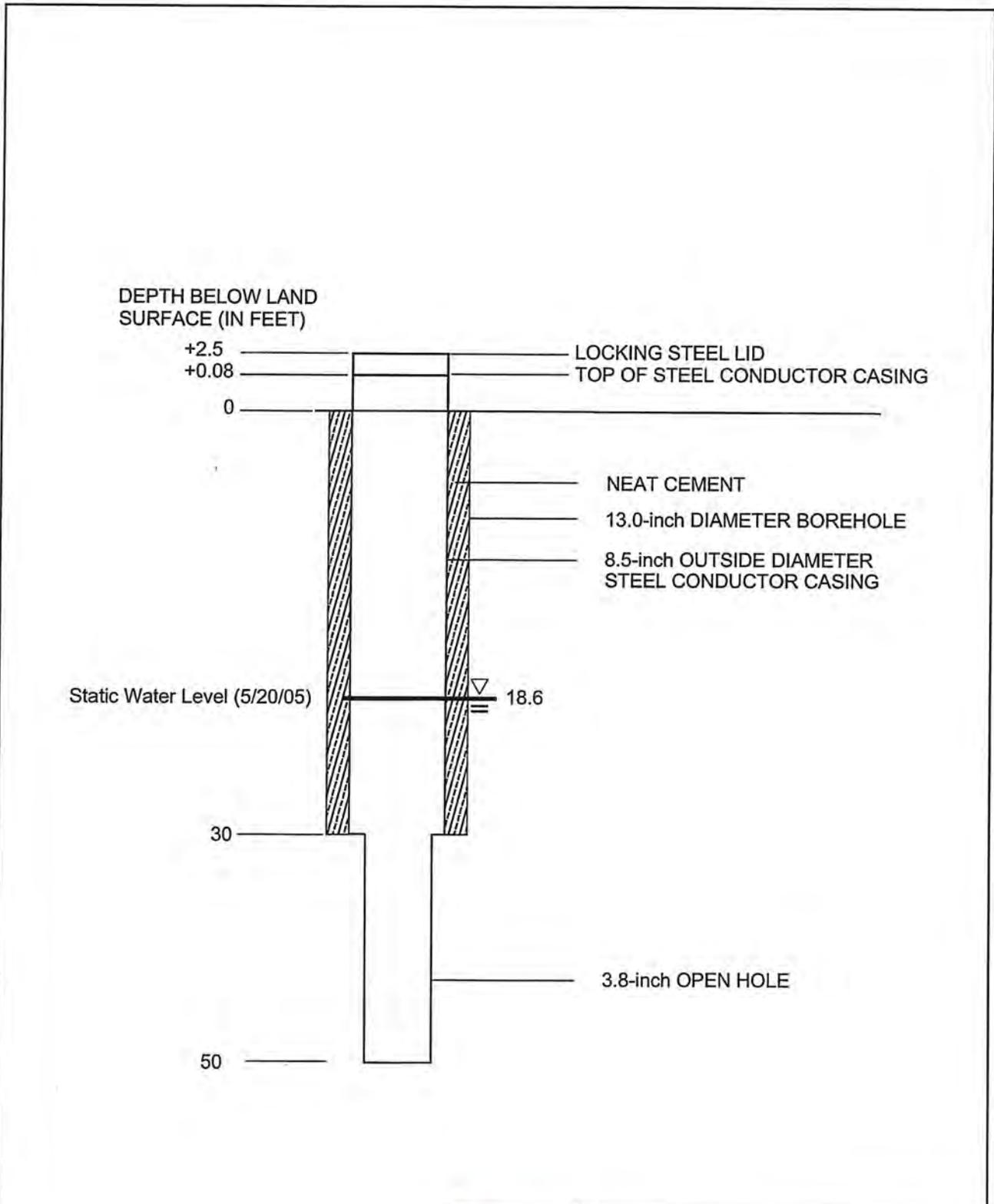
THE BOEING COMPANY
ROCKETDYNE PROPULSION AND POWER
SANTA SUSANA FIELD LABORATORY

WELL SCHEMATIC
FOR RD-88

NOT TO SCALE

NOVEMBER 2004

FIGURE B-4

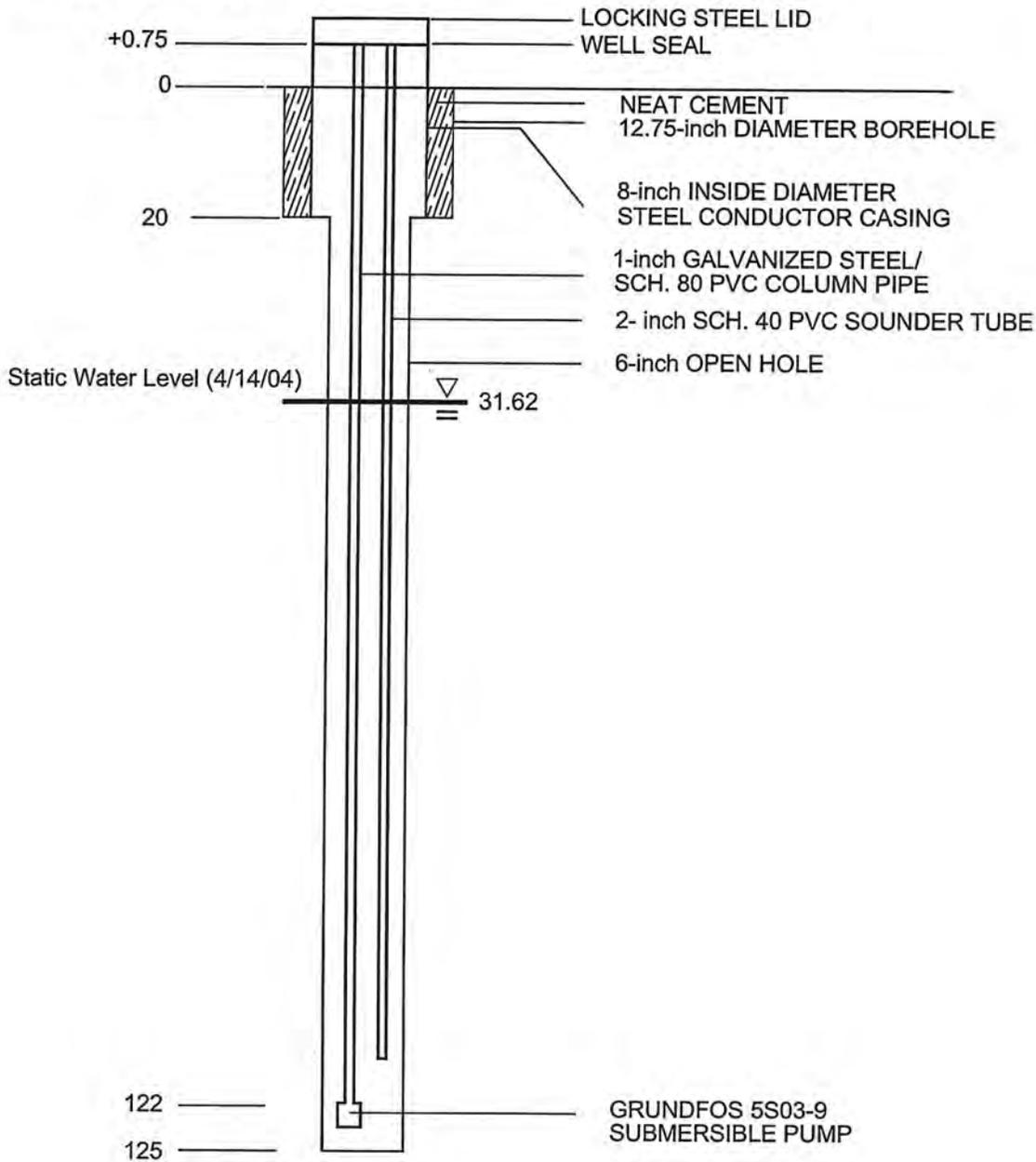


26473-000 A81

	<p>THE BOEING COMPANY ROCKETDYNE PROPULSION AND POWER SANTA SUSANA FIELD LABORATORY</p>
<p>WELL SCHEMATIC FOR RD-89</p>	
<p>NOT TO SCALE</p>	<p>JULY 2005</p>

FIGURE B-5

DEPTH BELOW LAND SURFACE (IN FEET)



26473-024 A65



THE BOEING COMPANY
ROCKETDYNE PROPULSION AND POWER
SANTA SUSANA FIELD LABORATORY

WELL SCHEMATIC
FOR RD-90

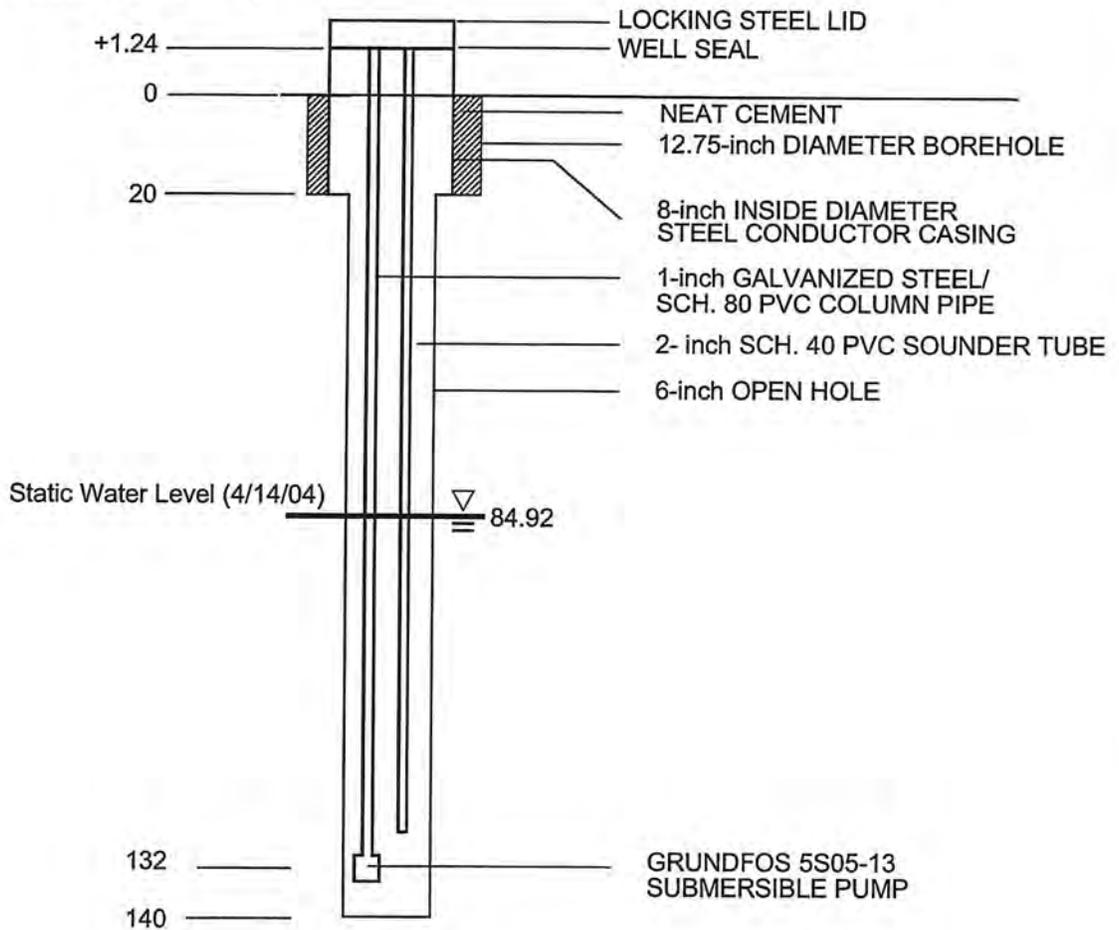
UNCLASSIFIED
EXCEPT WHERE SHOWN
OTHERWISE

NOT TO SCALE

JUNE 2004

FIGURE B-6

DEPTH BELOW LAND SURFACE (IN FEET)



26473-024 A66



THE BOEING COMPANY
ROCKETDYNE PROPULSION AND POWER
SANTA SUSANA FIELD LABORATORY

WELL SCHEMATIC
FOR RD-91

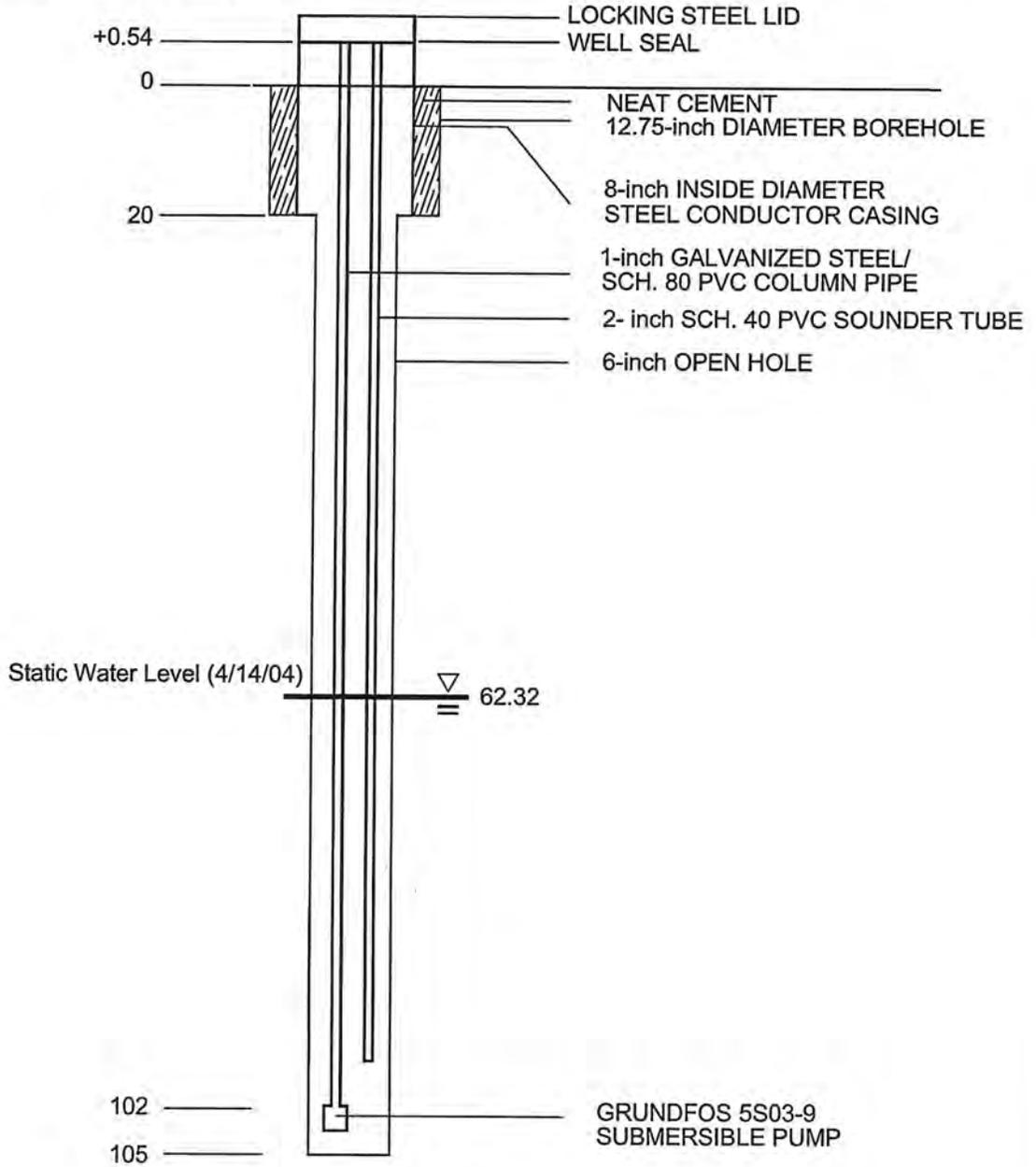
UNIVERSITY
ENGINEERING &
ENVIRONMENTAL
SCIENCE

SCALE: AS SHOWN

JUNE 2004

FIGURE B-7

DEPTH BELOW LAND SURFACE (IN FEET)



26473-024 A67



THE BOEING COMPANY
ROCKETDYNE PROPULSION AND POWER
SANTA SUSANA FIELD LABORATORY

WELL SCHEMATIC
FOR RD-92

NOT TO SCALE

JUNE 2004

FIGURE B-8

DEPTH BELOW LAND SURFACE (IN FEET)

+1.54

+0.18

0

20

Static Water Level (5/20/05)

60

LOCKING STEEL LID

TOP OF STEEL CONDUCTOR CASING

NEAT CEMENT

13.0-inch DIAMETER BOREHOLE

8.625-inch OUTSIDE DIAMETER STEEL CONDUCTOR CASING

3.8-inch OPEN HOLE

▽
≡ 35.9

26473-000 A80



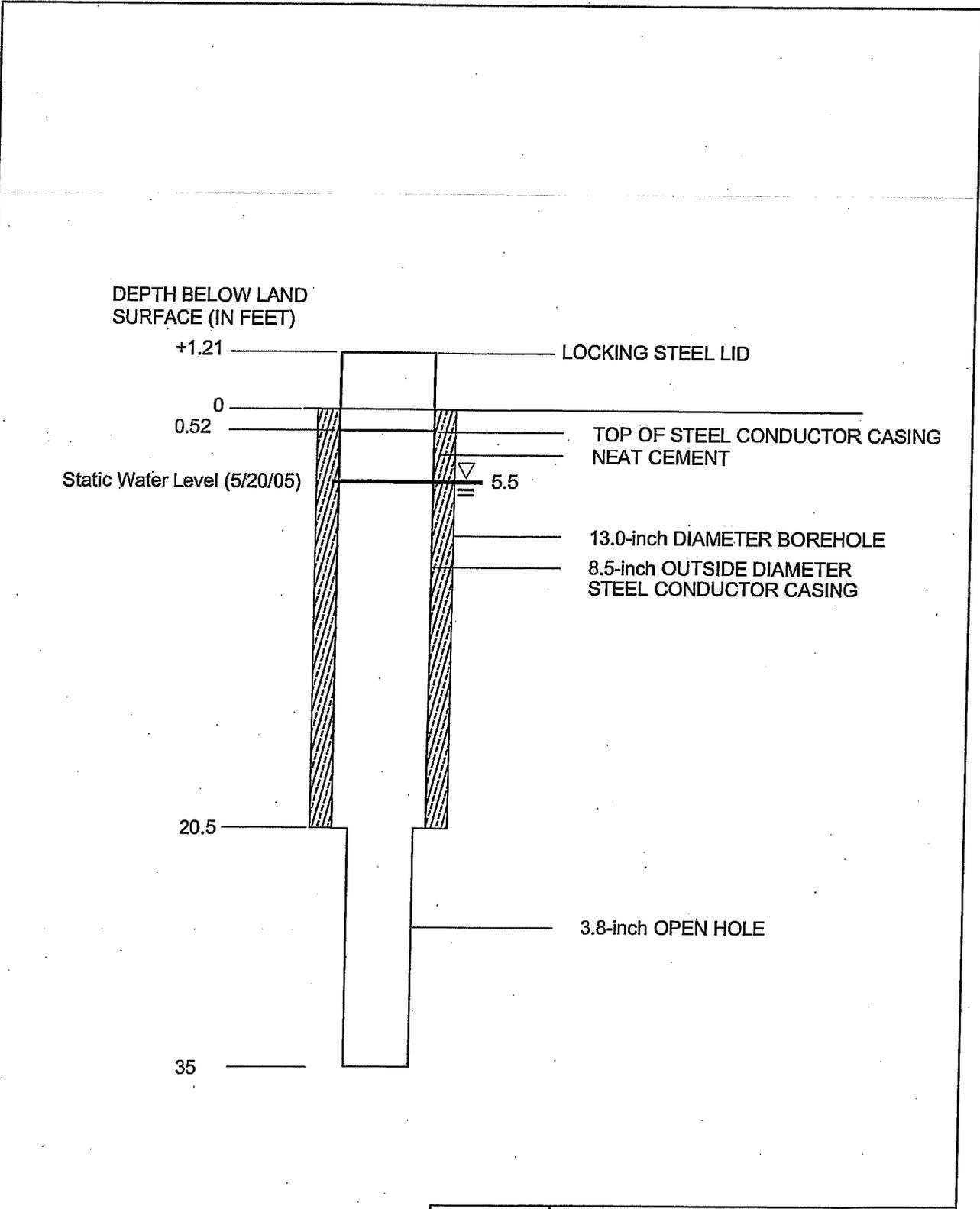
THE BOEING COMPANY
ROCKETDYNE PROPULSION AND POWER
SANTA SUSANA FIELD LABORATORY

WELL SCHEMATIC
FOR RD-93

NOT TO SCALE

JULY 2005

FIGURE B-9



26473-000 A82

	<p>THE BOEING COMPANY ROCKETDYNE PROPULSION AND POWER SANTA SUSANA FIELD LABORATORY</p>
<p>WELL SCHEMATIC FOR RD-94</p>	
<p>NOT TO SCALE</p>	
<p>JULY 2005</p>	

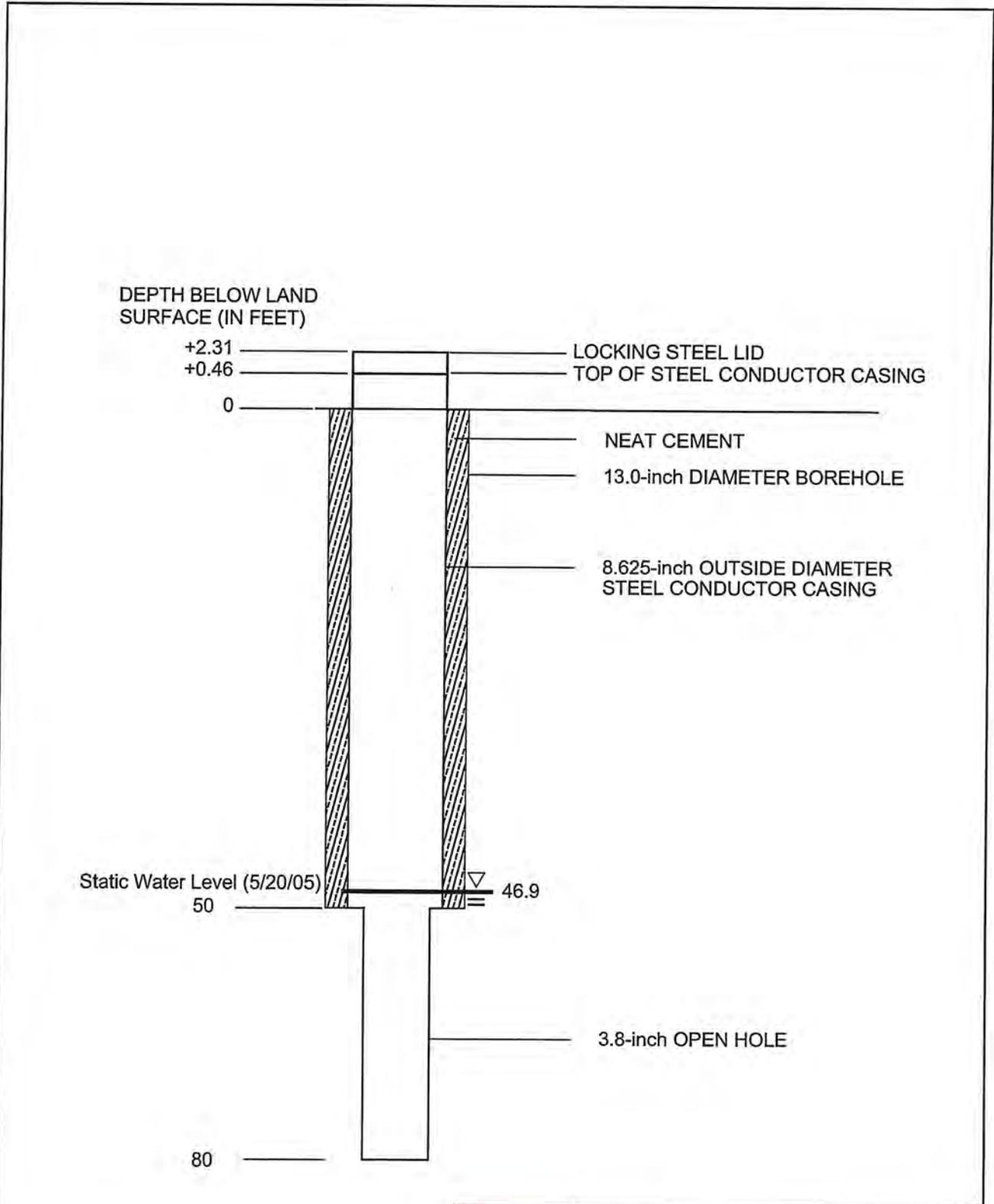
FIGURE A-3

TABLE B-4
RD-95 CORE DRILLING DATA
 BOEING SANTA SUSANA FIELD LABORATORY
 VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks		Client: Boeing - Area IV		Job No: 26411-041	
Boring Number/Location: RD-95; behind former B/013 location		Drilling Co: WDC Exploration		Date Started: 5/9/2005	
Length, Kelly: 10' Rods: 10'		Collars: 8'		Subs: NA	
Type/Diameter of Bit: coring / 3.8" OD		Drilling Fluid: Air		Bit: 6" Height of K.B.:	
				Rig Type: CME 85 Date Finished: 5/12/2005	

Depth (feet)	Core			Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample										Rxn w/HCL																
	% Rec	Rgt	Color							Particle Size Distribution %				Sorting	Grain Shape	Apparent Density			Plasticity		Odor Gas, etc (Air Rotary)															
										Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded		Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High	None	Weak	Moderate	Strong	
0								augered from surface to 29' fill from surface to ~30'																												
5																																				
10																																				

Total Depth of Borehole (feet): 80'
Groundwater, Depth Encountered: ~50'
Static Water Level: 50'



26473-000 A83



THE BOEING COMPANY
ROCKETDYNE PROPULSION AND POWER
SANTA SUSANA FIELD LABORATORY

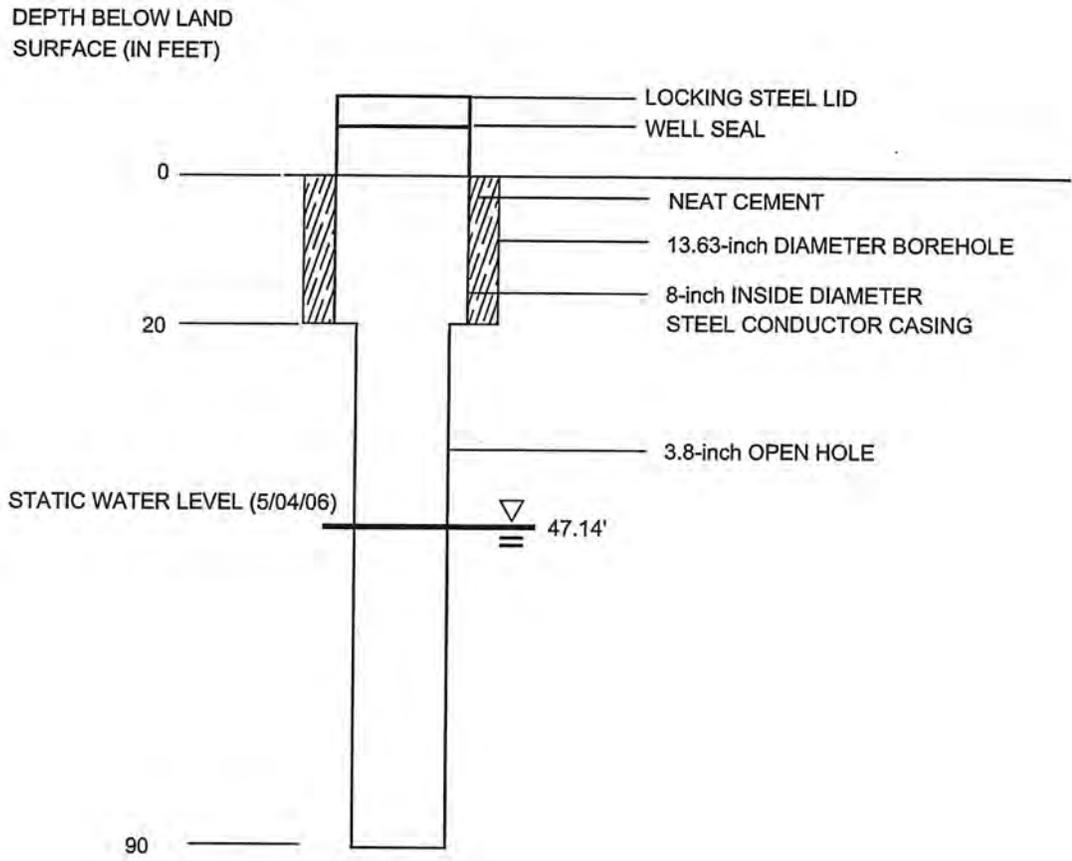
WELL SCHEMATIC
FOR RD-95

NOT TO SCALE

JULY 2005

FIGURE B-11

G:\GRAPHICS\PROJECTS\26472 - BOEING ROCKETDYNEWORKEAREA_IV_DRILLING_2006\26473A84.DWG



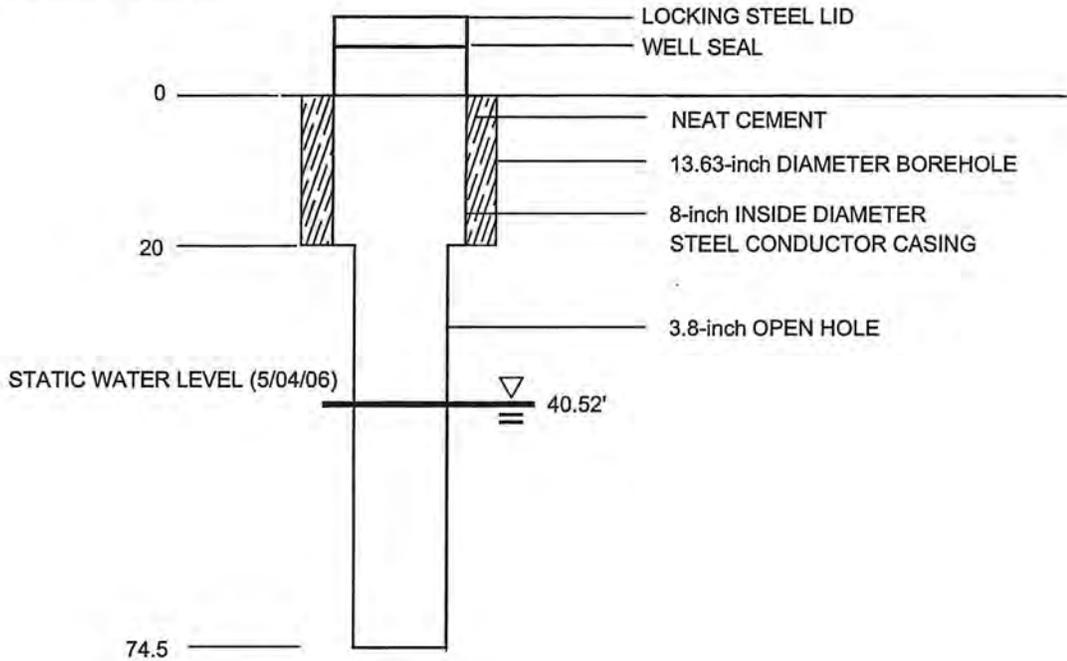
HALEY & ALDRICH THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

WELL SCHEMATIC FOR RD-96

SCALE: AS SHOWN
JULY 2006

FIGURE B-12

DEPTH BELOW LAND SURFACE (IN FEET)



G:\GRAPHICS\PROJECTS\26472 - BOEING ROCKETDYNETWORK\AREA_IV_DRILLING_2006\26473A85.DWG

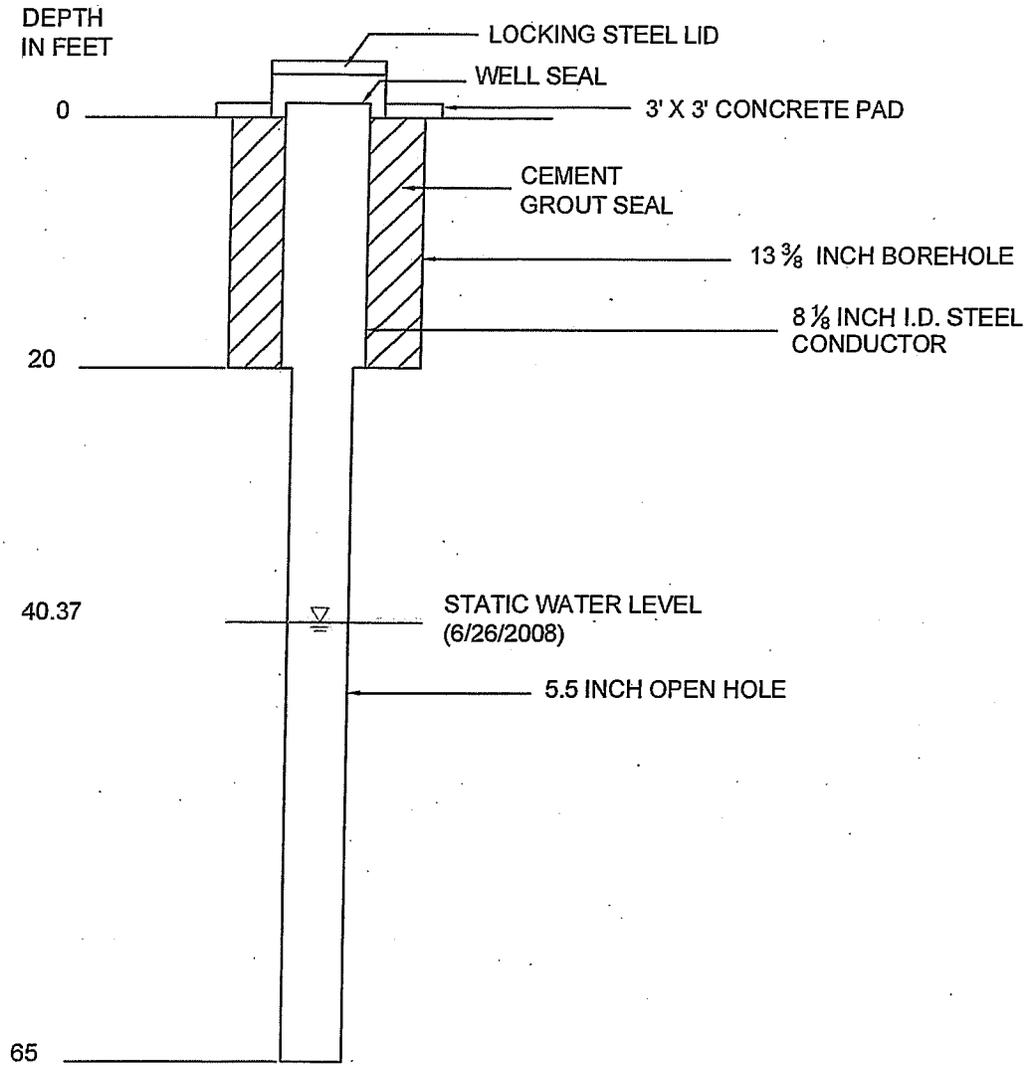
HALEY & ALDRICH THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

WELL SCHEMATIC FOR RD-97

SCALE: AS SHOWN
JULY 2006

FIGURE B-13

G:\GRAPHICS\PROJECTS\26472 - BOEING ROCKETDYNEWELL_CONSTRUCTION\20060-497-0001-RD-98-WELL-SCHEMATIC.DWG



NOT TO SCALE

HALEY & ALDRICH

THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

RD-98 WELL SCHEMATIC

SCALE: NOT TO SCALE
AUGUST 2008

FIGURE 2



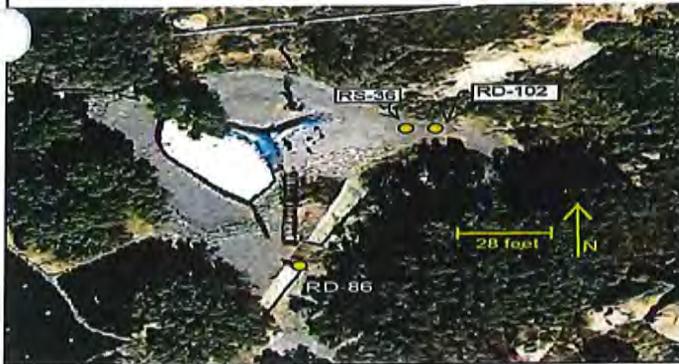
MWH®

Coring Log RD-102

Page 1 of 26

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation



Site:	SRE Pond	Hole Diameter:	See Below
Drilling Start:	11/9/11	Drill Bit Type:	See Below
Drilling End:	11/16/11	Drilling Method:	Air Rotary
Logged By:	C. Nancarrow	Drill Rig Type:	Speedstar 30K
Reviewed By:	S. Valenzuela, PG	Drillers Name:	J. Villegas
Well Completion Start:	11/17/11	Helper:	M. Adame
Well Completion End:	11/21/11	Helper:	--
Sampler Type:	2.4" ID HQ3 Core	Drilling Company:	WDC
TOTAL DEPTH:	100' bgs		
DEPTH TO WATER:	66' bgs		

Latitude: 34-14-09.41611

Longitude: 188-42-22.02611

Depth in Feet	Cored Interva	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
---------------	---------------	-----------	-----------	-----------------------	----------------------	---------------------	------------------	-----	---------------	---------	------	-------------

- Sample Condition
- Unrecovered
 - Rock Core
 - Hand Augered

Hole Diameter/Drill Bit Type: (0'-30'bgs) 10 5/8" Tricone bit; (30'-100'bgs) 4" (nominal) HQ-size rock core bit. Set conductor casing (6" ID) to 30' bgs.

0									0			Silty SAND (SM), 2.5Y4/2 (Dk. Grayish Brn.), sand [(80%), very fine to medium grained, moderately sorted, subangular to subrounded], silt (20%), loose but more dense with depth, sl. plastic.
1									1			
2									2			
3									3			

SM



MWH®

Coring Log RD-102

Page 2 of 26

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
3			0.1						3			at 3' bgs: (Grab) Silty SAND (SM) with trace very coarse sand and gravel. 2.5Y4/2 (Dk. Grayish Brn.), well to moderately sorted. Silty SAND (70%), very coarse sand (10%), gravel (10%), and charcoal pieces. Slightly moist, nonplastic.
4									4			
5			0.3						5		SM	at 5' bgs: Same as above.
6									6			
7									7			



MWH®

Coring Log RD-102

Page 3 of 26

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Sample Condition

- Unrecovered
- Rock Core
- Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
7									7			at 7' bgs: Same as above.
8			0.2						8		SM	
9		15:43							9			No recovery.
10		15:47 8:26	0.1	VOC					10		SS	SANDSTONE, 2.5Y4/2 (Dk. Grayish Brn.), very fine to medium grained, moderately sorted, subangular to subrounded, slightly moist, moderately cemented, soft to moderately hard, moderately strong, slightly weathered (W3). Bedding contact (160*). SANDSTONE, 2.5Y5/4 (Lt. Olive Brn.), very fine grained, very well sorted, subangular to subrounded, slightly moist, moderately cemented, soft to moderately hard, moderately strong, slightly weathered (W3). Bedding contact (170*). SANDSTONE, 2.5Y4/3 (Olive Brn.), very fine to medium grained, moderately sorted, subangular to subrounded, slightly moist, moderately cemented, soft to moderately hard, moderately strong, slightly weathered (W3).
11									11		SS	SANDSTONE, 10YR4/6 (Dk. Yellowish Brn.), very fine to medium grained, w/ trace coarse grains, poorly sorted, subangular to subrounded, slightly moist, well cemented, moderately hard, moderately strong, moderately to slightly weathered (W4).

C:\Users\christine.nancarrow\Desktop\SSFL Drilling Forms\QuickLog\Corelog_RD-102

03-29-2012 C:\



Sample Condition

- Uncovered
- Rock Core
- Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
11			0.1	VOC		20	W4		11		SS	Banded SANDSTONE, 10YR4/6 (Dk. Yellowish Brn.), very fine to fine grained w/some medium, coarse and very coarse grains. Poorly sorted, angular to subrounded, slightly moist, well cemented, moderately hard, moderately strong, moderately to slightly weathered (W4). at 11.5' bgs: Grain size change to coarse to very coarse grained in a very fine grained matrix, moderately sorted, angular to subrounded, very well cemented, moderately hard, moderately strong, moderately to slightly weathered (W4).
12				VOC		25	W4		12			SANDSTONE, 10YR4/6 (Dk. Yellowish Brn.), very fine grained, well sorted, angular to subrounded, slightly moist, very well cemented, moderately hard, moderately strong, moderately to slightly weathered (W4). Grain size increasing with depth. at 12.5' bgs: Increasing grain size to very fine to fine grained, subangular to subrounded, well cemented.
13			0.1	VOC					13			at 13' bgs: Color change to 2.5Y5/4 (Lt. Olive Brn.).
14				VOC					14		SS	at 14' bgs: Increasing grain size to very fine to fine grained, w/some medium grained, moderately sorted.
15		8:43					W4		15			



Sample Condition

- Unrecovered
- Rock Core
- Hand Augered

DESCRIPTION

C:\Users\Christine Nancarrow\Desktop\SSFL Drilling Forms\QuickLog\Corelog_RD-102

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
15		9:32							15			at 15' bgs: Increasing grain size to very fine to medium grained, w/some coarse and very coarse grains, poorly sorted, subangular to subrounded, slightly moist, moderately cemented, moderately hard, moderately strong, moderately to slightly weathered (W4).
			0.1	VOC							SS	
					12							
16				VOC					16			Banded SANDSTONE, 2.5Y4/4 (Olive Brn), bedding alternates between very fine grained, very well sorted, well cemented, to very fine to medium grained, w/ some coarse and/or very coarse grains, very poorly sorted, poorly cemented; subangular to subrounded, slightly moist, moderately hard, moderately strong, slightly weathered (W3). Fracture at 16.2 (15 deg), open, sl. rough. Bedding (23-25 deg).
					15						SS	
					24							
					23							
					25							
					8							at 16.7' bgs: Bedding Fracture (8 deg), open, sl. rough. Friable to 16.8' bgs.
					8							
					22							at 16.8' bgs: Banded continues but with lith change to very fine grained beds alternating with very fine to fine grained beds. 10YR4/4 (Dk. Yellowish Brn.), slightly moist, well cemented, moderately hard, moderately strong, slightly weathered (W3). Bedding (22-31 deg).
					31							
					31							SANDSTONE, N4 (Med. Dk. Gray), very fine to fine grained, well sorted, slightly moist, well cemented, moderately hard, moderately strong, fresh (W1). Bedding contact (22 deg).
					31							
					22							
18			0.1	VOC					18		SS	
				VOC								
				VOC								at 18.6' bgs: Increase to moist.
				VOC								
					0							at 18.9' bgs: Fracture (0 deg), open, sl. rough. Oxidized surface.
					20							
19									19			



MWH®

Coring Log RD-102

Page 8 of 26

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
27									27			
				VOC								at 27.5' bgs: Some coarse and very coarse grains, poorly sorted, angular to subrounded.
28									28			at 28' bgs: Clast of SILTSTONE, 3mm long.
				VOC								
29									29		SS	at 29' bgs: Increasing grain size to very fine to very coarse grained, very poorly sorted, angular to rounded, moist to wet, well cemented, moderately hard, moderately strong, fresh (W1). Clast of SILTSTONE, 2mm by 6mm, with bedding. Bedding fracture (15 deg), open, rough.
				VOC	15							at 29.5' bgs: Fracture (165 deg), open, sl. rough.
				VOC	165							at 29.8' bgs: Fracture (0 deg), open, sl. rough.
				VOC	0							at 30' bgs: Same as 29' bgs. Fracture (22 deg), open, sl. rough.
30									30			
		11:19 10:29										at 30.5' bgs: Less coarse grains, angular to subrounded, well cemented, hard, moderately strong, reacts w/HCl.
				VOC	0							
31									31			

C:\Users\Christine Nancarrow\Desktop\SSFL Drilling Forms\QuickLog\Corelog_RD-102



Sample Condition

- Uncovered
- Rock Core
- Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
31			0.0	VOC					31			
				VOC								at 31.5' bgs: Coarse grains increasing with depth.
32									32	SS		
33									33	SS		at 32.9' bgs: Same as 29' bgs. Color change to 10YR5/3 (Brown), subangular to subrounded, no reaction to HCl.
34			0.0	VOC	0				34	SS		at 33.8' bgs: Same as 29' bgs. Color change to N4 (Med. Dk. Gray). Fracture (0 deg), open, fresh, mechanical.
										SS		SANDSTONE, N5 (Med Gray), very fine to medium grained, moderately sorted, subangular to subrounded, moist to wet, well cemented, hard, moderately strong, fresh (W1). Bedding contact (142 deg).
										NR		NO RECOVERY
35		10:41 11:19							35	SS		at 35' bgs: Increasing grain size to very fine to medium grained w/ trace coarse grains.

C:\Users\Christine Nancarrow\Desktop\SSFL Drilling Forms\QuickLog\Corelog_RD-102

03-29-2012 CA



MWH®

Coring Log RD-102

Page 10 of 26

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
35		11:19						62	35			at 35' bgs: Increasing grain size to very fine to medium grained w/ trace coarse grains.
			VOC		150						SS	from 35.5-35.7' bgs: Fracture (150 deg), open, sl. rough.
36					174				36			at 36' bgs: Fracture (174 deg), open, sl. rough. Increasing grain size to very fine to medium grained w/ some coarse grains.
			VOC		171							at 36.5' bgs: Fracture (171 deg), open, sl.rough. Grain size change to angular to subrounded.
37					12		W1		37			SANDSTONE, N4 (Med. Dk. Gray), very fine to medium grained w/some coarse grains, poorly sorted, angular to subrounded, moist to wet, well cemented, very hard, strong, fresh (W1). Calcite present, reacts w/HCl. Bedding contact (24 deg).
			VOC		165							at 36.8' bgs: Fracture (12 deg), open, sl. rough. at 37' bgs: Bedding contact (0 deg). Increasing grain size to very fine to medium grained w/some coarse and trace very coarse grains, very poorly sorted. Fracture (165 deg), open, sl. rough. at 37.3' -37.7' bgs: No calcite, no reaction w/ HCl.
38					9				38			at 38' bgs: Increasing grain size to very fine to coarse grained w/ some very coarse grains, very poorly sorted. Fracture (9 deg), open, sl. rough.
			VOC		23							at 38.3' bgs: Fracture (23 deg), open, sl. rough.
39							W4		39		IB	at 38.9' bgs: Clast of pyrite, <.5mm.



MWH®

Coring Log RD-102

Page 11 of 26

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
39					30	30			39			<p>Interbedded SANDSTONE [N5 (Med Gray), very fine grained, very well sorted, subangular to subrounded] and SILTSTONE [N3 (Dk. Gray)], moist to wet, very well cemented, moderately hard, moderately strong, moderately to slightly weathered (W4). Calcite present, reacts w/ HCl. Bedding contact (0 deg), fracture (30 deg), filled w/clay, sl. rough.</p> <p>-at 39.3' bgs: Bedding (30 deg).</p> <p>-at 39.4' bgs: Bedding Fractures (22, 30 deg), open, sl. rough.</p> <p>at 39.7' bgs: Bedding (32 deg). Major oxidation throughout.</p>
				Microb	22	30				IB		
		11:34 14:05		VOC	20	35			40			<p>Bedding fracture (32-33 deg), filled w/clay, sl. rough. Below fracture: SANDSTONE, 2.5Y5/3 (Lt. Olive Brn.), very fine to fine grained, well sorted, subangular to subrounded, moist to wet, well cemented, moderately hard, moderately strong, slightly weathered (W3). No reaction to HCl. Bedding (30-31 deg). Minor oxidation throughout.</p>
					33	33		76	40			
												<p>Grain size increasing with depth.</p>
				VOC	31	30			41		SS	
			0.0									<p>at 42.2' bgs: Increasing grain size to very fine to medium grained, moderately sorted. Color change to 10YR4/6 (Dk. Yellowish Brn.).</p> <p>Thinly interbedded SANDSTONE [N5 (Med. Gray), N7 (Lt. Gray), very fine grained, very well sorted, subangular to subrounded] and SILTSTONE [N2 (Grayish Black), N3 (Dk. Gray)], moist to wet, very well cemented, moderately hard, moderately strong, moderately to slightly weathered (W4). Calcite present, reacts w/ HCl. Parallel Hairline and Bedding fracture (34 deg), open, sl.rough. Half highly oxidized.</p> <p>-from 42.35-42.4' bgs: Fracture (31 deg), filled w/clay.</p> <p>-at 42.5' bgs: Multiple hairline bedding fractures (33 deg).</p>
					31	34			42			
				VOC	33	33						<p>IB</p>
					34	30			43			
				VOC								SS

03-29-2012 C:\Users\Christine Nancarrow\Desktop\SSFL Drilling Forms\QuickLog\Corolog_RD-102



Sample Condition

- Unrecovered
- Rock Core
- Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
47									47		SS	from 47.4'-47.9' bgs: Fracture (65 deg), open, sl. rough. at 47.5' bgs: Color change to 10YR5/6 (Yellowish Brn.).
48				VOC	65				48		SS	at 47.9' bgs: Fracture (145, 45 deg), open, sl. rough.
49			0.0	VOC	145				49		SS	SANDSTONE [N5 (Med. Gray), medium grained, well sorted, subangular to subrounded] with SILTSTONE clasts up to 10mm in length (140 deg) [N4 (Med. Dk. Gray), very fine grained, very well sorted], moist to wet, moderately cemented, moderately hard, moderately strong, fresh (W1).
49					45				49		SS	at 49' bgs: Change to wet, poorly cemented, soft, weak, fresh (W1).
50				VOC	125				50		SS	SANDSTONE, N5 (Med. Gray), medium to coarse grained w/some very fine to fine grained, moderately sorted, subangular to subrounded, wet, poorly cemented, soft, weak, fresh (W1). Fracture (45 deg), open, sl.rough. from 49.1'-49.3' bgs: Fracture (125 deg), open, sl.rough. from 49.2'- 49.4' bgs: Fracture (60 deg), open, sl. rough. at 49.4' bgs: Fracture (130 deg), open, sl.rough. at 49.5' bgs: Change to moderately cemented, moderately hard, moderately strong, fresh (W1). at 49.6' bgs: Fracture (0 deg), open, sl. rough. from 49.6'-49.8' bgs: Fracture (65 deg), open, sl. rough.
51		15:35 8:22			60				51		SS	Banded SANDSTONE, N4 (Med. Dk. Gray), very fine to coarse grained, very poorly sorted, subangular to subrounded, moist, well cemented, hard, moderately strong to strong, fresh (W1). at 50.6' bgs: Grain size change to very fine to fine grained, well sorted. Bedding fracture (0 deg), open, sl. rough. at 50.8' bgs: Grain size change to very fine to medium grained w/ trace coarse grains, moderately sorted. Bedding contact (135 deg).
51					0			67	51		SS	
					0						SS	
					135						SS	

C:\Users\Christine Nancarrow\Desktop\SSFL Drilling Forms\QuickLog\Corelog_RD-102



Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
51			0.0	VOC	25	27			51		SS	at 51.1' bgs: Grain size change to very fine to fine grained, well sorted. Bedding contact (27 deg). Bedding fracture (25 deg), open, sl. rough.
						30	W1				IB	Thinly interbedded SANDSTONE [N5 (Med. Gray), very fine to fine grained; N4 (Med. Dk. Gray), very fine grained; very well sorted, subangular to subrounded] and SILTSTONE [N3 (Dk. Gray)], moist, well cemented, hard, strong, fresh (W1). Bedding (30-38 deg).
52				VOC	0	33			52		IB	at 51.9' bgs: Bedding fracture (33 deg), filled w/clay, sl. rough.
							W1				SS	SANDSTONE, 5Y2.5/2 (Black), very fine grained, very well sorted, subangular to subrounded, moist, well cemented, hard, moderately strong to strong, fresh (W1).
53				VOC					53		SS	at 53' bgs: Color change to 2.5Y5/4 (Lt. Olive Brn.). Grain size increasing with depth.
											SS	from 53.7'-54.3' bgs: Fracture (110 deg), open, sl. rough, surface oxidized.
54			0.0	VOC		110			54		SS	at 54.5' bgs: Increasing grain size to very fine to medium grained, moderately sorted.
						0					SS	
55						160			55		SS	



Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
55		8:34 9:05		VOC	27	27	W1	84	55		SS	Same as above, color change to N5 (Med. Gray).
				VOC	29						SS	
			0.0	VOC							IB	Thinly interbedded SANDSTONE [N3 (Dk. Gray), very fine grained, very well sorted, subangular to subrounded] and SILTSTONE [N3 (Dk. Gray)], slightly moist to moist, well cemented, moderately hard, moderately strong, fresh (W1). Bedding (27-30 deg). Bedding fractures (27, 29 deg), open, sl. rough.
				VOC	125	130	W2				IB	at 55.9' bgs: Bedding fracture (130 deg), open, sl. rough. Color change to N4 (Med. Dk. Gray).
56				Microb					56		SS	SANDSTONE, 2.5Y5/4 (Lt. Olive Brn.), very fine grained, very well sorted, subangular to subrounded, slightly moist to moist, very well cemented, hard, strong, slightly weathered to fresh (W2). Grain size increasing with depth.
				VOC	0						SS	at 56.2' bgs: Fracture (0 deg), open, sl. rough.
											SS	at 56.5' and 56.7' bgs: Bedding (160 deg).
				VOC							SS	
57									57		SS	
			0.0	VOC							SS	
58									58		SS	at 58.5' bgs: Increasing grain size to very fine to fine grained, well sorted.
59									59		SS	



MWH®

Coring Log RD-102

Page 16 of 26

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Sample Condition

-  Unrecovered
-  Rock Core
-  Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
59									59			
		9:11 9:55										at 59.5' bgs: Increasing grain size to very fine to medium grained, moderately sorted.
60									60			
								W2 100				at 60.4' bgs: Same as above, well cemented, moderately hard to hard, moderately strong, slightly weathered to fresh (W2).
61						24			61		SS	at 60.9' bgs: Bedding (24 deg).
						0						at 61.4' bgs: Color change to 2.5Y5/3 (Lt. Olive Brn.).
62			0.0	VOC					62			
						32						at 62.2' bgs: Bedding (32 deg).
63				VOC					63			

03-29-2012 C:\...ents and Settings\Christine Nancarrow\Desktop\SSFL Drilling Forms\QuickLog\Corelog_RD-102



MWH®

Coring Log RD-102

Page 17 of 26

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Sample Condition

-  Unrecovered
-  Rock Core
-  Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
63				VOC		29			63			
64				VOC		29			64			at 63.8' bgs: Bedding (29 deg). Increasing grain size to very fine to coarse grained, poorly sorted.
65		10:21	0.0						65		SS	at 64.8' bgs: Bedding (29 deg).
66		10:00 10:10				72		W1 96	66			at 65.3' bgs: Fracture (72 deg), mechanical, open, sl. rough. Color change to 2.5Y5/4 (Lt. Olive Brn.).
67			0.0	VOC					67			at 66.7' bgs: Fracture (27 deg), open, sl. rough.
				VOC		27		W2				at 66.9' bgs: Fracture (11 deg), open, sl. rough. Less fines, more coarse grains.
				VOC		11						at 67' bgs: Bedding (30 deg). Change to very fine grained, very well sorted.
				VOC		30						

03-29-2012 C:\Users\Christine Nancarrow\Desktop\SSFL Drilling Forms\QuickLog\Corelog_RD-102



Sample Condition

- Unrecovered
- Rock Core
- Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
67						30			67		SS	at 67.6' bgs: Bedding (10 deg). Color change to 2.5Y5/3 (Lt. Olive Brn.). Increasing grain size to very fine to fine grained, well sorted.
68			0.0	VOC		10			68		SS	SANDSTONE [2.5Y5/3 (Lt. Olive Brn.), very fine to fine grained, well sorted, subangular to subrounded] with SILTSTONE clasts up to 10mm in length [2.5Y4/3 (Olive Brn)], moist, well cemented, moderately hard, moderately strong, slightly weathered to fresh (W2). Contact with clasts oxidized. at 68.5' bgs: Color change to 2.5Y5/4 (Lt. Olive Brn.).
69			0.0	VOC					69		SS	
70		13:14					W2	59	70		SS	at 70' bgs: Increasing grain size to very fine to medium grained, moderately sorted.
71									71		SS	SANDSTONE, 10YR5/4 (Yellowish Brn.), very fine to medium grained, moderately sorted, subangular to subrounded, moist, well cemented, moderately hard to hard, moderately strong, slightly weathered to fresh (W2).



Sample Condition

- Unrecovered
- Rock Core
- Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
71				VOC					71			
												at 71.7' bgs: Change to moderately cemented.
72				VOC					72			
												at 72.5'-73' bgs: Fracture, (75 deg), open, sl. rough. Minor oxidation/staining on fracture surface.
					75							
				VOC								
					175							
73									73		SS	
												at 73.3'-73.8' bgs: Fracture (60 deg), open, sl. rough. Minor oxidation/staining on fracture surface. Friable above fracture.
				VOC								
					60							
				Microb								
					160							
					60							at 73.8' bgs: Fracture, (160 deg), open, sl. rough. Minor oxidation/staining on fracture surface.
74									74			
												from 74.1'-74.6' bgs: Fracture (74 deg), open, sl. rough. Minor oxidation/staining on fracture surface.
												from 74.3'-74.7' bgs: Multiple fractures (73, 125, 40), open, sl. rough. Minor staining.
					74							
				VOC								
					125							
												at 74.7' bgs: Increasing grain size to very fine to coarse grained, poorly sorted. Fracture, (145 deg), open, sl. rough. Friable below fracture.
					40							at 74.8' bgs: Competent.
												at 74.9' bgs: Bedding (30 deg), 2.5Y5/3 (Lt. Olive Brn.). Decreasing grain size to very fine grained.
75									75			



MWH®

Coring Log RD-102

Page 20 of 26

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Sample Condition

- Unrecovered
- Rock Core
- Hand Augered

DESCRIPTION

03-29-2012 C:\enms and Settings\Christine Nancarrow\Desktop\SSFL Drilling Forms\QuickLog\Corelog_RD-102

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
75		13:20 14:10			60				75		SS	<p>from 75.0-75.3' bgs: Increasing grain size to very fine to fine grained. Multiple hairline fractures (60 deg). Friable near 75.3' bgs.</p> <p>at 75.6' bgs: Change to subangular to rounded.</p> <p>at 75.7' bgs: Fracture (0 deg), open, sl. rough. Friable below fracture.</p> <p>at 75.8' bgs: Fracture (0 deg), open, sl. rough. Friable below fracture. Color change to 2.5Y5/6 (Lt. Olive Brn.).</p>
76			VOC	0 25 147 35				W2 84	76			<p>at 76.1' bgs: Fracture (0 deg), open, sl. rough. Slightly weathered to fresh (W2).</p>
77			VOC	0				W2	77		SS	<p>Fracture (125 deg), open, sl. rough. Below fracture: SANDSTONE, N5 (Med. Gray), very fine to medium grained, moderately sorted, subangular to subrounded, moist, well cemented, moderately hard to hard, moderately strong, slightly weathered to fresh (W2).</p>
78			VOC	125				W2	78			<p>at 78' bgs: Lens of very fine grained. Bedding (150-152 deg). Below lens: SANDSTONE, N5 (Med. Gray), very fine to fine grained, well sorted, subangular to subrounded, moist, well cemented, moderately hard to hard, moderately strong, fresh (W1).</p>
79								152 W1 150 160	79			<p>at 78.5' bgs: Bedding (160 deg). Decreasing grain size to very fine grained, very poorly sorted. Increasing w/depth.</p> <p>at 79' bgs: Increasing grain size to very fine to fine grained, poorly sorted.</p>



MWH®

Coring Log RD-102

Page 22 of 26

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Sample Condition

-  Uncovered
-  Rock Core
-  Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
83									83			
84				PhysProp		18		30	84			at 84.2' bgs: Bedding (18-20 deg).
85				VOC					85		SS	
86		15.03 15.28						W2 37	86			at 85.8' bgs: Large clast of SILTSTONE, N4 (Med. Dk. Gray).
87					39				87			from 86.9'-87.7' bgs: Parallel fractures every 1mm, (30-50 deg), open, sl. rough.

03-29-2012 C:\...ents and Settings\Christine Nancarrow\Desktop\SSFL_Drilling Forms\QuickLog\Corelog_RD-102



Sample Condition

- Unrecovered
- Rock Core
- Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
87					40				87		SS	
				VOC	33							at 87.7' bgs: Bedding (20 deg).
					50	20						at 87.8' bgs: Fracture (35 deg), open, sl. rough. Friable below fracture to 87.9' bgs.
88				VOC	150	150	W1		88		IB	Bedding contact (150 deg). Thinly interbedded SANDSTONE [N6 (Med Lt. Gray), very fine grained, very well sorted, subangular to subrounded] and SILTSTONE [N3 (Dk. Gray), N4 (Med.Dk. Gray), very fine grained, very well sorted], moist, well cemented, hard, strong, fresh (W1). Bedding (150-155 deg).
					150							at 88.1' bgs: Bedding fracture (165 deg), open, sl. rough.
					165							at 88.4' bgs: Fracture (60 deg), open, sl. rough.
					60							at 88.6' bgs: Bedding fractures (150 deg), open, sl. rough.
					150	150						at 88.7' bgs: Bedding fractures (160 deg), open, sl. rough.
				VOC	160							at 88.8' bgs: Friable.
					160	155						at 88.9' bgs: Competent. Bedding fracture (155 deg), open, sl. rough.
89					0				89			at 89.1' bgs: Friable.
					0							at 89.2' bgs: Competent.
				VOC	155	155						at 89.5' bgs: Bedding fracture (155 deg), open, sl. rough.
90		15:38 8:08			158	168	W1	48	90			at 90.1' bgs: Friable.
					168							at 90.2' bgs: Competent. Bedding (168 deg).
					168							at 90.3' bgs: Increasing grain size to very fine to fine grained, well sorted.
					0							at 90.45' bgs: Bedding (168 deg).
91			0.0	VOC	155				91		SS	



Sample Condition

Unrecovered

Rock Core

Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
91					155				91			SANDSTONE, N4 (Med. Dk. Gray), very fine to fine grained, well sorted, subangular to subrounded, moist, well cemented, moderately hard to hard, moderately strong, fresh (W1). Bedding (155 deg). from 91.3'-91.7' bgs: Fracture (43 deg), open, sl. rough.
				VOC	43						SS	
92					168				92			Thinly interbedded SANDSTONE [N6 (Med. Lt. Gray), very fine grained, very well sorted, subangular to subrounded] and SILTSTONE [N3 (Dk. Gray), N4 (Med. Dk. Gray), very fine grained, very well sorted], moist, well cemented, hard, strong, fresh (W1). Bedding (157-165 deg). Multiple parallel bedding fractures to 94.4' bgs.
			0.0	VOC	162							at 92.3' bgs: Hairline bedding fracture (168 deg). at 92.4' bgs: Bedding fracture (160 deg). at 92.5' bgs: Bedding fracture, (165 deg). at 92.6' bgs: Bedding fracture (162 deg). at 92.7' bgs: Bedding fracture (171, 48, 171 deg). Hairline fracture (57 deg). from 92.7'-93' bgs: Fracture (65 deg); at 93' bgs: Bedding fracture (160 deg); from 93'-93.2' bgs: Fracture (54 deg);
				VOC	171							at 93.2' bgs: Bedding fracture (164 deg); from 93.2-93.3' bgs: Parallel fractures (57, 70 deg); at 93.3' bgs: Bedding fracture (154 deg); all open, all sl. rough. Below fracture is friable. at 93.4' bgs: 0.1mm of competent core. at 93.5' bgs: Friable.
93					65				93		IB	at 93.8' bgs: Competent SANDSTONE. Fracture (159 deg).
				VOC	160							from 94.1'-94.5' bgs: Bedding (165-167 deg).
				VOC	164							
				VOC	70							
				VOC	154							
				VOC	19							
				VOC	159							
94					167				94			
					165							
					165							
95		8:19 9:19							95			



Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	Sample Condition
												DESCRIPTION
95		9:19		VOC 175	32	W1	91	95		IB		SANDSTONE, N4 (Med. Dk. Gray), very fine to fine grained, well sorted, subangular to subrounded, moist, well cemented, moderately hard to hard, moderately strong, fresh (W1). Bedding contact (32 deg). Multiple parallel fractures 95.2'-95.5' bgs (5-25 deg), open, sl. rough.
96			0.0	VOC 25				96				at 96.2' bgs: Lens of very fine grained. Bedding (29 deg).
97				VOC 21				97		SS		at 97' bgs: Color change to N5 (Med. Gray), Lens of very fine grained. Bedding (22-26 deg). at 97.2' bgs: Below lens, Color change to N4 (Med. Dk. Gray), increasing grain size to very fine to fine grained.
98				VOC 21				98				at 98.8' bgs: Increasing grain size to very fine to medium grained, w/ trace coarse grains, moderately sorted.
99				VOC 29				99				at 99' bgs: Same as 97' bgs. Bedding (25-28 deg).



MWH®

Coring Log RD-102

Page 26 of 26

Job #:1010919.010401

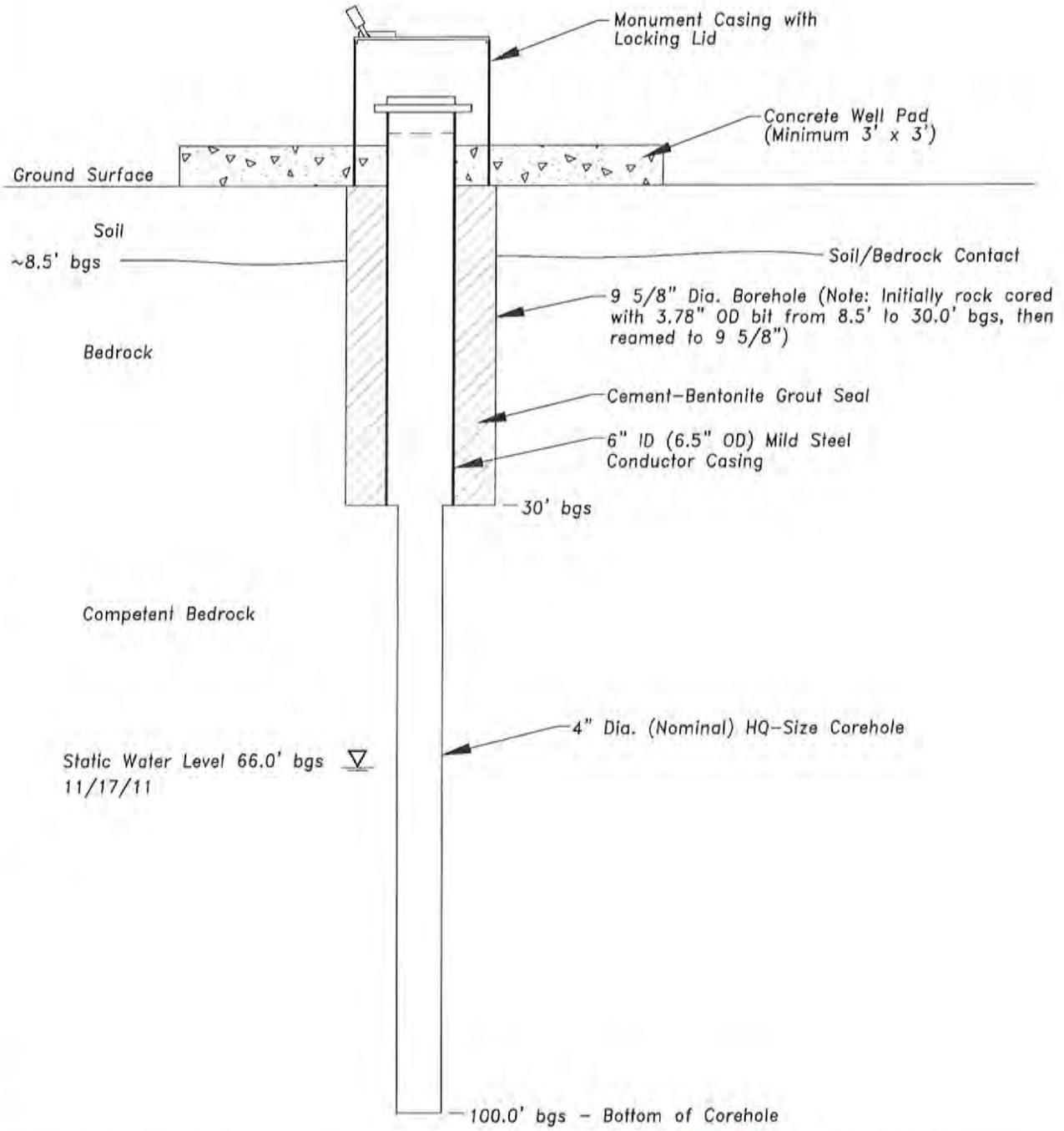
Project: SSFL GW RI Data Gap SAP Implementation

Sample Condition

-  Unrecovered
-  Rock Core
-  Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
99					25	28			99		SS	at 99.2' bgs: Grain size change to very fine to medium grained, moderately sorted.
100		9:30			18				100			at 99.9' bgs: Fracture (18 deg), open, sl. rough.
												END OF COREHOLE.
101									101			
102									102			
103									103			

FILE: CA_EBKE\BOEING SANTA SUSANA\AILY DRILLING SUMMARY\COREHOLE_RD-102



Static Water Level 66.0' bgs
11/17/11

Not to Scale

Notes:
Standpipe is ~4.0' above ground surface

	MWH
	SANTA SUSANA FIELD LABORATORY VENTURA COUNTY, CALIFORNIA GROUNDWATER RI DATA GAP SAP IMPLEMENTATION MARCH 2012
COREHOLE RD-102 CONSTRUCTION DIAGRAM	
FIGURE 1	



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
		REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.	CASING DEPTH: 40 ft. bgs.
		HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 4/26/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A
		LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.		WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
0		Silty SAND (SM), brown (10YR 4/3), fine to coarse sand, predominantly medium and fine, sub-angular to sub-rounded sand, ~20% fines, roots [Backfill]								
1		grades to brown (7.5YR 4/4)								
2										
3		Logged from drill cuttings								
4										
5		grades finer, with clay, low plasticity								
6										
7										
8										
9										
10		grades to yellowish brown (10YR 5/4)								
11										
12										
13			Sandstone, light yellowish brown (10YR 6/4) to yellowish brown (10YR 5/4), fine to medium-grained, sub-angular to sub-rounded, slightly weathered (W2)							
14										
15										

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/26/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.	WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Matt Cain	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RGD (%)	FRACTURE ORIENTATION				
15		Interbedded sandstone and shale, dark gray (N 4/0) to very dark gray (N 3/0), fine to very fine									
16											
17											
18											
19											
20											
21											
22		grades to grayish brown (10YR 5/2)									
23											
24											
25											
26											
27											
28											
29											
30											

LOG OF CORING ROCKCORE DOQ 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TCU = Total Chloride



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
		REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.	CASING DEPTH: 40 ft. bgs.
		HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 4/26/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A
		LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.		WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
30		Interbedded sandstone and shale, continued									
31		grades to gray (N 4/0)									
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											
								Injecting water for dust control, very few cuttings from cyclone			

LOG OF CORING ROCKCORE D00 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/26/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.	WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer		DRILLING COMPANY: National
DRILLERS NAME: Matt Cain		

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
45		Interbedded sandstone and shale, continued									
46								Trip out to check hammer - bit caked with bentonite plug, check hammer mechanics			
47											
48											
49											
50											
51											
52											
53		grades to light yellowish brown (10YR 6/4)									
54											
55											
56		weathered zone						Driller injecting more water to clean out cuttings - possible fractured/weathered zone			
57											
58											
59											
60											

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/26/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.	WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Matt Cain	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
60		Interbedded sandstone and shale, continued						trip out to check hammer - not firing correctly - wet cuttings clogging hammer			
61											
62											
63											
64											
65											
66											
67											
68		grades to grayish brown (10YR 5/2), more competent						Adjust air compression (200 cfm to 300 cfm)			
69											
70								Injecting water, very low dust, few cuttings			
71											
72											
73											
74		grades to light yellowish brown (10YR 6/4)									
75											

LOG OF CORING - ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/26/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.	WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
75		Interbedded sandstone and shale, continued								
76										
77										
78										
79										
80										
81										
82										
83										
84		grades to grayish brown (10YR 5/2)								
85										
86										
87										
88										
89										
90										

LOG OF CORING ROCKCORE DOO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TDS = Total Dissolved Solids



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
		REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.	CASING DEPTH: 40 ft. bgs.
		HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 4/26/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A
		LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.		WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
90		Interbedded sandstone and shale, continued									
91											
92											
93		grades to light yellowish brown (10YR 6/4)									
94											
95											
96											
97											
98								Very soft drilling, drill advanced quickly			
99								Harder drilling			
100											
101											
102		grades to yellow (10YR 7/6)									
103											
104											
105											

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/26/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.	WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Matt Cain	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	ROD (%)	FRACTURE ORIENTATION	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
								DISCONTINUITY DESCRIPTION				
105		Interbedded sandstone and shale, continued										
106												
107												
108		grades to grayish brown (10YR 5/2)						Drilling rate slows significantly				
109												
110								Slower Drilling				
111												
112												
113												
114												
115												
116												
117												
118												
119												
120												

LOG OF CORING ROCKCORE.DOC 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/26/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.	WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						ROD (%)	FRACTURE ORIENTATION				
120 - 135		Interbedded sandstone and shale, continued Gray sandstone						Stop injecting water - gray dust cloud from cyclone Hard drilling			

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
		REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.	CASING DEPTH: 40 ft. bgs.
		HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 4/26/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A
		LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.		WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
135		Sandstone, continued									
136											
137											
138											
139											
140											
141											
142											
143											
144											
145											
146											
147											
148											
149											
150											

LOG OF CORING ROCKCORE DOQ 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TBT = Total Bacterium Hydrocarbon



MWH

LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/26/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.	WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Matt Cain	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RQD (%)	FRACTURE ORIENTATION				
150		Sandstone, continued									
151											
152											
153											
154											
155											
156											
157											
158											
159											
160											
161											
162											
163											
164											
165											

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

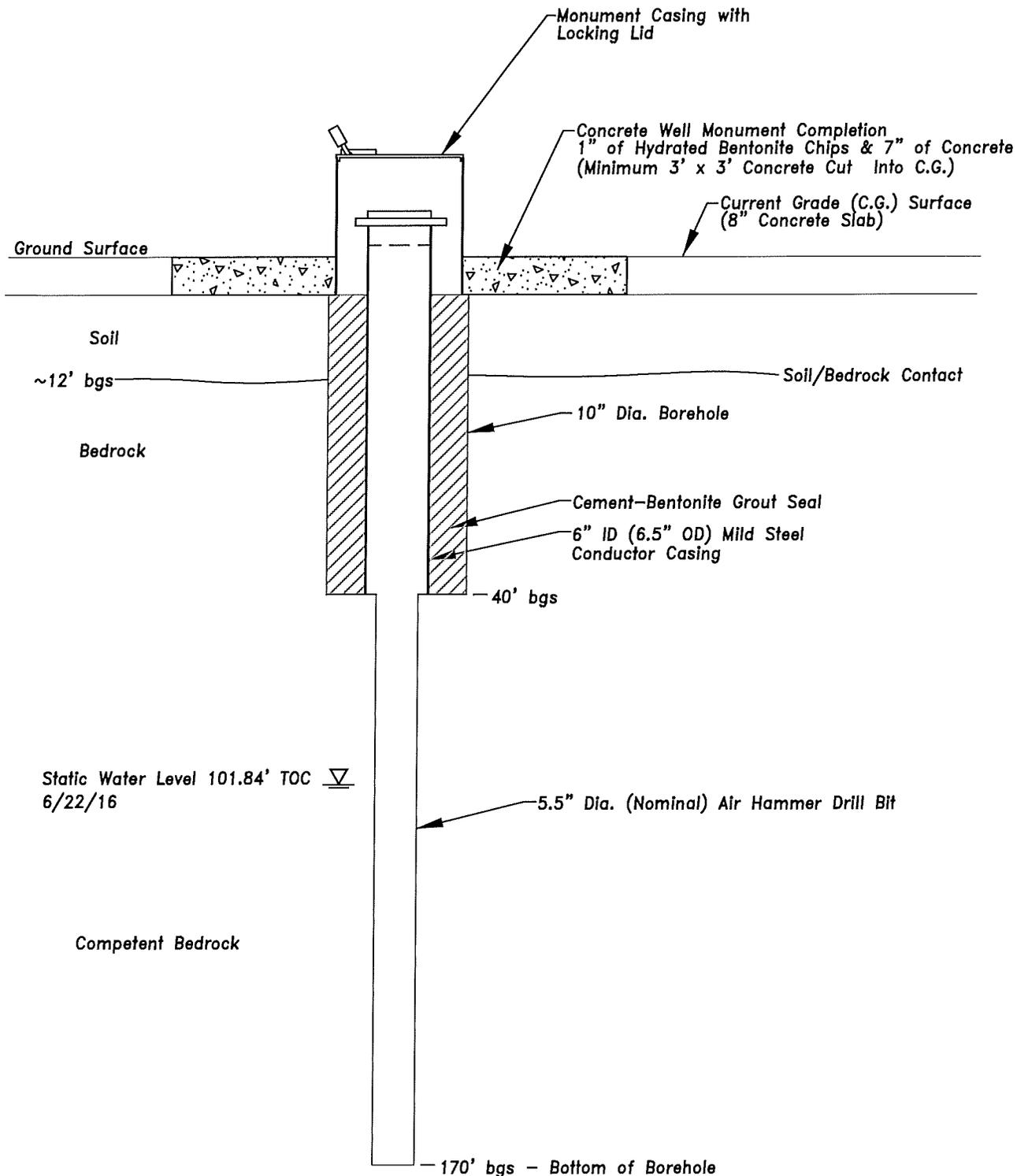
LOG OF CORING RD-150

PROJECT: SSFL Groundwater RI	SITE: ESADA Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/21/2016	DRILLING END: 4/26/2016	LOGGED BY: A. Payne, PG
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/26/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 133 ft. bgs.	WATER LEVEL AFTER DRILLING: 101.84 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						ROD (%)	DISCONTINUITY DESCRIPTION			
165 - 170		Sandstone, continued								
170 - 180		Total Depth = 170.0 feet bgs.								

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



Not to Scale



MWH

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
APRIL 2016

WELL RD-150
CONSTRUCTION DIAGRAM

FIGURE 1



MWH

LOG OF CORING RD-151

PROJECT: SSFL Groundwater RI	SITE: Pond Dredge Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/3/2016	DRILLING END: 5/9/2016	LOGGED BY: E. VanderVelde REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 130 ft.	CASING DEPTH: 41 ft. bgs. HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 5/9/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 102 ft. bgs.		WATER LEVEL AFTER DRILLING: 104.35 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer		DRILLING COMPANY: National DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						ROD (%)	FRACTURE ORIENTATION			
0 - 15		<p>SILT with sand (ML), dark reddish brown (5YR 3/3), silt to very fine sand, moist, no odor</p> <p>SILT with clay (ML), dark reddish brown (5YR 3/3), clay to silt, moist, no odor</p> <p>13' - grades with less clay</p>								

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TSS = Total Suspended Solids



MWH

LOG OF CORING RD-151

PROJECT: SSFL Groundwater RI	SITE: Pond Dredge Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/3/2016	DRILLING END: 5/9/2016	LOGGED BY: E. VanderVelde
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 130 ft.
CASING DEPTH: 41 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/9/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 102 ft. bgs.		WATER LEVEL AFTER DRILLING: 104.35 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer		DRILLING COMPANY: National
DRILLERS NAME: Jimmie Freitas		

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						ROD (%)	FRACTURE ORIENTATION				
15		SILT with clay, continued									
16											
17		Sandstone, dark yellowish brown (10YR 4/4), fine to coarse-grained, predominantly fine-grained, with some silt, dry									
18											
19											
20								Driller noted slowdown wth drilling rate			
21											
22											
23											
24											
25		grades finer to fine-grained sandstone, yellowish brown (10YR 5/6)									
26											
27											
28											
29											
30											

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-151

PROJECT: SSFL Groundwater RI	SITE: Pond Dredge Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/3/2016	DRILLING END: 5/9/2016	LOGGED BY: E. VanderVelde
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 130 ft.
CASING DEPTH: 41 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/9/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 102 ft. bgs.	WATER LEVEL AFTER DRILLING: 104.35 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	DISCONTINUITY DESCRIPTION			
30		Sandstone, continued								
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
41							Cleared borehole for setting conductor casing. Borehole collapsed back to 36 ft.			
42										
43		grades to dark yellowish brown (10YR 4/4)								
44										
45										

LOG OF CORING ROCKCORE DCO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-151

PROJECT: SSFL Groundwater RI	SITE: Pond Dredge Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/3/2016	DRILLING END: 5/9/2016	LOGGED BY: E. VanderVelde
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 130 ft.
CASING DEPTH: 41 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/9/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 102 ft. bgs.	WATER LEVEL AFTER DRILLING: 104.35 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RQD (%)	FRACTURE ORIENTATION				
45		Sandstone, continued									
46											
47											
48											
49			grades to dark grayish brown (2.5Y 4/2)								
50											
51											
52											
53			Siltstone, dark gray (2.5Y 4/1), very fine-grained moderate plasticity								
54											
55											
56											
57											
58											
59											
60											

LOG OF CORING: ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

Driller notes change in drilling behavior

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 ZTC = Total Petroleum Hydrocarbons



MWH

LOG OF CORING RD-151

PROJECT: SSFL Groundwater RI	SITE: Pond Dredge Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/3/2016	DRILLING END: 5/9/2016	LOGGED BY: E. VanderVelde REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 130 ft.	CASING DEPTH: 41 ft. bgs. HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 5/9/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 102 ft. bgs.		WATER LEVEL AFTER DRILLING: 104.35 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer		DRILLING COMPANY: National DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA			PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION	DISCONTINUITY DESCRIPTION MB = Mechanical Break FZ = Fracture Zone			
60 - 75		<p>Siltstone, continued, grayish brown (2.5Y 5/2) Grades coarser to fine to very fine-grained, with nodules of clay</p> <p>Sandstone, olive brown (2.5Y 4/4), predominantly fine-grained, with trace medium-grained and very fine-grained</p>									

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-151

PROJECT: SSFL Groundwater RI	SITE: Pond Dredge Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/3/2016	DRILLING END: 5/9/2016	LOGGED BY: E. VanderVelde
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 130 ft.
CASING DEPTH: 41 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/9/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 102 ft. bgs.	WATER LEVEL AFTER DRILLING: 104.35 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
75		Sandstone, continued, grades to brown (10YR 5/3), trace gravels of red oxidized concretions								
76										
77										
78										
79										
80										
81										
82										
83			grades with increasing medium and very fine-grained fraction							
84										
85										
86										
87										
88										
89										
90										

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TBL = Total Bacteria Count



LOG OF CORING RD-151

PROJECT: SSFL Groundwater RI	SITE: Pond Dredge Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/3/2016	DRILLING END: 5/9/2016	LOGGED BY: E. VanderVelde
DRILLING START: 5/3/2016	DRILLING END: 5/9/2016	REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 130 ft.	CASING DEPTH: 41 ft. bgs.
GROUND ELEVATION: N/A	TOTAL DEPTH: 130 ft.	HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 5/9/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A
WELL COMPLETION DATE: 5/9/2016	SAMPLER TYPE: Cuttings	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 102 ft. bgs.	WATER LEVEL AFTER DRILLING: 104.35 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
90 - 100		Interbedded Siltstone and Sandstone, brown (10YR 5/3), fine to very fine-grained, dry								
100 - 102		Clay, reddish brown (5YR 5/4), clay (100%), low to medium plasticity								
102 - 105		Well-graded sandy Gravel/gravelly Sand, fine to medium elongated, sub-angular to sub-rounded gravels, with fine to coarse sand					102.5 ft - drill string abruptly dropped approximately 2 feet			

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TBL = Total Benthic Invertebrates



MWH

LOG OF CORING RD-151

PROJECT: SSFL Groundwater RI	SITE: Pond Dredge Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/3/2016	DRILLING END: 5/9/2016	LOGGED BY: E. VanderVelde
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 130 ft.
CASING DEPTH: 41 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/9/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 102 ft. bgs.	WATER LEVEL AFTER DRILLING: 104.35 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
105		Sandstone, brown (10YR 5/3), predominantly fine grained								
106										
107										
108										
109										
110										
111										
112										
113										
114										
115										
116										
117										
118										
119										
120										

LOG OF CORING ROCKCORE DQG_10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-151

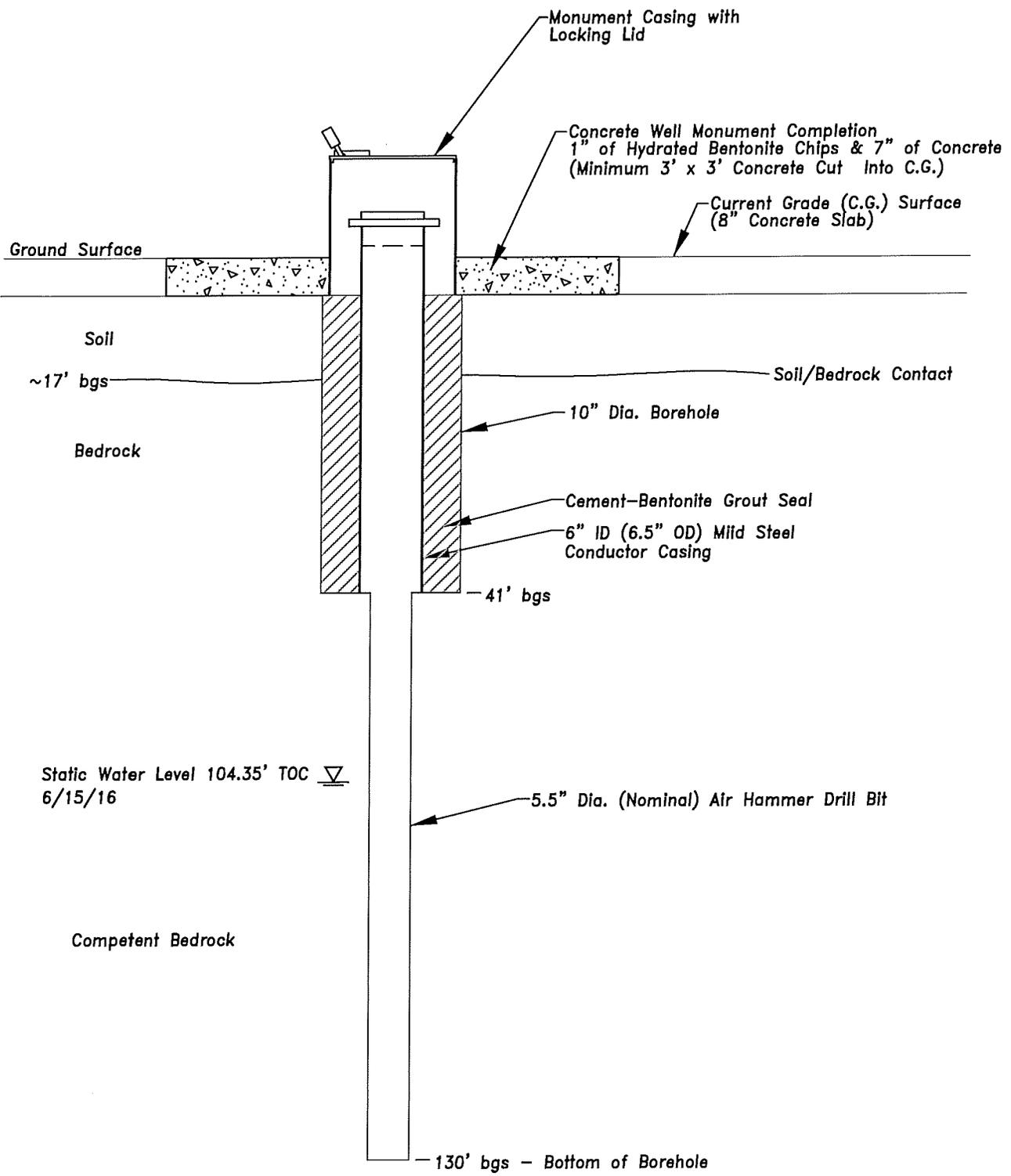
PROJECT: SSFL Groundwater RI	SITE: Pond Dredge Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/3/2016	DRILLING END: 5/9/2016	LOGGED BY: E. VanderVelde
		REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 130 ft.	CASING DEPTH: 41 ft. bgs.
		HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 5/9/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A
		LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 102 ft. bgs.		WATER LEVEL AFTER DRILLING: 104.35 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						ROD (%)	DISCONTINUITY DESCRIPTION				
120 - 120		Sandstone, continued, grades to gray (7.5YR 5/4)									
121 - 121								No water or cutting circulation			
122 - 122											
123 - 123											
124 - 124											
125 - 125											
126 - 126											
127 - 127											
128 - 128											
129 - 129									continued low circulation. Flush hole with water.		
130 - 130		Total Depth = 130.0 feet bgs.									
131 - 131											
132 - 132											
133 - 133											
134 - 134											
135 - 135											

LOG OF CORING - ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate

FILE: BOEING SANTA SUSANA DAILY DRILLING SUMMARY COREHOLE RD-151



Not to Scale



MWH

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
MAY 2016

WELL RD-151
CONSTRUCTION DIAGRAM

FIGURE 1



MWH

LOG OF CORING RD-152

PROJECT: SSFL Groundwater RI	SITE: Building 4011 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/27/2016	DRILLING END: 4/29/2016	LOGGED BY: E. VanderVelde
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 60 ft.
CASING DEPTH: 20 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/29/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: N/A	WATER LEVEL AFTER DRILLING: 35.5 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA			PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION	DISCONTINUITY DESCRIPTION			
0 - 15		<p>Silty SAND, brown (10YR 4/3), fine to coarse sand, predominantly sub-angular to sub-rounded fine to medium sand. [Back fill]</p> <p>grades to yellowish brown (10YR 5/4)</p> <p>Sandstone, (yellowish brown (10YR 5/4), fine to medium-grained, weathered, soft</p>									

LOG OF CORING - ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-152

PROJECT: SSFL Groundwater RI	SITE: Building 4011 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/27/2016	DRILLING END: 4/29/2016	LOGGED BY: E. VanderVelde
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 60 ft.
CASING DEPTH: 20 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/29/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: N/A	WATER LEVEL AFTER DRILLING: 35.5 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RGD (%)	FRACTURE ORIENTATION				
15 - 24		Sandstone, continued									
25 - 27		Silty CLAY, pale blue (5B 6/2), low to medium plasticity									
27 - 30		Sandstone, pale blue (5PB 6/2), fine-grained									
<p>Flush hole to set casing. Hole collapses 1 foot to 19' bgs</p>											

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-152

PROJECT: SSFL Groundwater RI	SITE: Building 4011 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/27/2016	DRILLING END: 4/29/2016	LOGGED BY: E. VanderVelde REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 60 ft.	CASING DEPTH: 20 ft. bgs. HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 4/29/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A LONGITUDE: N/A
WATER LEVEL DURING DRILLING: N/A	WATER LEVEL AFTER DRILLING: 35.5 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						ROD (%)	FRACTURE ORIENTATION				
30 - 31		Sandstone, continued, grades to grayish blue (5PB 5/2)									
31 - 32											
32 - 33											
33 - 34											
34 - 35											
35 - 36											
36 - 37			grades to brown (10YR 5/4)								
37 - 38											
38 - 39											
39 - 40											
40 - 41			grades to light olive gray (5Y 5/2)								
41 - 42											
42 - 43											
43 - 44											
44 - 45											

LOG OF CORING: ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-152

PROJECT: SSFL Groundwater RI	SITE: Building 4011 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/27/2016	DRILLING END: 4/29/2016	LOGGED BY: E. VanderVelde
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 60 ft.
CASING DEPTH: 20 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/29/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: N/A	WATER LEVEL AFTER DRILLING: 35.5 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Matt Cain

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA			PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						ROD (%)	FRACTURE ORIENTATION	DISCONTINUITY DESCRIPTION				
45		Sandstone, continued										
46												
47												
48												
49												
50			grades to medium light gray (N 6/0) to light olive gray (5Y 5/2)									
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-152

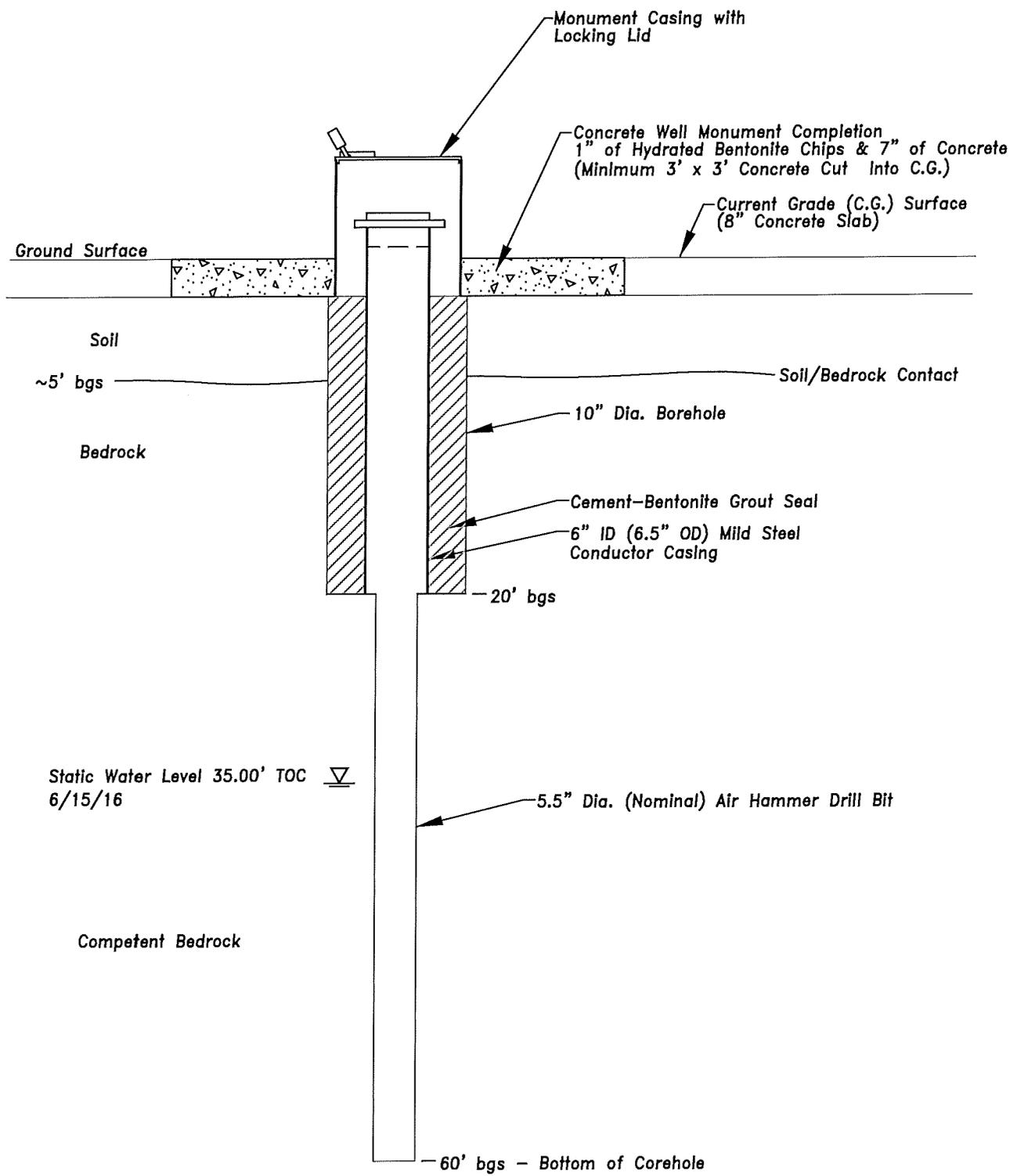
PROJECT: SSFL Groundwater RI	SITE: Building 4011 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 4/27/2016	DRILLING END: 4/29/2016	LOGGED BY: E. VanderVelde
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 60 ft.
CASING DEPTH: 20 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 4/29/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: N/A	WATER LEVEL AFTER DRILLING: 35.5 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Matt Cain	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
60		Total Depth = 60.0 feet bgs.								
61										
62										
63										
64										
65										
66										
67										
68										
69										
70										
71										
72										
73										
74										
75										

LOG OF CORING - ROCKCORE DCO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate

FILE: BOEING_SANTA_SUSANA\DAI\DRILLING SUMMARY\COREHOLE RD-152



Not to Scale



MWH

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
MAY 2016

WELL RD-152
CONSTRUCTION DIAGRAM

FIGURE 1



MWH

LOG OF CORING RD-153

PROJECT: SSFL Groundwater RI	SITE: EEL - Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/10/2016	DRILLING END: 5/11/2016	LOGGED BY: V. Vathanasin
		REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 55 ft.	CASING DEPTH: 20 ft. bgs.
		HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 5/11/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A
		LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 30 ft. bgs.		WATER LEVEL AFTER DRILLING: 26.12 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (pptm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
0 - 15		<p>Silty SAND (SM), yellowish brown (10YR 5/4), loose, dry, fine sand, non-plastic silt, (graded native material), no stains, no odors [Fill]</p> <p>grades to light yellowish brown (10YR 6/4), and coarser with medium sand [Native Soil]</p> <p>Sandstone, pale yellow (2.5YR 7/4), highly weathered (W4), soft (H6) [Chatsworth Fm.]</p>									
								Hand augered from 0-5 feet			
								Change from hollow stem auger to rotary drilling. Logged from cuttings			
								Very easy drilling, inject water for dust suppression			

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/21/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-153

PROJECT: SSFL Groundwater RI	SITE: EEL - Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/10/2016	DRILLING END: 5/11/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 55 ft.
CASING DEPTH: 20 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/11/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 30 ft. bgs.	WATER LEVEL AFTER DRILLING: 26.12 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
15		Sandstone, continued								
16										
17										
18		grades to light yellowish brown (10YR 5/4)								
19										
20								Trip out, switch to downhole hammer. Install conductor casing to 20' bgs.		
21										
22										
23										
24		grades to light brownish gray (10YR 6/2), more competent						Increasingly difficult drilling, competent rock		
25										
26										
27										
28										
29										
30							Water vapor from cyclone, potentially first water			

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/21/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-153

PROJECT: SSFL Groundwater RI	SITE: EEL - Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/10/2016	DRILLING END: 5/11/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 55 ft.
CASING DEPTH: 20 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/11/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 30 ft. bgs.	WATER LEVEL AFTER DRILLING: 26.12 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RQD (%)	FRACTURE ORIENTATION				
30 - 31		Sandstone, continued									
31 - 32											
32 - 33											
33 - 34											
34 - 35											
35 - 36											
36 - 37											
37 - 38											
38 - 39			grades to brown (10YR 5/3)					Pulverized rock powder			
39 - 40											
40 - 41			grades to gray (10YR 5/1)								
41 - 42								Very difficult drilling, white dust from cyclone			
42 - 43											
43 - 44								Slight increase in drill rate			
44 - 45											

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/21/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

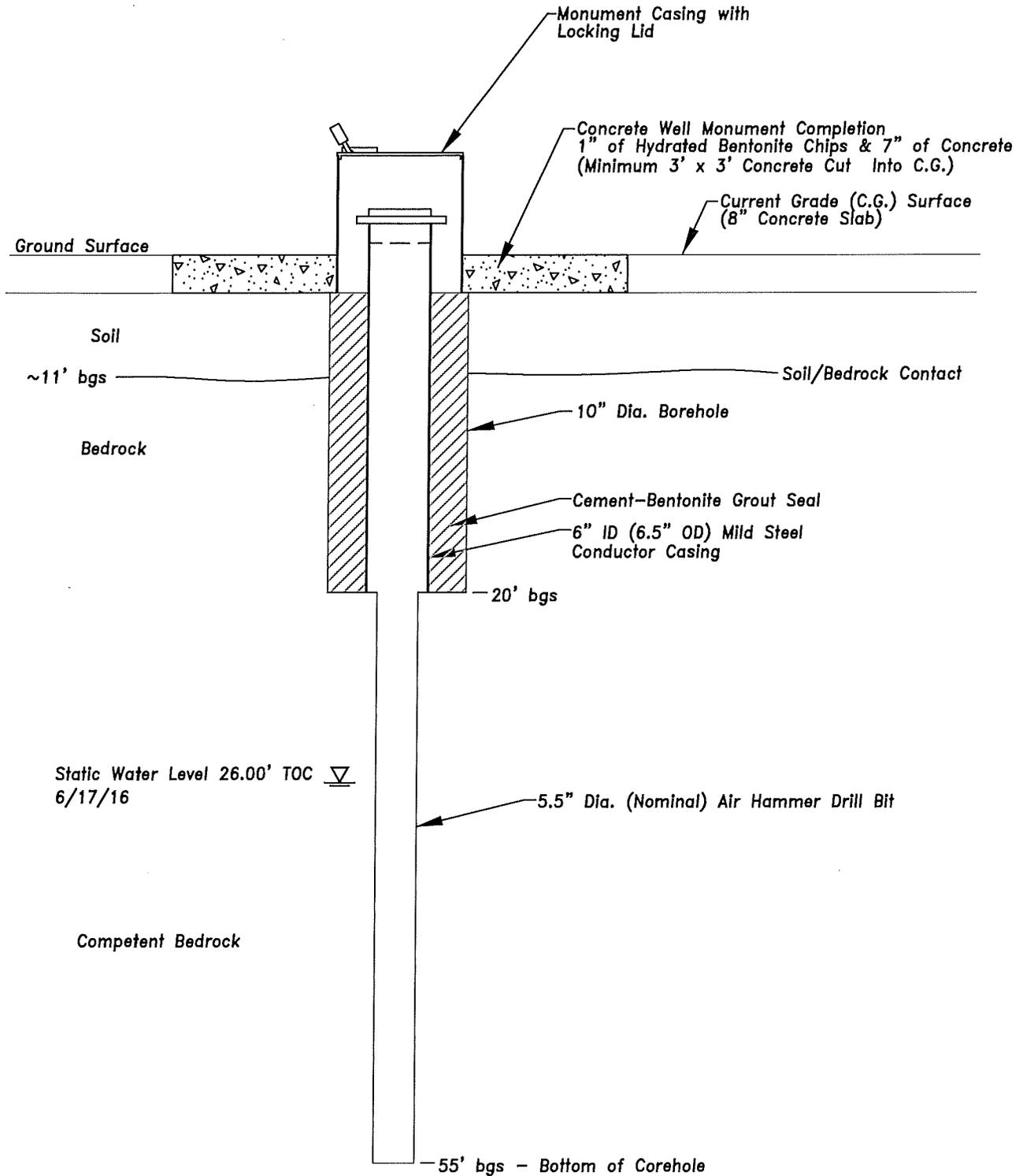
LOG OF CORING RD-153

PROJECT: SSFL Groundwater RI	SITE: EEL - Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/10/2016	DRILLING END: 5/11/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 55 ft.
CASING DEPTH: 20 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/11/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 30 ft. bgs.	WATER LEVEL AFTER DRILLING: 26.12 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						ROD (%)	FRACTURE ORIENTATION				
45 - 55		Sandstone, continued									
55 - 60		Total Depth = 55.0 feet bgs.									

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/21/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



Not to Scale



MWH

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
MAY 2016

WELL RD-153
CONSTRUCTION DIAGRAM

FIGURE 1



MWH

LOG OF CORING RD-154

PROJECT: SSFL Groundwater RI	SITE: NewCon Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/18/2016	DRILLING END: 5/23/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 145 ft.
CASING DEPTH: 31 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 120.25 ft. bgs.	WATER LEVEL AFTER DRILLING: 109.90 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						ROD (%)	FRACTURE ORIENTATION				
0		Poorly-graded SAND with silt (SP-SM), dark brown (10YR 3/3), loose, dry, predominantly fine sand with medium sand and silt, no odors, no staining									
1											
2											
3			grades to dark yellowish brown (10YR 3/4)								
4			Sandstone, light yellowish brown (10YR 6/4), loose, dry, predominantly fine-grained, no odor, no staining								
5											
6											
7											
8											
9			grades to medium dense, grades coarser to fine to coarse-grained, with biotite and plagioclase								
10											
11											
12											
13											
14			grades to grayish brown (10YR 5/2)								
15											

Hand augered from 0-4 feet

LOG OF CORING: ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-154

PROJECT: SSFL Groundwater RI	SITE: NewCon Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/18/2016	DRILLING END: 5/23/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 145 ft.
CASING DEPTH: 31 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 120.25 ft. bgs.	WATER LEVEL AFTER DRILLING: 109.90 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA			PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RDD (%)	FRACTURE ORIENTATION	DISCONTINUITY DESCRIPTION			
15		Sandstone, continued									
16		grades to light yellowish brown (10YR 6/4)									
17								Rig chatter			
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
											Improved drilling
											Set casing to 31.0 feet, convert to 5.5-inch

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-154

PROJECT: SSFL Groundwater RI	SITE: NewCon Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/18/2016	DRILLING END: 5/23/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 145 ft.
CASING DEPTH: 31 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 120.25 ft. bgs.	WATER LEVEL AFTER DRILLING: 109.90 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	DISCONTINUITY DESCRIPTION			
30		Sandstone, continued.					hammer			
31		zone of increased weathering, softer					Inject water for dust suppression			
32										
33										
34										
35		grades to highly weathered, very soft								
36								Increased drilling difficulty		
37										
38								38'-39' - Fractured, no dust from hopper		
39		grades to pale brown (10YR 5/2)						Dust, increased drilling difficulty		
40										
41										
42		grades to grayish brown (10YR 5/2), siltstone interbeds								
43										
44										
45										

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-154

PROJECT: SSFL Groundwater RI	SITE: NewCon Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/18/2016	DRILLING END: 5/23/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 145 ft.
CASING DEPTH: 31 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 120.25 ft. bgs.	WATER LEVEL AFTER DRILLING: 109.90 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RQD (%)	FRACTURE ORIENTATION				
45		Sandstone, continued									
46											
47											
48		grades harder						Increased drilling difficulty, increased water injection			
49											
50											
51											
52											
53											
54											
55		grades to gray (N 5/0)									
56											
57											
58											
59											
60											

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TSM = Total Suspended Matter



MWH

LOG OF CORING RD-154

PROJECT: SSFL Groundwater RI	SITE: NewCon Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/18/2016	DRILLING END: 5/23/2016	LOGGED BY: V. Vathanasin
		REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 145 ft.	CASING DEPTH: 31 ft. bgs.
		HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 6/10/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A
		LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 120.25 ft. bgs.		WATER LEVEL AFTER DRILLING: 109.90 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
60		Sandstone, continued									
61											
62											
63											
64			grades to grayish brown (10YR 5/2)								
65											
66											
67			grades to gray (10YR 5/1)						Reduction in drilling rate		
68											
69											
70											
71											
72											
73											
74											
75											

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TDU = Total Dissolved Solids



MWH

LOG OF CORING RD-154

PROJECT: SSFL Groundwater RI	SITE: NewCon Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/18/2016	DRILLING END: 5/23/2016	LOGGED BY: V. Vathanasin REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 145 ft.	CASING DEPTH: 31 ft. bgs. HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 6/10/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 120.25 ft. bgs.		WATER LEVEL AFTER DRILLING: 109.90 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer		DRILLING COMPANY: National DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA			PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RQD (%)	FRACTURE ORIENTATION	DISCONTINUITY DESCRIPTION				
75		Sandstone, continued										
76												
77												
78			grades to grayish brown (10YR 5/2) to brown (10YR 5/3)									
79												
80												
81												
82												
83			grades to gray (10YR 5/1)						Increased drilling difficulty			
84												
85												
86												
87												
88												
89												
90												

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-154

PROJECT: SSFL Groundwater RI	SITE: NewCon Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/18/2016	DRILLING END: 5/23/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 145 ft.
CASING DEPTH: 31 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 120.25 ft. bgs.	WATER LEVEL AFTER DRILLING: 109.90 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA			PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION	DISCONTINUITY DESCRIPTION			
90		Sandstone, continued									
91											
92		grades to grayish brown (10YR 5/2)						Improved drilling			
93		grades to gray (10YR 5/1)									
94											
95		grades to grayish brown (10YR 5/2)									
96		grades to gray (10YR 5/1)									
97											
98											
99											
100											
101											
102											
103											
104											
105		grades to bluish gray (5B 5/1)									

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-154

PROJECT: SSFL Groundwater RI	SITE: NewCon Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/18/2016	DRILLING END: 5/23/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 145 ft.
CASING DEPTH: 31 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 120.25 ft. bgs.	WATER LEVEL AFTER DRILLING: 109.90 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						ROD (%)	FRACTURE ORIENTATION					
105		Sandstone, continued										
106												
107												
108												
109												
110												
111												
112												
113												
114												
115												
116												
117												
118												
119												
120												
									Improved drilling			
									Low return from cyclone (water not turned off)			

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-154

PROJECT: SSFL Groundwater RI	SITE: NewCon Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/18/2016	DRILLING END: 5/23/2016	LOGGED BY: V. Vathanasin
GROUND ELEVATION: N/A	TOTAL DEPTH: 145 ft.	REVIEWED BY: J. Van Pelt, PG
WELL COMPLETION DATE: 6/10/2016	SAMPLER TYPE: Cuttings	CASING DEPTH: 31 ft. bgs.
		HOLE DIAMETER: 5.5
		LATITUDE: N/A
		LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 120.25 ft. bgs.		WATER LEVEL AFTER DRILLING: 109.90 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer		DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RQD (%)	DISCONTINUITY DESCRIPTION				
120		Sandstone, continued									
121											
122											
123											
124											
125											
126											
127											
128											
129											
130											
131											
132											
133											
134											
135											

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

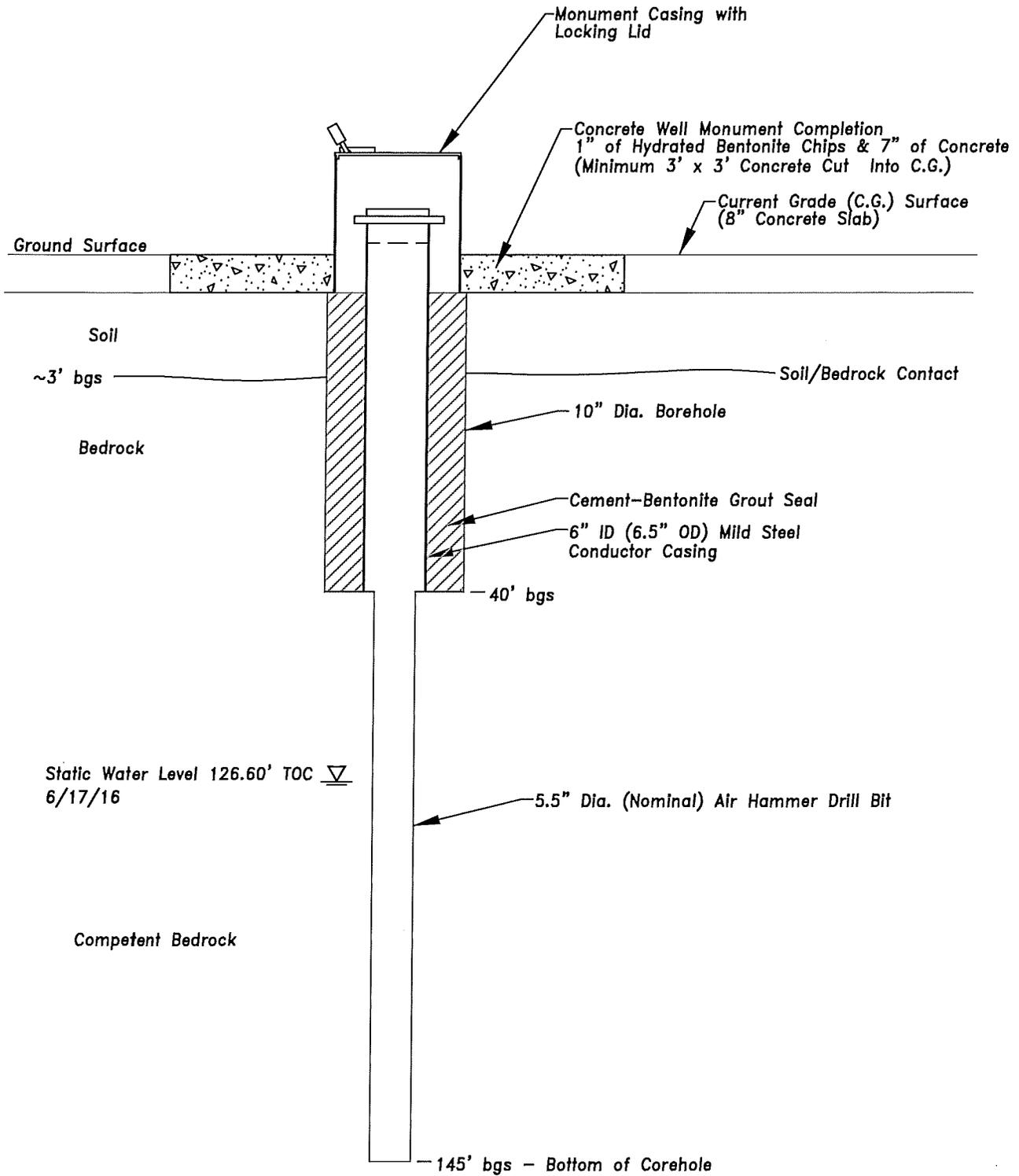
LOG OF CORING RD-154

PROJECT: SSFL Groundwater RI	SITE: NewCon Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/18/2016	DRILLING END: 5/23/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 145 ft.
CASING DEPTH: 31 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 120.25 ft. bgs.	WATER LEVEL AFTER DRILLING: 109.90 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
135		Sandstone, continued									
136											
137											
138											
139											
140											
141											
142											
143											
144											
145											
146			Total Depth = 145.0 feet bgs.								
147											
148											
149											
150											

LOG OF CORING - ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TDM = Total Dissolved Solids



Not to Scale



MWH

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
MAY 2016

WELL RD-154
CONSTRUCTION DIAGRAM

FIGURE 1



MWH

LOG OF CORING RD-155

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/12/2016	DRILLING END: 5/17/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 115 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/47/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 89.9 ft. bgs.	WATER LEVEL AFTER DRILLING: 93.55 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Atr-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
0		Asphalt to 4-inches									
1		Poorly-graded SAND with gravel (SP), yellowish brown (10YR 5/4), medium dense, mosit, fine and medium sand, fine angular to sub-angular gravel, road base [Fill]						Hand augered from 0-2.5 feet			
2		grades with silt									
3		Sandstone, light yellowish brown (10YR 6/4), medium to fine-grained, moderately to highly weathered (W3-W4), soft (H6), weakly cemented [Chatsworth Fm.]									
10								10-Auger to 10'. Change over to rotary with tricone			

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 8/3/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-155

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/12/2016	DRILLING END: 5/17/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 115 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/47/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 89.9 ft. bgs.	WATER LEVEL AFTER DRILLING: 93.55 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						ROD (%)	FRACTURE ORIENTATION					
15		Sandstone, continued										
16												
17								Increased drilling difficulty				
18												
19												
20												
21			grades to grayish brown (10YR 5/2)						Some rig chatter, increased drilling difficulty			
22												
23												
24												
25												
26												
27												
28									Rig chatter, some rig hop			
29												
30												

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 8/3/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TDS = Total Dissolved Solids



MWH

LOG OF CORING RD-155

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/12/2016	DRILLING END: 5/17/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 115 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/47/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 89.9 ft. bgs.	WATER LEVEL AFTER DRILLING: 93.55 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RQD (%)	FRACTURE ORIENTATION					
30 - 31		Sandstone, continued										
32 - 33												
34 - 35												
36 - 37			grades to gray (10YR 5/1)						Reduced rig chatter			
38 - 39												
40 - 41												
42 - 43			grades to light yellowish brown (10YR 6/4)						Reduced drilling difficulty			
44 - 45												

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 8/3/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TDU = Total Dissolved Solids



MWH

LOG OF CORING RD-155

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/12/2016	DRILLING END: 5/17/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 115 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/47/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 89.9 ft. bgs.	WATER LEVEL AFTER DRILLING: 93.55 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RDD (%)	DISCONTINUITY DESCRIPTION				
45		Sandstone, continued, grades to gray (10YR 5/1)									
46											
47											
48											
49											
50											
51											
52											
53											
54											
55											
56											
57											
58											
59											
60											

LOG OF CORING ROCKCORE DQD 10508421 AREA IV.GPJ 8/3/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-155

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/12/2016	DRILLING END: 5/17/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 115 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/47/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 89.9 ft. bgs.	WATER LEVEL AFTER DRILLING: 93.55 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
60 - 60		Sandstone, continued								
61 - 61										
62 - 62										
63 - 63										
64 - 64								Reduced dust, potential fracture/wearthered zone		
65 - 65										
66 - 66										
67 - 67										
68 - 68								Increased drilling difficulty		
69 - 69			grades to graysih brown (10YR 5/2)							
70 - 70										
71 - 71			grades to brown (10YR 5/3), grades finer					Reduced dust		
72 - 72										
73 - 73										
74 - 74								Increased dust		
75 - 75										

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 8/3/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-155

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/12/2016	DRILLING END: 5/17/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 115 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/47/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 89.9 ft. bgs.	WATER LEVEL AFTER DRILLING: 93.55 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
75		Sandstone, continued						Reduced drilling difficulty			
76											
77									Increased drilling difficulty		
78											
79											
80											
81											
82											
83											
84											
85		grades to graysih brown (10YR 5/2)									
86											
87											
88											
89											
90											

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 8/3/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-155

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/12/2016	DRILLING END: 5/17/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 115 ft.
CASING DEPTH: 40 ft. bgs.	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 5/47/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 89.9 ft. bgs.	WATER LEVEL AFTER DRILLING: 93.55 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
90		grades to graysih brown (10YR 5/2)								
91										
92										
93		grades to gray (10YR 5/1)						Increased drilling difficulty		
94										
95								Reduced dust		
96										
97										
98										
99										
100										
101		grades to gray (10YR 5/1)								
102										
103										
104										
105										

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 8/3/16

*VOCs = Volatile Organic Compounds
CL = Chloride
FD = Field Duplicate
TCU = Total Chloride



MWH

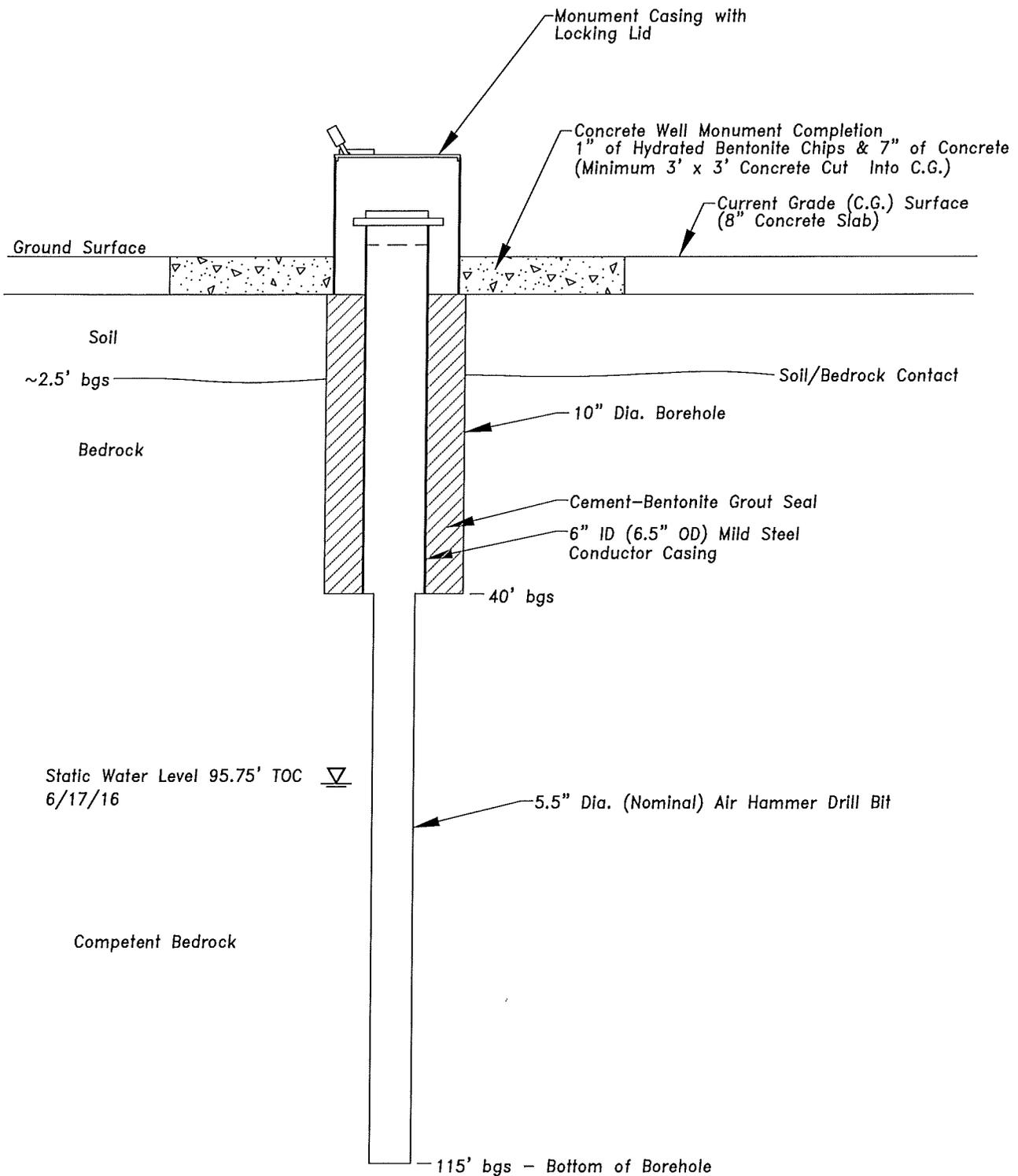
LOG OF CORING RD-155

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 5/12/2016	DRILLING END: 5/17/2016	LOGGED BY: V. Vathanasin REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 115 ft.	CASING DEPTH: 40 ft. bgs. HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 5/47/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 89.9 ft. bgs.		WATER LEVEL AFTER DRILLING: 93.55 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer		DRILLING COMPANY: National DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RQD (%)	FRACTURE ORIENTATION					
105		Sandstone, continued										
106												
107												
108												
109												
110			grades coarser to fine to verfine grained									
111												
112												
113												
114												
115		Total Depth = 115.0 feet bgs.										
116												
117												
118												
119												
120												

LOG OF CORING ROCKCORE.DOC 10508421 AREA IV.GPJ 8/3/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



Not to Scale



MWH

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
MAY 2016

WELL RD-155
CONSTRUCTION DIAGRAM

FIGURE 1



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: N/A	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.	WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						ROD (%)	FRACTURE ORIENTATION				
0		Silty SAND (SM), brown (10YR 4/3), loose, dry to moist, fine sand, low plasticity silt, very weakly cemented. Asphalt fragments, slightly compacted [Fill]									
1											
2											
3			grades to yellowish brown (10YR 5/4)					Hand augered from 0-5 feet			
4											
5											
6											
7		Sandstone, light yellowish brown (10YR 6/4), moderately weathered (W3), soft (H6), weakly cemented									
8											
9											
10								10-Auger to 10'. Change over to rotary with tricone			
11											
12											
13											
14											
15											

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: N/A	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.	WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						ROD (%)	FRACTURE ORIENTATION					
15		Sandstone, continued						Yellowish brown rock dust from cyclone				
16												
17												
18												
19												
20												
21												
22												
23									Rig chatter, reduced drilling rate			
24									Reduced drilling difficulty			
25												
26												
27												
28												
29												
30												

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TDS = Total Dissolved Solids



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.	CASING DEPTH: N/A HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 6/10/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.		WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer		DRILLING COMPANY: National DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
30 - 31		Sandstone, continued								
31 - 32							Rig chatter			
32 - 33							Increased drilling difficulty			
33 - 34		grades to grayish brown (10YR 5/2)								
34 - 35										
35 - 36										
36 - 37										
37 - 38										
38 - 39										
39 - 40										
40 - 41		grades to gray (10YR 6/1), fresh (W1)					Minor fall-back, set casing to 40'			
41 - 42										
42 - 43										
43 - 44										
44 - 45							Increased drilling difficulty, reduced rate			

LOG OF CORING - ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TDS = Total Dissolved Solids



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: N/A	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.	WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RQD (%)	FRACTURE ORIENTATION				
45		Sandstone, continued									
46											
47											
48											
49											
50											
51											
52											
53			grades to grayish brown (10YR 5/2)					Reduced drilling difficulty			
54											
55											
56											
57											
58											
59											
60											

LOG OF CORING ROCKCORE DQD 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.	CASING DEPTH: N/A HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 6/10/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.		WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer		DRILLING COMPANY: National DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
60 - 75		Sandstone, continued									
								Reduced drilling difficulty, dust cut off to 69.5'			
								Increased drilling difficulty			

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: N/A	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.	WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
75		Sandstone, continued								
76										
77										
78		grades to grayish brown (10YR 5/2) and gray (10YR 6/1)								
79										
80										
81		Reduced cyclone dust								
82		grades to gray (10YR 5/2)								
83										
84		Increased cyclone dust, increased drilling difficulty								
85	grades to grayish brown (10YR 5/2), very hard (H2)									
86										
87										
88										
89										
90										

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TSS = Total Suspended Solids



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin REVIEWED BY: J. Van Pelt, PG
GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.	CASING DEPTH: N/A HOLE DIAMETER: 5.5
WELL COMPLETION DATE: 6/10/2016	SAMPLER TYPE: Cuttings	LATITUDE: N/A LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.		WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer		DRILLING COMPANY: National DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*	
						RQD (%)	FRACTURE ORIENTATION				
90		Sandstone, continued									
91											
92											
93											
94											
95											
96											
97											
98											
99											
100											
101											
102											
103											
104											
105											

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TDU = Total Duplicate



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: N/A	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.	WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						ROD (%)	FRACTURE ORIENTATION				
105		Sandstone, continued									
106											
107											
108											
109											
110											
111											
112											
113											
114											
115			grades to gray (10YR 5/1)								
116											
117											
118											
119											
120											

LOG OF CORING: ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TTH = Total Petroleum Hydrocarbons



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: N/A	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.	WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.	DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer
DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas	

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						ROD (%)	FRACTURE ORIENTATION			
120		Sandstone, continued								
121										
122										
123										
124										
125										
126										
127										
128										
129										
130		grades to gray (10YR 6/1)								
131										
132										
133										
134										
135										

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 * - Total Petroleum Hydrocarbon



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: N/A	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.	WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA			PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION	DISCONTINUITY DESCRIPTION			
135		Sandstone, continued, grades to gray (10YR 5/1)									
136											
137											
138											
139											
140			grades to greenish gray (5BG 6/1)								
141											
142											
143											
144											
145											
146											
147											
148											
149											
150											

LOG OF CORING ROCKCORE DQG 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TDS = Total Dissolved Solids



MWH

LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: N/A	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.	WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION			
150 - 165		Sandstone, continued								
							Reduced drilling difficulty, increased drilling rate			
							Fracture			

LOG OF CORING ROCKCORE DQO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate



MWH

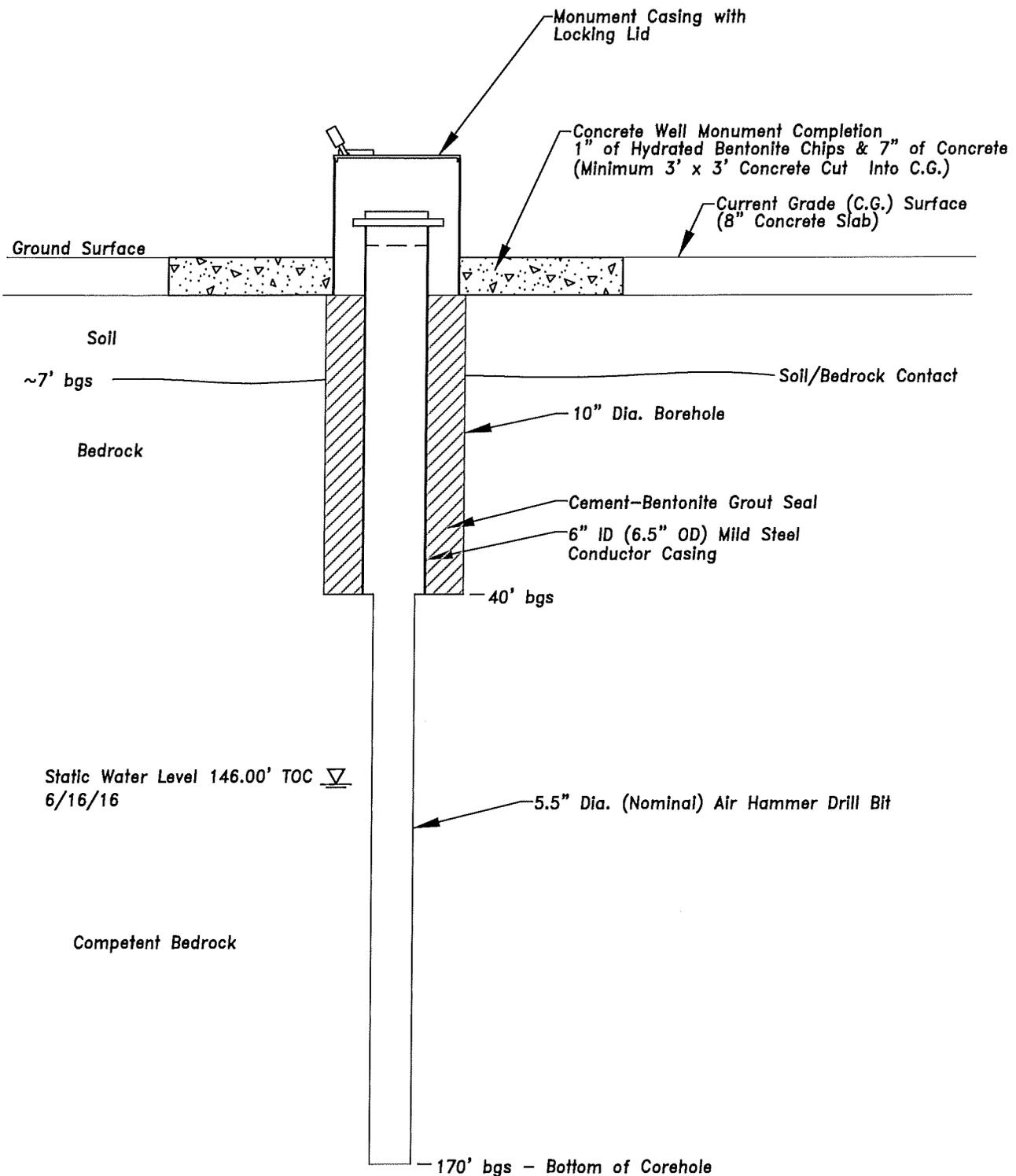
LOG OF CORING RD-156

PROJECT: SSFL Groundwater RI	SITE: Building 4100 Area IV	PROJECT NUMBER: 10508421
DRILLING START: 6/3/2016	DRILLING END: 6/9/2016	LOGGED BY: V. Vathanasin
REVIEWED BY: J. Van Pelt, PG	GROUND ELEVATION: N/A	TOTAL DEPTH: 170 ft.
CASING DEPTH: N/A	HOLE DIAMETER: 5.5	WELL COMPLETION DATE: 6/10/2016
SAMPLER TYPE: Cuttings	LATITUDE: N/A	LONGITUDE: N/A
WATER LEVEL DURING DRILLING: 145 ft. bgs.	WATER LEVEL AFTER DRILLING: 148.72 ft. bgs.	
DRILLING EQUIPMENT/METHOD: Air Rot.-CME-85, Air-Hammer	DRILLING COMPANY: National	DRILLERS NAME: Jimmie Freitas

ELEVATION DEPTH (ft)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	SAMPLE TYPE	CORE NO.	RECOVERY (%)	DISCONTINUITY DATA		DISCONTINUITY DESCRIPTION	PID (ppm)	RETAINED FOR ANALYSIS	LABORATORY TESTS*
						RQD (%)	FRACTURE ORIENTATION				
165 - 170		Sandstone, continued									
170 - 180		Total Depth = 170.0 feet bgs.									

LOG OF CORING ROCKCORE DCO 10508421 AREA IV.GPJ 7/22/16

*VOCs = Volatile Organic Compounds
 CL = Chloride
 FD = Field Duplicate
 TDS = Total Dissolved Solids



Not to Scale



MWH

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
JUNE 2016

WELL RD-156
CONSTRUCTION DIAGRAM

FIGURE 1

RS WELL LOGS

RS-11, 16, 18, 23, 24,
25, 27, 28, 36, 54

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-22

LITHOLOGIC LOG OF MONITOR WELL RS-11

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 2.0	FILL	Clayey sand, brown, concrete fragments, no odor.
2.0 - 8.0	SILTY SAND	Light brown, some clay, loose, damp, no odor, clay content increasing with depth.
8.0 - 14.0	SANDSTONE (CHATSWORTH FORMATION)	Yellow-brown, interlayers of mudstone, damp, weathered. At 14.0 feet, wet, no odor.
14.0 - 17.5	SANDSTONE (CHATSWORTH FORMATION)	Hard, unweathered, wet. At 15.0 feet, first seepage noted, no odor.

TOTAL DEPTH OF BOREHOLE: 17.5 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

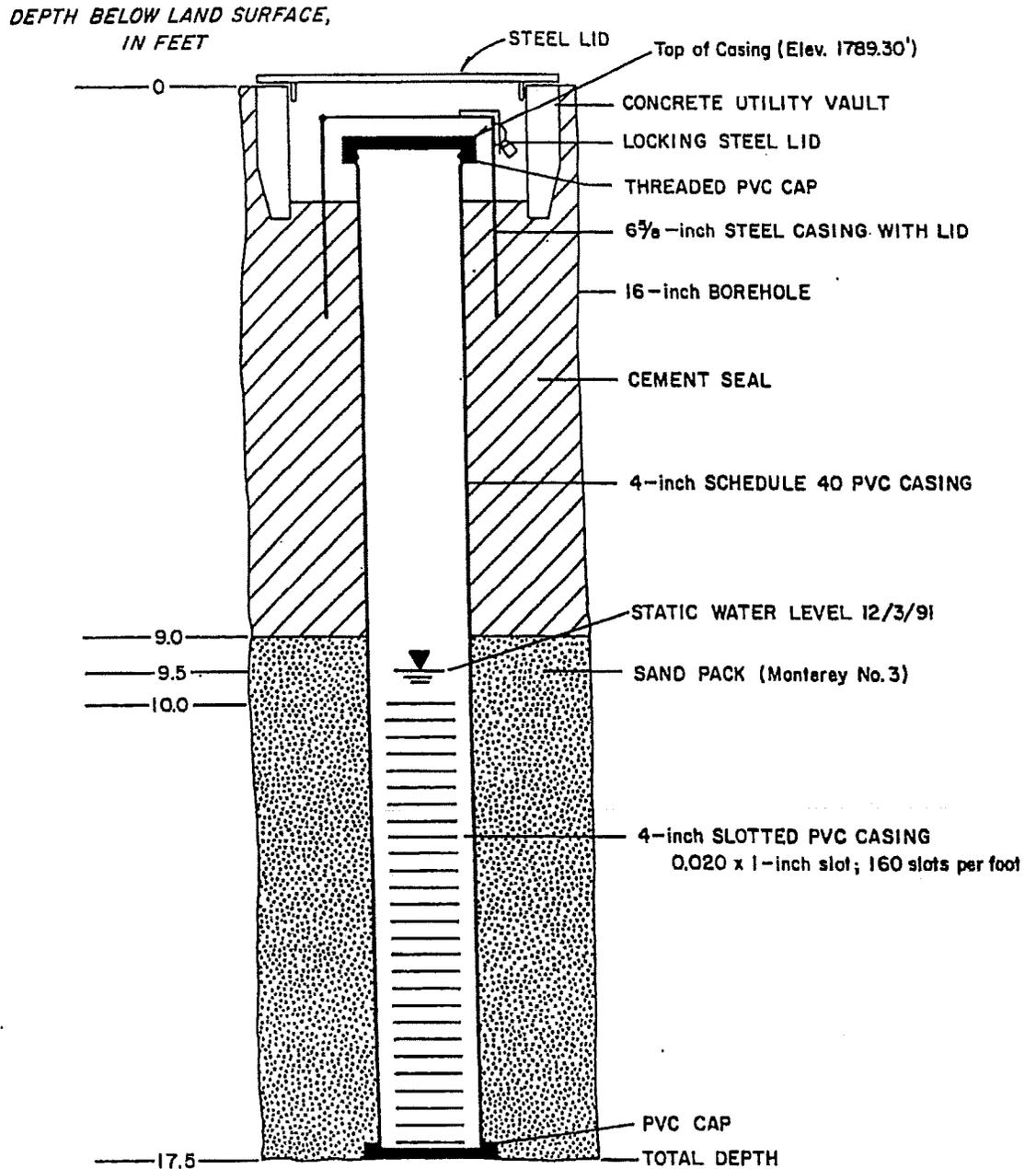


FIGURE C-II SCHEMATIC CONSTRUCTION DIAGRAM OF MONITORING WELL RS-11

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-27

LITHOLOGIC LOG OF MONITOR WELL RS-16

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 7.0	CLAYEY SAND	Light brown, some clay interlayers, trace gravel, dry, may be fill, no odor. At 2.0 feet, damp.
7.0 - 11.0	SANDY CLAY	Dark brown, some gravel, trace sandstone cobbles, no odor, may be fill.
11.0 - 18.0	SILTY SAND	Brown, some clay, trace gravel, damp, traces of concrete.
18.0 - 20.5	SANDSTONE (CHATSWORTH FORMATION)	Yellow-brown, friable, weathered, damp, no odor.

TOTAL DEPTH OF BOREHOLE: 20.5

GROUNDWATER RESOURCES CONSULTANTS, INC.

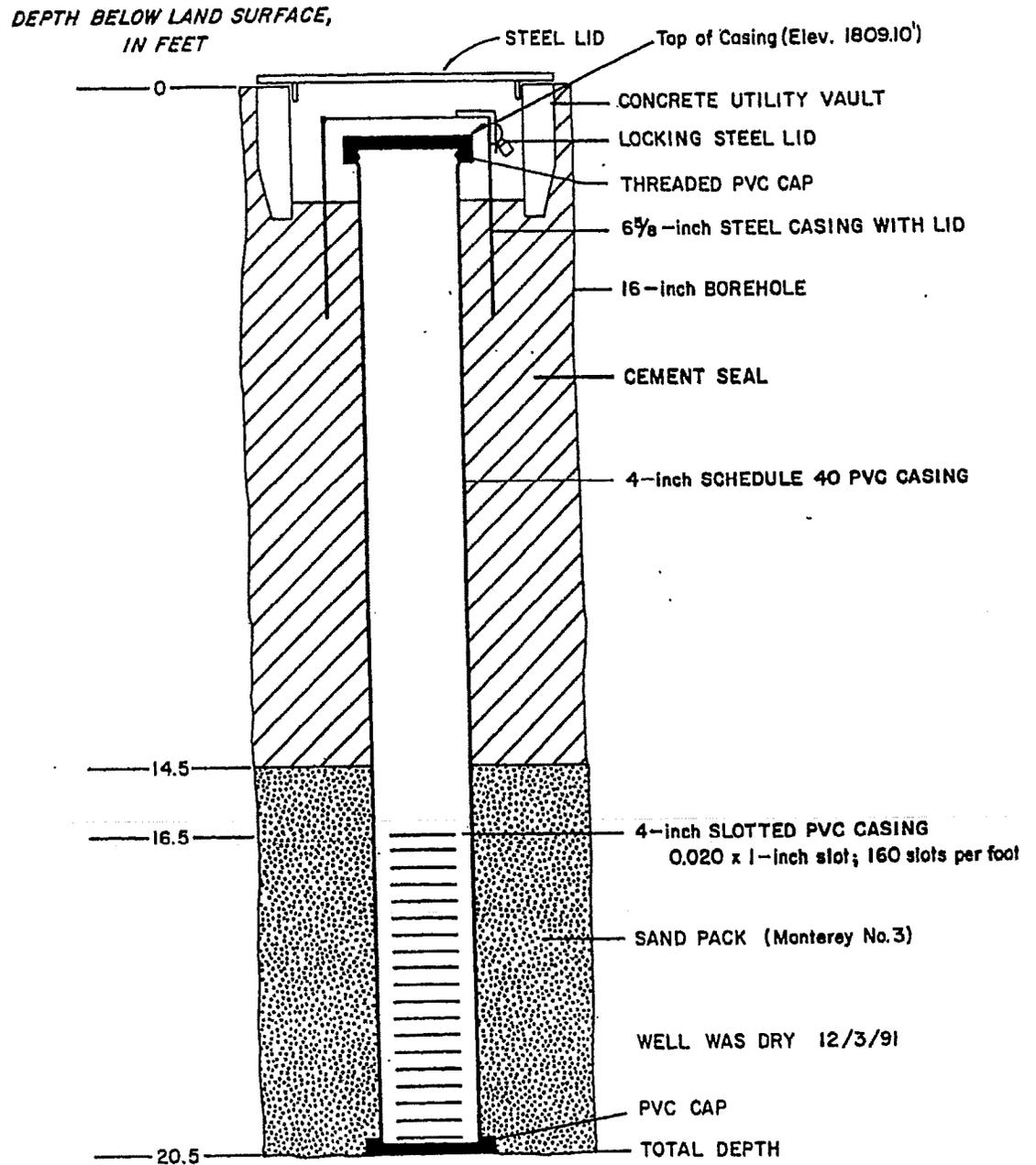


FIGURE C-16 SCHEMATIC CONSTRUCTION DIAGRAM OF MONITORING WELL RS-16

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-29

LITHOLOGIC LOG OF MONITOR WELL RS-18

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 9.0	CLAYEY SAND	Brown, 2-inch layer of asphalt on surface, some red mottling; clay content decreasing with depth, no odor, damp. At 5.0 feet, light brown; trace fine pebbles.
9.0 - 13.0	SANDSTONE (CHATSWORTH FORMATION)	Yellow-brown, damp, weathered, friable; some siltstone interlayers, damp, no odor.

TOTAL DEPTH OF BOREHOLE: 13.0 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

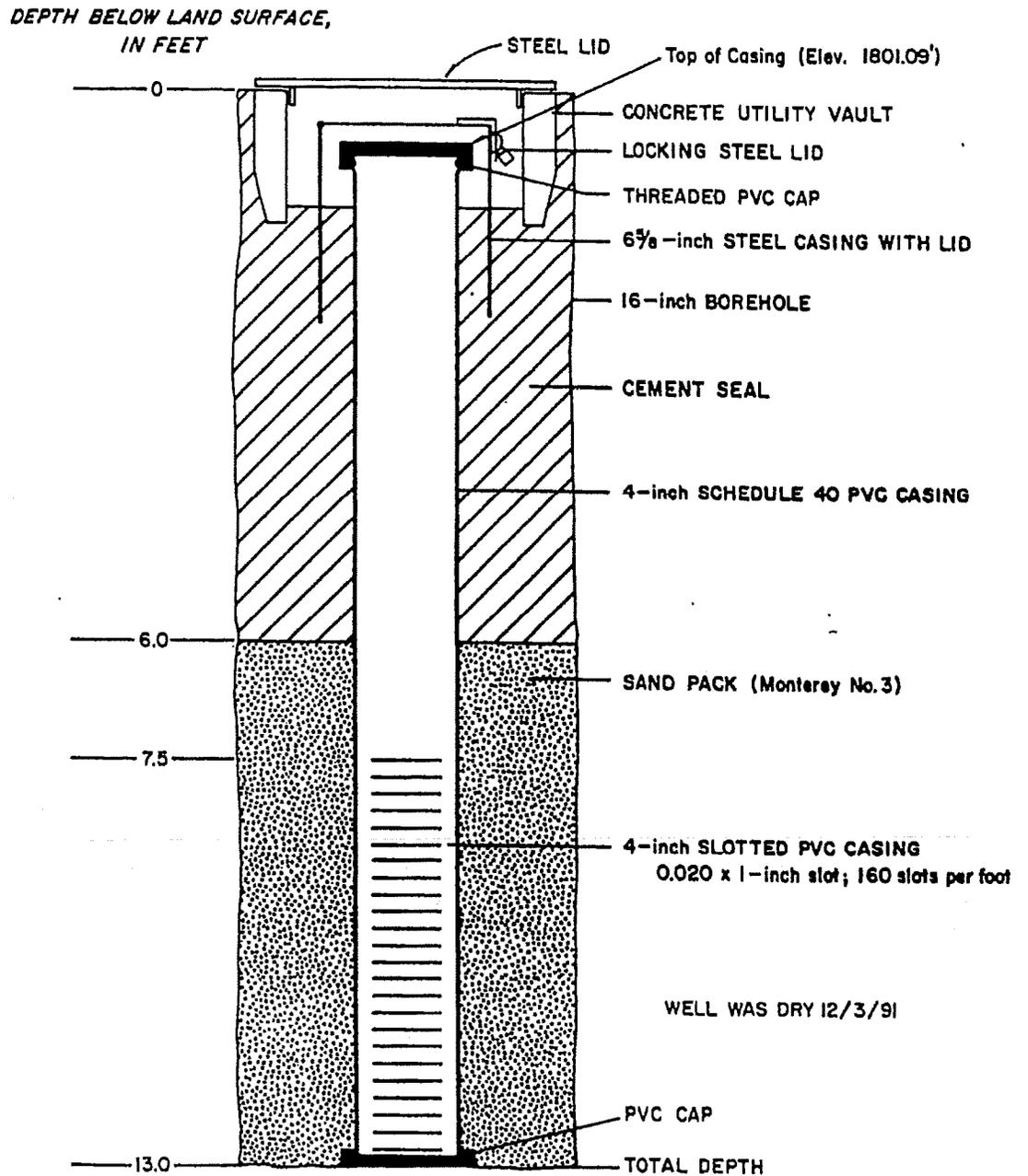


FIGURE C-18 SCHEMATIC CONSTRUCTION DIAGRAM OF MONITORING WELL RS-18

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-34

LITHOLOGIC LOG OF MONITOR WELL RS-23

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 6.5	SILTY CLAY	Light brown, low plasticity, soft, slightly moist.
6.5 - 10.0	SILTY CLAY	Mottled light brown and light grey, moderately plastic, firm, slightly moist.
10.0 - 13.0	SILTY SAND (WEATHERED CHATSWORTH FORMATION)	Very light brown, cementation increasing with depth, slightly moist.
At 13.0 feet, Chatsworth Formation.		

TOTAL DEPTH OF BOREHOLE: 13.0 FEET

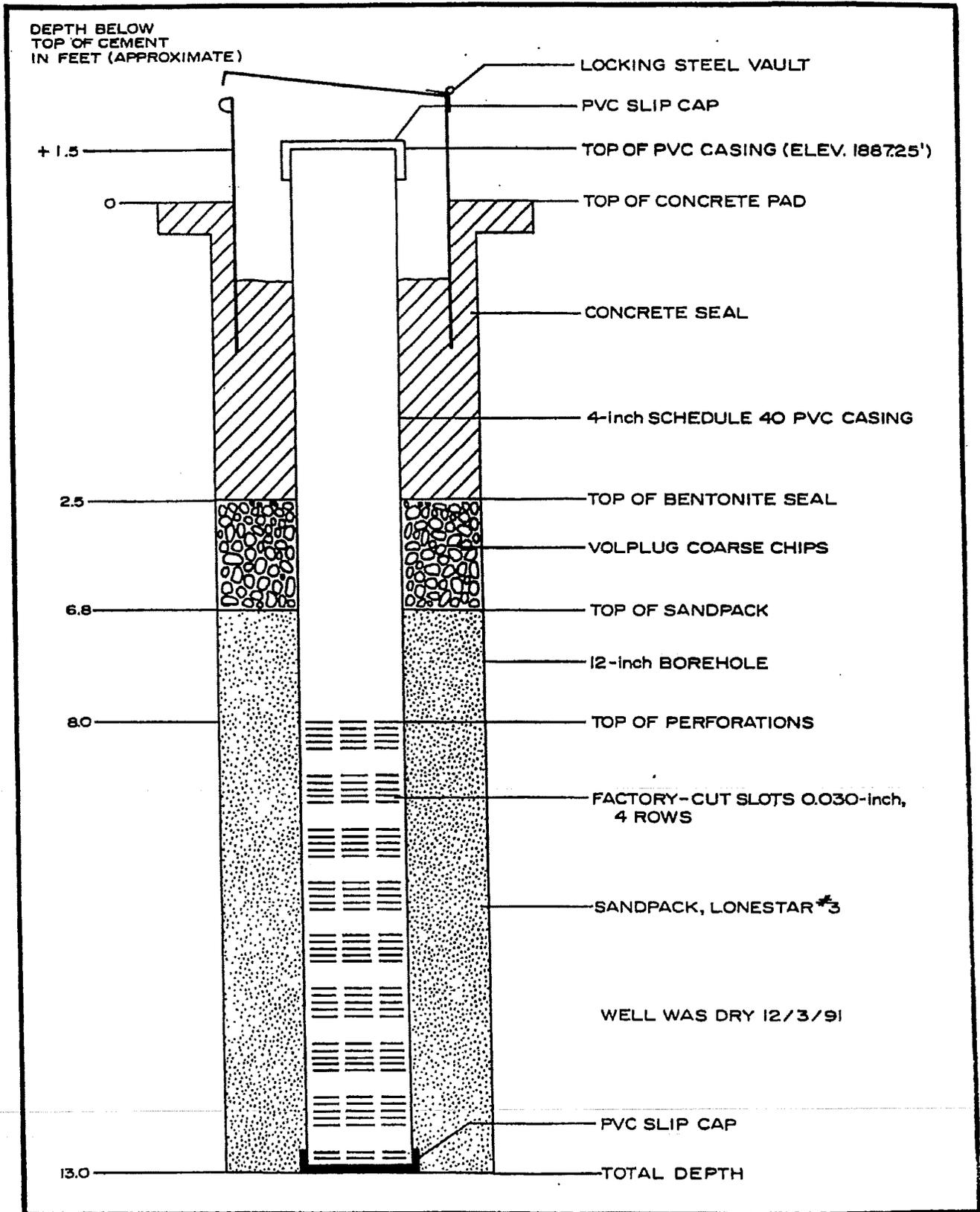


FIGURE C-23
 SCHEMATIC DIAGRAM OF SHALLOW ZONE
 MONITOR WELL RS-23

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-35

LITHOLOGIC LOG OF MONITOR WELL RS-24

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 6.0	SANDY CLAYEY SILT	Brown, low plasticity, soft, dry.
6.0 - 7.0	SILTY SAND (WEATHERED CHATSWORTH FORMATION)	Light brown, loose, moist.
7.0 - 8.5	SILTY SANDSTONE (CHATSWORTH FORMATION)	Light brown, well cemented, moist.

TOTAL DEPTH OF BOREHOLE: 8.5 FEET

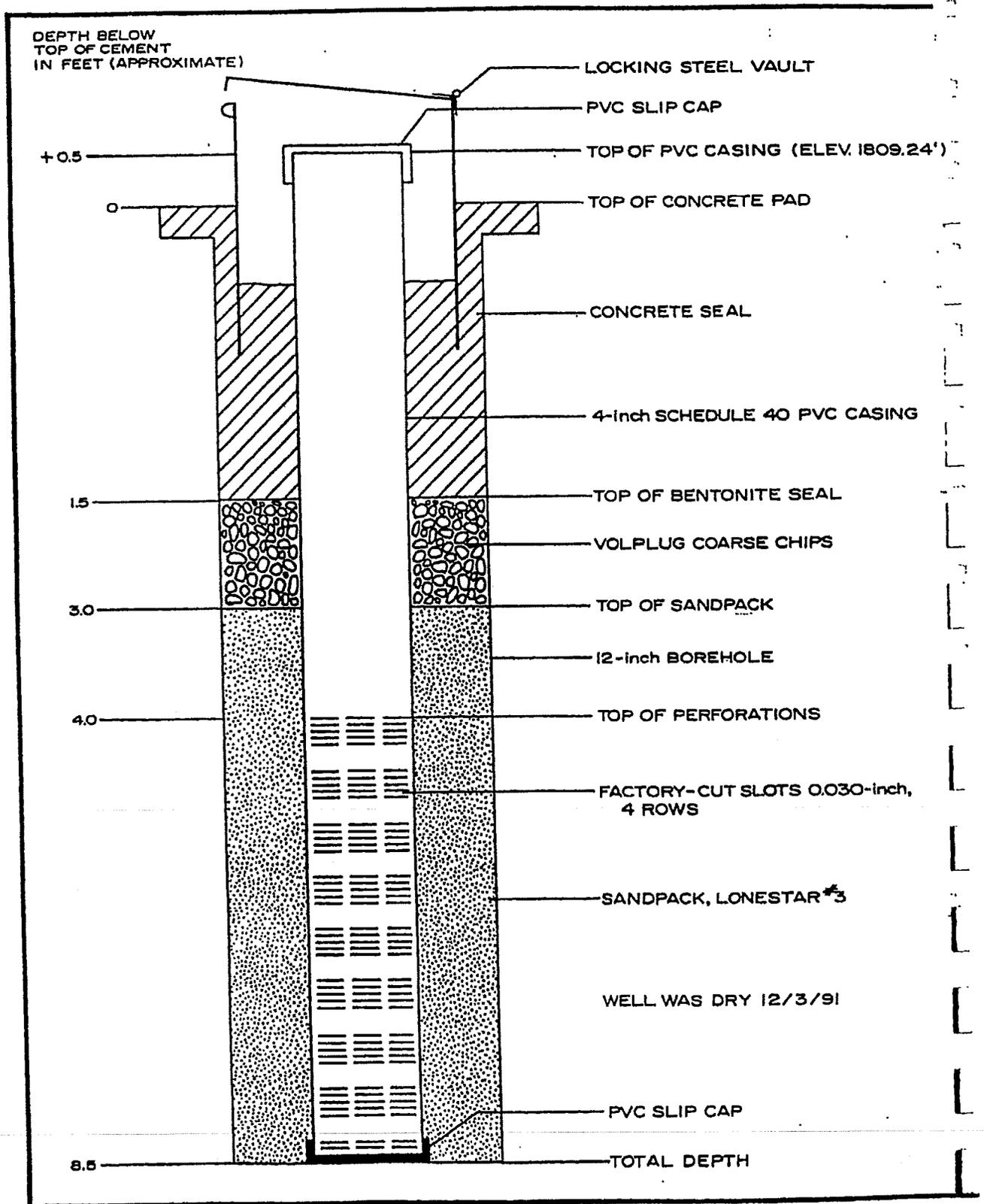


FIGURE C-24
SCHEMATIC DIAGRAM OF SHALLOW ZONE
MONITOR WELL RS-24

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-36

LITHOLOGIC LOG OF MONITOR WELL RS-25

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0.0 - 9.0	SILTY CLAY/SAND	Light brown, slightly moist.
9.0 - 13.5	SILTY CLAY	Dark brown, moist. At 9.0 feet, zone of burned vegetation, barbed wire, mottled soil, black, orange and brown

TOTAL DEPTH OF BOREHOLE: 13.5 FEET

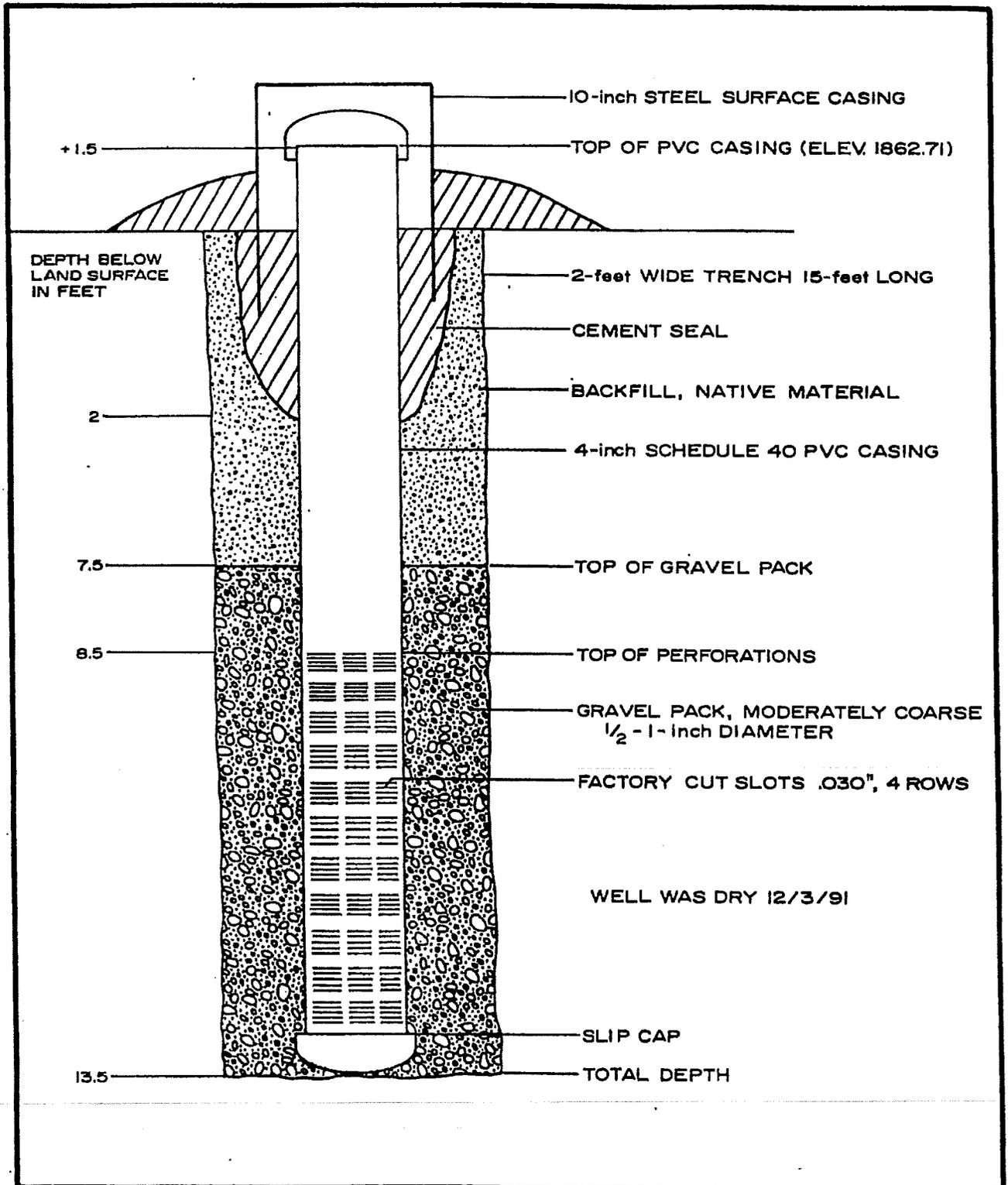


FIGURE C-25
SCHEMATIC DIAGRAM OF SHALLOW ZONE
MONITOR WELL RS-25

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-37

LITHOLOGIC LOG OF MONITOR WELL RS-27

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 6.5	SAND	Medium brown, fine-grained, loose, low plasticity, moderately graded, moderate moisture content.
6.5- 9	SANDSTONE	Orange-brown, fine-grained, moderately sorted, subrounded to subangular, weakly cemented, moderate moisture content.

TOTAL DEPTH OF BOREHOLE: 9 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

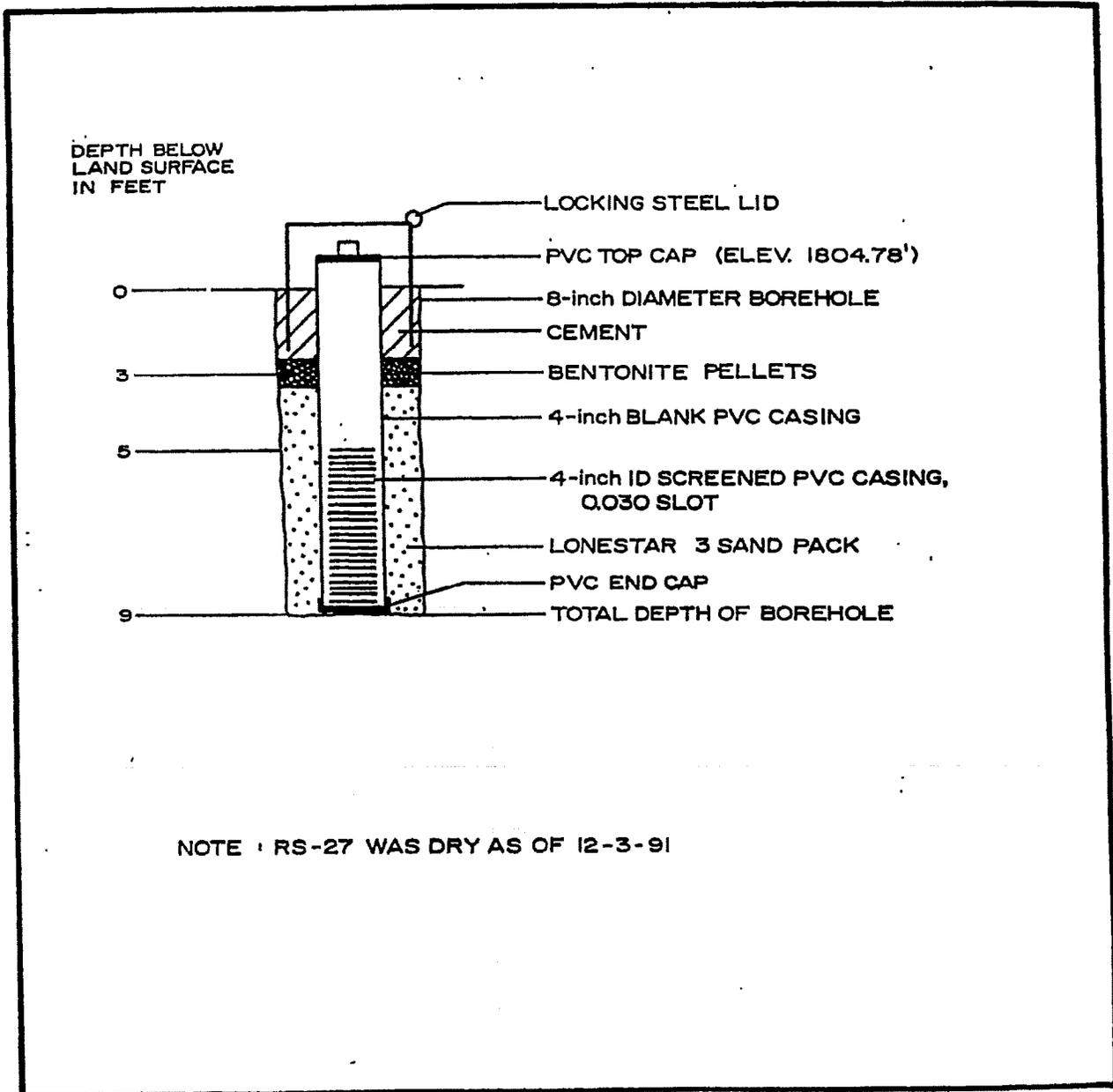


FIGURE C-26
SCHEMATIC DIAGRAM OF MONITOR WELL RS-27

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-38

LITHOLOGIC LOG OF MONITOR WELL RS-28

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 1	ASPHALT CONCRETE & AGGREGATE SUB-BASE	
1 - 3	SAND	Brown, fine-grained, silty, moderately sorted, loose, moderate moisture content.
3 - 19	SANDSTONE	Orange-brown, fine-grained, moderately to well sorted; subrounded or subangular, weakly cemented, moderate moisture content.

TOTAL DEPTH OF BOREHOLE: 19 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

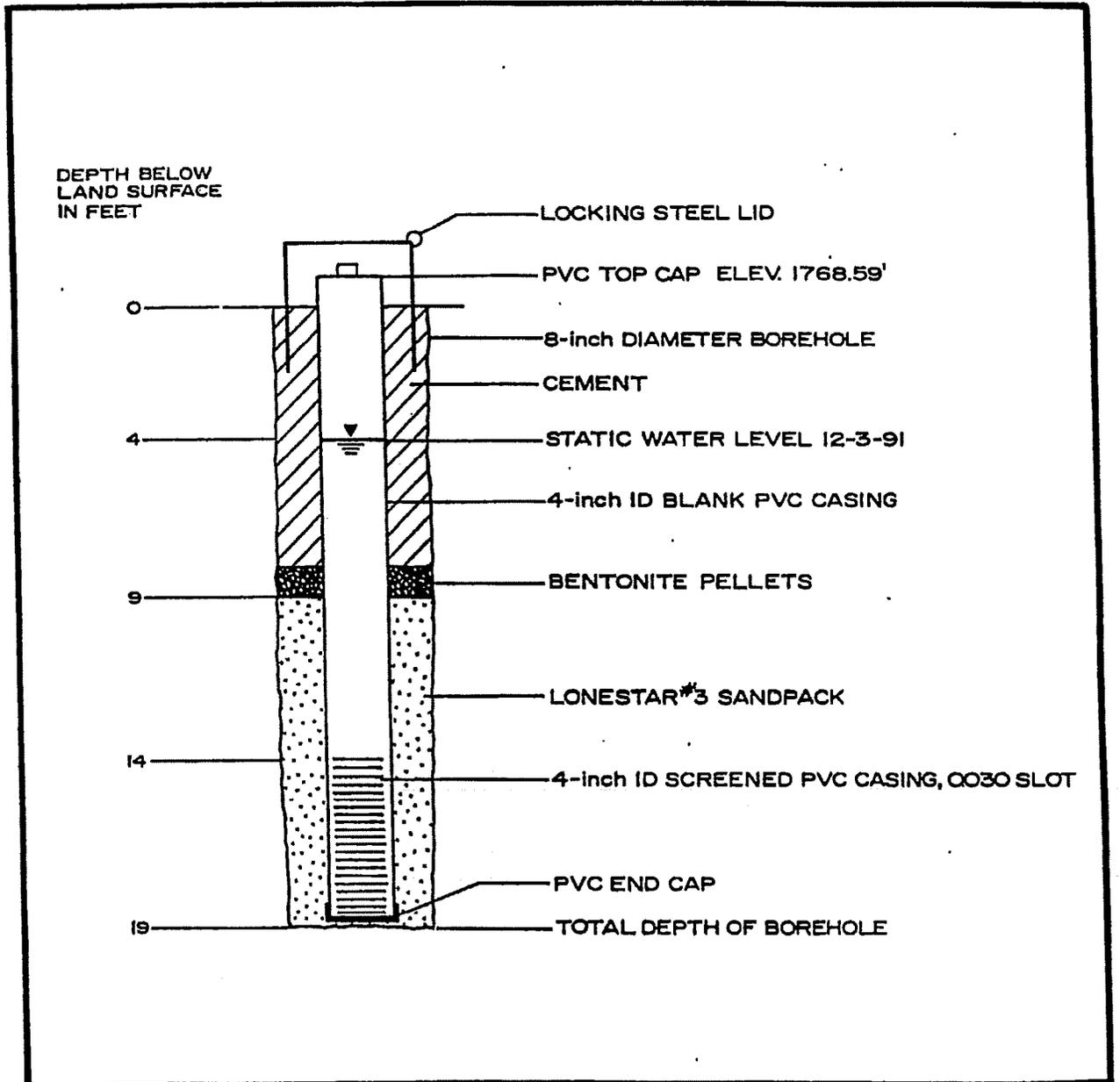


FIGURE C-27
SCHEMATIC DIAGRAM OF MONITOR WELL RS-28



Coring Log RS-36

Page 1 of 4

Job #:1010919.010401



Project: SSFL GW RI Data Gap SAP Implementation	
Site: Former SRE Pond	Hole Diameter: See Below
Drilling Start: 11/16/11	Drill Bit Type: See Below
Drilling End: 11/17/11	Drilling Method: Air Rotary
Logged By: C. Nancarrow	Drill Rig Type: Speedstar 30K
Reviewed By: S. Valenzuela, PG	Drillers Name: J. Villegas
Well Completion Start: 11/17/11	Helper: M. Adame
Well Completion End: 11/21/11	Helper: --
Sampler Bit: 2.4" ID HQ3 Core	Drilling Company: WDC
TOTAL DEPTH: 20' bgs	
DEPTH TO WATER: 5' bgs	

Latitude: 34-14-09.37077 Longitude: 118-42-22.12396

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
---------------	----------------	-----------	-----------	-----------------------	----------------------	---------------------	------------------	-----	---------------	---------	------	-------------

Sample Condition

- Unrecovered
- Rock Core
- Hand Augered

Hole Diameter/Drill Bit Type: (0-19.5'bgs) 9 5/8" Tricone bit. Set conductor casing (6" ID) to 15' bgs.

This corehole was converted to a conventional groundwater monitoring well.

0		11/16/11						0.0/5	0		SM	Silty SAND (SM) with little clay, 5YR4/4, very fine to medium grained, moderately sorted, (50%) sand, (35%) silt, (15%) clay, moist, slightly dense, slightly plastic. Fill.
1								0%	1		SM	
2									2		SM	
3			0.0						3		SM	at 3' bgs: (Grab) Silty Sand (SM) with few very coarse sand and gravel. 2.5Y4/2 (Dk. Grayish Brn.), well to moderately sorted. Fine to medium sand (50%), some silt (30%), few very coarse sand (10%), few gravel (10%), and trace charcoal pieces. Slightly moist, nonplastic.
4									4		SM	
5									5		SM	



MWH®

Coring Log RS-36

Page 2 of 4

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Sample Condition

Unrecovered

Rock Core

Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
5		0845						4.9/5 98%	5			Unconsolidated sediments. NO RECOVERY.
6									6			
7		0.0							7	SM		
8									8			
9									9			
9.1					80				9.1			Fracture at 9.1' (80 deg), open, slightly rough.
9.2					19				9.2			Fracture at 9.2'-9.3' (19 deg), open, slightly rough.
9.4					130				9.4	SS		at 9.4'-9.5' bgs: Fracture (130 deg), open, slightly rough. Friable.
9.5					142				9.5			
9.6					24				9.6			
9.9					15				9.9			at 9.9'-10.0' bgs: Fracture (15 deg), open, slightly rough.
10		0848	0.0	Microb					10			SANDSTONE, 10GY4/1 (Dk. Greenish Gray), very fine to fine grained increasing with depth, subangular to subrounded, moist, well cemented, moderately hard, moderately strong.
10.1		0859	0.0	VOC/CL					10.1			at 10'bgs: Minor oxidation begins.
10.2			0.0	VOC	28				10.2			Thin bedding from 10.2'-10.4' bgs (28 deg). Grain size increasing to very fine to fine grained, subangular to rounded.
10.3					28				10.3			
10.4									10.4			
10.8									10.8	SS		at 10.8' bgs: Increasing to very fine to medium grained.
11									11			
11.3									11.3			at 11.3' bgs: Increasing to very fine to medium with a trace coarse grain.



MWH®

Coring Log RS-36

Page 3 of 4

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

- Sample Condition
- Unrecovered
 - Rock Core
 - Hand Augered

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
11									11			at 11.3' bgs: Increasing to very fine to medium with a trace coarse grain.
			0.0	VOC							SS	at 11.8' bgs: Increasing to very fine to medium with some coarse grain.
12				Geochem		27	W2		12			at 12.2' bgs: Increasing to very fine to coarse grained, very poorly sorted, subangular to rounded, moist, well cemented, moderately hard, moderately strong, slightly weathered to fresh, minor oxidation throughout. Bedding at 12.2 is (27 deg).
												12.3' bgs: SANDSTONE, 2.5Y5/4 (Lt. Olive Brn.), very fine grained, very well sorted, subangular to subrounded, moist, very well cemented, moderately hard, moderately strong, slightly weathered to fresh (W2).
13									13			at 12.9' bgs: Increasing to very fine to fine grained, well sorted.
			0.0	VOC		29					SS	at 13.5' bgs: Increasing to very fine to medium grained, moderately sorted.
14									14			at 13.8' bgs: Fracture (29 deg), healed.
15		0906 0957		VOC/CL		174	W2		15			SANDSTONE, 10YR4/6 (Dk. Yellowish Brn.), very fine to fine grained, well sorted, subangular to subrounded, moist, very well cemented, moderately hard, moderately strong, slightly weathered to fresh (W2), minor oxidation continues to 18.6' bgs.
				VOC/CL				5.0/5 100%				at 14.9' bgs: Fracture (174 deg) open, slightly rough, minor oxidation on surface. Below fracture at 14.9, SANDSTONE, 10YR4/6 (Dk. Yellowish Brn.), very fine to medium grained, moderately sorted, subangular to subrounded, moist, very well cemented, moderately hard, moderately strong, slightly weathered to fresh, minor oxidation continues. Grain size increases with depth.
16									16			at 15.3' bgs: Increasing to very fine to medium with a trace coarse grains.
			0.0	VOC							SS	at 16.3' bgs: Increasing to very fine to medium with some coarse grains.
17									17			at 16.4' bgs: Vesicle void spaces that continue to 18.0' bgs.



MWH®

Coring Log RS-36

Page 4 of 4

Job #:1010919.010401

Project: SSFL GW RI Data Gap SAP Implementation

Sample Condition

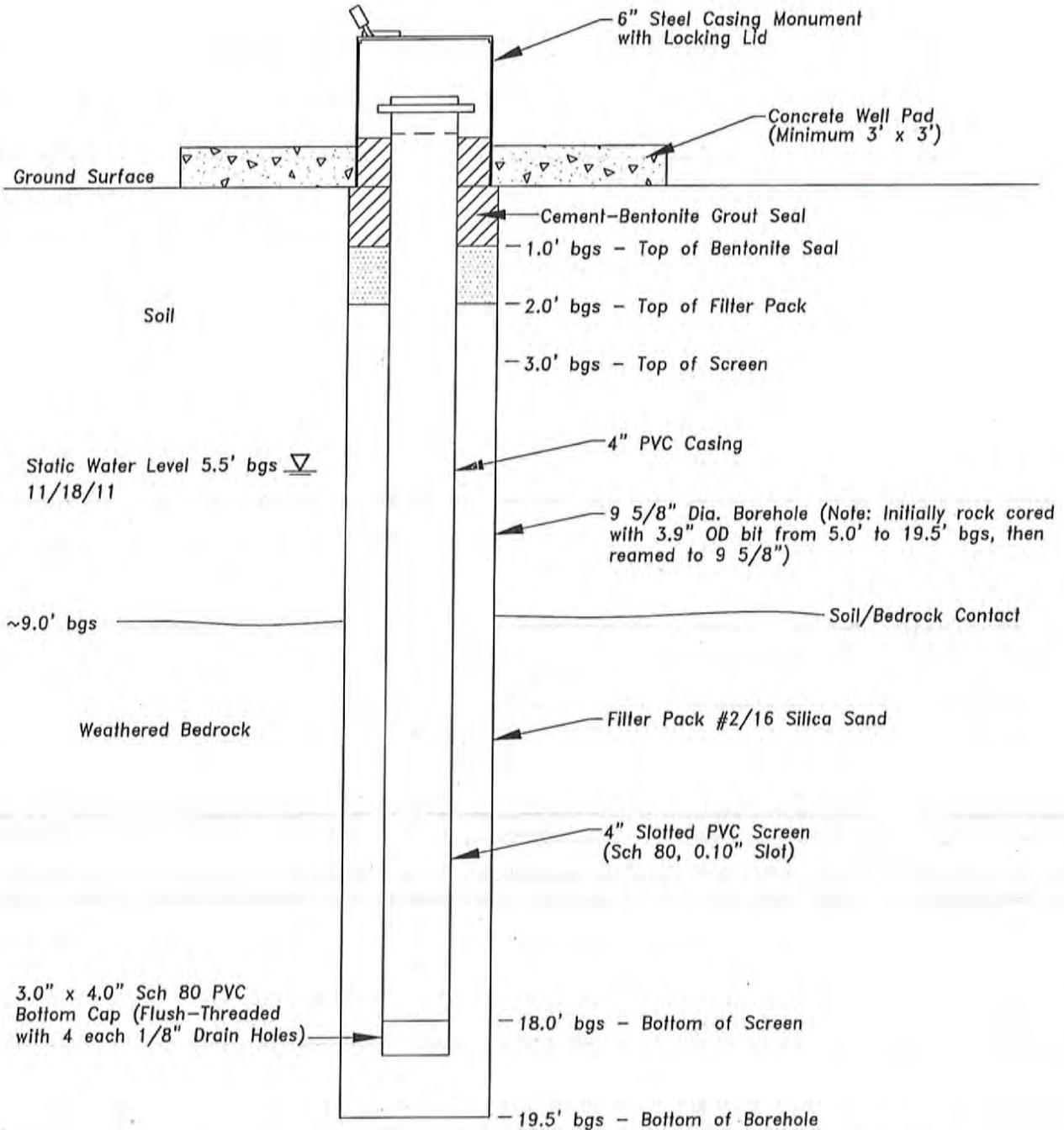
- Unrecovered
- Rock Core
- Hand Augered

DESCRIPTION

Depth in Feet	Cored Interval	Date/Time	PID (ppm)	Retained for Analysis	Fracture < (degrees)	Bedding < (Degrees)	Weathering Index	RQD	Depth in Feet	GRAPHIC	USCS	DESCRIPTION
17				VOC					17			
18						37			18		SS	at 18' bgs: Bedding (37 deg).
						0						at 18.2' bgs: Bedding (0 deg). LITH CHG to very fine, very well sorted.
			0.0	VOC		30	W4					at 18.6' bgs: Bedding (30 deg). Below bed, increasing to very fine to fine grained, well sorted, moderately to slightly weathered (W4). Major oxidation from 18.6' to 19.2' bgs.
19			0.0	VOC	26	26	W2		19			at 19.0'-19.1' bgs: Bedding (28 deg).
											SS	at 19.2' bgs: Fracture (26 deg) along bedding plane (26 deg), open, slightly rough. Below fracture, SANDSTONE, N4 (Med. Dk. Gray), very fine to fine grained, well sorted, subangular to subrounded, moist, very well cemented, moderately hard, moderately strong, fresh.
20	1001								20			END OF COREHOLE at 20 feet.
21									21			
22									22			
23									23			

C:\Users\Christine Nancarrow\Desktop\SSFL Drilling Forms\QuickLog\Corelog_RS-36_09-28-2012

FILE: CA \EBKE\BOEING SANTA SUSANA\DRILLING SUMMARY\COREHOLE RS-36



Not to Scale



SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
GROUNDWATER RI DATA GAP SAP IMPLEMENTATION
MARCH 2012

COREHOLE RS-36
CONSTRUCTION DIAGRAM

FIGURE 1

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-43

LITHOLOGIC LOG OF MONITOR WELL RS-54

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 38	SANDSTONE	Brown, some silt, fine to medium grained, poorly graded, subrounded, compact, moderate cementation, slightly calcareous, dry. @ 2' blue grey. @ 8' light brown. @ 10' blue grey. @ 18' brown, fractured and weathered, very fine to fine grained, silty, weak cementation. @ 26' blue grey, dry. @ 34' brown, silty and clayey, fractured, weak cementation, moist.

TOTAL DEPTH OF BOREHOLE = 38 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

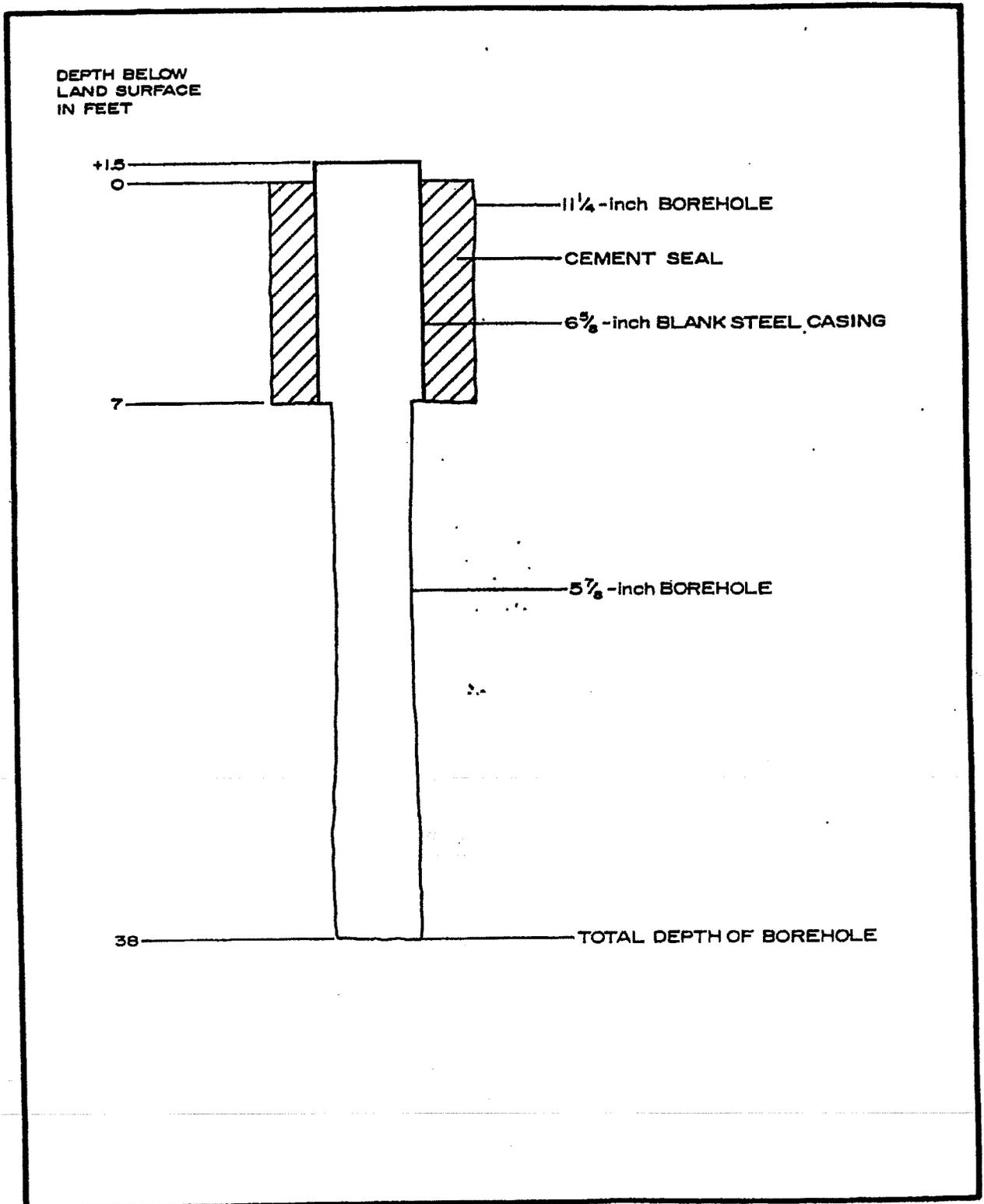


FIGURE C-32
SCHEMATIC DIAGRAM OF MONITOR WELL RS-54

**SB-TRITE
WELL LOGS**

SB-TRIT 01

SB-TRIT 02



CORE BORING REPORT

BORING NO.

SB_Trit-01

Page 1 of 4

PROJECT SSFL Area IV
 LOCATION Former Building 10
 CLIENT Boeing, D.O.E.
 CONTRACTOR WDC
 DRILLER Chris Neal

H&A FILE NO. 20060-984
 PROJECT MGR. Todd Hall
 FIELD REP. William Drake
 DATE STARTED 8-Mar-07
 DATE FINISHED 16-Mar-07

Elevation		ft Datum		Boring Location			
Item	Casing	Sampler	Core Barrel	Rig Make & Model		Speedstar 30k	Drill Mud
Type	Steel		84 mm	<input checked="" type="checkbox"/> Tripod	<input type="checkbox"/> Cat-Head	Hammer Type	<input type="checkbox"/> Bentonite
Diameter (in)	8 3/4			<input type="checkbox"/> ATV	<input type="checkbox"/> Geoprobe	<input type="checkbox"/> Safety	<input type="checkbox"/> Polymer
Hammer Weight (lb)				<input type="checkbox"/> Track	<input type="checkbox"/> Air Track	<input type="checkbox"/> Doughnut	<input checked="" type="checkbox"/> None
Hammer Fall (in)				<input type="checkbox"/> Skid	<input type="checkbox"/> Cutting Head	Casing	<input type="checkbox"/> Driven <input type="checkbox"/> Spun

Depth (ft)	Drilling Rate (min/ft)	Core Run	Recovery		Fracture profile	Sample	Stratum Change (ft)	Visual Classification and Remarks
			Total	RQD (%)				
0	2.6	1	5%					Silly sand, SM, tan, fine to coarse grained, well graded, subangular to subrounded, very loose, dry, 67% sand, 15% silt and clay, 15% gravel, 3% cobbles, fill material.
5	2.6	2	100%	66				Same as above.
6.5						S-01		Sandstone, light yellowish brown (2.6Y 6/4), fine to medium grained, poorly graded, subrounded, dense, moist, 98% sand, 2% silt and clay, fining-upwards sequences 5 to 7.5 ft, 7.5 to 8.5 ft, 8.5 to 10 ft bgs, Chatsworth Formation.
10	2	3	100%	52				Sandstone, same as above, except fine to coarse grained, well graded, subangular to subrounded, fining-upwards sequences 10 to 13 ft, 13 to 14 ft, 14 to 15 ft.
12.0						S-02		Fracture with iron staining on surfaces, between 12.0 and 21.5 ft bgs.
14-14.5								Two fractures between 14.0 and 14.5 ft bgs.
15	3	4	70%	94				Sandstone, same as above, except medium grained, poorly graded, subrounded, very dense, 100% sand, structureless and homogeneous.
20	8	5	65%	88		S-03		Sandstone, same as above, except fine to medium grained, subrounded to rounded, dense, 95% sand, 5% silt and clay. Note: Steel conductor casing installed from ground surface to 20 ft bgs.
20						S-04		
25	2.4	6	95	77				Sandstone, same as above.
27.0						S-05		2-in silty clay horizon.
28.5-29.5								Silty clay horizons alternating with sandstone. Five fractures with iron staining on fracture planes.
30		7						

Water Level Data					Sample ID	Well Diagram	Summary
Date	Time	Elapsed Time (hr)	Depth in feet to:				
			Bottom of Casing	Bottom of Hole	Water	<input type="checkbox"/> Riser Pipe	Overburden (Linear ft.)
			20	128.5	-40	<input type="checkbox"/> Screen	Rock Cored (Linear ft.)
						<input type="checkbox"/> Filter Sand	128.5
						<input type="checkbox"/> Cuttings	Number of Samples
						<input type="checkbox"/> Grout	25
						<input type="checkbox"/> Concrete	
						<input type="checkbox"/> Bentonite Seal	
							BORING NO. SB_Trit-01



CORE BORING REPORT

BORING NO.
SB_Trit-01

Page 2 of 4

Depth (ft)	Drilling Rate (min/ft)	Core Run	Recovery		Fracture profile	Sample	Stratum Change (ft)	Visual Classification and Remarks
			Total	RQD (%)				
30	2.4	7	100%	82				Sandstone, light yellowish brown (2.5Y 6/4), fine to medium grained, poorly graded, subrounded, to rounded, dense, slightly moist, 85% sand, 6% silt and clay, Chatsworth Formation.
35	1.6	8	100%	90		S-06	34.5-35	Coarse-grained sandstone, Sandstone, same as above, except fine to medium grained.
40	2	9	100%	82		S-07	39-40 40	Coarse-grained sandstone. Sandstone, same as above, except fine to medium grained, moist, 98% sand, 2% silt and clay, structureless and homogeneous. Groundwater encountered at approximately 40 ft bgs.
45	1.4	10	90%	100		S-08	43.5-45 44 44.75	Coarse-grained sandstone Shale rip-up clasts 1.0 - 1.5 in. long Fracture with slickenlines on surface, between 44.5 and 45.0 ft bgs. Sandstone, same as above, except dominantly medium grained, very moist to wet
50	2	11	100%	72		S-09	47-48	Silty sandstone. 49-49.5 Medium to coarse grained.
55	4	12	60%	73		S-10	50-50.5 51 53	Sandstone, same as above, except wet. Two fractures with iron staining on fracture planes. 2 in-thick shale layer. Fining upwards sequence from 53-50 ft. Fracture between 53.0 and 53.5 ft.
60	3.4	13	100%	78		S-11	54.5-55 57-58 57.5-58 58-60	Two fractures with calcite fibers on surfaces, between 54.5 and 55.0 ft bgs, Sandstone, same as above. Coarse-grained sandstone, fining upwards to 55 ft. Fine silty sandstone, moderately graded, 90% sandstone and 10% silt and clay. Two fractures with iron staining on surface planes, between 57.5 and 58.0 ft bgs. No recovery 58 to 60 ft.
65	3.8	14	70%	11		S-12 S-13 S-14	61-64.5 63.5 67-67.5	Sandstone, same as above, except light olive brown (2.5Y 5/6), fine to medium grained, poorly graded, 95% sand, 5% silt and clay, structureless and homogeneous, Ten evenly-spaced fractures from 61.0 to 64.5 ft. Iron staining on fracture surfaces 61.0 to 63.5 ft bgs. Shale, dark gray (2.5Y 4/1), poorly graded, dense, slightly moist to moist, 100% silt and clay, indurated. Shale, same as above, except moist, more clay, less indurated. 6 in-thick horizon of medium grained silty sandstone, dark gray (2.5Y 4/1), subrounded to rounded, moderately graded, dense, moist, 80% sand, 20% silt and clay.
70		15						

FILE NO. 20060-984 BORING NO. SB_Trit-01



CORE BORING REPORT

BORING NO.

SB_Trit-01

Page 3 of 4

Depth (ft)	Drilling Rate (min/ft)	Core Run	Recovery		Fracture profile	Sample	Stratum Change (ft)	Visual Classification and Remarks
			Total	RQD (%)				
70	2	15	90%	29				Shale, dark gray (2.5Y 4/1), poorly graded, dense, moist, 100% silt and clay, indurated, Chatworth Formation. Three evenly-spaced fractures 70.5 to 71.6 ft bgs. 70.5-71.6 Fine-grained sandstone, dark gray (2.5Y 4/1).
						S-15		72-72.5 Fine-grained sandstone, dark gray (2.5Y 4/1). Moderately-dipping fracture at 72 ft. 72.5-73 Moderately-dipping fracture between 72.5 and 73.0 ft bgs.
								74-75 Sandstone, dark gray (2.5Y 4/1), medium grained. 74.6 Thin shale layer at 74.6 ft.
75	3.2	16	100%	100				Sandstone, gray (2.5Y 5/1), medium grained, poorly graded, subrounded to rounded, dense, wet, 95% sandstone, 5% fines and clay, structureless and homogeneous, Chatworth Fm.
						S-16		79.5-80 Fracture between 79.5 and 80.0 ft bgs. 80-81 Sandstone, same as above. Three fractures with iron mottling on fracture surfaces. 80.5-82
80	2.8	17	100%	72				80.5-82 High-angle fracture with iron mottling on fracture surfaces, between 80.5 and 82.0 ft bgs.
								83-84 Fractures with iron mottling on fracture surfaces, between 83.0 and 84.0 ft bgs.
85	5.4	18	100%	62				Sandstone, same as above.
								86.6-87 Fracture with iron mottling and calcite on fracture surfaces.
								87.5-88 Shale rip-up clasts.
90	3.8	19	90%	16		S-17		Sandstone, same as above.
						S-18		95.5-96 Sandstone, same as above, except fine to medium grained, 90% sand, 10% silt and clay. Fracture between 95.5 and 96.0 ft bgs.
95	2.8	20	60%	17				
						S-19		
100	1.2	21	60%	0				Sandstone, same as above, except fine grained, compact, moderately indurated.
						S-20		
105	2	22	96%	18				Sandstone, same as above, except dense, more indurated.
						S-21		
110		23						

FILE NO. 20060-984

BORING NO.

SB_Trit-01



CORE BORING REPORT

BORING NO.

SB_Trl-01

Page 4 of 4

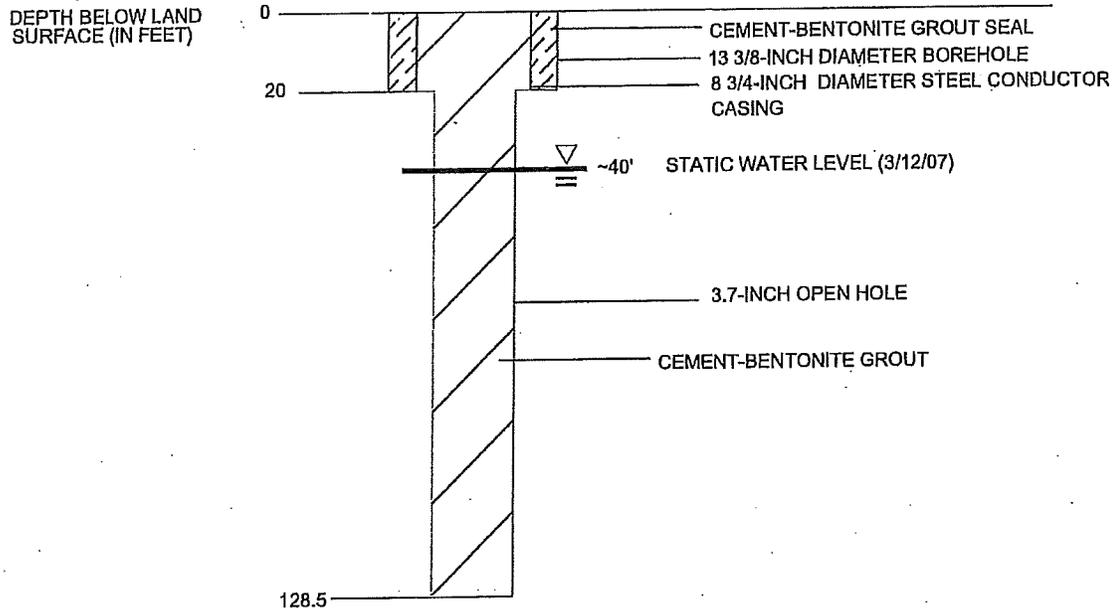
Depth (ft)	Drilling Rate (min/ft)	Core Run	Recovery		Fracture profile	Sample	Stratum Change (ft)	Visual Classification and Remarks
			Total	RQD (%)				
110	2.4	23	90%	0		S-22		Sandstone, gray (2.6Y 5/1), medium grained, poorly graded, subrounded to rounded, dense, w/ol, 95% sandstone, 5% fines and clay, structureless and homogeneous, Chatworth Fm.
115		24	98%	79		S-23		Sandstone, same as above, except 98% sand, 2% silt and clay.
120		25	86%	25		S-24		Sandstone, same as above, except fine to medium grained.
125		26	100	85		S-25		Sandstone, same as above, except 98% sand, 2% silt and clay.
128.5							128.5	End coring at total depth of 128.5 ft bgs.
130								Notes: 10 3/8-in borehole 0' to 20' 8 3/4-in diameter steel conductor casing 0' to 20' 3.7-in borehole 20' to 128.5'
135								
140								
145								
150								

FILE NO. 20060-984

BORING NO.

SB_Trl-01

G:\GRAPHICS\PROJECTS\26472 - BOEING ROCKETDYNE\WORKAREA_IV_DRILLING_2006\20060-992-00A1-TRIT1.DWG



HALEY & ALDRICH

THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

BOREHOLE SCHEMATIC FOR
SB-Trit-01

SCALE: AS SHOWN
OCTOBER 2007

FIGURE A-1

0 22 44
VERTICAL SCALE IN FEET



CORE BORING REPORT

BORING NO.

SB_Trit-02

Page 1 of 6

PROJECT SSFL Area IV	H&A FILE NO. 20060-984	
LOCATION Former Building 10	PROJECT MGR. Todd Hall	
CLIENT Boeing, D.O.E.	FIELD REP. William Drake	
CONTRACTOR WDC	DATE STARTED 20-Mar-07	
DRILLER Chris Neal	DATE FINISHED 23-Mar-07	

Elevation ft Datum		Boring Location	
Item	Casing	Sampler	Core Barrel
Type	Steel		94 mm
Diameter (in)	8 3/4		
Hammer Weight (lb)			
Hammer Fall (in)			
		Rig Make & Model Speedstar 30K	
		<input type="checkbox"/> Tripod	
		<input type="checkbox"/> Cat-Head	
		<input type="checkbox"/> Winch	
		<input type="checkbox"/> Roller Bit	
		<input type="checkbox"/> Cutting Head	
		<input type="checkbox"/> Geoprobe	
		<input type="checkbox"/> Alr Track	
		<input type="checkbox"/> Skid	
		<input type="checkbox"/> Safety	
		<input type="checkbox"/> Doughnut	
		<input type="checkbox"/> Hammer Type	
		<input type="checkbox"/> Bentonite	
		<input type="checkbox"/> Polymer	
		<input checked="" type="checkbox"/> None	
		<input type="checkbox"/> Casing	
		<input checked="" type="checkbox"/> Driven	
		<input type="checkbox"/> Spun	

Depth (ft)	Drilling Rate (min/ft)	Core Run	Recovery		Fracture profile	Sample	Stratum Change (ft)	Visual Classification and Remarks
			Total	RQD (%)				
0	4.4	1	20%	0				Silty sand, SM, dark grayish brown (10YR 4/2), fine grained, moderately graded, subangular to subrounded, loose, slightly moist, 60% sand, 40% silt and clay, fill material.
5	2.8	2	0%	0				No recovery.
10	2	3	10%	0		S-01		Clay, CL, dark reddish brown (5YR 3/3), well graded, compact, 100% silt and clay, medium plasticity, fill material (?)
15	3	4	0%	0				No recovery.
20	2.2	5	5%	0				Silt, ML, dark brown (7.5YR 3/4), fine grained, well graded, subangular to subrounded, loose, slightly moist, 5% sand, 95% silt and clay, low plasticity, fill material (?)
25	2.6	6	6	0				Silt, ML, same as above.
30		7						

Water Level Data			Depth in feet to:			Sample ID	Well Diagram	Summary
Date	Time	Elapsed Time (hr.)	Bottom of Casing	Bottom of Hole	Water			
			35	220	47.75			Overburden (Linear ft.)
								Rock Cored (Linear ft.)
								Number of Samples
								220
								40
								BORING NO. SB_Trit-02

Edwards & Kelcey Form 3702-2-06



CORE BORING REPORT

BORING NO.

SB_Trit-02

Page 2 of 6

Depth (ft)	Drilling Rate (min/ft)	Core Run	Recovery		Fracture profile	Sample	Stratum Change (ft)	Visual Classification and Remarks
			Total	RGD (%)				
30	1.8	7	80%	0				Sandstone, dark yellowish brown (10YR 4/8), fine grained, poorly graded, subrounded to rounded, compact, slightly moist, 95% sand, 5% silt and clay, Chatsworth Formation.
						S-2	33-33.5	Medium- to coarse-grained sandstone.
35	2.6	8	0%	0			35	No recovery. Note: Steel conductor casing installed from ground surface to 35 ft bgs.
40	1.8	9	56%	0		S-3		Sandstone, same as above, except fine to medium grained, dense, structureless and homogeneous. Note: Total depth of steel conductor casing is 40 ft bgs.
46	2	10	58%	0		S-4		Sandstone, same as above, except moist.
								Groundwater encountered at 47.75 ft bgs.
50	2.2	11	82%	13				Sandstone, same as above.
						S-5	53-54	Medium- to coarse-grained sandstone.
							54-54.5	Shale rip-up clasts.
65	3.6	12	60%	60				Sandstone, same as above.
						S-6	59-59.5	Fracture with iron-mottled surfaces, between 59.0 and 59.5 ft bgs.
							59.5-60	Fracture with iron-mottled surfaces, between 59.5 and 60.0 ft bgs.
							60	Sandstone, same as above, except wet.
						S-7	60-61	Shale layer 60.5 to 61.0 ft bgs. Two fractures between 60.0 and 61.0 ft bgs.
							63-63.5	Medium- to coarse grained sandstone.
65	2	14	50%	60				Sandstone, same as above.
						S-8	68-67.5	Fine-grained sandstone.
70		15						

FILE NO. 20060-984

BORING NO.

SB_Trit-02

CORE BORING REPORT

Depth (ft)	Drilling Rate (min/ft)	Core Run	Recovery		Fracture profile	Sample	Stratum Change (ft)	Visual Classification and Remarks
			Total	ROD (%)				
70	2	15	82%	11				Sandstone, dark yellowish brown (10YR 4/6), fine grained, poorly graded, subrounded to rounded, dense, wet, 95% sand, 5% silty and clay, structureless and homogeneous, Chatsworth Formation.
75	3.6	16	82%	39		S-9		Sandstone, same as above, except more silty than above, 80% sand, 20% silt and clay.
80	2.6	17	70%	8		S-10		Sandstone, same as above, except yellowish brown (10YR 6/4), silty, 80% sand, 20% silt and clay. Fracture between 80.5 and 80.0 ft bgs.
85	2.4	18	46%	28		S-11	82.6-83.83	Shale horizon Sandstone less silty than above, 95% sand, 5% silt and clay.
85	2.4	18	46%	28		S-12		Sandstone, same as above.
85	2.4	18	46%	28			86.5	1-in-thick shale layer.
85	2.4	18	46%	28			87.5	1-in-thick shale layer.
90	1.8	19	66%	0				Shale, dark gray (7.5YR 4/1), poorly graded, dense, wet, 100% silt and clay, medium plasticity.
90	1.8	19	66%	0		S-13	92.0-93.0	Three fractures between 92.0 and 93.0 ft bgs.
95	6.6	20	64%	38				Shale, same as above, with fine laminations.
100	2.2	21	80%	53		S-14	99-99.5	Fracture between 99.0 and 99.5 ft bgs.
100	2.2	21	80%	53		S-15	99.5	Sandstone, dark gray (7.5YR 4/1), fine grained, poorly graded, subrounded to rounded, dense, wet, 95% sand (~3% biolite), 5% silt and clay, structureless and homogeneous. Fracture between 99.5 and 100.0 ft bgs.
105	1.6	22	72%	0				Same as above, except fine to medium grained.
110		23				S-16	108-110	Medium to coarse grained sandstone.

CORE BORING REPORT

Depth (ft)	Drilling Rate (min/ft)	Core Run	Recovery		Fracture profile	Sample	Stratum Change (ft)	Visual Classification and Remarks
			Total	RCD (%)				
110	1.8	23	70%	0				Sandstone, dark gray (7.6YR 4/1), medium grained, poorly graded, subrounded to rounded, dense, w/ 95% sand (~3% silt), 5% silt and clay, structureless and homogeneous, Chatsworth Formation.
115	3.4	24	100%	30		S-17 S-18	114-114.5 114.5-115	Fracture between 114.0 and 114.5 ft bgs. Fracture between 114.5 and 115.0 ft bgs. Sandstone, same as above, except loose to compact. Dense sandstone. Fracture between 116.5 and 117.0 ft bgs.
120	3	25	70%	17		S-19	120-121.5	Sandstone, same as above, except fine to medium grained. High-angle fracture between 120 and 121.5 ft bgs.
125	2.2	26	70%	0		S-20	124 125-126 126	~1-in.-thick shale layer. Sandstone, same as above. High-angle fracture between ~125 and 126.0 ft bgs. Shale layer at 125-126.5 ft bgs. Medium-grained sandstone.
130	1.8	27	80%	24		S-21	128-128.5 130-131 132-135	Sandstone, same as above, except medium to coarse grained, moderately graded. Fracture between 130 and 131.0 ft bgs. Medium-grained sandstone.
135	2	28	92%	54		S-22		Sandstone, same as above, medium grained.
140	2	29	92%	45		S-23		Sandstone, same as above, except gray (10YR 5/1), fine to medium grained.
145	2.2	30	86%	40		S-24		Sandstone, same as above.
150		31					149-149.5 149.5-150	Possible fracture between 149 and 149.5 ft bgs. Possible fracture between 149.5 and 150.0 ft bgs.

CORE BORING REPORT

Depth (ft)	Drilling Rate (min/ft)	Core Run	Recovery		Fracture profile	Sample	Stratum Change (ft)	Visual Classification and Remarks
			Total	RQD (%)				
150	3.2	31	98%	45				Sandstone, gray (10YR 5/1), fine to medium grained, poorly graded, subrounded to rounded, dense, wet, 95% sand (~3% biotite), 5% silt and clay, structureless and homogeneous, Chatsworth Formation.
							163-164.6	Fine-grained sandstone from 153.0-164.6 ft bgs.
155	2	32	84%	33		S-25		165-165.5 Sandstone, same as above, except medium grained. Possible fracture between 165.0 and 165.0-166.6 ft bgs. 166 Possible fracture at 166.0 ft bgs.
						S-26		
160	1.8	33	68%	12		S-27	160.6-161	Sandstone, same as above, except fine to medium grained. Fracture 160.6 to 161.0 ft bgs.
							162.5-163	Fine-grained sandstone.
							163-163.5	Medium-grained sandstone.
							163.5-165	No recovery from 163.5 to 165 ft bgs.
165	2	34	64%	13				Sandstone, same as above, except fine to medium grained.
						S-28	167-167.5	Possible fracture at 167.0-167.5 ft bgs.
170	1.8	35	100%	60		S-29		Sandstone, same as above.
175	2	36	100%	64		S-30		Sandstone, same as above. 176.5 Possible low-angle fracture at 176.5 ft bgs. 177.5 Possible low-angle fracture at 177.5 ft bgs.
180	1.8	37	100%	74			180-180.5	Sandstone, same as above. Low-angle fracture between 180.0 and 180.5 ft bgs.
						S-31	183.5	Thin shale layer at 183.5 ft bgs. Fracture between 183.5 and 184.0 ft bgs.
185	3	38	90%	40		S-32	184.75	Thin shale layer and fracture at 184.75 ft bgs. Sandstone, same as above. Fracture between 185.0-185.6 ft bgs.
							188.5	Shale, dark gray (10YR 4/1), moderately graded, very dense, wet, 10% sand, 90% silt and clay.
							187-187.5	few thin fine-grained sand interbeds. Low-angle fracture between 187.0 and 187.5 ft bgs.
							187.5-188	Low-angle fracture between 187.5 and 188.0 ft bgs.
190		39						



CORE BORING REPORT

BORING NO.

SB_Trit-02

Page 6 of 6

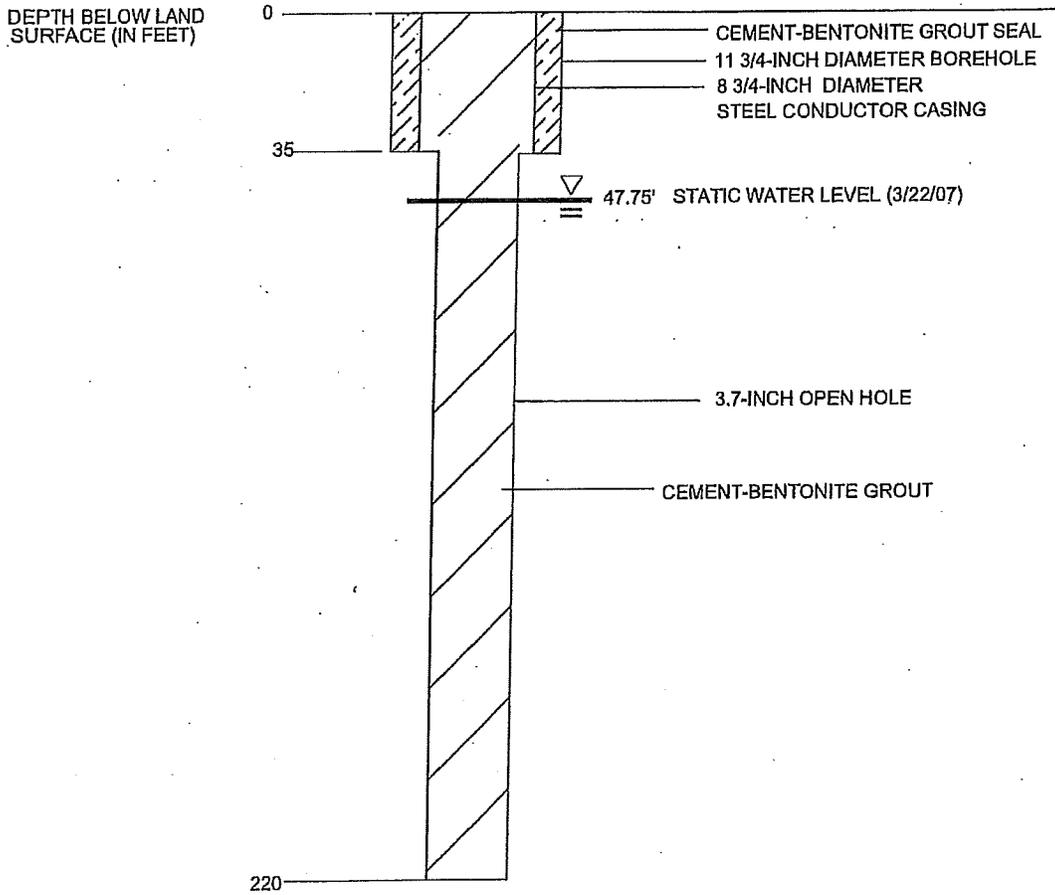
Depth (ft)	Drilling Rate (min/ft)	Core Run	Recovery		Fracture profile	Sample	Stratum Change (ft)	Visual Classification and Remarks
			Total	RCD (%)				
190	2.8	39	100%	56			190.25 Shale, dark gray (10YR 4/1), moderately graded, very dense, wet, 10% sand, 90% silt and clay, few thin fine-grained sand interbeds, Chatsworth Fm. Low-angle fracture at 190.25 ft bgs.	
							191 Fine-grained sandstone layer, ~3-in thick at 191.0 ft bgs. Low-angle fracture at 191.0 ft bgs.	
							191.5-192 Three low-angle fractures between 191.6 and 192.0 ft bgs.	
							192.5 Sandstone, gray (10YR 5/1), fine to medium grained, poorly graded, subrounded to rounded, dense, wet, 85% sand (~3% blotite), 5% silt and clay.	
						S-33	194.5-195 Low-angle fracture between 194.6 and 195.0	
195	3.2	40	100%	49			195-195.5 Thin sandstone and shale interbeds from 195.0 to 195.5 ft bgs. Low-angle fracture between 195.0 and 195.5 ft bgs.	
							196 Low-angle fracture at 196.0 ft bgs.	
							196.5-197 Sandstone, gray (10YR 5/1), fine to medium grained, poorly graded, subrounded to rounded, dense, wet, 85% sand (~3% blotite), 5% silt and clay. Low-angle fracture at 196.5-197 ft bgs.	
							197.5-198 Fracture between 197.5 and 198.0 ft bgs.	
							198-199 High-angle fracture between 198.0 and 199.0 ft bgs.	
							198.5-199 Fracture between 198.5 and 199.0 ft bgs.	
						S-34	199-199.5 Fracture between 199.0 and 199.5 ft bgs.	
200	1.8	41	96%	58			200-200.5 Sandstone, same as above, except structureless and homogeneous. Low-angle fracture between 200.5 and 200.5 ft bgs.	
						S-35	201.5-203 Fine- to coarse-grained sandstone, well graded.	
							202.5-203.5 High-angle fracture between 202.5 and 203.5 ft bgs.	
							203 Fine- to medium-grained sandstone.	
							204-204.5 Fracture between 204.0 and 204.5 ft bgs.	
205	4.6	42	100%	62			205-206 Sandstone, same as above. Three fractures between 205.0 and 206.0 ft bgs.	
							206.5-208 Three evenly-spaced fractures between 206.6 and 208 ft bgs (possibly caused by drilling).	
						S-36	200-200.5 Sandstone, same as above. Fracture between 200.0 and 200.5 ft bgs.	
210	2.4	43	100%	80			210.5-211 1-in-thick shale layer at 210.8 ft bgs. Moderate-angle fracture and high-angle fracture between 210.6 and 211.0 ft.	
						S-37	212.5-214 Three evenly-spaced fractures between 212.5 and 214.0 ft bgs.	
						S-38	213-214 Shale with thinly laminated interbed of fine-grained sandstone.	
215	1.8	44	100%	72			Sandstone, same as above, except medium grained.	
						S-39	216.5-217 Fracture between 216.5 and 217.0 ft bgs.	
							217-217.5 Two possible fractures above thin layer of shale.	
							217.5 1-in-thick layer of shale.	
						S-40	219-219.5 Two fractures between 219.0 and 219.5 ft bgs.	
220							End coring at total depth of 220.0 ft bgs.	
225							Notes: 11 3/4-in borehole 0' to 35' 6 3/4-in diameter steel conductor casing 0' to 35' 3.7-in borehole 35' to 220'	
230								

FILE NO. 20060-984

BORING NO.

SB_Trit-02

G:\GRAPHICS\PROJECTS\SB47Z - BOEING ROCKETDYNETWORKAREA_IV_DRILLING_2006\20060-952-00A2-TRITZ.DWG



HALEY & ALDRICH

THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

BOREHOLE SCHEMATIC FOR
SB-Trit-02

0 22 44
VERTICAL SCALE IN FEET

SCALE: AS SHOWN
OCTOBER 2007

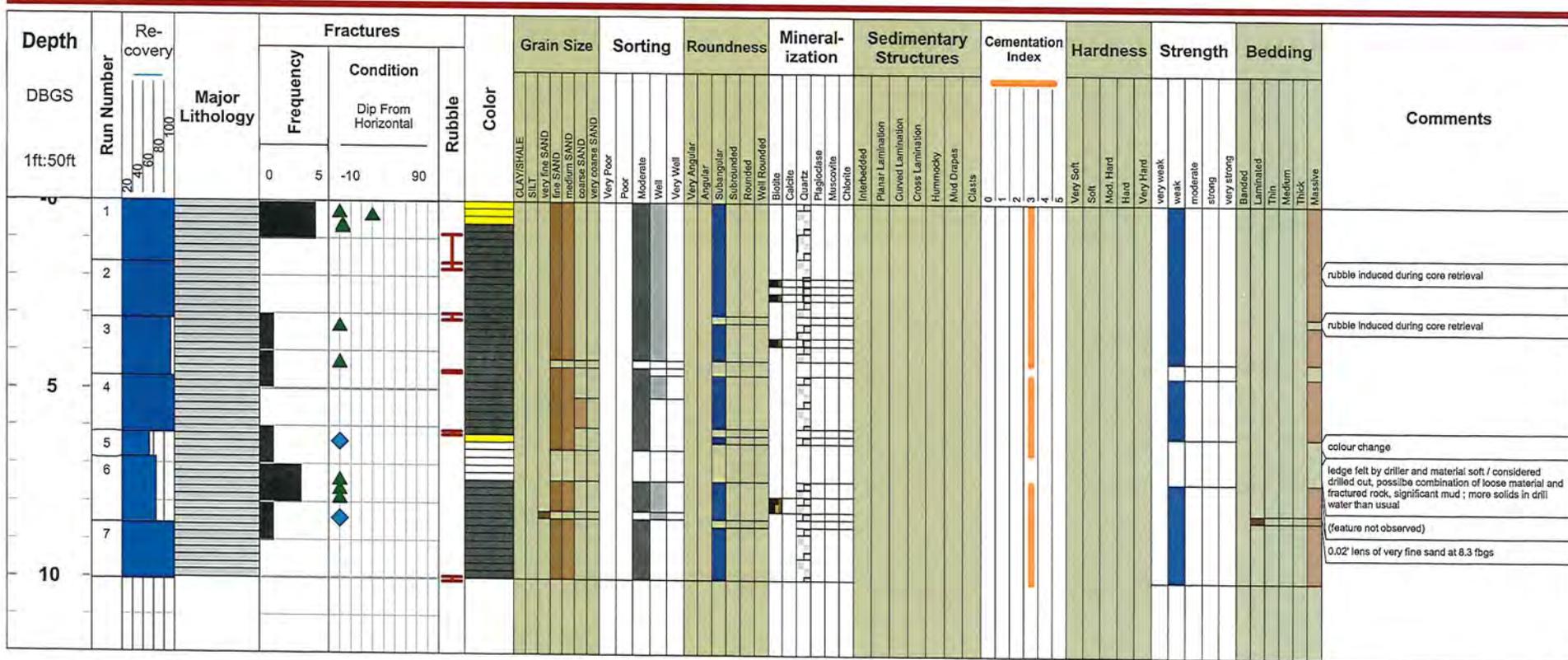
FIGURE A-2

SP-900

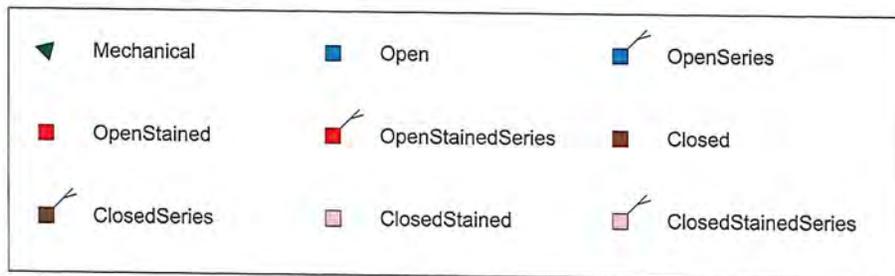
SP-900A

SP-900B

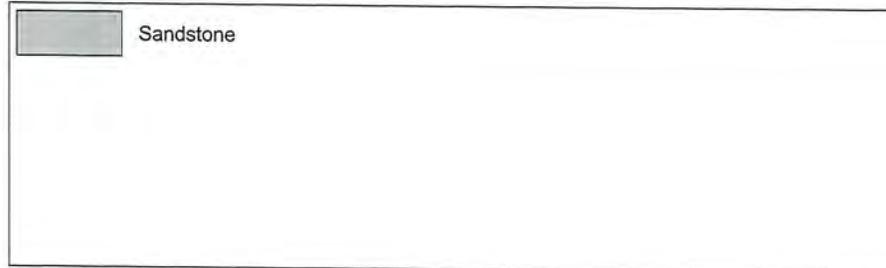
SP-900C

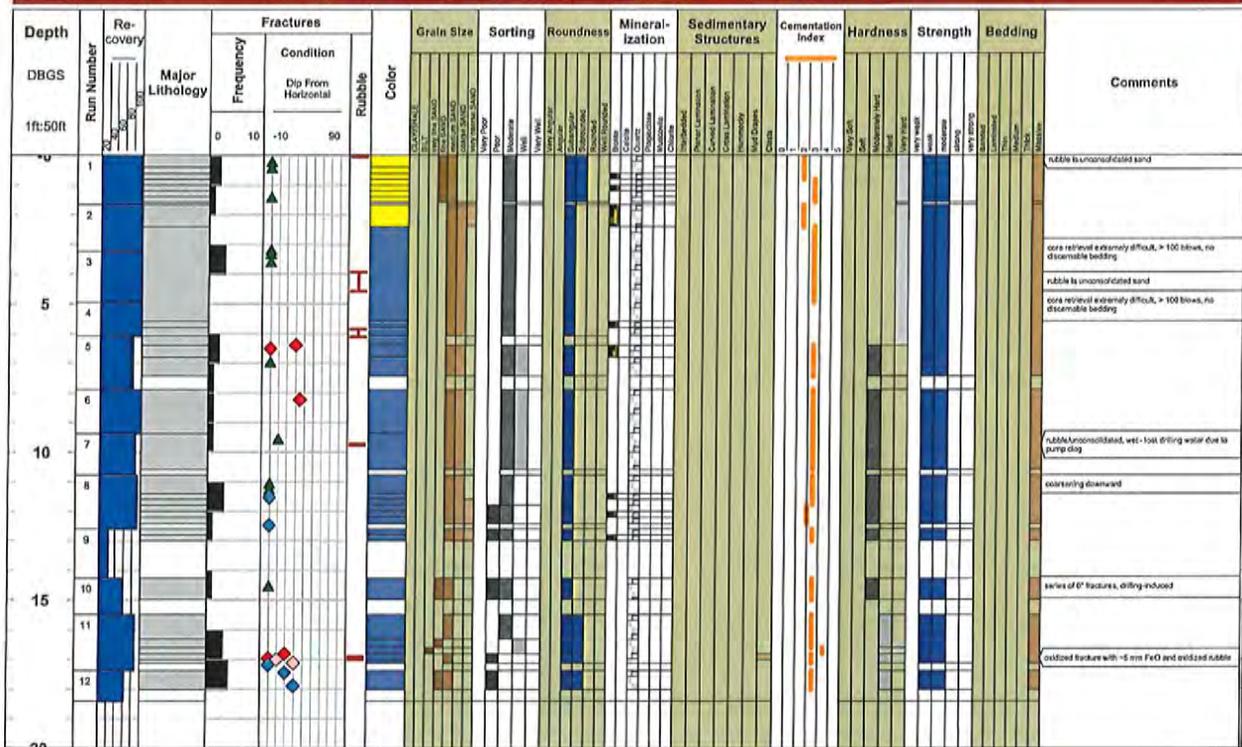


Fracture Condition



Lithology



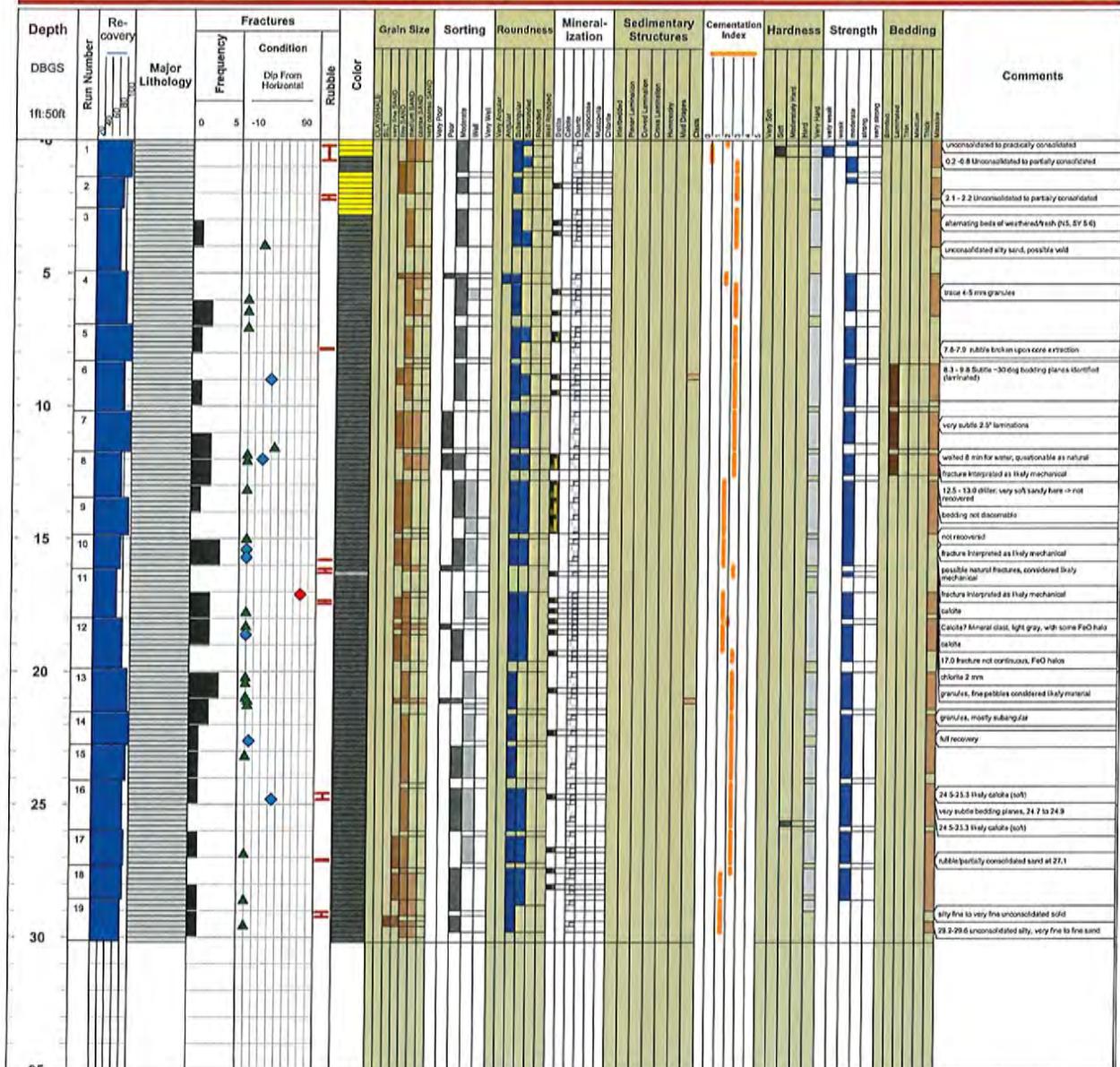


Fracture Condition

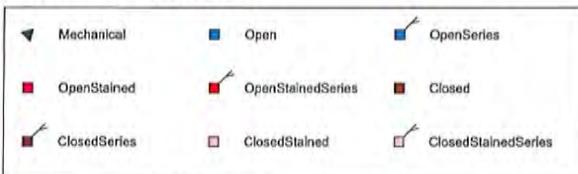
Mechanical	Open	OpenSeries
OpenStained	OpenStainedSeries	Closed
ClosedSeries	ClosedStained	ClosedStainedSeries

Lithology

Sandstone
No Recovery



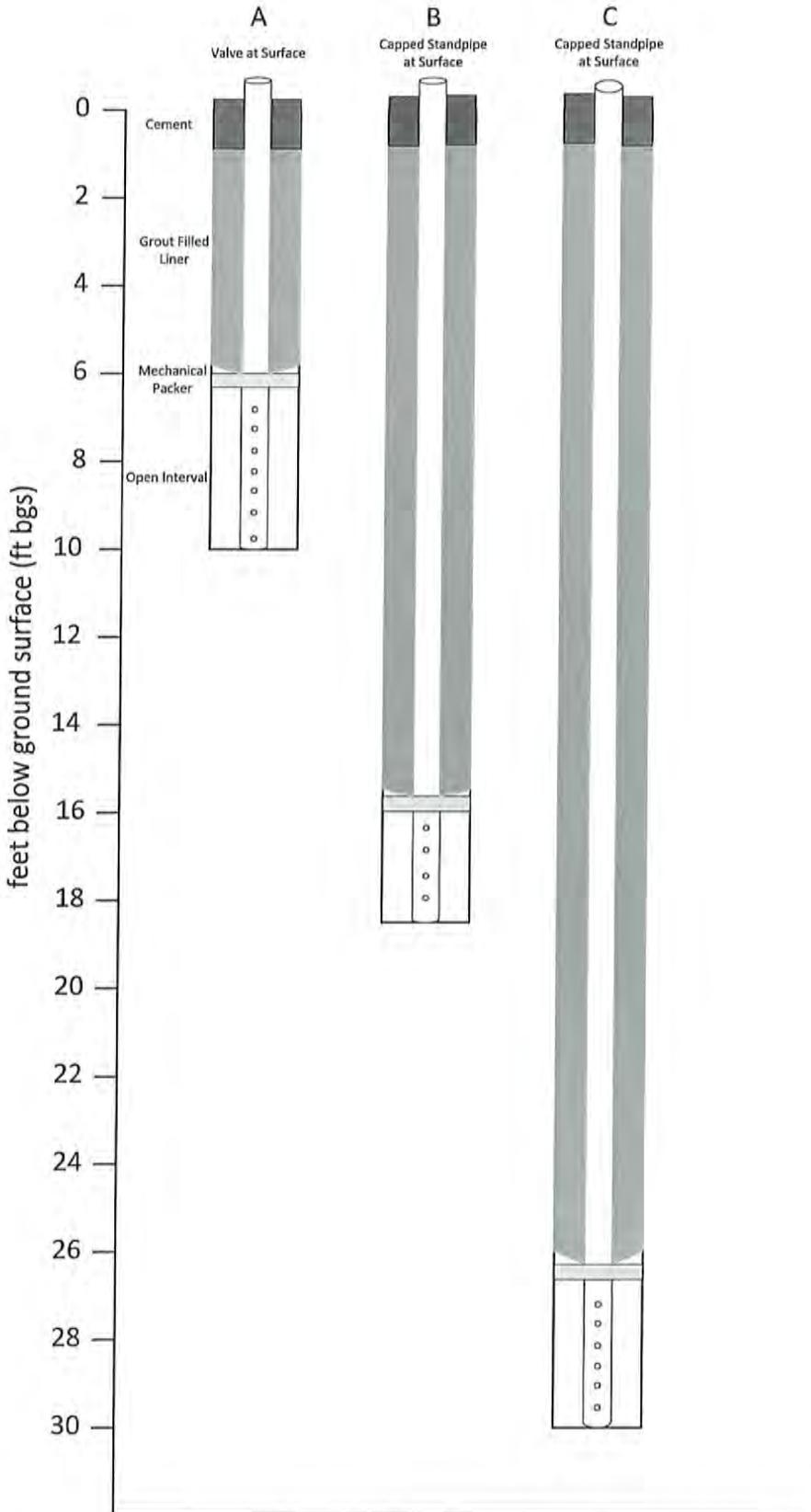
Fracture Condition



Lithology



Well Completion Diagram
Seep Well Cluster: SP-900



Well ID: SP-900A
 Drill: Shaw Drill, 1.65-inch
 Total Depth: 10.0 ft
 Completion Method: Grout Liner
 Standpipe Diameter: ½-inch

Coordinates (NAD 27):
 North: 267350.25
 East: 1782521.19

Elevations:
 Ground: 1460.53
 Top of Valve: 1460.64

Water Level: Artesian

Well ID: SP-900B
 Drill: Shaw Drill, 1.65-inch
 Total Depth: 18.4 ft
 Completion Method: Grout Liner
 Standpipe Diameter: ½-inch

Coordinates (NAD 27):
 North: 267690.40
 East: 1782403.65

Elevations:
 Ground: 1395.11
 Top of Casing: 1395.27

Water Level at Completion:
 6.28' bgs

Well ID: SP-900C
 Drill: Shaw Drill, 1.65-inch
 Total Depth: 30.1 ft
 Completion Method: Grout Liner
 Standpipe Diameter: ½-inch

Coordinates (NAD 27):
 North: 267687.75
 East: 1782403.73

Elevations:
 Ground: 1395.18
 Top of Casing: 1395.27

Water Level at Completion:
 6.25' bgs

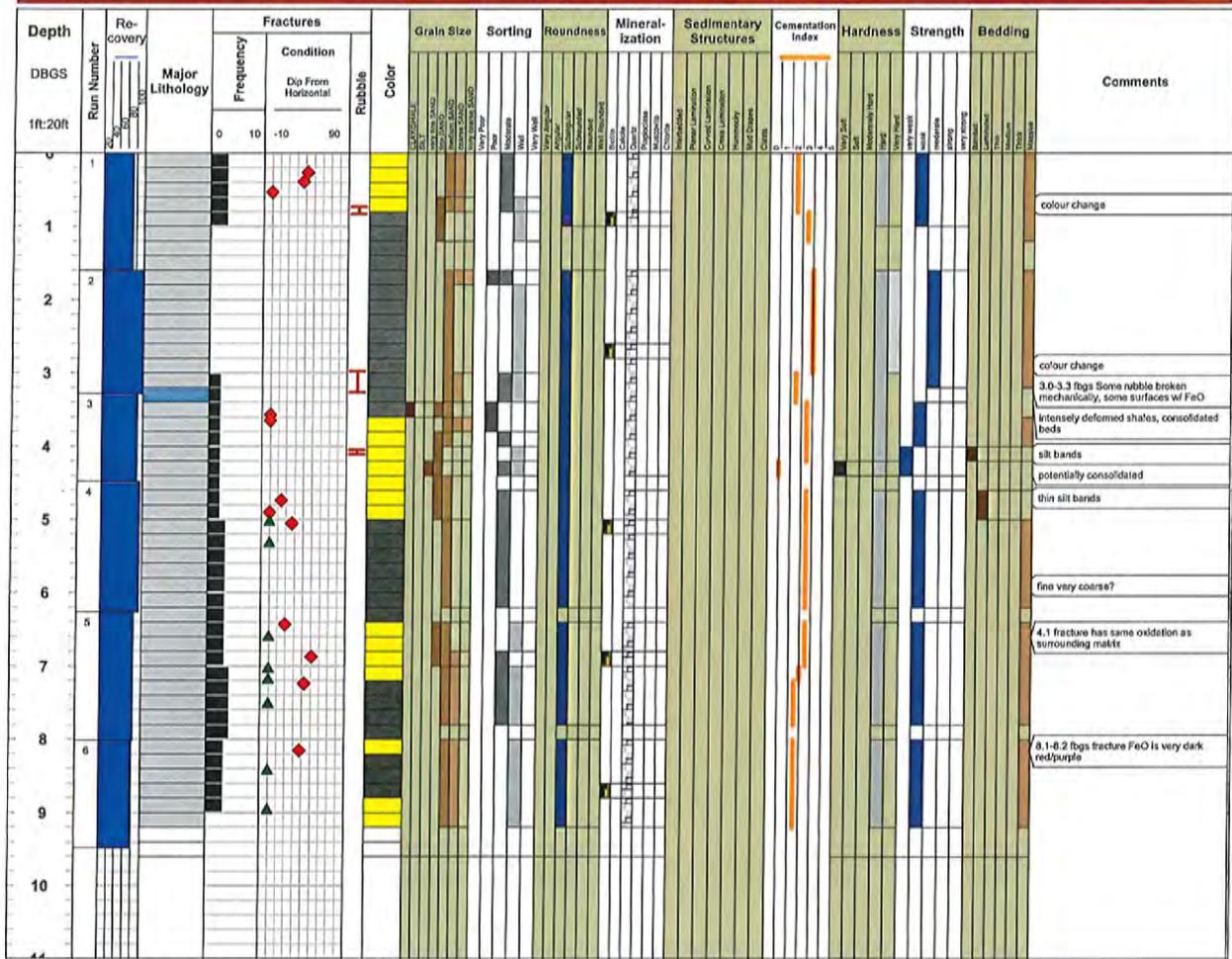
SP-T02
WELL LOGS

SP-T02A

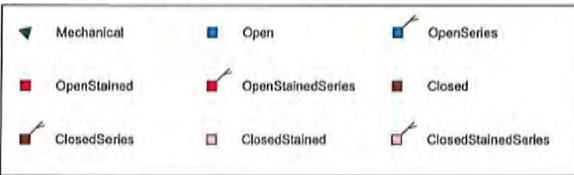
SP-T02B

SP-T02C

SP-TOCD

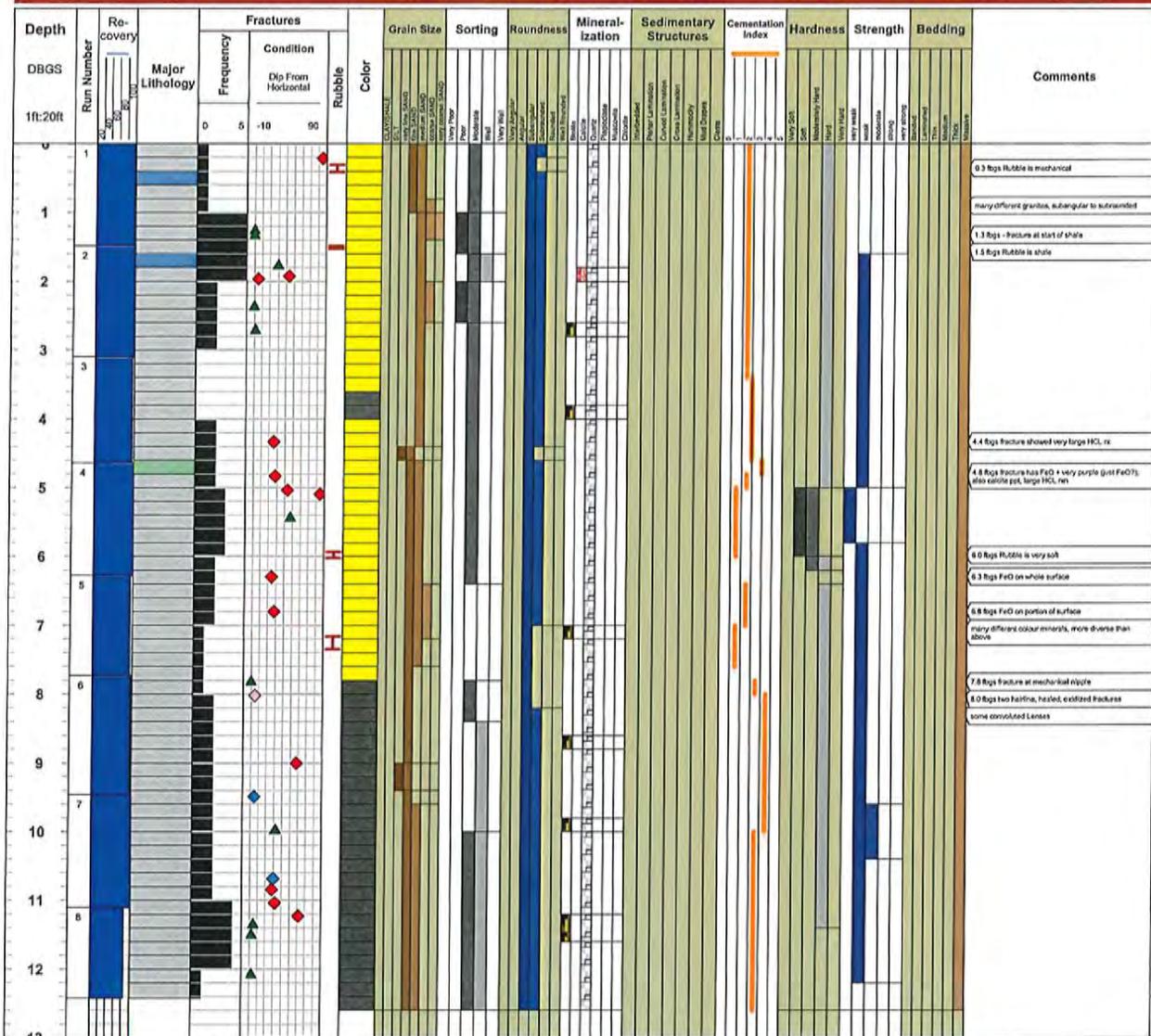


Fracture Condition



Lithology



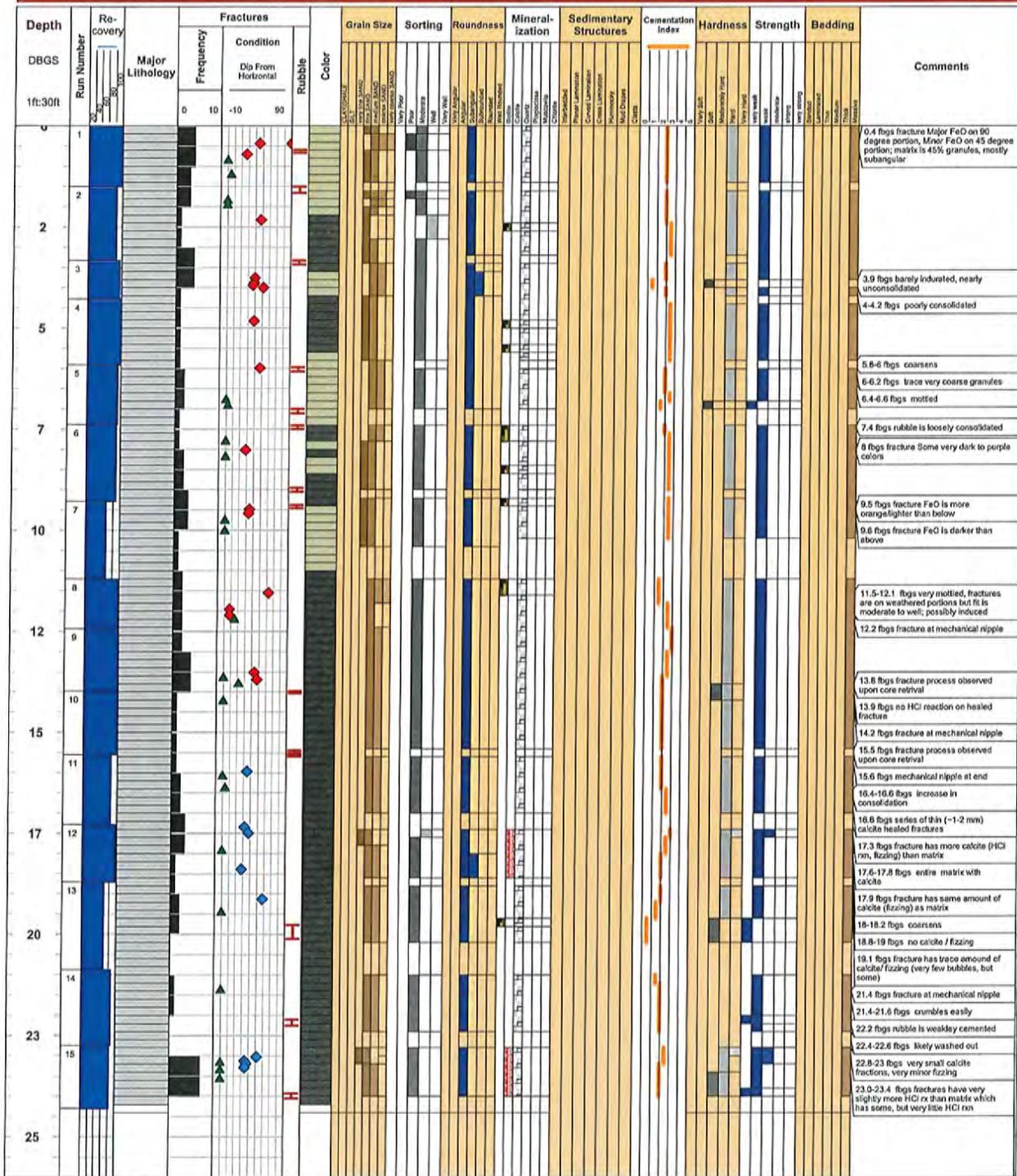


Fracture Condition

▼ Mechanical	■ Open	■ OpenSeries
■ OpenStained	■ OpenStainedSeries	■ Closed
■ ClosedSeries	■ ClosedStained	■ ClosedStainedSeries

Lithology

■ Shale
■ Sandstone
■ Sandy Silt

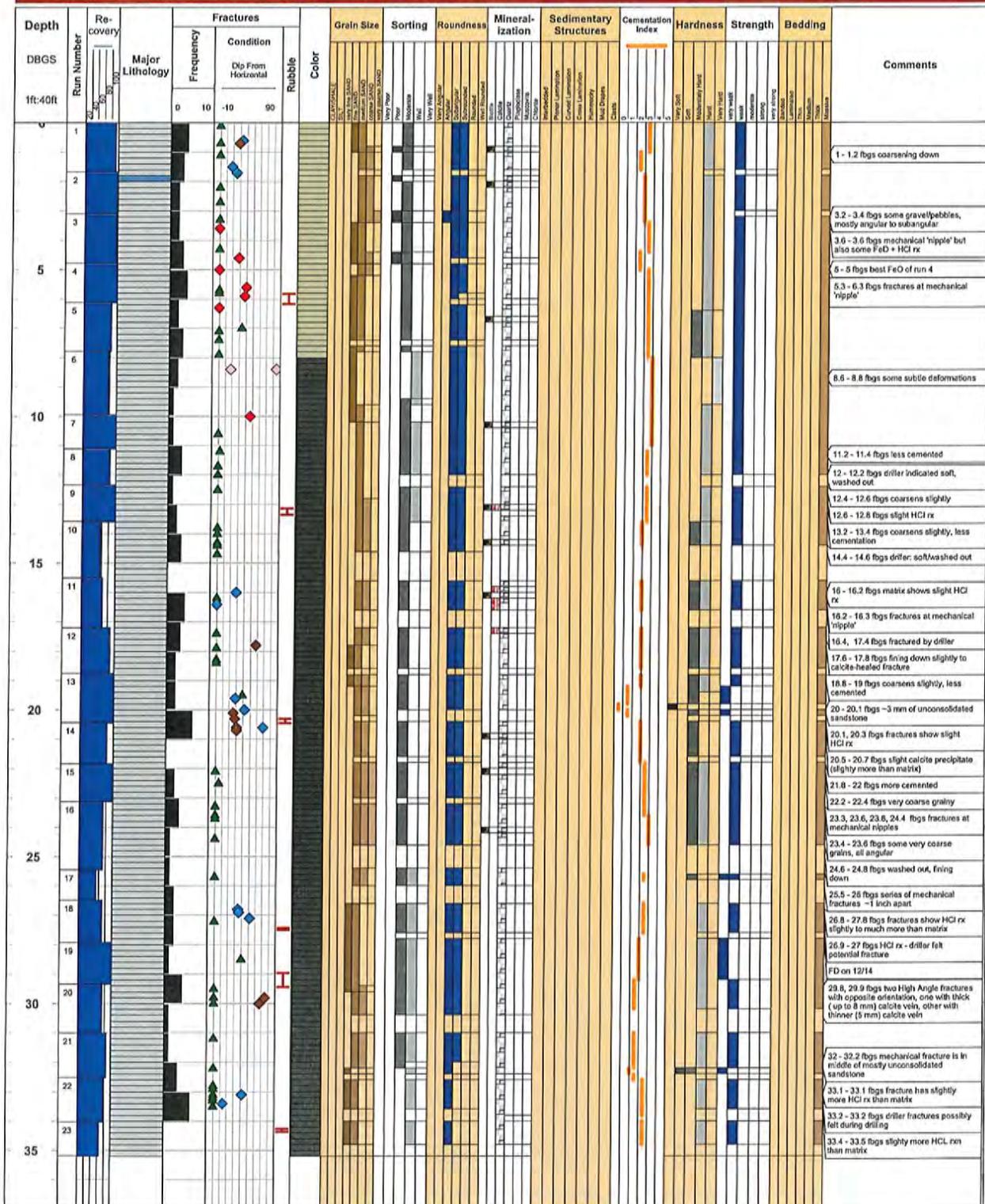


Fracture Condition

▼ Mechanical	■ Open	■ OpenSeries
■ OpenStained	■ OpenStainedSeries	■ Closed
■ ClosedSeries	■ ClosedStained	■ ClosedStainedSeries

Lithology

■ Sandstone
□ No Recovery



Fracture Condition

▼ Mechanical	■ Open	■ OpenSeries
■ OpenStained	■ OpenStainedSeries	■ Closed
■ ClosedSeries	■ ClosedStained	■ ClosedStainedSeries

Lithology

■ Shale
■ Sandstone



Table C1
Well Construction Information

Area	Well ID	Drill Date (dd-mmm-yy)		Drill Used	Total Corehole Depth (ft)	Corehole Diameter (Inches)	Screen Length (ft)	Casing			Latitude (NAD 27)	Longitude (NAD27)	Well Head Elevation (ft amsl)	Ground Elevation (ft amsl)	
		Start	End					Type	Schedule	OD (Inches)					ID (Inches)
Area IV Buffer Zor	SP-T02A	18-Dec-13	18-Dec-13	Shaw	9.48	1.65	2	PVC	80	0.840	0.526	34.2335265	-118.7129328	1716.82	1716.41
	SP-T02B	16-Dec-13	16-Dec-13	Shaw	12.42	1.65	2.5	PVC	80	0.840	0.526	34.2335103	-118.7129716	1714.06	1713.71
	SP-T02C	06-Jan-14	07-Jan-14	Shaw	24.30	1.65	5	PVC	80	0.840	0.526	34.2335084	-118.7129634	1714.78	1714.22
	SP-T02D	17-Dec-13	18-Dec-13	Shaw	35.18	1.65	5	PVC	80	0.840	0.526	34.2335095	-118.7129762	1714.08	1713.7

WS-7

TABLE A-105

LITHOLOGIC LOG OF WELL WS-7

(Log obtained from State of California
Department of Water Resources)

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
0 - 10	Surface
10 - 48	Yellow sandstone
48 - 78	Blue sandstone, coarse
78 - 132	Blue sandstone, hard
132 - 145	Blue sandstone and shale ledges
145 - 172	Blue sandstone
172 - 194	Blue sandstone and shale ledges
194 - 207	Blue sandstone
207 - 292	Blue sandstone, shale ledges
292 - 323	Blue sandstone, coarse and shale
323 - 338	Gray sandstone, coarse
338 - 345	Blue sandstone shale lenses
345 - 358	Grey sandstone, fine
358 - 401	Grey sandstone, coarse
401 - 520	Grey sandstone and shale ledges
520 - 592	Blue sandy shale
592 - 610	Blue sandstone and shale ledges
610 - 678	Gray sandstone, fine
678 - 686	Blue sandstone and shale ledges
686 - 700	Blue sandstone, coarse

TOTAL DEPTH OF BOREHOLE: 700 feet

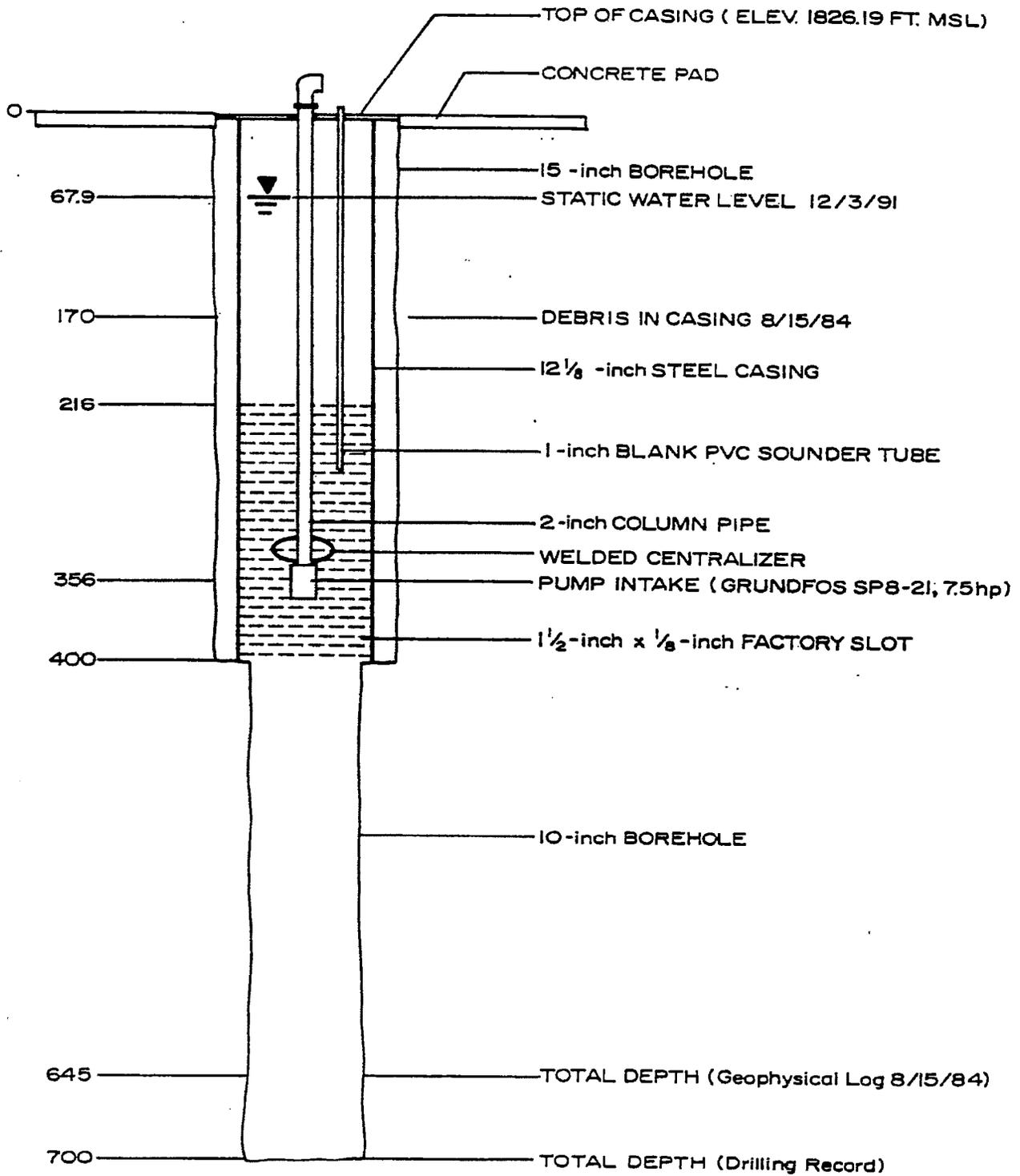


FIGURE F-4
SCHEMATIC DIAGRAM OF WATER SUPPLY WELL WS-7