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APPENDIX A

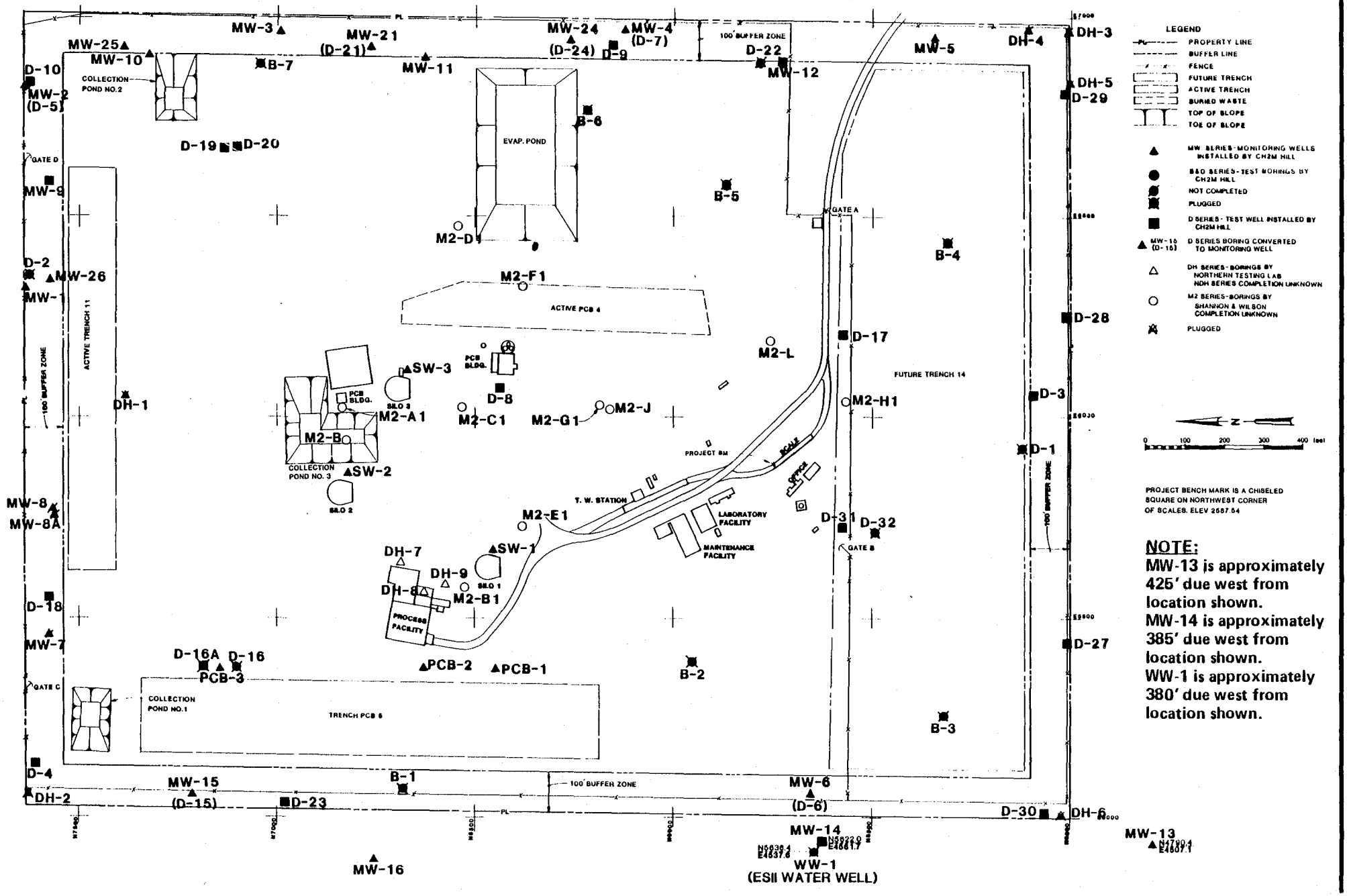

FIGURE A-1
WELL AND BORING LOCATIONS

B18066.CO

Table

WELL LOG AND REPORT TO THE STATE RECLAMATION ENGINEER OF IDAHO (DEEP ARTESIAN WELL AT ESH SITE)

JAN 2 1959
Department of Reclamation

Log No.
Rec'd. _____, 19___
Well No.
Permit No.

(DO NOT FILL IN)

Owner U. S. ARMY CORP of ENGINEERS Address Walla Walla, Washington

Driller Core Drilling Inc. Address Grandview Idaho Lic. No.

Location of Well: SW ¼ NE ¼ Sec. 19, T. 4 N, R 2 E WM CLARKE County,
and 1422 feet NS, and 431 feet EW from ¼ Cor 18/19 Corner of ¼ ¼ Sec

Size of Drilled Hole 55/8 reamed 8 3/4 3515 Total depth of Well 3080

Give depth of standing water from surface Water Temp. 165 °Ferenheit

On pumping test delivery was g.p.m. or c.f.s. Drawdown was feet.

Size of pump and motor used to make the test

Length of time pumped during check was hr., minutes.

If flowing well, give flow in c.f.s. or g.p.m. 335 and shut in pressure 73#

If flowing well, describe control works 6 inch rising stem valve
(TYPE AND SIZE OF VALVE, ETC.)

Water will be used for Weight of casing per linear foot

Thickness of casing .329 Casing material pipe (steel)
E.G., PIPE, CONCRETE, WOOD.

Diameter, length and location of casing 14 inch 50 feet 10¾ inch 400 feet, 6⅝ inch to 2515
(CASING 12" IN DIAMETER AND UNDER GIVE INSIDE DIAMETER; CASING OVER 12" IN DIAMETER GIVE OUTSIDE DIAMETER.)

Number and size of perforations located feet to feet from surface of ground.

Other perforations

Date of commencement of well Oct 26 1958 Date of completion of well Nov 12 1958

Type of well rig 200 Sullivan Rotary

CASING RECORD

DIAM. CASING	FROM FEET	TO FEET	LENGTH	"REMARKS" -- SEALS, GROUTING, ETC.
14 inch	0	50	50	Cemented
10¾ inch	0	401½	401½	Cemented 20 sacks
6⅝ inch	0	2515	2515	

GENERAL INFORMATION—Pumping Test, Quality of Water, Etc.

Flow test 50 gpm 70# pressure at 3000 feet

Flow test 335 gpm 76# pressure at 3080

0

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Table
(continued)

WELL LOG

From Feet	To Feet	Type of Material	Drilling Time Hrs.	Drilling Time Min.	Water-bearing Formation Ans. Yes or No	Casing Perforated Ans. Yes or No
0	4	Sandy soil				
4	42	Angular gravel				
42	173	Clay brown with Sand streks				
173	410	Clay Blue				
410	415	Clay Blue Sandy	GLENNS			
415	657	Clay Blue	FERRY			
657	812	Shale Blue	FORMATION			
812	967	Shale Gry.				
967	1665	Clay Blue				
1665	1672	Cinder bed consolidated				
1672	1685	Cinders and Shale interbedded				
1685	1700	Shale Gry.				
1700	1700.5	Cinder bed consolidated	POISON			
1700.5	1736	Shale Gry.	CREEK			
1736	1740	Cinder bed consolidated	FORMATION			
1740	1820	Shale Gry.				
1820	1822	Cinder bed consolidated				
1822	1940	Clay Blue				
		If more space is required use Sheet No. 2				

WELL DRILLERS STATEMENT

This well was drilled under my jurisdiction and the above information is true and correct to the best of my knowledge and belief.

Signed [illegible]

By [illegible]

License No. [illegible]

Dated [illegible], 19[illegible]

LOGGED BY: Richard G Robinson

Robinson & Roberts
4603 So. J Street
Tacoma 8, Wash.

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SHEET NO. 2

TABLE
(continued)

Well Driller CORE DRILLING INC.

Well Location .....

WELL LOG

From feet	To feet	Type of Material	Drilling Time		Water-bearing formation Ans. Yes or No	Casing Perforated Ans. Yes or No
			Hrs.	Min.		
1940	2285	Shale gry.				
2285	2291	Basalt Blk.				
2291	2352	Shale gry.				
2352	2360	Basalt Blk.				
2360	2400	Shale Gry.				
2400	2495	Basalt Blk.				
2495	2519	Shale Gry.				
2519	2562	Volcanic breccia (Basalt Rhyolite Sh.)				
2562	2595	Rhyolite				
2595	2836	Shale Gry.				
2836	2845	Rhyolite				
2845	2846	Shale Gry				
2846	2856	Rhyolite				
2855	2860	Shale Gry.				
2860	2886	Rhyolite				
2886	2888	Shale Gry.				
2888	2980	Rhyolite				
2980	3006	Sand Black			yes	
3006	3012	Shale red				
3012	3030	Sand Black			yes	
3030	3080	Basalt Black			"	
		GRAVEL SIZE				

BANBURY BASALT

TERTIARY SILICIC VOLCANICS

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SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION ADJACENT WEST SIDE TRENCH 12

ELEVATION ~2560' DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT CME – 75, 8" O.D. HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START 10:20 9/ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
5.0	5.0 6.5	S-1	12"	4-4-4 8	SANDY CLAYEY SILT, LIGHT BROWN, DRY FIRM - STIFF. ML (FILL)		
					SILTY, SANDY GRAVEL, LIGHT BROWN, DRY, VERY DENSE, GW		
10.0	10.0	S-2	2"	50/6"			
	10.5						
15.0	15.0 16.3	S-3	12"	27-31-50/3" 81+	AS ABOVE		
20.0	20.0 20.9	S-4	9"	20-50/5" 70+	AS ABOVE – REDDISH BROWN		
					CLEAN SAND, FINE TO COARSE, REDDISH BROWN, DRY, MEDIUM DENSE TO DENSE, SW		
25.0	25.0 26.5	S-5	12"	8-10-20 30			

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION WEST OF TRENCH 12

ELEVATION APPROX. 2,560' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75 8" O.D. HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE ____ START ____ FINISH ____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30.0	30.0 31.5	S-6	1/2"	13-20-19 39	CLEAN GRAVELLY SAND, FINE TO COARSE, REDDISH BROWN, SLIGHTLY MOIST, DENSE SW		
35.0	35.0 35.9	S-7	10"	13-50/5" 63+	SILT, LOW PLASTICITY, BROWN SLIGHTLY MOIST, HARD, ML		
40.0	40.0 41.3	S-8	15"	19-48-50/4" 98+	CLEAN FINE SAND, BROWN, SLIGHTLY MOIST, VERY DENSE SP		
45.0	45.0 46.4	S-9	15"	18-36-50/5" 86+	AS ABOVE – LIGHT BROWN		
50.0	50.0 51.0	S-10	9"	17-50 67	AS ABOVE		
55.0	55.0 56.0	S-11	10"	17-50 67	AS ABOVE		

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SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION WEST OF TRENCH 12

ELEVATION APPROX. 2,560' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGER, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60.0	60.0 61.4	S-12	12"	19-31-50/5" 81+	CLEAN SAND, FINE, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE SP		
65.0	65.0 66.5	S-13	9"	16-37-50 87	AS ABOVE		
70.0	70.0 71.4	S-14	10"	12-30-50/5" 80+	AS ABOVE		
75.0	75.0 76.3	S-15	7"	33-50/4" 83+	AS ABOVE WITH THIN ZONE OF FINE SANDY SILT, SAND 10%, BROWN, MOIST, HARD – ML		
					5:40 PM		
					SILTY CLAY TO CLAYEY SILT, PLASTIC BROWN, MOIST, HARD CL - ML. WITH 2" ZONE OF SILTY SAND, FINE – SM		
80.0	80.0 81.3	S-16	15"	7-19-50/4" 69+			
85.0	85.0 85.9	S-17	8"	26-50/5" 76+	CLEAN SAND, FINE, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE – SP		

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SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION WEST OF TRENCH 12

ELEVATION APPROX. 2,560' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
90.0	90.0 90.9	S-18	9"	15-50/5" 65	8:15 AM 9/20/83 SLIGHTLY SILTY SAND, FINE, SILT 5%, BROWN, SLIGHTLY MOIST, VERY DENSE – SP		
95.0	95.0 95.8	S-19	8"	20-50/4" 70+	AS ABOVE		
100.0	100.0 100.5	S-20	3"	50/6" 100+	AS ABOVE		
105.0	105.0 105.9	S-21	10"	43-50/5"	AS ABOVE		
110.0	110.0 110.8	S-22	2"	38-50/3" 88+	AS ABOVE		
115.0	115.0 116.5	S-23	18"	30-35-50 85	AS ABOVE SILTY CLAY AND SOME SILT, BROWN MOIST, HARD CL AND ML. 1" HARD CALICHE ZONE AT TOP		

CH2M HILL

B16579.F0 | B-1 | SHEET 5 OF 6

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION WEST OF TRENCH 12

ELEVATION APPROX. 2,560' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH 4:00 9/20/83 LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME; GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
120.0	120.0 – 121.3	S-24	12"	20-44-50/3" 94+	SILTY CLAY, FINE SAND AND SILT, LIGHT BROWN, SLIGHTLY MOIST, HARD AND VERY DENSE CL, SP, ML		AT 120.3' SWITCHED TO NWD4 COREBARREL.
	121.3	NW-1	4.0'= 5.0' 80%	RQD = 0%		LOSS	
125.0					SILTY CLAY WITH SOME SILT, NON-PLASTIC GREENISH BROWN, MOIST, HARD, CL WITH ML. CONTAINS TRACES OF FINE SAND AND TRACES OF ORGANICS. BEDDING BREAKS 1"-2" THINLY LAMINATED		2 MINS/FT CORED WITH CLEAR WATER, NO FLUID RETURN
	126.3				END OF BORING 126.3'		HOLE GROUTED TOP TO BOTTOM USING 47 BAGS OF PORTLAND CEMENT
130.0							

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B16579.F0

ROCK CORE LOG

PROJECT ESI GRANDVIEW SITE LOCATION WEST OF TRENCH 12

DRILLING METHOD CME-75- NWD4 CORE DRILLERS & EQUIPMENT ERICKSON-FORD

ELEVATION ~2,560' ORIENTATION VERTICAL **BORE HOLE:** B-1

WATER LEVEL _____ DATE: _____ START: 5:20 9/20/83 FINISH: _____ INSPECTOR A. BENFER

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
	120.0'-120.3' SAMPLED WITH SPLIT SPOON								
121									
121.3									
	2 MINS/FT	4.0'/5.0' = 80%	?	1	0%	>6	ALL HORIZONTAL BEDDING PLANES. THINNLY LAMINATED BREAKS 1"-2".	LOSS ZONE PROBABLY SAND. SILTY CLAY WITH MINOR NON-PLASTIC SILT, GREENISH BROWN, MOIST, HARD, CL WITH ML.	
122	SMOOTH								
	NO FLUID RETURN								
123								CONTAINS TRACES OF FINE SAND AND TRACES OF ORGANICS.	
124									
126									
126.3							END OF BORING 126.3'.		
								HOLE GROUTED FROM TOP TO BOTTOM USING 47 BAGS OF PORTLAND CEMENT.	

FORM D 2113A 5/78

CH2M HILL

B16579.B0 | B-2 | SHEET 1 OF 5

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION GRANDVIEW, IDAHO

ELEVATION ~2,577 FT DRILLING CONTRACTOR ERICKSON-FORD CO.

DRILLING METHOD AND EQUIPMENT HOLLOW-STEM AUGER – CME 75

WATER LEVEL AND DATE _____ START 10/4/83 FINISH _____ LOGGER R. SIEGEL

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0							EASY SMOOTH DRILLING TO 3.0 FT GRINDING BELOW 3.0 FT
	4.5				GRAVELLY SAND, GRAVEL FINE, CLEAN, TAN, DRY, VERY DENSE, SW OR SP.		
5	6.0	S-1	12"	13-22-32 (54)			SLOW GRINDING DRILLING FROM 4.5 TO 9.5 FEET.
	9.5						
10	9.9	S-2	1/2"	50/5"	SAND AND GRAVEL, CLEAN, TAN, DRY, VERY DENSE (SAMPLE NOT RETAINED).		SMOOTH, EASY DRILLING BELOW 11.5
	14.5						
15	16.0	S-3	12"	11-15-18 (33)	SAND, FINE-GRAINED, CLEAN, TAN, DRY, DENSE, SP.		
	19.5						SLOW, GRINDING DRILLING BELOW 18.0'
20	19.6	S-4	0"	50/1"			
	24.5						SMOOTH EASY DRILLING BELOW 22.5', OCCASIONALLY THIN STIFF LAYERS
25	25.5	S-5	10"	27-59-	SAND, FINE-GRAINED, CLEAN, TAN, MOIST, VERY DENSE, SP, TOP 2" SILTY, SM		3" MINUS GRAVEL INCUTTINGS
30	29.5	S-6	16"	20-32-43	SAND, FINE-GRAINED, CLEAN, TAN		

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION GRANDVIEW, IDAHO

ELEVATION ~2,577 FT DRILLING CONTRACTOR ERICKSON-FORD CO.

DRILLING METHOD AND EQUIPMENT HOLLOW-STEM AUGER CME-75

WATER LEVEL AND DATE ____ START 10/4/83 FINISH ____ LOGGER R. SIEGEL

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30.0	31.0			(75)	MOIST, VERY DENSE, SP		SMOOTH EASY DRILLING BELOW 29.5 FT
	34.5	S-7	16"	14-24-34 (58)	SAME AS ABOVE		
35.0	36.0						
	39.5	S-8	14"	21-45-50/4.5"	SAME AS ABOVE		OCCASIONAL STIFF LAYERS BELOW 41.0'
40.0	40.9						
	44.5	S-9	16"	23-40-58 (98)	SAME AS ABOVE		SMOOTH EASY DRILLING BELOW 39.5 FT
45.0	46.0						
	49.5	S-10	8"	40-50/4"	SAME AS ABOVE		
50.0	50.5						GRINDING, BOUNCING ACTION AT 52 FT
	54.5	S-11	9"	28-50/5"	SAME AS ABOVE		
55.0	55.4						
	59.5	S-12	8"	31-50/4"	SAME AS ABOVE, EXCEPT TOP 1" CLAYEY		
60.0							

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION GRANDVIEW, IDAHO

ELEVATION ~2,577 FT DRILLING CONTRACTOR ERICKSON-FORD CO.

DRILLING METHOD AND EQUIPMENT HOLLOW-STEM AUGER CME-75

WATER LEVEL AND DATE ____ START 10/4/83 FINISH ____ LOGGER R. SIEGEL

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60.0							
	64.5 / 65.3	S-13	8"	29-50/4"	SAND, CLEAN, FINE GRAINED, TAN, DRY, VERY DENSE, SP		
65.0							
	69.5 / 70.3	S-14	7"	43-50/3"	SAME AS ABOVE		
70.0							
	74.5 / 75.2	S-15	6"	38-50/2.5"	SAME AS ABOVE		
75.0							SLIGHT GRINDING ACTION AT 78 FT
	79.5 / 80.3	S-16	8"	46-50/3.5"	SAME AS ABOVE, EXCEPT MOIST		
80.0							
	84.9 / 85.3	S-17	7"	40-50/3"	SAME AS ABOVE, EXCEPT TOP 1" IS SILTY		
85.0							DRILLED STIFFER BELOW 87 FT
	89.5	S-18	12"	22-41-50/1½"	3" SAME AS ABOVE, SP.		
90.0							

CH2M HILL

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SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION GRANDVIEW, IDAHO

ELEVATION ~2,577 FT DRILLING CONTRACTOR ERICKSON-FORD CO.

DRILLING METHOD AND EQUIPMENT HOLLOW-STEM AUGER CME-75

WATER LEVEL AND DATE _____ START 10/4/83 FINISH _____ LOGGER R. SIEGEL

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
90.0					6" CLAY, LOW PLASTIC, TAN, MOIST, HARD, CL; 3" SAND, FINE GRAINED, CLEAN, TAN, DRY, VERY DENSE, SP		
	94.5						STOPPED END OF DAY AT 94.5 FT; RESUMED 10/5/83 WITH S-19
		S-19	5"	21-50/2½"	SAME AS ABOVE, EXCEPT 3" CLAY 2" SAND, AND DRY		
95.0	95.2						
	99.5						
	100.0	S-20	1"	55-	CLAYEY SAND, FINE GRAINED, TAN, DRY, VERY DENSE, SC		
100.0							
	104.5						
105.0		S-21	18"	21-46-61 (107)	INTERBEDDED SILTY SAND, FINE GRAINED LOW PLASTIC SILT AND CLAY; TAN, DRY, VERY DENSE OR HARD, SM, ML, AND CL.		AUGER REFUSAL AT 105 FT; INSTALLED NW CASING TO 106.5 FT AND SWITCHED TO NWD4 CORING.
	106.0						
	106.0	NW-22	24"		CLAY, LOW PLASTIC, TAN, DRY, HARD, CL.		
	108.0						
	108.0				INTERBEDDED, CLAY AND SILTY SAND, CL AND SM.		
110.0		NW-23	48"				
	113.0						
	113.0				SAME AS ABOVE		
115.0		NW-24	36"				
	118.0						
	118.0	NW-25	36"		SAME AS ABOVE		
120.0							

REV 11/82 FORM D1586

CH2M HILL

B16579.B0 | B-2 | SHEET 5 OF 5

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION GRANDVIEW, IDAHO

ELEVATION ~2,577 FT DRILLING CONTRACTOR ERICKSON-FORD CO.

DRILLING METHOD AND EQUIPMENT HOLLOW-STEM AUGER CME-75

WATER LEVEL AND DATE _____ START 10/4/83 FINISH _____ LOGGER R. SIEGEL

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
120.0							
	121.5						END OF BORING AT 121.5 FT.

REV 11/82 FORM D1586

HILL

B16579.F0 | B-3 | SHEET 1 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION WEST END TRENCH 14

ELEVATION ~2,600' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, HOLLOW STEM AUGER, 8" DIA, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START 8:00am 9/7/84 FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0					FINE SANDY SILT, SAND 25%, NONPLASTIC, LIGHT BROWN, DRY, ML		GRAB SAMPLE
5.0	5.0	S-1	8"	17-25-32 57	AS ABOVE, HARD		
	6.5				GRAVELLY, SILTY SAND, SILT AND GRAVEL - 10%, LIGHT BROWN, DRY, VERY DENSE, SW		
					1/4" GRAVEL		
10.0	10.0	S-2	7"	20-50 70	8:45 AM		
	11.0						
15.0	15.0	S-3	NSR	50/4"	INCREASE IN GRAVEL – 2"-3" DIAM.		
	15.3						
20.0	20.0	S-4	2"	50/2"	9:15 AM		RODS BOUNCING LARGE GRAVEL NOT RETRIEVED SEPARATE GRAB SAMPLE.
	20.2				VERY FINE TO FINE SAND, TRACE OF SILT, LIGHT BROWN, DRY, VERY DENSE, SP		
25.0	25.0	S 5	12"	16-33-50 83			
	26.5						

REV 11/82 FORM D1586

CH2M HILL

B16579.F0 | B-3 | SHEET 2 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION WEST END TRENCH 14

ELEVATION ~2,600' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-74, 8" HOLLOW STEM AUGER, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE ____ START ____ FINISH ____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30.0	30.0–31.0	S-6	9"	14-50 64	FINE SAND, CLEAN, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE, SP		
35.0	35.0	S-7	13"	15-31-44 75	AS ABOVE – TRACE OF SILT		
	36.5				AS ABOVE – TRACE OF SILT		
40.0	40.0–41.0	S-8	13"	32-75 108	VERY FINE TO FINE SAND, TRACE OF SILT LIGHT BROWN, DRY, VERY DENSE, TRACE OF CLAY AT 40.0' SP		
45.0	45.0–46.0	S-9	15"	32-70 102	AS ABOVE – MINOR CALCIUM CABONATE CEMENT		
50.0	50.0–50.75	S-10	9"	34-50 84	VERY FINE TO FINE SILTY SAND, ~ 20% SILT, LIGHT BROWN, DRY, VERY DENSE, SM POSSIBLE 6" CLAY LENSE AT 52.5		
55.0	55.0–56.0	S-11	10"	35-50 85	AS ABOVE		

CRAIG HILL

B16579.F0 | B-3 | SHEET 3 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION WEST END TRENCH 14

ELEVATION ~2,600' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60.0	61.0	S-12	10"	32-70 102	12:00 P.M. VERY FINE TO FINE SAND, SLIGHTLY SILTY ~10%, LIGHT BROWN, DRY, VERY DENSE, SP-SM		
65.0	65.0 65.8	S-13	10"	42-75 117	VERY FINE, SILTY SAND, ~45% SILT, NON-PLASTIC, LIGHT BROWN, DRY, VERY DENSE SM		
70.0	70.0 71.0	S-14	9"	40-65 105	1:05 PM CLAYEY SILT, PLASTIC, LIGHT GRAY TO BROWN, DRY, HARD, ML THINLY INTERBEDDED CLAY, SILT AND FINE SAND WITH ADMIXTURES OF EACH.		OXIDIZED LAMINATION
75.0	75.0 76.0	S-15	9"	11-70 81			
80.0	80.0 80.7	S-16	7"	55-50/2" 105+	AS ABOVE		
85.0	85.0 86.0	S-17	9"	17-50 67	AS ABOVE		

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION WEST END TRENCH 14

ELEVATION ~2,600' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" HOLLOW STEM AUGER, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE DRY START _____ FINISH 3:00 PM 9/8/83 LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
90.0	90.0 90.8	S-18	5"	41-70/4	SILTY CLAY, GREENISH BROWN, SLIGHTLY MOIST' HARD, CL		
95.0	95.0 95.9	S-19	9"	25-70/5"	THINLY INTERBEDDED CLAY, SILT AND FINE SAND.		
100.0	100.0 100.9	S-20	11"	25-50/5"	5:30 PM CLAYEY SILT, SLIGHTLY PLASTIC GREENISH GRAY, DRY, HARD ML		GROUTED HOLE TOP TO BOTTOM USING 45 BAGS OF PORTLAND CEMENT
105.0					END OF BORING 105.0'		

SOIL BORING LOG

OJECT ESI GRANDVIEW SITE LOCATION EAST END TRENCH 14

ELEVATION ~2,580' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" DIA HOLLOW STEM AUGER, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START 9:45 AM 9/10/83 FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0					GRAVELLY, SLIGHTLY SILTY SAND, FINE TO COARSE, LIGHT BROWN, DRY, VERY DENSE, SW		
5.0	5.0	S-1	5"	18-50/4" 68+	10:00 AM CLEAN SAND, FINE TO COARSE, LIGHT BROWN DRY, VERY DENSE, SW		
	5.8				GRAVELLY SAND, WITH TRACE OF SILT, FINE TO COARSE, LIGHT BROWN, DRY, VERY DENSE SW		
10.0	10.0 10.4	S-2	4"	70/5" 100+			
15.0	15.0 15.5	S-3	6"	50/6" 100+	10:45 AM SILTY VERY FINE TO FINE SAND, 25% SILT, LIGHT BROWN, DRY, VERY DENSE, SM THIN GRAVELLY ZONES		LITHOLOGIES GRADATIONAL
20.0	20.0 21.5	S-4	17"	17-41-39 80	CLEAN TO SLIGHTLY SILTY GRAVELLY SAND, FINE TO COARSE, 10% FINE GRAVEL, LIGHT BROWN, DRY, VERY DENSE, SW THIN GRAVELLY ZONES		
25.0	25.0 26.5	S-5	15"	11-16-22 38	SILTY FINE SAND, 30% SILT, LIGHT BROWN, SLIGHTLY MOIST, DENSE, SM THIN GRAVELLY ZONES		

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION EAST END TRENCH 14

ELEVATION ~2,580' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" DIA HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30.0	31.5	S-6	15"	8-16-22 38	CLEAN FINE SAND, LIGHT BROWN, SLIGHTLY MOIST, DENSE, SP		
35.0	35.0 36.5	S-7	16"	5-11-16 27	AS ABOVE		
40.0	40.0 41.6	S-9	11"	13-41-50/5" 91+	AS ABOVE – VERY DENSE		
45.0	45.0 46.4	S-9	11"	20-40-50/5" 90+	AS ABOVE		
50.0	50.0 51.4	S-10	13"	17-32-50/4" 82+	SLIGHTLY SILTY, FINE SAND, APPROXIMATELY 10% SILT, LIGHT BROWN, DRY, VERY DENSE, SP-SM		
					SILTY CLAY, LIGHT BROWN, DRY, HARD, CL-CH		
55.0	55.0 56.4	S-11	14"	17-40-50/4" 90+	CLEAN FINE SAND, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE SP		

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION EAST END TRENCH 14

ELEVATION ~2,580' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" DIA HOLLOW STEM AUGERS, 2' O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60.0		S-12	10"	22-45-50/4" 95+	9/10/83 CLEAN FINE SAND, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE, SP		
	61.4						
65.0	65.0	S-13	16"	25-37-50/5" 87+	AS ABOVE		
	66.4				SLIGHTLY FINE SANDY SILT, ~ 10% SAND SLIGHTLY PLASTIC, LIGHT BROWN, DRY, HARD ML		
70.0	70.0	S-14	11"	12-30-50 80	CLEAN FINE SAND, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE SP		
	71.5				THIN CLAYEY SEAMS		
75.0	75.0	S-15	11"	19-38-50/4" 88+	9/12/83 SILTY TO CLEAN VERY FINE TO FINE SAND, SILT 0-15%, LIGHT BROWN, DRY, VERY DENSE SP-SM		
	76.3				THIN (2"-4") ZONES OF SILTY CLAY, MOTTLED LIGHT BROWN AND ORANGE BROWN. SLIGHTLY CARBONACEOUS, CALCAREOUS, SLIGHTLY MOIST, HARD, CL		
80.0	80.0	S-16	10"	15-27 72	AS ABOVE – SILTY FINE SAND AND SILTY CLAY		
	81.0						
85.0	85.0	S-17	10"	22-70 92	INTERBEDDED SAND SILT AND CLAY AND ADMIXTURES OF EACH, LIGHT BROWN, DRY TO SLIGHTLY MOIST, VERY DENSE TO HARD, SM-CL		
	86.0						

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION EAST END TRENCH 14

ELEVATION ~2,580' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75 8" DIA HOLLOW STEM AUGER, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH 2:05 PM 9/12/83 LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
90.0	90.0	S-18	16"	30-30-50/5" 80+	10:35 SLIGHTLY SILTY FINE SAND, SILT 5%, LIGHT BROWN, DRY, VERY DENSE SP		SAND AND CLAY BAGGED SEPARATELY
	91.4				SILTY CLAY, LIGHT BROWN, SLIGHTLY MOIST, HARD, CL		
95.0	95.0	S-19	13"	30-44-50/2" 94+	AS ABOVE		
	96.2						
100.0	100.0	S-20	12"	22-63 85	12:30 PM SILTY CLAY, LIGHT BROWN, SLIGHTLY MOIST, HARD, CL, WITH 2-3 THIN (1") INTERBEDDED SLIGHTLY SILTY (5-10%) FINE SAND, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE, SP-SM		LITHOLOGIES GRADATIONAL
	101.0						
105.0	105.0	S-21	17"	8-27-57 84			
	106.5				AS ABOVE		
					SEE CORE LOG		
110.0							

HILL

B16579.F0

ROCK CORE LOG

OJECT ESI GRANDVIEW SITE LOCATION EAST END TRENCH 14

DRILLING METHOD NWD4 COREBARREL DRILLERS & EQUIPMENT ERICKSON-FORD, CME-75

ELEVATION _____ ORIENTATION _____ BORE HOLE: B-4

WATER LEVEL _____ DATE: _____ START: 2:15 PM 9/12/83 FINISH: _____ INSPECTOR A. BENFER

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
104.67									
104.67	NO FLUID RETURN								
105		5' RUN		1	0%				
	~1'/2 MIN	1.25/5.0 = 25%					BREAKS WASHED	PROBABLE LOST SAND AT BREAKS	
106								FINE SANDY SILT, LIGHT BROWN, SOFT – POSSIBLE SLOUGH	
107								FINE SANDY SILT AND CLAY, LIGHT BROWN, HARD ML.	
108			?				BEDDING DIPPING 40° PROBABLE CROSS BEDDING. CONTAINS IRON OXIDE.		?
			?				CLAY – HORIZONTAL BED	SILTY CLAY, CL	?
109.67							END OF BORING 109.67		
								GROUTED HOLE USING 46 BAGS OF PORTLAND CEMENT. AUGERS STUCK 20'-85' ABOVE AND BELOW, HOLE IS FILLED. 20'-85' GROUT ONLY IN CENTER OF AUGERS.	

FORM D 2113A 5/78

HILL

B16579.F0 | B-5 | SHEET 1 OF 2

SOIL BORING LOG

JECT ESI GRANDVIEW SITE LOCATION SOUTH OF EVAPORATION POND

ELEVATION ~2,572' DRILLING CONTRACTOR ERICKSON FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGER, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START 11:00 AM 9/16/83 FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0					GRAVELLY, SANDY, SILTY CLAY, LIGHT BROWN, DRY, HARD, CL		
					SILTY, SANDY GRAVEL, LIGHT BROWN, DRY, VERY DENSE GW		2" GRAVEL
5.0	5.0	S-1	12"	11-21-15 37			
	6.5						
10.0	10.0	S-2	10"	23-52 75	AS ABOVE		
	11.0						
15.0	15.0	S-3	11"	28-50 78	SLIGHTLY SANDY SILT, SLIGHTLY PLASTIC, LIGHT BROWN, DRY, HARD, ML		
	16.0				SANDY, SLIGHTLY SILTY GRAVEL, LIGHT BROWN, DRY, VERY DENSE, GW.		
20.0	20.0						
	20.5	S-4	6"	50/6"	AS ABOVE		
25.0	25.0						
	25.5	S-5		50/6"	12:30 P.M. SLIGHTLY SILTY SAND, SILT-5%, TRACE OF GRAVEL, SAND FINE TO COARSE, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE, SW.		

REV 11/82 FORM D1586

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION SOUTH OF EVAPORATION POND

ELEVATION ~2,572' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGER, 2' O.D. SPLIT SPOON

WATER LEVEL AND DATE DRY START _____ FINISH 1:40 PM 9/16/83 LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30.0	31.5	S-6	15"	13-24-41 65	CLEAN SAND, FINE TO MEDIUM, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE, SP		
35.0	35.0 36.5	S-7	14"	10-16-28 44	AS ABOVE – FINE TO COARSE – SW		HOLE GROUTED TOP TO BOTTOM USING 15 BAGS OF PORTLAND CEMENT
40.0	40.0 41.5	S-8	14"	15-32-50 82	END OF BORING 41.5'		

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION EVAPORATION POND

ELEVATION ~2,546' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START 1:30 PM 9/21/83 FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0							
5.0	5.0 – 6.5	S-1	14"	10-18-34 52	CLEAN SAND, FINE TO COARSE, BROWN, MOIST, VERY DENSE, SW		
					GRAVELLY		
10.0	10.0 – 10.9	S-3	13"	23-40-50 90	AS ABOVE – 10% GRAVEL		
15.0	15.0 – 16.5	S-3	13"	23-40-50 90	CLEAN SANDY GRAVEL, BROWN, MOIST, VERY DENSE GW		
20.0	20.0 – 21.5	S-4	13"	8-14-19 23	CLEAN SAND, FINE, BROWN, MOIST, MEDIUM DENSE, SP		
					SILT, LOW PLASTICITY, LIGHT BROWN, MOIST, (HARD) ML		
25.0	25.0 – 26.5	S-5	14"	7-17-24 41	3:00 PM CLEAN SAND, FINE, LIGHT BROWN, SLIGHTLY MOIST, DENSE, SP WITH 1" SEAM OF SILTY CLAY – CL		
					SILTY SAND, FINE, SILT – 7%, BROWN, MOIST, DENSE SP-SM		

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION EVAPORATION POND

ELEVATION ~2,546' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30.0	30.0 – 31.5	S-6	15"	10 16-17 33	INTERBEDDED, FINE SANDY SILT, CLEAN FINE SAND AND SILT, LIGHT BROWN, MOIST, DENSE TO HARD, ML, SP		
35.0	35.0 – 36.5	S-7	12"	8 15-19 34	CLEAN SAND, FINE, LIGHT BROWN, SLIGHTLY MOIST, DENSE, SP		
40.0	40.0 – 41.5	S-8	11"	14 29-44 73	4:15 PM AS ABOVE WITH 1" SEAM OF CLAYEY FINE SAND		
45.0	45.0 – 46.5	S-9	17"	10-17-34 51	CLEAN SAND, FINE, LIGHT BROWN, SLIGHTLY MOIST, DENSE, SP 4:45 PM SILTY CLAY & SILT, LOW TO MODERATE PLASTICITY, LIGHT BROWN, SLIGHTLY MOIST, HARD – CL-ML		DRILLED STIFF LIKE CLAY
50.0	50.0 – 51.5	S-10	10"	16-27-50 77	5:10 PM CLEAN SAND, FINE LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE – SP		
55.0	55.0 – 55.9	S-11	5"	14-50/5" 69+	5:50 PM AS ABOVE		

SOIL BORING LOG

JECT ESI GRANDVIEW SITE LOCATION EVAPORATION POND

ELEVATION ~2,546' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE ____ START ____ FINISH ____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60.0	60.0	S-12	9"	17-40 50/5"	8:15 AM 9/22/83		
	61.4			90+	CLEAN SAND, FINE, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE, SP		
					THIN CLAYEY ZONES		
65.0	65.0	S-13	7"	17-50/5"	SILT, LOW PLASTICITY, LIGHT BROWN,		
	65.9			67	SLIGHTLY MOIST, HARD – ML		
					CLEAN SAND, FINE, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE, SP		
					THIN CLAYEY ZONES		
70.0	70.0	S-14	8"	17-50			
	71.0			67	AS ABOVE		
					INTERBEDDED SILT, SAND AND SOME CLAY		
75.0	75.0	S-15	5"	24-50			
	76.0			74	AS ABOVE		
80.0	80.0	S-16	7"	20-50	11:40 AM		
	81.0			70	AS ABOVE		
					THIN CLAYEY ZONES		
					12:30 PM		
85.0	85.0	S-17	6"	10 42-50/5"	SILT, LOW PLASTICITY, LIGHT BROWN, DRY, HARD, ML		
	86.4			92+			

HILL

B16579.F0 | B-6 | SHEET 4 OF 5

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION EVAPORATION POND

ELEVATION ~2,546' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
90.0	90.0	S-18	15"	15 30 50/5" 80+	2:20 PM SILTY SAND, FINE, SILT – 35%, LIGHT BROWN DRY, VERY DENSE – SM WITH SOME FINE SANDY SILT – ML		
	91.4						
95.0	95.0	S-19	8"	16 43-50/4" 93+	3:20 PM AS ABOVE		
	96.3				INTERBEDDED SILTY FINE SAND, WITH SOME SILT		
100.0	100.0	S-20	11"	33-50 83	AS ABOVE WITH SOME SILT – ML		
	101.0						
105.0	104.5	S-21	4"	24-70 94	SILTY SAND, FINE, 25% SILT, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE – SM		WATER ADDED TO REMOVE CUTTINGS VERY HARD DRILLING 104'-105' AUGERS BINDING SWITCHED TO NX CASING AND 2 15/16" ROCK BIT AT 105'. CLEAR WATER DRILLING FLUID
	105.5				SILTY CLAY, LIGHT BROWN, SLIGHTLY MOIST HARD – CL		
110.0	110.0	S-22	3"	14-39-50/5" 89+			
	111.4				3:00 PM INTERBEDDED SILT AND CLAY WITH SOME FINE SAND		
115.0	115 0	S-23	3"	36-50-50/3" 100+	SILT, LOW PLASTICITY WITH SOME SILTY SAND, FINE AND SILTY CLAY, MINOR CALICHE, LIGHT BROWN WITH ORANGE BROWN OXIDATION STREAKS, SLIGHTLY MOIST, HARD AND VERY DENSE, – ML, SM, CL		
	116.3						

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION EVAPORATION POND

ELEVATION ~2,546' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 3½" O.D. NX CASING, 2-15/16" TRICONE BIT, NWD4 COREBARREL

WATER LEVEL AND DATE _____ START _____ FINISH 1:30 PM 9/24/83 LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
120.0	120.0	S-24	12"	42-41-50/4" 91+	SILT' SILTY CLAY, WITH SOME FINE SANDY SILT, LIGHT BROWN, SLIGHTLY MOIST; HARD, ML, CL		NX CASING DRILLED TO 122.0: DRILLED DRY LAST FOOT
	121.3						
	122.0	NW-1	2.1 = 3.3 64%	RQD = 0%	SILTY CLAY, LIGHT BROWN, SLIGHTLY MOIST' HARD - CL WITH SILTY SAND, FINE, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE – SP, AND SOME SILT, PLASTIC, LIGHT BROWN, HARD – ML SAND THINLY LAMINATED AND CONSOLIDATED		1.8 MINS/FT 100% FLUID RETURN TO 124. WATER BLOCKED OFF AT 124'.
125.0	125.3						
	125.3	NW 2	1.1 = 4.5 24%	RQD = 0%	CLEAN SAND, FINE, BROWN, VERY DENSE, SP AND SILTY CLAY, LIGHT BROWN, HARD – CL SAND MASSIVE AND UNCONSOLIDATED		1.5 MINS/FT 100% FLUID RETURN
	129.8						
130.0	129.8	NW-3	3.1 = 5.0 62%	RQD = 0%	INTERBEDDED SILTY SAND, FINE, SILTY CLAY AND SILT, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE AND HARD, SM, CL, ML SAND THINLY LAMINATED AND SEMI-CONSOLIDATED		1.5 MINS/FT 100% FLUID RETURN
	134.8						
135.0	134.8	NW-4	3.85 = 5.0 77%	RQD = 6%	INTERBEDDING, SILTY SAND, FINE, SILTY CLAY, SILT, AND SANDY SILT, FINE, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE AND HARD, SM, CL, ML. SAND THINLY LAMINATED AND SEMI-CONSOLIDATED		1.5 MINS/FT 100% FLUID RETURN
	139.8						
140.0					END OF BORING 139.8'		HOLE GROUTED TOP TO BOTTOM USING 21 BAGS OF PORTLAND CEMENT CONSTANT HEAD PERMEABILITY TEST PERFORMED ON UNCASED HOLE FROM 119.9' TO 139.8'

CH2M HILL

B16579.F0 | B-7 | SHEET 1 OF 3

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION CENTER TRENCH 13

ELEVATION ~2,548' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGER, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START 5:20 PM 9/16/83 FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0					SILTY FINE SAND, SILT 15%, LIGHT BROWN, DRY, VERY DENSE SM – GRAVELLY		
5.0	5.0 – 6.5	S-1	14"	9-15-19 34	GRAVELLY, SLIGHTLY SILTY SAND, GRAVEL – 15%, SILT – 5%, SAND FINE TO COARSE, LIGHT BROWN, DRY, DENSE SW		
					SANDY GRAVEL, LIGHT BROWN, DRY, VERY DENSE, GW.		
10.0	10.0 – 10.3	S-2	NSR	50/3"			RODS BOUNCING ON ROCK
					6:05 PM		
15.0	15.0 – 16.4	S-3	14"	18-37-54/5" 91+	GRAVELLY, SILTY SAND – GRAVEL AND SILT 15%, SAND FINE TO COARSE, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE SW – SM		
20.0	20.0 – 20.5	S-4	3"	50/6"	AS ABOVE		
25.0	25.0 – 25.3	S-5	NSR	50/3"	6:40 PM		RODS BOUNCING ON ROCK
					CLAYEY, SILTY SAND, CLAY AND SILT 20%, SAND FINE TO COARSE, BROWN, MOIST, HARD SC-SM		SLOUGH

REV 11/82 FORM D1586

CH2M HILL

B16579.F0 | B-7 | SHEET 2 OF 3

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION CENTER TRENCH 13

ELEVATION ~2,548' DRILLING CONTRACTOR ERICKSON FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGERS, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30.0	30.0 31.0	S-6	8'	20-50 70	7:05 PM CLEAN SAND, FINE TO COARSE, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE – SW		SLOUGH FROM ~30' INCLUDED IN BAG
					SILTY CLAY, MINOR SAND, LIGHT BROWN, MOIST, HARD, CL. CONTAINS OXIDIZED STREAKS.		
35.0	35.0	S-7	17"	6-15-27 42	11:15 AM 9/17/83 FINE SANDY SILT-SAND 15%, LIGHT BROWN, MOIST, HARD ML		
	36.5				SILTY CLAY, MINOR SAND, LIGHT BROWN, MOIST, HARD, CL. CONTAINS OXIDIZED STREAKS		
40.0	40.0 41.0	S-8	8"	23-50 83	SILTY FINE SAND, SILT-30%, PLASTIC, LIGHT BROWN. MOIST, VERY DENSE SM		
45.0	45.0	S-9	16"	20 30-50/4" 80+	SLIGHTLY SILTY FINE SAND, – SILT 10% LIGHT BROWN, MOIST, VERY DENSE SP-SM		
	46.3				SILT, PLASTIC, LIGHT BROWN, MOIST, HARD ML		
50.0	50.0 51.0	S-10	11"	16-50 66	12:45 PM CLEAN TO SLIGHTLY SILTY FINE SAND, SILT 0-10%, LIGHT BROWN, MOIST, VERY DENSE, SP-SM		
55.0	55.0	S 11	18"	32-32 45 77	AS ABOVE		
	56.5				CLAY, HIGHLY PLASTIC, REDDISH BROWN, MOIST, HARD CH		

CH2M HILL

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SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION CENTER TRENCH 13

ELEVATION ~2,548' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT CME-75, 8" O.D. HOLLOW STEM AUGERS 2 ' O.D. SPLIT SPOON

WATER LEVEL AND DATE DRY START _____ FINISH 2:10 PM 9/17/83 LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60.0	60.0 61.4	S-12	16"	11-25-50/5" 75+	INTERBEDDED SILT AND CLAY, LIGHT BROWN WITH OXIDIZED STRINGERS, MOIST, ~~HARD~~ ML-CL END OF BORING 61.4'		HOLE GROUTED TOP TO BOTTOM USING 17 BAGS OF PORTLAND CEMENT
65.0							

REV 11/82 FORM D1586

CH2M HILL

B16579.B0 | D-1 | SHEET 1 OF 8

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION SOUTH EDGE PROPOSED TRENCH 14

ELEVATION ~ 2606 FT DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT 8" HOLLOW-STEM AUGER – CME 75

WATER LEVEL AND DATE 220.9' 10/24/83 START 10/1/83 FINISH LOGGER R. SIEGEL

ELEVATION / DEPTH BELOW SURFACE (FT.)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					9:00 AM		SLOW GRINDING DRILLING
5	5.0	S-1	6"	9-9-11 (20)	SANDY GRAVEL, CLEAN, TAN, DRY, MEDIUM DENSE, SUBANGULAR GP OR GW.		
	6.5				(NOTE: GRAVEL IS WEATHERED AND BREAKS DUE TO DRIVING).		2-INCH MINUS GRAVEL IN CUTTINGS
10	10.0	S-2	16"	15-21-30 (51)	9:20 AM SAME AS ABOVE, EXCEPT VERY DENSE.		
	11.5						
15	15.0				9:43 AM		
	15.1	S-3	2"	50/2"	SAME AS ABOVE, EXCEPT SILTY, GM		ROD BOUNCED DURING DRIVING
	20.2				10:02 AM		
20		S-4	5"	50/5"	SAME AS ABOVE, EXCEPT CLEAN, GP OR GW; TOP 2" SAND, CLEAN MEDIUM-GRAINED, TAN, DRY, VERY DENSE, SW OR SR.		ROD BOUNCED
	20.4						BELOW 22 FT, DRILLING MORE DIFFICULT, GRAVEL COURSER, SOME COBBLES?
25	25.0				SAME AS ABOVE, GW OR GP.		ROD BOUNCED
	25.1	S-5	1"	50/1"			3" MINUS GRAVEL IN CUTTINGS; MANY PIECES FLAT AND ELONGATED
30							

REV 11/82 FORM D1586

CH2M HILL

B16579.B0 | D1 | SHEET 2 OF 8

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE | LOCATION SOUTH EDGE PROPOSED TRENCH 14

ELEVATION ~2606 FT | DRILLING CONTRACTOR ERICKSON FORD CO

DRILLING METHOD AND EQUIPMENT 8" HOLLOW-STEM AUGER – CME 75

WATER LEVEL AND DATE _____ | START 10/1/83 | FINISH _____ | LOGGER R. SIEGEL

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	30.0 31.5	S-6	16"	11-29-40 (69)	SAND, FINE GRAINED, CLEAN, TAN WITH REDDISH TINT, DRY, VERY DENSE, SP; WITH SOME FINE GRAVEL IN TOP 3".		SMOOTH EASY DRILLING BELOW SOFT
35	35.0 36.5	S-7	14"	18-34-46 (80)	SAME AS ABOVE, EXCEPT LACKS REDDISH TINT.		
40	40.0 41.5	S-8	14"	14-19-17 (36)	SAME AS ABOVE, EXCEPT DENSE		
45	45.0 46.5	S-9	14"	12-25-32 (57)	11:47 AM SAME AS ABOVE, EXCEPT VERY DENSE		
50	50.0 51.5	S-10	16"	25-40-57 (97)	12:17PM SAME AS ABOVE		
55	55.0	S-11		32-58	SAME AS ABOVE		

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE | LOCATION SOUTH EDGE PROPOSED TRENCH 14

ELEVATION ~2606 FT | DRILLING CONTRACTOR ERICKSON – FORD CO

DRILLING METHOD AND EQUIPMENT 8" HOLLOW-STEM AUGER – CME 75

WATER LEVEL AND DATE | START 10/1/83 | FINISH | LOGGER R. SIEGEL

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	60.0 61.0	S-12	8"	35-70-	SAME AS ABOVE		
65	65.0 66.0	S-13	10"	33-81-	SAME AS ABOVE		
70	70.0 71.0	S-14	12"	32-52-	SAME AS ABOVE EXCEPT BOTTOM 2" SILTY AND CEMENTED.		
75	75.0 76.0	S-15	10"	33-95-	SAME AS ABOVE, CLEAN, UNCEMENTED		STOPPED END OF WEEK AT 75.0 FT. RESUMED-10/3/83 WITH S-15
80	80.0 81.0	S-16	9"	40-55	SAME AS ABOVE		BELOW 82 FT DRILLER NOTED STIFF LAYERS COUPLE INCHES THICK
85	85.0 85.9	S-17	7"	40-100/5"	SILTY SAND, FINE-GRAINED, TAN, DRY, VERY DENSE SM;-TOP 1" CLAYEY, HARD		
90							

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION SOUTH EDGE PROPOSED TRENCH 14

ELEVATION ~2606 FT DRILLING CONTRACTOR ERICKSON- – FORD CO.

DRILLING METHOD AND EQUIPMENT 8" HOLLOW-STEM AUGER – CME 75/LONG YEAR - 44, AIR ROTARY 3 7/8", 2" SPLIT SPOON

WATER LEVEL AND DATE _____ START 10/1/83 FINISH _____ LOGGER R. SIEGEL/A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
	90.0 91.0	S-18	12"	15-52-	CLAY, PLASTIC, TAN, DRY, HARD, CL, BOTTOM 5" SILTY SAND AS ABOVE.		HARD SMOOTH DRILLING FROM 91 TO 92.5' EASY FROM 92.5 TO 95.0'
95	95.0 96.3	S-19	12"	17-24-50/3"	INTERBEDDED, CLAY, PLASTIC SILT, SILTY FINE SAND, TAN, DRY, HARD OR VERY DENSE, CL, ML, AND SM.		HARD SMOOTH DRILLING BELOW 97.5'
100	100.0 100.5	S-20	5"	65/6"	CLAYEY FINE SAND, TAN, DRY, HARD CL; BOTTOM 1/2" SILTY FINE SAND		AUGER REFUSAL AT 100.0' ADD 5 GAL OF WATER TO HOLE AFTER SAMPLING S-20 VERY SLOW SMOOTH DRILLING FROM 100 TO 105 FT.
105	105.0 106.0	S-21	12"	15-82-	SILT, PLASTIC, TAN, DRY, HARD, ML; BOTTOM 3" CLEAN FINE SAND NOTE: WATER ADDED TO AID DRILLING, WETTED SAMPLE.		AUGER REFUSAL AT 105.5', PULLED CME 75 OFF HOLE 4" CASING SET TO 110.0' LONGYEAR -44 BEGAN DRILLING 106.0'
110	111.0 111.75	S-22	8"	39-50/3"	11:20 AM 10/14/83 FINE SANDY SILT, PLASTIC, LIGHT BROWN, DRY, HARD, ML, WITH SOME SILTY CLAY		
115							
120							

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE | LOCATION SOUTH EDGE PROPOSED TRENCH 14

ELEVATION ~ 2605.5' | DRILLING CONTRACTOR ERICKSON-FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR - 44, 3 7/8" O.D. AIR ROTARY, 2" O.D' SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
120.0	120.0 121.0	S-23	12"	28-50-78	12:45 PM SILTY CLAY, LIGHT BROWN, DRY HARD, CL-ML.		
125.0							
130.0	130.0 130.75	S-24	9"	37-50/3" 87+	2:00 PM AS ABOVE WITH 1" LENS OF VERY SILTY FINE SAND – SM SLIGHTLY MOIST		
135.0							
140.0	140.0 140.75	S-25	8"	44-50/3" 94+	SILTY CLAY, LIGHT BROWN, SLIGHTLY MOIST, HARD CL, WITH 1" LENSE OF SILTY FINE SAND.		
145.0					149.5'		

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION SOUTH EDGE PROPOSED TRENCH 14

ELEVATION ~2605.5 DRILLING CONTRACTOR ERICKSON -- FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 3 7/8" AIR ROTARY, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
150.0	150.0	S-26	10"	48-50/3" 98+	4:50 PM SILTY CLAY, GRAY. SLIGHTLY MOIST., HARD CL.		
	150.75						
155.0							
					8:15 AM 10/15/83 AS ABOVE		
160.0	160.0	S-27	13"	29-50/5"			CLAY IS EXPANDING IN LENGTH
	160.9						
165.0							
170.0	170.0	S-28	13"	34-50/3" 84+	SILTY CLAY AND SILT, PLASTIC, GRAY, SLIGHTLY MOIST, HARD, SLIGHTLY ORGANIC, CL AND ML.		4" CASING TO 170'
	170.75						
175.0							

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION SOUTH EDGE PROPOSED TRENCH 14

ELEVATION ~ 2605.5' DRILLING CONTRACTOR ERICKSON — FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR 44, 3 7/8" AIR ROTARY, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE ____ START ____ FINISH ____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	180.0 180.9	S-29	13"	19-50/5"	11:45 AM SILTY CLAY, GRAY, SLIGHTLY MOIST, HARD, WITH SOME SILT, PLASTIC, CL AND ML		
190.0	190.0 191.0	S-30	15"	25-50-75	SILTY CLAY, GRAY, SLIGHTLY MOIST, HARD, CL		
200.0	200.0 200.75	S-31	12"	62-50/3"	8:50 AM 10/17/83 AS ABOVE		

CH2M HILL

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SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION SOUTH EDGE PROPOSED TRENCH 14

ELEVATION ~ 2605.51' DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR 44, 3 7/8" AIR ROTARY, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START _____ FINISH 3:00 10/19/83 LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
210.0	210.0	S-32	12"	21-50/5" 71+	6:15 SILTY CLAY, GRAY, MOIST, HARD - CL		
	210.9						
215.0							
					3:15 10/18/83 AS ABOVE		
220.0	220.0	S-33	14"	28-52-80			
	221.0						
225.0							CUTTINGS DRY
	227.5				FINE SANDY SILT TO SILTY FINE SAND LOW PLASTICITY, GRAY, VERY MOIST, HARD, - ML-SM. BOTTOM 6" SILTY CLAY, GRAY, MOIST, HARD - CL.		SAMPLER MUDDY
	228.5	S-34		39-77 116			HOLE ADVANCED TO 232.5'
230.0							SAMPLE TAKEN 10/19 HOLE COLLAPSED AT 227'
							SAMPLER DRIVEN 227-228.5 CONTAINED WET SILTY CLAY. SLOUGH.
					1:25 9/19/83 SILTY CLAY, GRAY, MOIST, HARD - CL		HOLE OPEN BELOW BRIDGE AND CONTAINED WATER
	232.5	S-35	14"	24-70-90	1/2" ZONE OF FINE SANDY SILT, GRAY, MOIST, HARD - ML		
	234.0			160	AS ABOVE		
	234.0	S-36	12"	60-233/5"			
235.0	234.9			293+	AS ABOVE		*400 LB EASING HAMMER USED TO DRIVE SPOON
		S-37	15"	10-20-36 *			
					AS ABOVE		HOLE GROUTED USING 135 BAGS OF PORTLAND CEMENT
	236.4						
	237.9	S-38	14"	10-20-22 *			
					END OF BORING 237.9'		

REV 11/82 FORM D1586

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~2600' DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 – 5 5/8" ϕ AIR ROTARY, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE 183.0' 10/5/83 START 9:00 AM FINISH 6:30 PM LOGGER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0					9:08 AM SLIGHTLY CLAYEY, SLIGHTLY FINE SANDY SILT, SLIGHTLY PLASTIC, LIGHT BROWN, DRY, HARD, ML		
5.0	5.0 5.7	S-1	7"	46-50/2"	AS ABOVE		
10.0	10.0 10.4	S-2	5"	50/5"	9:50 AM AS ABOVE WITH THINLY INTERBEDDED FINE SANDS AND CLAY LENSES		HARD DRILLING AT 13.0' - POSSIBLE GRAVELS
15.0	15.0 15.7	S-3	8"	65-50/2"	10:45 AM GRAVELLY SAND, FINE TO COARSE, LIGHT GRAY TO LIGHT BROWN, DRY, VERY DENSE - SW		NOTE: DIFFICULTY WITH HAMMER - MAY HAVE CUTTINGS IN SAMPLE.
20.0	20.0 21.5	S-4	7"	15-35-50/3" 85+	11:55 AM SANDY GRAVEL, WITH TRACE OF INTERBEDDED SILT, FINE TO COARSE, MULTICOLORED GRAVEL WITH LIGHT BROWN SILT, DRY, VERY DENSE - GW		HAMMER WORKING BETTER. STILL POSSIBILITY OF CUTTINGS IN SAMPLE
25.0	25.0 25.9	S-5	9"	16-50/4 1/2" 66+	5:15 PM GRAVELLY, FINE, SANDY SILT, SLIGHTLY PLASTIC, LIGHT BROWN, DRY, HARD, ML		HOLE CAVED IN. HAD TO REDRILL 6" WITH CASING TRIED FOR SAMPLE AT 5:15 P. LOWBLOW COUNTS INDICATE DRIVING THROUGH CUTTINGS. (3-7/8" ϕ)
					END 9-8-83		

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~2600' DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT CME - 75, 8" O.D. HOLLOW STEM AUGER, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE 9-9-83 START 8:00 AM FINISH LOGGER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30.0	30.0 30.3	S-6	4"	50/4" 100+	GRAVELLY, SLIGHTLY SILTY, SAND, FINE TO COARSE, LIGHT BROWN, DRY, VERY DENSE, SW		CHANGED DRILL RIGS TO GET THROUGH GRAVEL STARTED PULLING LY-44 AT 8:45 AM.
35.0	35.0 35.4	S-7	4"	50/5"	AS ABOVE, TRACE OF SILT, SLIGHTLY MOIST		1" TO 3" GRAVELS NOT BEING PICKED UP BY SAMPLER OBSERVED IN CUTTINGS
40.0	40.0 40.3	S-8	4"	50/4"	1:00 PM AS ABOVE, BROWN		
45.0	45.0 45.75	S-9	8"	30-50/3"	SAND, WITH TRACE OF SILT AND GRAVELS, FINE, BROWN TO LIGHT GRAY, DRY, VERY DENSE, SP		
50.0	50.0 51.25	S-10	13"	50-50-50/3" 100+	AS ABOVE WITH 3" ZONE OF SILTY FINE SAND, – SM		WATER ADDED AT 52' TO CLEAN OUT CUTTINGS
55.0	55.0 56.0	S-11	11"	21-50 71	2:50 PM CLEAN SAND, FINE TO MEDIUM, BROWN, MOIST VERY DENSE - SP-SW		WATER ADDED AFTER SAMPLING
60.0							

CH2M HILL

B16579.F0 | D-2 | SHEET 3 OF 15

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE | LOCATION NW BUFFER ZONE

ELEVATION ~2600' | DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT CME 75 – 8" ϕ HOLLOW STEM AUGER, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE 9/9/83 | START | FINISH | LOGGER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60.0	60.0	S-12	9"	17-50/3"	FINE SANDY SILT, 20% SAND, LIGHT BROWN, SLIGHTLY MOIST, HARD, ML		WATER ADDED AFTER SAMPLING
	60.75						
65.0	65.0	S-13	6"	31-50/4"	SEQUENCE VARIABLE BETWEEN FINE SANDY SILT, AND SILTY FINE SAND WITH MINOR CLAY AND CALICHE		
	65.8						
70.0	70.0	S-14	8"	31-50/4"	4:50 PM SILTY FINE SAND, 40% SILT, LIGHT BROWN, SLIGHTLY MOIST, VERY DENSE, SM.	INTERMIXED	MOVED OFF CME MOVED ON LONG YEAR INSTALLED 6" CASING TO 61'
	70.8						
75.0	75.0	S-15	6"	21-75/4"	1:55 PM 9-10-83 INTERMIXED FINE SANDY SILT AND SILTY FINE SANDS WITH THIN LAYER OF GRAVEL IN BETWEEN, BROWN, MOIST, HARD, VERY DENSE. ML-SM		CHANGED BACK TO 5-5/8" ϕ DRILL THROUGH 6" CASING
	75.8						
80.0	80.0	S-16	8"	30-50/3"	4:00 PM END OF DAY SLIGHTLY GRAVELLY, SLIGHTLY SILTY, FINE SAND, FINE, BROWN, DRY TO MOIST, VERY DENSE (SP)		
	80.75						
85.0	85.0	S-17	16"	15-41-50 2½" 91+	BEGIN 9:00 AM 9-12-83 SLIGHTLY SILTY, FINE SAND, (UPPER 3") WITH THIN LAYER OF FINE GRAVEL SLIGHTLY SILTY, SLIGHTLY SANDY, CLAY (LOWER 13") HIGHLY PLASTIC, BROWN TO TAN, SLIGHTLY MOIST, VERY DENSE, CL SAMPLE 10:00 AM	SAND CLAY SAND	COULD BE SOME CUTTINGS IN UPPER 3", SAND IN BOTTOM TIP OF SAMPLER
	86.2						
90.0							

REV 11/82 FORM D1586

CH2M HILL

B16759.F0 | D-2 | SHEET 4 OF 15

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~2600' DRILLING CONTRACTOR ERICKSON – FORD

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 – 5 5/8" ϕ AIR ROTARY, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE 9/12/83 START 9:00 AM FINISH CONT'D LOGGER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
90.0	90.0	S-18	8"	19-50/3"	11:05 AM FINE SAND, (UPPER 5") TAN, DRY TO MOIST, DENSE, (SP) SLIGHTLY SANDY CLAY (LOWER 3") MOD. PLASTIC, BROWN, MOIST, HARD, CL		
	90.75						
95.0	95.0	S-19	8"	41-50/3"	12:25 PM SAND, FINE, TAN, DRY TO MOIST, VERY DENSE, (SP)		LIGHT BROWN SILTY SAND IN TIP OF SAMPLER
	95.75						
100.0	100.0	S-20	6"	70/6"	AS ABOVE, TRACE OF SILT		
	100.5						
105.0	105.0	S-21	8"	37-52/3"	2:45 PM SLIGHTLY SILTY SAND, FINE, LIGHT BROWN, DRY, VERY DENSE, (SP)		
	105.75						
110.0	110.0	S-22	9"	34-50/3"	3:55 PM AS ABOVE, TRACE OF SILT, PARTIALLY CEMENTED		
	110.75						
115.0	115.0	S-23	7½"	21-50/3"	4:05 PM AS ABOVE, NO CEMENT		

CH2M HILL

B16579.F0 | D-2 | SHEET 5 OF 15

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~2600' DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 – 5 5/8" ϕ AIR ROTARY – 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START 9/12/83 FINISH 9/14/83 LOGGER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
120.0	120.0 120.8	S-24	7½"	13-50/4"	6:30 PM SAND, FINE, LIGHT BROWN, DRY TO MOIST, VERY DENSE, (SP)		ROD DROPPED AND DROVE IN ±2" BEFORE COUNTING BLOWS IN FIRST 6"
125.0	125.0 125.8	S-25	9"	18-50/4"	±9:00 AM 9-13-83 AS ABOVE, BROWN TO LIGHT BROWN,		DRILLERS ON SITE AT 8:00 AM
130.0	130.0	S-26	8"	55-50/1"	11:50 AM AS ABOVE, BROWN TO LIGHT BROWN,		12:00 - DRILLERS BEGAN INSTALLING 4" CASING TO 130' FINISHED CASING INSTALLATION AT 3:30 PM
135.0	135.0 135.7	S-27	8"	51-50/2"	5:00 PM AS ABOVE (UPPER 5") SLIGHTLY SANDY SILT WITH TRACE OF CLAY (LOWER 3") LOW PLASTICITY, LIGHT BROWN, SLIGHTLY MOIST, HARD (ML)		CHANGED TO 3-7/8" ϕ DRILL BIT THROUGH 4" CASING
140.0	140.0	S-28	8"	SEE COMMENTS	6:30 PM AS ABOVE – FINE SAND AND SANDY SILT WITH TRACE OF INTERBEDDED CLAY		LOST RODS IN HOLE AFTER FISHING, COULD NOT MAKE ANY PROGRESS WITH HAMMER RECOVERED SAMPLE
145.0	145.0 145.4	S-29	3"	75/5"	11:15 AM 9-14-83 SILTY SAND WITH SOME CEMENTED SILT PELLETS AND GRAVEL, LOW PLASTICITY LIGHT BROWN, DRY, HARD, (ML)		DRILLERS ON SITE AT 7:30 AM – EXTENDED 4" CASING TO

SOIL BORING LOG

Not the same as previous page

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~2558' DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 – 3 7/8" ϕ AIR ROTARY – 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE START 9/14/83 FINISH 9/15/83 LOGGER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
150.0	150.0 150.3	S-30	4"	7 5/4"	SANDY, SILT – FINE MOD. PLASTICITY, LIGHT BROWN, DRY, TO MOIST, HARD.		
	155.0				3:10 PM INTERBEDDED SANDY SILT (LOWER 2"), CLAY (MIDDLE 2") AND SANDY, SILTY, CLAY (UPPER 4") FINE, PLASTIC, LIGHT BROWN TO BROWN, DRY, HARD.		
155.0		S-31	8"	52-50/2"			
	155.7						
	160.0				4:45 PM INTERBEDDED SILTY CLAY AND CLAY WITH SILT PELLETS AND TRACE OF SAND, CLAY HIGH PLASTICITY, GREENISH BROWN CLAY AND LIGHT BROWN SILT, MOIST, HARD,		
160.0	160.5	S-32	5"	55-50/0"			
	165.0				6:15 PM SILTY CLAY WITH TRACE OF FINE SAND, MOD. PLASTICITY BROWN, MOIST, HARD.		
165.0	165.6	S-33	7"	36-50/1"			
	170.0				9:30 AM 9-15-83 SILT – WITH SOME SAND, LOW PLASTICITY BROWN, MOIST, HARD,		DRILLERS ON SITE AT 8:00 AM
170.0	170.3	S-34		50/4"			
	175.0				11:10 AM SILTY CLAY (WITH THIN LAYER GRAY SAND) HIGHLY PLASTIC, GRAY, MOIST, HARD		
175.0	175.8	S-35	10"	32-50/3½"			
180.0							

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~2,558' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 3-7/8 DIA. AIR ROTARY. 2" O.D. SPLIT SPOON.

WATER LEVEL AND DATE 180' 9/16/83 START 9/15/83 FINISH 9/17/83 LOGGER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
108.0	108.0						
	108.4	S-36	8"	50/5"	12:45 PM SILTY CLAY WITH THIN LAYERS OF SANDY CLAY, HIGHLY PLASTIC, GRAY, MOIST, HARD.		
							HIT WATER AT APPROX. 183'.
185 0	185.0						
		S-37	9"	50/5"	2:30 PM SILTY CLAY, AS ABOVE, WET.		SPOON FULL OF WATER.
	185.4						
							3:00 PM -- COMPRESSOR DEVELOPED HYDRAULIC LEAK TOOK SAMPLE AND QUIT OPERATION FOR REPAIR.
190.0	190.0						
		S-38	6"	67/6"	4:00 PM SANDY SILT, GRAY, WET, HARD, (SM) OXIDIZED ORGANICS.		
	190.5						
							9/16/83--TOOK H2O SAMPLE AT 11:00 AM WITH SHELBY TUBE.
							11:45--BEGAN SURGING HOLE, TOOK APPROX 2.5 MINS. TO BLOW OUT 10' OF H2O.
195.0	195.0				9/17/83		
	195.6	S-39	15"	50-50/2'	CLAYEY SILT, WITH TRACE OF SAND, MOD. PLASTIC, GRAY, MOIST, HARD		12:35--2ND SURGE, TOOK APPROX. 3.5 MINS TO BLOW OUT WATER.
							1:15--3RD SURGE, TOOK APPROX 4 MINS TO BLOW OUT WATER
							1:30-- 4TH SURGE TOOK APPROX 3 MINS TO BLOW OUT WATER
							1:53--MEASURED WATER LEVEL AT 188'.
200.0	200.0						
		S-40	12"	47-51/3"	CLAYEY SILT, AS ABOVE, MOD. PLASTIC, GRAY, MOIST, HARD. (WATER IN HOLE WHEN DRILLING CONTINUED)		2:05--MEASURED WATER LEVEL AT 184'.
	200.75						2:11--WATER LEVEL AT 183'
							2:15--WATER LEVEL AT 182.3'.
							2:20--WATER LEVEL AT 181'-10"
							2:25--WATER LEVEL AT 181'-4"
							2:35--WATER LEVEL AT 180'-3"
							2:48--WATER LEVEL AT 180'-0"
							3:05--WATER LEVEL AT 179'-9"
							3:15--WATER LEVEL AT 179'-7"
							3:30--WATER LEVEL AT 179'-6"
205.0	205.0				3:15 PM		4:00--COMPLETED MONITORING WATER LEVEL AND DRILLERS BEGAN INSTALLING 4" CASING TO 170'.
	205.8	S-41	11"	52-50/3"	INTERMIXED CLAYEY SILT AND FINE SAND, WET, MOD. PLASTIC, GRAY, MOIST, HARD WITH MORE CLAY CONTENT IN TIP OF SAMPLER.		
							3.5 - 4' Art. head

CH2M HILL

B16579.F0 | D-2 | SHEET 8 OF 15

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~2,558' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 -- 3-7/8" AIR ROTARY, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START 9/17/83 FINISH 9/20/83 LOGGER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
210.0	210.0	S-42			5:00 PM FINE, SANDY, CLAYEY, SILT, SLIGHTLY PLASTIC, GRAY, MOIST, HARD, TRACE OF ORGANICS THROUGHOUT.		END OF DAY. DRILLERS ON SITE AT 8:30 AM.
215.0	215.0	S-43	4"	75/4"	11:05 AM 9/19/83 AS ABOVE		9:00 AM -- MEASURED WATER LEVEL AT 181.5'.
	215.33						
220.0	220.0	S-44	3"	75/5"	3:10 PM AS ABOVE WITH LAYER OF FINE SAND AND CEMENTED SILT PELLETS (POSSIBLY CUTTINGS)		MADE WATER FLOW MEASUREMENTS BEFORE TAKING SAMPLE (SEE TABLE)
	220.4						
225.0	225.0 225.5	S-45	9"	75/6"	5:15 PM AS ABOVE		INCREASE IN WATER -- NO CUTTING RETURN UNTIL HOLE IS SURGED.
							9/19/83 -- DRILLED TO DEPTH 230'.
230.0	230.0 230.5	S-46	9"	75/6"	9:20 AM 9/20/83 AS ABOVE.		9/20/83 -- SURGED HOLE AND TOOK SAMPLE AT 230'.
235.0	235.0 235.5	S-47	4"	75/5"	11:40 AM AS ABOVE.		

BORING D-2
WATER LEVEL MEASUREMENTS 9-19-83 MDCN

Time	Level Below Ground	Comments
±11:25-11:47 AM		DRILLED FROM DEPTH 215' TO 220'
12:02 PM		BEGIN FIRST SURGE
12:06		WATER OUT *(STILL SMALL AMOUNT OF WATER)
12:26		BEGIN SECOND SURGE
12:30		WATER OUT (AS ABOVE)
12:48		BEGIN THIRD SURGE
12:52		WATER OUT (AS ABOVE)
1:02		BEGIN PULLING RODS
1:30	191'-2"	HOLE DEPTH = 220'
1:35	190'-2"	
1:40	188'-6"	
1:45	187'-0"	
1:50	186'-0"	
1:55	185'-2"	
2:00	184'-8"	
2:10	183'-10"	
2:20	183'-5"	END OF TEST

*SMALL AMOUNT OF WATER STILL COMING UP. (FINE SPRAY)

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~2558' DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 – 3 7/8" AIR ROTARY – 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE _____ START 9/20/83 FINISH 9/21/83 LOGGER M CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
240.0	240.0	S-48	7"	50-50/4"	1:50 PM FINE SANDY, CLAYEY, SILT SLIGHTLY PLASTIC, GRAY, MOIST, HARD, TRACE OF OXIDIZED ORGANICS THROUGHOUT		SAMPLER FULL OF SAND FROM CUTTINGS
	240.8						
	245.0						
245.0	245.0	S-49	4"	75/5"	AS ABOVE		
	245.4						
					6:00 PM AS ABOVE		
250.0	250.0	S-50	10"	75/6"			END OF DAY
	250.5						
					10:20 AM 9-21-83 AS ABOVE		8:15 AM 9-21-83 MEASURED WATER LEVEL AT 182' DRILLERS ON SITE
255.0	255.0	S-51	7"	66-50/1"			
	255.6						
260.0	260.0	S-52	8"	75-50/2"	± 1:15 PM AS ABOVE		SURGED HOLE TWICE TO TRY AND REDUCE CUTTINGS IN SAMPLER
	260.67						STILL SAME AMOUNT OF CUTTINGS IN SAMPLER
265.0	265.0	S-53	9"	75/6"	3:20 PM AS ABOVE		SAMPLER CONSISTANTLY FULL OF CUTTINGS IN UPPER PORTION
270.0							

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~2,558' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 – 3-7/8" AIR ROTARY, 2" O.D. SPLIT SPOON

WATER LEVEL AND DATE START 9/21/83 FINISH LOGGER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
270.0	270.0	S-54	10"	62-50/2"	5:30 PM CLAYEY SILT WITH TRACE OF FINE SAND, DECREASING OXIDATION, INCREASING PLASTICITY, GRAY, MOIST, HARD.		
	270.67						
	275.0				11:00 AM 9/22/83		9/22/83
275.0	275.8	S-55	12"	43-75/4"	AS ABOVE.		4" CASING FELL DOWN HOLE. PROGRESS STOPPED TO RETRIEVE CASING.
	280.0						
280.0	280.75	S-56	10"	47-50/3"	AS ABOVE.		
	285.0						9/23/83 8:25AM CLEANED HOLE OUT FROM 266' TO 280' – PULLED RODS AND BEGAN WATER LEVEL MEASUREMENTS AT 9:30AM. STEADY WATER RETURN DURING CLEANOUT – POSSIBLY 1 GPM (SEE TABLE)
285.0	285.8	S-57	10"	48-50/2"	SILTY CLAY, MUD, PLASTIC, GRAY, MOIST, HARD, NO SIGN OF ORGANICS, CM.		
290.0							2:30PM READY TO START CORING. DRILLERS BEGIN PULLING RODS AND PUTTING DOWN CASING. 9/24/83 10:00 AM WATER LEVEL = 182'-9" 3" CASING INSTALLED 9/26/83 WATER LEVEL = 182'-5".
295.0							

BORING D-2
WATER LEVEL MEASUREMENTS 9-23-83 MDCN

Time	Level Below Ground	Comments
8:25-9:20 AM		CLEANED HOLE OUT TO 280'
9:30 AM		BEGIN FIRST SURGE
9:35		WATER OUT (STEADY MIST STILL BLOWING)
9:37		BEGIN PULLING RODS
10:22	197'-6"	HOLE DEPTH = 280'
10:30	197'-3"	CASING DEPTH = 195'
10:35	193'-9"	APPARENTLY WATER RUNNING IN HOLE AT BOTTOM OF CASING WAS TOUCHING PROBE AND AFFECTING METER READINGS
10:40	191'-6"	
10:45	191'-0"	
10:50	190'-8"	END OF TEST

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B16579.F0 | D-2 | SHEET 11 OF 15

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~2558 DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 –

WATER LEVEL AND DATE _____ START 9/28/83 FINISH _____ LOGGER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
290.0							DRILLERS ON SITE AT 8:00 AM SEATED CASING AND BEGIN LOWERING RODS FOR CORING
295.0							14 MIN/5
300.0							2.8 MIN/FT SOFT CORING
305.0	303.0 – 308.0	NQ-1	2.0' = 5.0' 40%	RQD = 0 BOX NO. 1	FINE SANDY SILT, SILT AND SOME SILTY CLAY, GRAY, MOIST, VERY DENSE AND HARD, – ML, CL		3' OF SLOUGH IN HOLE
310.0	308.5 – 313.5	NQ-2	5.0' = 5.0' 100%	RQD 3.80 = 5.0 76% BOX NO. 1	SILT WITH SOME FINE SANDY SILT, GRAY, MOIST, HARD – ML SAND IS THINLY LAMINATED		1.9 MIN/FT
315.0	313.5 – 317.5	NQ-3	3.35 4.0 85%	RQD 1.95 = 4.0 49% BOX NO. 1 NO. 2	SILT, LOW PLASTICITY, GRAY, MOIST, HARD – ML		2.25 MINS/FT
320.0	317.5	NQ-4	1.80 3.5 51%	RQD .65 = 3.5 19% BOX NO. 2	SILT, LOW PLASTICITY, AND SILTY CLAY, GRAY, MOIST, HARD – ML AND CL		1.4 MIN/FT

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~ 2558' DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR - 44, NQ WIRELINE CORE

WATER LEVEL AND DATE ____ START ____ FINISH ____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
320.0	321.0				3:00 PACKED TESTING		
		NQ-5	5.0 = 5.0 100%	RQD 2.1 = 5.0 42% BOX NO. 2	SILT WITH SOME SILTY CLAY, GRAY, SLIGHTLY MOIST, HARD, ML AND CL MASSIVE		2.0 MINS/FT 100% FLUID RETURN
325.0	326.0				8:45 9/29/83		
	326.0	NQ-6	3.85 4.0 = 96%	RQD 3.15 = 4.0 79% BOX NO. 2 NO. 3	SILTY CLAY WITH SOME SILT, GRAY, SLIGHTLY MOIST, HARD CL WITH ML MASSIVE		2.1 MINS/FT 100% FLUID RETURN
	330.0				9:30		
330.0	330.0	NQ-7	5.0 = 5.0 100%	RQD 2.3 = 5.0 46% BOX NO. 3	AS ABOVE HIGHLY FRACTURED 330.0-331.0 AND 333.5-335.0 PREDOMINANTLY CLAY		2.3 MINS/FT 100% FLUID RETURN
	335.0				10:15		
335.0	335.0	NQ-8	5.0 5.0 = 100%	RQD 1.4 = 5.0 28% BOX NO. 3 NO. 4	SILTY CLAY, GRAY, SLIGHTLY MOIST, HARD, CL. MOSTLY HIGHLY FRACTURED, POSSIBLY MECHANICAL BREAKS		2.7 MINS/FT 100% FLUID RETURN
340.0	340.0						
	340.5	NQ-9	5.0 = 5.0 100%	RQD .4 = 5.0 8% BOX NO. 4	AS ABOVE		2.5 MINS/FT 100% FLUID RETURN FOOTAGE GAPS DUE TO LOST CORE AND SUBSEQUENT RETRIEVAL PLUS OVER CORING
345.0	345.5						
					AS ABOVE		LOW RQD DUE TO MECHANICAL BREAKAGE.
	346.5	NQ-10	5.0 = 5.0 100%	RQD 2.4 = 5.0 48% BOX NO. 4 NO. 5			2.5 MINS/FT 100% FLUID RETURN
350.0							

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SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE | LOCATION NW BUFFER ZONE

ELEVATION ~2558' | DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR - 44, NQ WIRELINE CORE

WATER LEVEL AND DATE _____ | START _____ | FINISH _____ | LOGGER A. BENFER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
350.0	351.5				SILTY CLAY – GRAY, SLIGHTLY MOIST, HARD, (CL)		
	351.5	NQ-11	5.0 = 5.0 100%	RQD 1.0 = 5.0 20% BOX NO. 5			2.3 MINS/FT 100% FLUID RETURN
355.0	356.5						
	357.0	NQ-12	5.0 = 5.5 91%	RQD .55 = 5.5 10% BOX NO. 5 NO. 6	AS ABOVE – HIGHLY FRACTURED		PACKER TEST 2:50 PM 326.0-357.0 NOT RECORED, YET FRACTURED, OVER CORED TO HELP RETRIEVAL
360.0	362.5						
	362.5	NQ-13	5.0 = 5.0 100%	RQD 4.2 = 5.0 84% BOX NO. 6	9-30-83 AS ABOVE – MASSIVE		2.5 MINS/FT
365.0	367.5						
	367.5	NQ-14	5.5 = 5.5 100%	RQD 4.8 = 5.5 87% BOX NO. 7	AS ABOVE		2.6 MINS/FT
370.0	373.0				AS ABOVE		
	373.0	NQ-15	5.0 = 5.0 100%	RQD 2.3 = 5.0 46% BOX NO. 7 NO. 8	AS ABOVE		2.8 MINS/FT
375.0	378.0						
	378.0	NQ-16	5.0 = 5.0 100%	RQD 4.0 = 5.0 80%			2.6 MINS/FT

SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION ~ 2558' DRILLING CONTRACTOR ERICKSON – FORD CO.

DRILLING METHOD AND EQUIPMENT LONGYEAR 44 – NQ WIRELINE CORE

WATER LEVEL AND DATE _____ START 9-30-83 FINISH _____ LOGGER A. BENFER M. CHRISTIAN

ELEVATION / DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
380.0							
	383.0			BOX NO. 8			
	383.0	NQ-17	4.0 = 4.0 100%	RQD 2.7 = 4.0 68% BOX NO. 8	SILTY CLAY – GRAY, SLIGHTLY MOIST, HARD (CL)		2.5 MINS/FT 100% FLUID RETURN
385.0	387.0						
	387.0	NQ-18	5.0 = 5.0 100%	RQD 3.7 = 5.0 74% BOX NO. 9	AS ABOVE		2.6 MINS/FT 100% FLUID RETURN
390.0	392.0						
	392.0	NQ-19	3.5 = 3.5 100%	RQD 4.5 = 3.5 13% BOX NO. 9	AS ABOVE		2.4 MINS/FT 100% FLUID RETURN
395.0	396.0						
	396.0	NQ-20	3.85 = 4.0 96%	3.85 = 4.0 96% BOX NO. 10	AS ABOVE		2.5 MINS/FT 100% FLUID RETURN
	400.0						
400.0	400.0	NQ-21	5.0 = 5.0 100%	RQD 5.0 = 5.0 100% BOX NO. 10	AS ABOVE		2.7 MINS/FT 100% FLUID RETURN SOLID 5.0' CORE
405.0	405.0						
	405.0	NQ-22	5.5 = 5.5 100%	4.0 = 5.5 73% BOX NO. 10 BOX NO. 11	AS ABOVE		3.0 MINS/FT 100% FLUID RETURN

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SOIL BORING LOG

PROJECT ESI GRANDVIEW SITE LOCATION NW BUFFER ZONE

ELEVATION APPROX. 2,558' DRILLING CONTRACTOR ERICKSON-FORD

DRILLING METHOD AND EQUIPMENT LONGYEAR-44, NQ WIRELINE CORE

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER A. BENFER

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
410.0	410.5						
	410.5	NQ-23	5.5 = 5.5 = 100%	RQD 3.95 = 5.5 = 72% BOX NO. 11	SILTY CLAY, GRAY, SLIGHTLY MOIST, HARD, MASSIVE — CL		2.4 MINS/FT 100% FLUID RETURN
415.0	416.0						
	416.0	NQ-24	5.5 = 5.5 = 100%	RQD 2.3 = 5.0 = 46% BOX NO. 12	AS ABOVE		2.6 MINS/FT 100% FLUID RETURN
420.0	421.0						
	421.0	NQ-25	3.5 = 3.5 = 100%	RQD 0% BOX NO. 12	AS ABOVE		2.5 MINS/FT 100% FLUID RETURN
	424.5						
425.0	424.5	NQ-26	5.5 = 5.5 = 100%	RQD .35 = 5.5 = 6% BOX NO. 12 BOX NO. 13	AS ABOVE		2.9 MINS/FT 100% FLUID RETURN
430.0	430.0				END OF BORING 430.0		HOLE GROUTED FROM TOP TO BOTTOM USING 125 BAGS OF PORTLAND CEMENT
435.0							

CH2M HILL

B18066.A0

ROCK CORE LOG

OJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION D-3

DRILLING METHOD Longyear 44 wash rotary-core DRILLERS & EQUIPMENT Erickson-Ford

ELEVATION - ORIENTATION VERTICAL BORE HOLE: D-3

WATER LEVEL 218 ±2 DATE: 4/11/84 START: 4/11/84 FINISH: 4/19/84 INSPECTOR Kuenzli

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
300									
	Casing set to 303'								
305	Drilled out to 305± Began coring at 306'								
	3:35	41"/48"		1	N/A			CLAY, silty clay, gray, damp, stiff, (CL/CL-ML)	
	Smooth continuous coring	60"/60"							
315	4:55 No recovery retrieved by reinserting core barrel Sample disturbed	23"/60"		1 2		Disturbed		CLAY, silty clay, some softer zones, from overdrill? (CL-ML/CL)	
320	5:30 Smooth	60"/54"		2			320.5		
	Picked up lost core from last run.								
325	10:15/11:40 No recovery first attempt. 0 2nd attempt 0 3rd attempt	No Recovery		3		No Recovery			
	Retrieved casing and barrel.								
330	12:03								

FORM D 2113A 5/78

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B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION D-3

DRILLING METHOD Longyear 44 DRILLERS & EQUIPMENT Erickson-Ford

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-3

WATER LEVEL 218 ±2 DATE: 4/11/84 START: 4/11/84 FINISH: 4/19/84 INSPECTOR Kuenzli

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
330	5'/20 minutes Smooth	57"/60"						CLAY, silty clay, gray, stiff, (CL/CL-ML)	
335	Smooth	8"/60"				No Recovery			
345	4:30 5'/45 minutes	6"/60"				No Recovery	First 6-8" appears to be blocking tube preventing further sample from entering barrel.		
	5:15 11:55 am 4/17/84	56"/60"				SOFT SLUFF?		Upper 2.5' soft, mushy clay-silty clay sluff? CLAY, silty clay, gray, stiff, (CL/CL-ML)	
350	12:22 2:36 no recovery first attempt.	60"/65"					* Fractures		
355	3:00	58"/78"					355.5 *		
360							*		

FORM D 2113A 5/78

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B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION D-3

DRILLING METHOD Wash rotary core DRILLERS & EQUIPMENT Erickson-Ford

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-3

WATER LEVEL 218 ±2 DATE: 4/11/84 START: 3 4/11/84 FINISH: 4/19/84 INSPECTOR Kuenzli

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION / CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
360	First attempt, no recovery. Core barrel has to be overdrilled.							CLAY, silty clay, gray, stiff (CL/CL-ML), damp, fractured areas indicated by asterisks (*).	
362	To capture sample, numerous attempts were made without overdrill, all yielded no recovery. 5:12	4'-6" / 6'-0"		2		1 0	*		
365	5:30						*		
368	1:45 (4/18/84)						In zones of continuous undisturbed core, no lenses or layering were observed.	Top 1.5' soft, mushy slough.	
		58" / 60"							
373	0 Recovery first attempt.						*		
	Overdrilled 1 foot to 379'.	57" / 72"		6		0	Badly fractured		
378	3:05								
379	3:26								
380	3:34						Badly fractured		
		63" / 69"		7					
385	4:07 384.75' 0 Recovery first attempt								
				7					
390	390.25 (5:40 PM)								

FORM D 2113A 5/78

CH2M HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION D-3

DRILLING METHOD Wash rotary core DRILLERS & EQUIPMENT Erickson-Ford

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-3

WATER LEVEL 218 ±2 DATE: 4/11/84 START: 4/11/84 FINISH: 4/19/84 INSPECTOR Kuenzli

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
390	390.25						Top 4' soft	CLAY, gray, silt clay, stiff (CL/CL-ML)	
		61"/66"		8					
	395.75 9:00 am								
		63"/69"		8					
	401.50 9:30 am								
405		62"/66"		9					
407	10:30 am 4/19/84								
410									

FORM D 2113A 5/78

CH2M HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION 2,528.5 ORIENTATION Vertical BORE HOLE: D-4

WATER LEVEL 140' DATE: %/ 5/9/84 START: 5/8/84 FINISH: 5/9/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN, LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED, STATE	GRAPHIC LOG
0								Re-entered hole and began placing casing to existing bottom (254')	
								NOTE: Stake in field said elev 2,852.00 ? Verify	
	Driller noticed H2O level at ± 135' when lowering casing								
								Previous H2O level from 10/20/83 sketch.	▽
250	Cored out to 250' and checked barrel. 5.0' recovery, probably sluff.								
	Made core run from 250' to 256' – 2.2' recovery. Driller felt barrel slip ~~over core loss still in btm~~ when core barrel was lowered back down hole.							254' – previous bottom of hole.	
								Set 4" casing to 250' Set 3" casing to 250'	
255									

FORM D 2113A 5/78

CH2M HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Diamond Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-4

WATER LEVEL N.M. DATE: _____ START: 5/9/84 FINISH: 5/10/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
255	Picked up 37" of core left in hole from last run					?		SLUFF	
	Coring from 256' to 259' at 3 minutes/ft.	NQ-1 2.0'/3.0'		1	2.0 3.0	0		CLAYEY SILT/SILTY CLAY, medium gray, moist, very hard core, sudden change in hardness at 256'.	
						0	NOTE: Core loss zones unknown. Loss zones shown at bottom of run reflects how measurements of breaks and fractures were made. (Typ)		
	5/10/84	67%			67%				
	Overdrilled to 5.5' to obtain good recovery	NQ-2		1		0			
		5.0'/5.5'			5.0 5.0	1			
	Smooth coring	Probably compressed				0	Hammer break at 262'		
						0			
		91%			100%	0			
	264.5					0	Bottom fractured due to overdrill		
264.5		NQ-3		2					
265						0	Broke at 265.5' while boxing		
		5.0'/5.5'			4.0 5.0	1	Break at 266.8'		
						0			
		91%			80%	0			
						2	Break at 269.3' Break at 269.9'		
270									

CH2M HILL

PROJECT NUMBER
B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Diamond Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-4

WATER LEVEL N.M. DATE: _____ START: 5/10/84 FINISH: 5/10/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
285		95%		3		96%	285.1'	CLAYEY SILT/SILTY CLAY to 285.5'	
							Break at 286.0'	285.5' – CLAYEY SILT/SILTY CLAY sandy, medium gray, moist	
								~~Bagged sample from 285.5' to 286.2.' for~~ sieve analysis	
		NQ-7		4			Broken		
287								CLAYEY SILT/SILTY CLAY without sand from 286.5' to 290.3'	
							Broken		
288		5.0'/5.5'							
							Break at 289.0'		
289									
							Break at 290.1	CLAYEY SILT/SILTY CLAY, SANDY from 290.3' to 290.9'	
		91%							
	1:45 pm Advanced 3" casing to ~~255'. Stopped to~~ run packer test.							CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, cores holding together well.	
292		NQ-8		4			Break at 292.5'		
							Break at 292.7'		
		4.0'/5.0'	Core loss = 1.0'				Break at 293.8'		
							Break at 294.6		
295		80%					Break at 295.5'		
297	NOTE: NW-9 was labeled wrong (as NW-8) on photo. Use depth interval for I.D.	NQ-9		5			Break at 297.8'		
		3.6'/4.0'	Core loss = 0.4'				Break at 299.0'		
		90%					Break at 299.5'		
300									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Diamond Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-4

WATER LEVEL N.M. DATE: _____ START: 5/10/84 FINISH: 5/11/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
300	6:15 pm End of run at 301.0'						End at 300.6'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, good core	
301	Smooth coring	NQ-10		5	N/A		Minor fracturing at 301.25 and 301.8'	5/11/84 – Sample is more wet due to sitting overnight.	
302		5.2'/5.5'	core loss = 0.3'				Break at 303.0'	CLAY layer from 302.5' to 302.8'	
303							Break at 303.2'	CLAYEY SILT/SILTY CLAY	
304							Break at 304.0'		
							Fractured at 305.3' Fractured at 305.8'		
	End of run at 306.5.'								
		NQ-11		6					
		5.1'/5.5'							
							Break at 308.4'		
310		93%	core loss = 0.4'				Break at 309.7 Fractured between Break at 310.3'		
312	End of run at 312.0'						Break at 311.3' Fractured to 311.4' Bottom at 311.6'		
		NQ-12		6				CLAY layer from 312.0' to 312.4' CLAYEY SILT/SILTY CLAY	
		5.1'/5.5'	core loss = 0.4'				Fractured from 313.0' to 313.3'		
		93%					Break at 314.2'		
315									

FORM D 2113A 5/78

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Diamond Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-4

WATER LEVEL _____ DATE: _____ START: 5/11/84 FINISH: 5/11/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
315							Fractured from 315.3' to 315.5'	CLAYEY SILT/SILTY CLAY, medium gray, moist (wetter on outside), hard, becoming more fractured.	
		93%					Minor fractures from 316.0' to 317.1		
	End of run at 317.5' 10:20 am ~~Driller notes H2O from top of casing.~~ No water coming up after pulling tube.						Bottom at 317.1'		
							Fractured from ~~317.5' to 317.7'~~	Noted more vertical fractures becoming apparent	
							Break at 318.4'		
		5.2'/5.5'					Break at 319.2'		
		95%					Fractured from 320.1' to 321.0'		
							Minor fractures from 321.0 to 321.8'		
	End of run at 323.0'						Break at 322.5' Bottom at 322.7'		
	11:00 am 11:42 am	NQ-14		7			Break at 323.8'	Not as many vertical fractures in this run.	
		5.2'/5.5'					Break at 324.95'		
325							Fractured at 325.6		
		95%							
							Minor fractures from 327.3' to 328.2'		
	End of run at 328.5' Begin run at 12:01 pm			8			Bottom at 328.2'		
		NQ-15		8					
		5.1'/5.5'					Break at 329.1'		
330									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Diamond Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-4

WATER LEVEL N.M. DATE: _____ START: 5/11/84 FINISH: 5/11/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
330		NQ-15 continued		8	N/A			CLAYEY SILT/SILTY CLAY, medium gray moist inside, saturated mud lining outside of core, good hard core holding together well.	
		5.0'/5.5'	core loss = 0.5'				Fractured at 332.0'		
		91%					Fractured from 332.4' to 332.5'		
							Fractured from 333.0' to 333.5'		
	End of run at 334.0'						Bottom at 333.5'		
	12:45 pm — Stopped to prepare for packer test.	NQ-16		9				CLAY layer, 334.0' to 334.45'	
								CLAYEY SILT/SILTY CLAY, as above	
	Begin core run NW-16 at 4:33 pm	5.25'/5.5'	core loss = 0.25'				Break at 335.2'		
							Fractured from 336.3' to 336.8'		
		96%					Fractured from 337.5' to 339.25'. Probably from overdrill.		
	End of run at 339.5'						Bottom at 339.25'.		
		NQ-17		9			Break at 339.7'		
340									
							Break at 341.0'		
		5.2'/5.5'	core loss = 0.3'				Vertical and horizontal fractures from 342.0' to 342.7'		
							Break at 343.25'		
							Fractured from 343.5' to 343.75'		
							Minor fractures from 343.75' to 344.7'		
345							Bottom at 344.7'		

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Diamond Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-4

WATER LEVEL N.M. DATE: _____ START: 5/11/84 FINISH: 5/12/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
345		NQ-18		10	N/A		Fractured from 345.0' to 345.8'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, becoming more fractured, could be compression.	
		5.0'/5.5'	core loss = 0.5'				Fractured at 346.4'		
							Fractured at 348.0'		
		91%							
							Fractured from 349.5 to 350.0'		
	End run at 350.5' 8:00 am 5/12/84						Bottom at 350.0'		
		NQ-19		11			Fractured from 350.5' to 351.5'		
		5.25'/5.5'	core loss = 0.25'				Fractured from 352.4' to 352.7'		
		95%					Minor fractures from 353.8 to 354.9'		
355							Fractured from 354.9' to 355.75'		
	End of run at 356.0'						Bottom at 355.75'		
		NQ-20		11			Fractured from 356.0 to 356.8		
		5.1'/5.5'	core loss = 0.4'						
		93%							
							Fractured at 359.4'		
360									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Diamond Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-4

WATER LEVEL N.M. DATE: _____ START: 5/12/84 FINISH: 5/12/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
360		93%		11	N/A		Minor fractures from 360.4' to 361.1'	CLAYEY SILT/SILTY CLAY, medium gray, moist, becoming badly fractured, hard	
	End of run at 361.5'			12			Bottom at 361.1'		
		NQ-21		12			Fractured at 361.9'		
			core loss = 0.3'				Badly fractured from 362.9' to 364.4'		
		5.2'/5.5'							
		95%							
							Fractured from 365.2' to 366.7'		
	End of run at 367.0'						Bottom at 366.7'		
		NQ-22					Fractured at 367.25'		
		5.2'/5.5'	core loss = 0.3'						
		95%					Fractured from 369.0' to 372.2' off and on		
370									
				13					
	End of run at 372.5'						Bottom at 372.2'		
		NQ-23		13			Fractured from 372.5' to 373.1'		
		5.2'/5.5'							
		95%							
375									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Diamond Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-4

WATER LEVEL N.M. DATE: _____ START: 5/12/4 FINISH: 5/14/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
375		NQ-23 continued	core loss = 0.3'	13	N/A			CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, NQ-23 good core, not as fractured	
							Fractured at 376.5' Several hairline breaks between		
	End of run at 378.0'						Break at 377.5' Bottom at 377.7'		
	Pressured up at 380.0'	NQ-24	core loss = 0.1'				Breaks from tip of barrel Bottom at		
	Recovered NQ-24 loss with NQ-25 run	1.9'/2.0'							
	End of run at 380.0'	95%							
		NQ-25		14			Break at 380.6'		
		4.0'/4.5'	core loss = 0.5'				Fractured from 381.7' to 382.6', probably compression		
		89%							
							Fractured from 383.1' to 384.0' Bottom at 384.0'		
	2:00 pm 5/12/84 End of run at 384.5'								
	12:00 pm 5/14/84	NQ-26		14			Upper 6" wet and soft from sitting in H2O		
385	Only recovered 1.6' with core run NQ-26						Fractured/breaks		
	Recovered additional 2.7' with run NQ-27	4.2'/6.5'					Pretty good quality core however breaks ± every foot		
			core loss = 2.3'						
		65%							
390									

FORM D 2113A 5/78

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Diamond Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-4

WATER LEVEL N.M. DATE: _____ START: 5/14/84 FINISH: 5/14/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
390	End run at 391.0'	NQ-26 continued						CLAYEY SILT/SILTY CLAY, medium gray, moist,	
	2.7' of recovery appears to be from last run	NQ-27	Loss zone unknown				Fractured		
		2.5'/3.5'							
		71%		15					
		NQ-28		15			Break at 394.7'		
		5.0'/5.5'					Fractured from 395.6' to 397.7'		
		91%					Fractured from 398.4' to 399.5'		
400	Terminate hole at 400'								

FORM D 2113A 5/78

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/17/84 FINISH: 5/17/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
0	Re-entered hole and set 3" casing to 195.0'								
	Existing bottom of hole = 193.4'								
								NOTE: Core loss zone ( ) unknown. Loss zone shown at bottom of run to indicate how measurements of fractures and breaks were made.	
190									
		NQ-1		1	N/A		Upper 1.0' softer (sluff)	CLAYEY SILT/SILTY CLAY, medium gray, moist to dry, upper 1.0' sluff	
	Smooth coring	5.3'/6.6'							
195							Fractured from 195.2 to 195.5'		
		80%	Core loss = 1.3'				Break at 196.5		
							Fractured from 197.0' to 198.9		
							Bottom at 198.7'		
200	End of run at 200.0'								

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/17/84 FINISH: 5/17/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
200		NQ-2		1	N/A		Upper 0.2 soft	CLAYEY SILT/SILTY CLAY, medium gray, moist, good quality core, intermittents, layers of organics present	
		5.2'/6.0'							
			Core loss = 0.8'				Break at 202.25'		
		87%					Break at 203.5'		
							Fractured from 204.3 to 204.5'		
205				2			Break at 205.0'		
	End run at 206.0'						Bottom at 205.2'		
		NQ-3		2			Broken and fractured from 206.0' to 207.4'		
		4.3'/7.0'	Core loss = 2.7'				Broken at 207.6'	CLAYEY SILT/SILTY CLAY, sandy, medium gray, moist	
							Broken at 208.0'		
		61%					Broken at 210.0'		
210							Crumbled	CLAY SILT/SILTY CLAY, sand, thinning out, medium gray, moist.	
							Bottom at 210.3'		
	End run at 213.0'								
		NQ-4					Break at 213.2'		
							Fractured at 213.4'		
							Break at 213.7'		
							~~Break at 213.8'~~		
		5.2'/6.3'					Break at 214.4'		
215							Break at 214.9'		

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D~~A~~8

WATER LEVEL N.M. DATE: _____ START: 5/17/84 FINISH: 5/17/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION / CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
215		5.2'/6.5'		2	N/A		Break at 215.4 Fractured at 215.8'	CLAYEY SILT/SILTY CLAY, medium gray, moist, layers of bedding and organics evident	
			Core loss = 1.3'				Break at 216.3' Break at 216.5' Fractured from 216.9 to 217.4' Break at 218.0'		
		80%					Bottom at 218.2'		
	End run at 219.5'								
220		NQ-5		3			Break at 219.8'		
							Break at 220.5		
		5.2'/6.0'					Break at 221.2' Break at 221.5' Break at 221.8'		
			Core loss = 0.8'				Fractured from 222.4' to 224.7		
		87%					SAND LENSE	223.6' 223.7'	
							SAND LENSE Bottom at 224.7'	224.1' 224.3' 224.6' 224.8'	
225	End run at 225.5'						SAND LENSE Break at 225.65'	225.1' 225.25	
		NQ-6					Break at 225.75' ~~Break at 226.0'~~		
	Recovery = 1.6' Assume remainder still in hole						Break at 226.9'		
		4.2'/5.5'	Core loss = 1.3'				Extent NQ-6 recovery = 227.0' Break at 227.5' ~~Fractured from~~ 227.5' to 228.8'		
		76%							
							Bottom at 229.7'		
230									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/17/84 FINISH: 5/17/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
230				3	N/A			CLAYEY SILT/SILTY CLAY, medium gray, moist, fractured	
	End run at 231.0'								
		NQ-7 1.9'/2.0'	Core loss = 0.1'	4			Break at 231.1		
		95%					Break at 232.7'		
	End run at 233.0'						Bottom at 232.9'		
		NQ-8					Break at 233.6'		
	NOTE: ~~Labeled as NQ-7 on~~ photo. Use depth int. to identify.						Fractured at 233.8'	SAND LENSE 233.8'	
		5.3'/5.5'					Break at 234.5		
235							Fractured at 235.4'	SAND LENSE 235.4' 235.9'	
			Core loss = 0.2'				Vertical fractures from 235.8' to 236.1'		
		96%					Break at 236.7'		
							Break at 237.5'		
							Fractured from 237.2' to 237.8'	SAND LENSE 237.8' 238.0'	
	End run at 238.5'						Bottom at 238.3'		
		NQ-9					Fractured from 238.5' to 240.0'		
		5.2'/6.5'							
240									
		80%	Core loss = 1.3'	5					
							Fractured from 242.6 to 243.7'		
							Bottom at 243.7'		
245	End run at 245.0'								

FORM D 2113A 5/7

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/18/84 FINISH: 5/18/84 INSPECTOR M. Christi

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
245	Had problems retrieving core barrel. Recovery = 3.0' -- possibly left some in hole.	NQ-10		5	N/A			CLAYEY SILT/SILTY CLAY, medium gray, moist, fractured	
		4.8'/5.0'					Break at 246.2' Break at 246.6'		
			Core loss = 0.2'				Fractured at 247.25' Extent NQ-10 recov. 248.0'		
		96%					Fractured from 248.5' to 248.7'		
							Vertical fracture from 249.5' to 249.8' Bottom at 249.8		
250	End run at 250.0' 1.8' recovered from last run	NQ-11		5			Break at 250.6'		
		3.5'/5.0'	Core loss = 1.5'				Fractured from 251.7' to 252.3'		
				6			Fractured from 252.7' to 253.0		
		70%					Bottom at 253.5'		
255	End run at 255.0' Coring fast and smooth	NQ-12					Fractured from 255.0 to 255.3'		
		5.2'/6.0'					Break at 256.25' Break at 257.0		
			Core loss = 0.8'				Fractured and compressed at 257.3'		
		87%					Fractured from 258.0' to 258.5'		
							Fractured from 259.0' to 260.2' Bottom at 260.2'		
260									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/18/84 FINISH: 5/18/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
260		87%			N/A		Bottom at 260.2'	CLAYEY SILT/SILTY CLAY, medium gray, moist, fractured	
	End run at 261.0'								
		NQ-13					Break at 261.2'		
							Break at 261.7'		
		5.2'/5.5'					Fractured from 262.1' to 262.6'		
							Break at 263.0'		
			Core loss = 0.3'	7					
		95%					Break at 264.4'		
265							Fractured from 265.2' to 266.0'		
	End run at 266.5'						Bottom at 266.2'		
		NQ-14					Break at 266.9'		
							Break at 267.0'		
							Break at 267.5'		
		5.2'/6.0'					Break at 268.5'		
			Core loss = 1.3'				Fractured from 269.1' to 269.4'		
270							Fractured from 269.6 to 269.9'		
		87%					Fractured from 270.3' to 271.7'		
							Bottom at 271.7'		
							SAND LENSE	272.2'	
	End run at 273.0'								
		NQ-15					Break at 273.2'		
							Break at 273.5'		
							Break at 273.8'		
							Break at 274.2'		
							Break at 274.3'		
							Break at 274.5'		
275							Fractured at 274.75'		
							Fractured at 275.0'		

HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/18/84 FINISH: 5/18/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
275		5.25'/6.5'		8			Break at 275.3' Break at 275.75'	CLAYEY SILT/SILTY CLAY, medium gray, moist, fractured	
			Core loss = 1.25'						
		81%					Fractured from 277.0' to 278.25'		
							Bottom at 278.25'		
	End run at 279.5'								
		NQ-16					Fractured from 279.5 to 279.9'		
280	Recovery = Possibly left some in hole						Break at 280.6' Break at 280.8'		
		5.8'/6.0'					Break at 281.3'		
							Extent of NQ-16 recovery		
		97%					Break at 283.8'		
							Fractured from 284.5' to 285.3'		
285	End run at 285.5'						Bottom at 285.3'		
		NQ-17					Fractured from		
	Recovered additional 2.8' of NQ-16	2.7'/3.0'		9			285.5' to 286.5'		
		90%					Fractured from 287.4' to 288.2'		
	End run at 288.5'						Bottom at 288.2'		
		NQ-18							
		5.2'/6.0'					Break at 289.2' Fractured at 289.4'		
290									

CH2M HILL

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/18/84 FINISH: 5/19/84 INSPECTOR M. Ch

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE
290				9	N/A			CLAYEY SILT/SILTY CLAY, medium gray, moist, fractured
		5.2'/6.0'	Core loss = 0.8'				Fractured from 291.1' to 291.7'	
		87%						
							Fractured at 293.5' Bottom at 293.7'	
	End run at 294.5'							
		NQ-19					Fractured from 294.9' to 295.2'	
295	Recovered 4.2 . Possibly left some in hole.						Fractured from 295.5' to 296.7'	
		5.4'/5.5'						
		98%	Core loss = 0.1'	10				
	Extent of NQ-19 recovery						Fractured from 298.4' to 298.6'	
	5:00 pm 5/18/84 End run at 300.0'						Break at 299.1' Fractured from 299.1' to 299.9' Bottom at 299.9'	Stop for packer test.
300	7:30 am 5/19/84	NQ-20					Break at 300.25'	
	Recovered additional 1.3' of NQ-14		Core loss = 1.3'				Break at 300.8' Fractured	
		4.2'/5.5'					Fractured at 301.4'	
	Photo with driller's camera						Fractured at 301.8'	
		76%					Break at 302.8'	
							Fractured from 303.6' to 304.2'	
							Bottom at 304.2'	
305								

FORM D 2

GRAW HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/19/84 FINISH: 5/19/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
305	End run at 305.5'						Fractured from 305.5 to 305.6'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured, (highly fractured)	
		NQ-21		10	N/A				
							Fractured from 306.3' to 307.5'		
		4.9'/6.0'					Fractures from 307.5' to 308.1'		
			Core loss = 1.1'	11					
		82%					Fractured at 309.4'		
310							Fractured from 309.9' to 310.4' Bottom at 310.4'		
	8:25 am								
	End run at 311.5'								
		NQ-22						Highly fractured	
							Upper 3.5' crumbled and highly fractured		
	Hard to get out of core barrel	5.2'/6.0'	Core loss = 0.8'						
315		87%					Lower 1.7' highly fractured		
							Bottom at 316.7'		
	9:45 am End at 317.5'								
		NQ-23					Fractured from 317.5' to 318.0'		
	Better core quality								
	Core loss probably at top of run in fractured zone.	4.9'/6.0'					Break at 320.0'		
320									

HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/19/84 FINISH: 5/19/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
320				11	N/A			CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
				12			Fractured from 320.5' to 322.4'		
		82%	Core loss = 1.1'						
							Bottom at 322.4'		
	End run at 323.5'								
		NQ-24					Fractured from 323.5' to 323.8'		
325									
		5.3'/6.0'					Fractured at 325.3'		
			Core loss = 0.7'				Fractured at 326.3'		
		88%					Fractured from 327.2' to 328.8'		
							Bottom at 328.8'		
	End run at 329.5'								
		NQ-25							
330							Fractured from 330.1' to 331.0'		
		5.2'/5.5'	Core loss = 0.3'						
				13			Break at 332.6'		
		95%							
							Fractured from 334.0' to 334.7' Bottom at 334.7'		
335									

FORM D 2113A 5/7

HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/19/84 FINISH: 5/21/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
335	12:00 pm	NQ-26		13	N/A		Fractured from 335.0' to 335.2' Softer from 335.2' to 336.6'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard except from 335.2' to 336.6', trace of fine sand from 335.2' to 336.6'	
		5.2'/6.0'					Fractured from 336.6' to 337.3'		
			Core loss = 0.8'				Break at 337.5'		
		87%					Break at 338.1'		
							Fractured from 338.8' to 340.2'		
340							Bottom at 340.2'		
	End run at 341.0'								
		NQ-27		14					
		5.1'/6.0'					Break at 342.3'		
			Core loss = 0.9'				Break at 343.3' Fractured from 343.3' to 346.1'		
		85%							
345									
							Bottom at 346.1'		
	1:30 pm End run at 347.0'								
	Stopped for packer test (5/19/84) 8:45 am 5/21/84	NQ-28					Upper 1.0' softer probably sluff		
	Had to redrill through ± 15 feet of cuttings and sluff	4.4'/6.0'	Core loss = 1.6'				Fractured from 348.0' to 349.7'		
		73%							
350									

FORM D 2113A 5/78

CH2M HILL

ROCK CORE LOG

PROJECT _____ LOCATION _____

DRILLING METHOD _____ DRILLERS & EQUIPMENT _____

ELEVATION _____ ORIENTATION _____ BORE HOLE: _____

WATER LEVEL _____ DATE: _____ START: _____ FINISH: _____ INSPECTOR _____

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
350		NQ-28 continued		14			Fractured from 350.6' to 351.4'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
		4.4'/6.0'					Bottom at 351.4'		
	End run at 353.0	73%							
		NQ-29		15			Upper 0.2' fractured		
	Mostly vertical fractures in this run	5.2'/6.0'					Fractured at 353.9'		
355			Core loss = 0.8'				Fractured from 354.8' to 355.5' mostly vertical		
		87%					Fractured from 355.9' to 356.3' mostly vertical		
							Fractured from 356.9' to 358.2'		
	End run at 359.0'						Bottom at 358.2'		
		NQ-30					Fractured from 359.0' to 360.4'		
360		5.3'/5.5					Badly fractured from 360.4' to 361.0'		
			Core loss = 0.2'				Small solid piece 361.4 to 361.8' Rest fractured		
		96%							
				16					
	End run at 364.5'						Bottom at 364.3'		
365		NQ-31							

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/21/84 FINISH: 5/21/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
365		NQ-31 continued		16	N/A		Good quality core — no breaks	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, not as fractured as above.	
		5.3'/6.0'							
			Core loss = 0.7'						
		88%					Fractured from 368.8' to 369.8' probably compression Bottom at 369.8'		
370	End run at 370.5'								
		NQ-32					Break at 370.8'	Becoming more fractured	
	Hard to get core sample out of barrel (sticky)						Minor fractures from 370.8' to 372.0'		
		5.0'/6.0'					Fractured worse from 372.0' to 372.8'		
			Core loss = 1.0'				Badly fractured from 373.6' to 375.5'		
		83%		17					
375							Bottom at 375.5'		
	End run at 376.5'								
		NQ-33							
							Fractured from 377.0' to 377.3'		
		5.2'/5.5'	Core loss = 0.3'				Fractured from 378.3' to 378.7'		
		95%							
380									

HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/21/84 FINISH: 5/21/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
380		NQ-33 continued	Core loss = 0.3'	17	N/A		Fractured from 380.0' to 381.1'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
		95%					Break at 381.5' Bottom at 381.7'		
		NQ-34					Fractured		
	Coring rate is smooth and consistent — no time to clock runs	5.1'/6.0'					Fractured with washed out spots from 383.0' to 383.3'		
			Core loss = 0.9'						
385		85%		18			Badly fractured from 385.0' to 386.0' Washed out spots throughout entire run		
							Bottom at 387.1'		
	End run at 388.0'								
		NQ-35					Fractured from 388.0' to 389.0'		
		5.2'/6.0'					Fractured from 389.5' to 389.8'		
390			Core loss = 0.8'				Fractured from 390.5' to 393.2'		
		87%							
	2:30 pm								
							Bottom at 393.2'		
	End of run at 394.0'								
	Had trouble getting core out of barrel	NQ-36 87%					Highly fractured from 394.0' to 395.0' (crumbly)		
395									

HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-8

WATER LEVEL N.M. DATE: _____ START: 5/21/84 FINISH: 5/21/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
395					N/A		Somewhat fractured from 395.5' to 396.7'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
		5.2'/6.0'	Core loss = 0.8'				Solid piece from 396.7' to 397.4'		
				19			Fractured from 397.4' to 399.2'		
		87%							
							Bottom at 399.2'		
400	End run at 400.0' Terminate hole at 400.0'								

FORM D 2113A 5/78

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
B18066.A0	D-9	SHEET 1 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION N510,030± E363,805±

ELEVATION _____ DRILLING CONTRACTOR Hiddleston Drilling

DRILLING METHOD AND EQUIPMENT Air and Water Rotary

WATER LEVEL AND DATE _____ START 5/16/84 FINISH 5/16/84 LOGGER C.E. Jenkins

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					Began at 10:00 am Fill, silty top soil		
					3' GRAVEL, sandy, 3/4" minus, silty, loose		
10							
20					10:25 am		
					29'		
30					SAND, clayey, gravelly, dense, baked particles throughout, medium-fine grain, More clay at 32', still sandy, not much gravel tan to light brown CLAY, hard and soft particles		Drilling smoothed out
40					10:55 am		
50							
					54' SAND, poorly graded (fine) slightly silty		
60					11:15 am		

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
B18066.A0	D-9	SHEET 2 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION N510,030± E363,805±

ELEVATION _____ DRILLING CONTRACTOR Hiddleston Drilling

DRILLING METHOD AND EQUIPMENT Air and Water Rotary

WATER LEVEL AND DATE _____ START 5/16/84 FINISH 5/16/84 LOGGER C.E. Jenkins

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
60							
64′					SANDY, SILTY, CLAY, plastic to stiff, tan to light brown, soft particles, reddish ash particles throughout, ash layers on clay		Drilling smooth
70							
80					12:00 pm		
90							
90′					CLAYEY SILTY SAND, poorly graded (fine), dense		Drilling is smooth and easy
100					1:15 pm		
107′					CLAY, silty, sandy, tan, firm to soft, poorly graded sand (fine)		Drilling is smooth and easy
110							
118′							Depth of casing
120					2:00 pm		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
B18066.A0	D-9	SHEET 3 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION N510,030± E363,805±

ELEVATION _____ DRILLING CONTRACTOR Hiddleston Drilling

DRILLING METHOD AND EQUIPMENT Air and Water Rotary

WATER LEVEL AND DATE _____ START 5/16/84 FINISH 5/16/84 LOGGER C.E. Jenkins

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
120					CLAY, silty, sandy, tan, firm to soft P.G. sand (fine)		Drilling is smooth and easy
130							
140					2:20 pm		
150							
					156'		
					SILTY CLAY, blue gray, stiff, sandy		Gradual interface
160					2:40 pm		
170							
180					3:05 pm		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
B18066.A0	D-9	SHEET 4 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION N510,030± E363,805±

ELEVATION _____ DRILLING CONTRACTOR Hiddleston Drilling

DRILLING METHOD AND EQUIPMENT Air and Water Rotary

WATER LEVEL AND DATE _____ START 5/16/84 FINISH 5/16/84 LOGGER C.E. Jenkins

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
180					SILTY CLAY, blue-gray, stiff, sandy		Drilling is smooth and easy
190							
195					3:30 pm Bottom of hole		

HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/22/84 FINISH: 5/22/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION	CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
0										
180										
	Re-enter hole and begin drilling									
	Hole sluffed in to ±183'	NQ-1								
185								Sluff		
	NOTE: Cutting return appears to be brown silt.									
190										

FORM D 2113A 5/7

CRAIG HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/22/84 FINISH: 5/22/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
190	Very soft, easy drilling	NQ-1 continued			N/A		No recovery, possibly still in hole.	Sluff	
	End run at 191.5'							Sluff	
		NQ-2		1				NOTE:	
	Core loss zone known this run.							Core loss zones unknown unless otherwise noted. Loss shown at bottom for orientation of fractures and breaks.	
		Lost sluff from top						Sluff	
	Bottom existing hole = 195.0' per C. Jenkins						Some sluff at top of recovery		
							Break at 195.0'		
195	Coring becoming smoother — more like blue clay						Break at 195.4'	CLAYEY SILT, medium gray, moist to dry, hard, good quality, no fractured zones, but breaks.	
							Break at 195.9'		
		100%					Break at 196.2'		
							Break at 196.5'		
							Break at 197.1'		
							Break at 197.3'		
							Break at 197.7'		
							Break at 197.8'		
							Break at 197.9'		
							Break at 198.8'		
	End run at 199.5'						Break at 199.2'		
							Bottom at 199.5'		
		NQ-3					Break at 199.6'		
200							Break at 199.75'		
							Break at 199.9'		
							Break at 200.1'		
							Break at 200.5'		
		5.3'/6.5'					Fractured at 201.2'		
							Break at 201.6'		
							Break at 202.0'		
			Core loss = 1.2'				Break at 202.1'		
							Fractured from 202.5' to 202.8'		
							Break at 203.0'		
		82%					Fractured from 203.0' to 203.6'		
205				2			Bottom at 204.8'		

FORM D 2113A 5/7

CH2M HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/22/84 FINISH: 5/22/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
205				2	N/A			CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
	End run at 206.0'								
		NQ-4					Break at 206.5'		
		5.2'/7.0'							
			Core loss = 1.8'				Fractured from 208.2 to 209.1		
		74%					Break at 209.5'		
210							Fractured from 210.3. to 210.8'		
							Bottom at 211.2'		
	End run at 213.0'								
		NQ-5					Entire run fractured — Had trouble getting core out of barrel — used hammer		
		5.3'/6.0'							
215			Core loss = 0.7'						
		88%							
				3					
	End run at 219.0'						Bottom at 218.3'		
		NQ-6					No breaks		
220									

FORM D 2113A 5/78

CH2M HILL

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/23/84 FINISH: 5/23/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
220	Smooth, consistent coring rate	NQ-6 continued		3	N/A		Breaks at 220.2'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
							Breaks at 220.25'		
		5.2'/6.0'					Fractured from 221.4' to 222.8'		
			Core loss = 0.8'						
		87%					Break at 224.0'		
							Bottom at 224.2'		
225	End run at 225.0'								
		NQ-7					Break at 225.4'		
							Break at 225.8'		
		5.3'/6.0'					Break at 226.3'		
							Break at 226.9'		
							Fractured at 227.3'		
			Core loss = 0.7'				Fractured at 227.7'		
		88%					Break at 228.2'		
				4			Fractured at 228.8'		
							Fractured from 229.3' to 230.3'		
230							Bottom at 230.3'		
	End run at 231.0.								
	Photo labeled as NQ-9 — Use depth for identification.	NQ-8					Break at 231.3'		
		5.3'/6.0'	Core loss = 0.7'				Break at 232.9'		
							Break at 233.1'		
							Fractured at 233.5'		
		88%					Break at 234.6'		
235									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/23/84 FINISH: 5/23/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
235		NQ-8 continued		4	N/A			CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
							Fractured from 235.9' to 236.3' Bottom at 236.3'		
	End run at 237.0'								
	Stop for packer test 10:45 am — raining hard	NQ-9						Sandy but solid (fine)	
		5.2'/7.0'					Break at 238.2' Break at 238.3' Break at 238.8' Break at 239.0'	Sandy but solid (fine)	
			Core loss = 1.8'				Break at 239.1' Fractured from 239.5' to 240.1'		
240		74%		5			Fractured/crumbled at 240.6 — possible loss to 241.4'		
							Break at 242.0'		
							Bottom at 242.2'		
	1:00 pm End run at 244.0'								
	Only 3"-4" recovered went back in to get remainder.	NQ-10					Layered (horiz.) Break Break at 244.8'	Sandy, noticable layers that break apart easily.	
245		4.8'/7.0'					Break at 245.2' Break at 245.8'	Intermittent sandy layers evident throughout.	
	NOTE: Made 5.5' run first time to 249.5' — only recovered 3"-4". Went back in and cored to 251.0' and retrieved rest. Probably left piece in hole.		Core loss = 2.2'				Fractured/washed out from 245.8' to 246.1' Softer and sandy from 246.1' to 246.7' Break at 247.1' Fractured from 247.6' to 248.0'		
	Recovered 0.8' of NQ-10 with NQ-11.	67%					Break Fractured Bottom at 248.8'		
250									

FORM D 2113A 5/7

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/23/84 FINISH: 5/23/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
250	End run at 251.0'			5	N/A			CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
		NQ-11							
		4.5'/5.0'	Core loss = 0.5'				Break at 252.45' Break at 252.55'		
							Fractured from 253.3' to 253.8'		
		90%		6			Fractured from 254.4' to 255.5'		
255	End run at 256.0'						Bottom at 255.5'		
		NQ-12					Fractured at 256.4' Break at 256.5' Break at 256.7'		
		5.2'/6.0'					Fractured at 257.0'		
			Core loss = 0.8'				Break at 259.0'		
		87%					Break at 259.6'		
260							Fractured from 260.1' to 261.2'		
	End run at 262.0'						Bottom at 261.2'		
		NQ-13					Fractured from 262.8' to 264.4'		
		5.0'/6.0'	Core loss = 1.0'						
		83%					Fractured from 264.9' to 265.1'		
265									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/23/84 FINISH: 5/23/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
265		NQ-13 continued	Core loss = 1.0'	6	N/A			CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
				7			Fractured from 265.5' to 267.0'		
		83%					Bottom at 267.0'		
	End run at 268.0'							Not as fractured	
		NQ-14							
	Only recovered 2.8' with NQ-14 — remainder still in hole	5.3'/5.5'					Break at 270.0'		
270			Core loss = 0.2'				Fractured at 270.6'		
		96%			2nd run		Fractured from 270.8' to 271.4'		
							Break at 272.0'		
							Break at 272.4'		
	End run at 273.5'						Bottom at 273.3'		
		NQ-15							
		2.8'/3.5'	Core loss = 0.7'						
275		80%					Fractured from 275.0' to 276.3'		
	End run at 277.0'						Bottom at 276.3'		
		NQ-16		8			Break at 277.7'		
		5.3'/5.5'	Core loss = 0.2'						
		96%							
280									

FORM D 2113A 5/7

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M' DATE: _____ START: 5/23/84 FINISH: 5/24/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
280		96%	Core loss = 0.2'	8	N/A		Vertical fracture beginning at 280.4'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, good core run, hardly any fractures or breaks	
							Fractured from 281.3' to 282.3'		
	End run at 282.5'						Bottom at 282.3'		
		NQ-17					Fractured from 282.5' to 283.3'	Becoming more fractured	
							Break at 283.8'		
		5.3'/6.0'					Fractured from 284.2' to 287.8'		
285			Core loss = 0.7'						
		88%							
				9			Bottom at 287.8'		
	End run at 288.5'								
		NQ-18					Fractured from 288.5 to 290.0'		
		0.2' sluff							
290		5.2'/5.0'	Core loss = 0'						
		100%							
							Fractured from 292.0' to 292.5'		
	End run at 293.5'						Fractured from 293.0' to 293.5'		
		NQ-19					Bottom at 293.5'		
		5.2'/6.0'					Break at 293.7'		
295									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/24/84 FINISH: 5/24/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION, CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
295		NQ-19 continued		9	N/A		Good quality core	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, mostly fractured with some good quality zones.	
		87%	Core loss = 0.8'				296.0' 296.6'	SAND LENSE	
				10			Fractured at 298.0'		
							Break at 298.5' Bottom at 298.7'		
	End run at 299.5'								
		NQ-20					Fractured from 299.5' to 300.0'		
300		5.2' 5.5'					Fractured from 300.6' to 302.0'		
			Core loss = 0.3'						
		95%							
							Fractured from 304.0' to 304.7' Bottom at 304.7'		
305	End run at 305.0'								
		NQ-21					Fractured at 306.0'		
		5.2' 6.0'							
			Core loss = 0.8'				Fractured at 307.5'		
		87%		11			Fractured at 308.6'		
							Some vertical and minor fractures between Break at 310.0'		
310									

FORM D 2113A 5/7

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ROCK CORE LOG

PROJECT ESI GRANDVEIW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/24/84 FINISH: 5/24/84 INSPECTOR M Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
310	End run at 311.0'			11	N/A		Bottom at 310.2'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured with some good zones.	
		NQ-22					Fractured at 311.5'		
		5.2'/6.0'					Break at 312.8'		
			Core lost = 0.8'				Break at 313.6'		
		87%					Fractured at 314.8		
315							Fractured from 315.3' to 316.0'		
	End run at 317.0'						Bottom at 316.2'		
		NQ-23					Fractured		
		5.2'/6.0'					Fractured at 318.6'		
							Fractured at 319.4'		
320				12					
		87%					Break at 320.1'		
							Fractured from 321.0' to 321.3' Minor fracturing to 322.0'		
	End run at 323.0'						End crumbled Bottom at 322.2'		
		NQ-24					Fractured from 323.0' to 324.0'		
		5.2'/6.0'							
325									

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ROCK CORE LOG

OJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

RILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

EVATION ____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: ____ START: 5/24/84 FINISH: 5/24/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
325		NQ-24 continued		12				CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, better quality, still some fractures.	
		87%	Core loss = 0.8'				Fractured from 327.0' to 328.1'	Becoming stickier in fractured zones — minor fractures but holding together.	
	End run at 329.0'						Bottom at 328.2'		
		NQ-25					Fractured from 329.0' to 329.4'		
330		5.2'/5.5'					Fractured from 330.4' to 330.8'		
			Core loss = 0.3'	13			Fractured from 331.8' to 332.4'		
		95%					Fractured from 333.2' to 334.2'		
	End run at 334.5'						Bottom at 334.2'		
		NQ-26					Fractured		
335		5.2'/5.5'							
			Core loss = 0.3'				Fractured from 336.1' to 336.5'		
		95%					Fractured from 337.1' to 337.4'		
							Fractured at 338.5' Minor fractures between Fractured at 339.5' Bottom at 339.7'		
340	End run at 340.0'								

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/24/84 FINISH: 5/25/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
340	Coring rate = ±2 min/ft	NQ-27		13	N/A		Break at 340.3'	CLAYEY SILT/SILTY CLAY, medium gray moist, hard, fractured	
							Break at 340.7'		
		5.2'/6.0'		14			Fractured from 341.8' to 342.8'		
		87%	Core loss = 0.8'				Fractured from 343.4' to 345.2'		
345							Bottom at 345.2'		
	End run at 346.0'								
		NQ-28					Fractured throughout from 346.0' to 348.7'		
		5.3'/6.0'							
							Small solid piece from 348.7' to 349.3'		
		88%	Core loss = 0.7'						
350							Bottom at 351.3'		
	6:00 pm 5/24/84 End run at 352.0'								
	Upper ± 0.8' sluff 10:00 am 5/25/84	NQ-29					Upper 1.0' of undisturbed core was wet and soft from soaking over night.		
		3.5'/3.5'	Core loss = 0'	15					
		100%					Fractured from 354.8' to 355.5'		
355									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/25/84 FINISH: 5/27/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
355	End run at 355.5'	100%		15	N/A		Crumbled Bottom at 355.5'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, mostly fractured	
		NQ-30							
		5.3'/5.5'					Fractured throughout run — would crumble if pressured but holding together		
		96%	Core loss = 0.2'						
							Small solid piece from 359.4' to 359.9'		
360									
	End run at 361.0'						Bottom at 360.8'		
		NQ-31					Upper 1.3' fractured		
		5.3'/5.5'		16					
		96%	Core loss = 0.2'						
365							Fractured from 365.0' to bottom		
	End run at 366.5' 5/29/84						Bottom at 366.3'		
		NQ-32							
		5.0'/5.0'							
			Core loss = 0'						
		100%					Break at 369.5'		
370									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/29/84 FINISH: 5/29/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
370		100%		16	N/A		Fractured from 370.2' to 371.5' Had to hammer lower 1.0' out of barrel	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard	
	End of run at 371.5'								
		NQ-33							
	Having trouble getting last 2 runs out of tube						Fractured from 371.5' to 376.8'	Highly fractured	
		5.3' 6.5'							
			Core loss = 1.2'						
375		82%		17			Had to hammer lower 1.5' out of barrel		
							Bottom at 376.8'		
	End run at 378.0'								
		NQ-34							
		5.1' 6.0'					Fractured at 379.2'		
380			Core loss = 0.9'				Fractured from 380.0 to 380.8'		
		85%					Fractured from 381.3' to 383.1'		
	End run at 384.0'						Bottom at 383.1'		
		NQ-35					Fractured from 384.0' to 385.0'		
385				17 18					

HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/29/84 FINISH: 5/29/84 INSPECTOR M. Christiar

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
385		NQ-35 continued		18	N/A		Fractured from 385.6' to 386.6'	CLAYEY SILT/SILTY CLAY, medium gray, hard, (moist to dry), crumbly, fractured	
		5.0'/5.5'							
		91%	Core loss = 0.5'				Fractured from 387.3' to 389.0'		
							Bottom at 389.0'		
	End run at 389.5'						Fractured from 389.5' to 391.5' but holding together		
		NQ-36							
390							Heavily fractured from 391.5' to 394.8'		
		5.3'/6.0'							
			Core loss = 0.7'						
		88%							
							Bottom at 394.8'		
395	End run at 395.5'								
		NQ-37		19			Fractured from 395.5' to 396.1'		
		5.3'/6.0'	Core loss = 0.7'				Fractured from 397.1' to 400.8'		
		88%							
400									

HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-9

WATER LEVEL N.M. DATE: _____ START: 5/29/84 FINISH: 5/29/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
400				19	N/A			CLAYEY SILT/SILTY CLAY, medium gray, dry, hard, fractured and crumbly.	
							Bottom at 400.8'		
	End run at 401.5'								
	Terminate hole at 401.5'								

FORM D 2113A 5/7

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
B18066.A0	D-10	SHEET 1 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION N511,495± E363,700±

ELEVATION _____ DRILLING CONTRACTOR Hiddleston Drilling

DRILLING METHOD AND EQUIPMENT Air and Water Rotary

WATER LEVEL AND DATE _____ START 5/16/84 FINISH 5/17/84 LOGGER C.E. Jenkins

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					Sandy, silty layers of ash, clay strata		Bentonite poured in annulus between casing and hole — foam used.
10							
					18′		
20					5:45 pm End of day 8:30 am 5/17/84 SANDY GRAVEL, medium to coarse grain sand, 3/4" minus, dense		Sandy gravels at 18′
30							
40					Sandier at 40′ 9:30 am		
					46′		
					Poorly graded sand, medium to fine grain, clean, no gravels		Drilling is smooth and easy
50							
					55′		
					SANDY CLAY, tan, medium to fine grain, soft, sticky, slightly silty, stiff to soft particles		
60					10:15 am		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
B18066.A0	D-10	SHEET 2 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION N511,495± E363,700±

ELEVATION _____ DRILLING CONTRACTOR Hiddleston Drilling

DRILLING METHOD AND EQUIPMENT Air and Water Rotary

WATER LEVEL AND DATE _____ START 5/16/84 FINISH 5/17/84 LOGGER C.E. Jenkins

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	60					SANDY CLAY, tan, medium to fine grain, stiff to soft particles, some coarse sand/ pea gravel		Drilling is smooth and easy
	70							
						Cemented sand particles in at approximately 79'		
	80					10:45 am		
						88'		
	90					CLAYEY SILTY SAND, poorly graded (fine) dense, tan		
	100					11:20 am		
						Sand is cleaner at 107'		
						Tuff particles present		
	110							
	120					12:00 pm		

CH2M HILL

PROJECT NUMBER	BORING NUMBER
B18066.A0	D-10 SHEET 3 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION N511,495± E363,700±

ELEVATION ______ DRILLING CONTRACTOR Hiddleston Drilling

DRILLING METHOD AND EQUIPMENT Air and Water Rotary

WATER LEVEL AND DATE ______ START 5/16/84 FINISH 5/17/84 LOGGER C.E. Jenkins

ELEVATION	DEPTH BELOW SURFACE	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	SYMBOLIC LOG	COMMENTS
		INTERVAL	TYPE AND NUMBER	RECOVERY	6"-6"-6" (N)	NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	120					CLAYEY SILTY SAND (as above)		
						129′		
	130					CLAY, sandy, silty, tan, soft to stiff		Drilling is smooth and easy
						138′		Depth of casing
	140					1:10 pm		
	150							
	160					1:30 pm		
	170							
						178′		
	180					SILTY CLAY, blue-gray, stiff 1:45 pm		

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CH2M HILL

PROJECT NUMBER	BORING NUMBER	
B18066.A0	D-10	SHEET 4 OF 4

SOIL BORING LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION N511,495± E363,700±

ELEVATION _____ DRILLING CONTRACTOR Hiddleston Drilling

DRILLING METHOD AND EQUIPMENT Air and Water Rotary

WATER LEVEL AND DATE _____ START 5/16/84 FINISH 5/17/84 LOGGER C.E. Jenkins

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	180					SILTY CLAY, blue-gray, stiff		
	190					2:00 pm Bottom of hole		

CH2M HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 6/2/84 FINISH: 6/2/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
395	End run at 396.0'	87%		18	N/A		Bottom at 395.2'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
		NQ-35					Fractured from 396.0' to 397.4'		
		5.3'/5.5'							
							Fractured at 398.5'		
		96%		19			Break at 399.9'		
400							Fractured from 400.3' to 401.3'		
	End run at 401.5'						Bottom at 401.3'		
	Terminate hole at 401.5'								
405									

CH2M HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 6/2/84 FINISH: 6/2/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
380		NQ-32 continued		17	N/A		Fractured	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
			Core loss = 0.8'						
		87%							
							Bottom at 383.7'		
	End run at 384.5'								
		NQ-33							
385		5.2'/5.5'							
							Fractured from 386.0' to 386.7'		
			Core loss = 0.3'						
		95%					Fractured from 387.6' to 389.7'		
				18					
							Bottom at 389.7'		
390	End run at 390.0'								
		NQ-34					Fractured and washed-out throughout run		
		5.2'/6.0'							
			Core loss = 0.8'						
		87%							
395									

CH2M HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 6/2/84 FINISH: 6/2/84 INSPECTOR M. Christi

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
365		NQ-29 continued	Core loss = 0.3'	15	N/A		Fractured from 365.0' to 366.0' but holding together	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, some fractured zones, but mostly good quality	
	End run at 367.0'	95%					Fractured from 366.0' to 366.7' Bottom at 366.7'		
		NQ-30		16			Break at 367.8'		
		5.2'/6.0'					Break at 368.6'		
			Core loss = 0.8'				Break at 369.4'		
370		87%					Fractured from 369.4' to 372.2' (sample got mixed when removing from tube)		
							Bottom at 372.2'		
	End run at 373.0'								
		NQ-31					Fractured from 373.3' to 374.0'		
		5.1'/5.5'					Break at 374.6'		
375			Core loss = 0.4'				Break at 375.6'		
		93%					Fractured from 376.5' to 378.1'		
	End run at 378.5'			17			Bottom at 378.1'		
		NQ-32							
		5.2'/6.0					Minor fractures throughout run but holding together		
380									

CH2M HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 6/2/84 FINISH: 6/2/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
350		NQ-27		14	N/A			CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, good quality,	
		5.2' 5.5'							
		95%	Core loss = 0.3'						
			Core loss = 0.3'				Fractured from 354.0' to 355.2' (probably compression)		
355	End run at 355.5'						Bottom at 355.2'		
		NQ-28					Fractured from 355.5' to 355.9'		
				15					
		5.2' 6.0'					Break at 357.2' Break at 357.9'		
			Core loss = 0.8'				Break at 358.5'		
		87%	Core loss = 0.8'						
360							Bottom at 360.7'		
	End run at 361.5'						361.2' 361.3'	SAND LENSE	
		NQ-30					Break at 362.0'		
		5.2' 5.5'							
			Core loss = 0.3'				Break at 363.2' Break at 363.9'		
		95%	Core loss = 0.3'				Fractured from 364.3' to 365.0'		
365									

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CH2M HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 6/1/84 FINISH: 6/2/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
335		NQ-24 continued		13	N/A		Fractured at 335.5'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
		5.3' 6.0'							
		88%	Core loss = 0.7'				Fractured from 337.1' to 338.8'		
							Bottom at 338.8'		
	End run at 339.5'								
		NQ-25					Fractured		
340		5.2'							
		5.5'					Fractured from 341.6' to 342.1'		
		95%	Core loss = 0.3'						
							Fractured from 343.7' to 344.0'		
	5:30 pm						Break at 344.5'		
345	End run at 345.0' 8:55 am 6/2/84	NQ-26					Break at 345.2' Break at 345.7'	Not as fractured	
		4.9 5.0'		14			Break at 346.6' Break at 346.8' Break at 347.0'		
			Core loss = 0.1'				Break at 347.7'		
		98%					Break at 348.4' Break at 348.5'		
350	End run at 350.0'						Bottom at 349.9'		

CH2M HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 6/1/84 FINISH: 6/1/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
320		NQ-21 continued		11	N/A		Bottom at 321.0'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
	End run at 322.0'								
		NQ-22					Fractured from 322.5' to 324.3'		
		5.2'/6.0'							
			Core loss = 0.8'	12					
325		87%							
							Fractured from 326.3' to 326.8'		
							Bottom at 327.2'		
	End run at 328.0'								
		NQ-23					Break at 328.8'		
		5.2'/5.5'					Break at 329.2' Fractured to 329.8'		
330			Core loss = 0.3'				Fractured from 330.5' to 331.5'		
		95%							
							Fractured at 332.1'		
							Break at 333.0'		
	End run at 333.5'						Bottom at 333.2'		
		NQ-24					Fractured to 334.0'		
335									

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 6/1/84 FINISH: 6/1/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
305	2:00 pm	NQ-19 continued		10	N/A		Fractured and broken from 305.7' to 307.2'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, fractured	
		5.2'/6.0'							
			Core loss = 0.8'						
		87%					Fractured from 308.0' to 309.2'		
							Bottom at 309.2'		
	End run at 310.0'								
310		NQ-20					Fractured from 310.0' to 310.6'		
		4.8'/6.0'					Break at 311.5'		
							Break at 312.0'		
			Core loss = 1.2'	11			Break at 312.2'		
		80%					Break at 312.7'		
							Break at 313.3'		
							Fractured from 314.0' to 314.8'		
315	End run at 316.0'								
		NQ-21							
		5.0'/6.0'					Break at 317.6'		
			Core loss = 1.0'				Break at 318.2'		
							Fractured from 318.7' to 321.0'		
		83%							
320									

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Iddho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 6/1/84 FINISH: 6/1/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
290		NQ-16 continued		9	N/A		Break at 291.0'	Organic layers from 290.2' to 290.7'	
		80%					Bottom at 291.2'	CLAYEY SILT/SILTY CLAY, with layers and some intermixed fine sand, medium gray, moist, mostly hard	
	End run at 292.5'								
		NQ-17					Fractured Break at 293.0'		
							Washed out at 293.8'	Organic, layered	
		5.1'/6.0'					Soft from 294.0' to 294.9'	Concentrated organic layer at 294.5'	
295			Core loss = 0.9'						
		85%						Less sand from 296.8'	
							Bottom at 297.6'		
	End run at 298.5'								
		NQ-18							
							Break at 299.8'		
300		5.2'/5.5'					Break at 300.5'	Softer from 300.8' to 301.2'	
		95%	Core loss = 0.3'	10			Fractured at 301.2		
							Fractured from 302.0' to 303.0'		
	End run at 304.0'						Breaks — 303.2' and 303.4' Bottom at 303.7'		
		NQ-19					Fractured and broken from 304.0' to 305.0'		
305									

FORM D 2113A 5/78

HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 6/1/84 FINISH: 6/1/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
275		NQ-14 continued		7	N/A		Break at 275.5' Fractured from 275.7' to 275.9'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard	
			Core loss = 0.7'				Fractured from 276.4' to 276.8'		
		88%		8			Somewhat fractured from 277.7' to 278.8'		
							Bottom at 278.8'		
	End run at 279.5'								
		NQ-15						Becoming sandy at 279.8'	
280							Fractured at 280.1' Break at 280.3'		
		5.1'/6.5'					Fractured at 281.1'		
			Core loss = 1.4'				Break at 283.3'	Soft, sandy layer from 282.9' to 283.7'	
		78%					283.0' SAND LENSE 283.5'	CLAY layer from 283.7' to 284.1'	
							Minor fractures Bottom at 284.6'		
285	End run at 286.0'								
		NQ-16					Break at 286.6'	Sandy	
		5.2'/6.5'					Break at 287.1' Fractured to 287.6'		
			Core loss = 1.3'				Break at 288.6'		
		80%		9				Soft sand at 289.0' and 289.8' (LENSE)	
290									

FORM D 2113A 5/78

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 6/1/84 FINISH: 6/1/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
260		NQ-11 continued		5	N/A		Bottom at 260.2'	CLAYEY SILT/SILTY CLAY, medium gray, moist, hard, some fractures	
	End run at 261.5'								
		NQ-12							
							Fractured from 262.5' to 263.1'		
		5.2'/6.0'							
			Core loss = 0.8'				Break at 264.5'		
265		87%		7					
							Bottom at 266.7'		
	End run at 267.5'								
		NQ-13							
							Break at 268.1'		
		5.2'/6.0'					Break at 269.3'		
270							Fractured from 270.2' to 270.6'	SAND LENSE	
		87%	Core loss = 0.8'				Fractured at 271.1'		
							Fractured from 272.0' to 272.7'		
	End run at 273.5'								
		NQ-14					Break at 273.8' Break at 273.9'		
		5.3'/6.0'					Break at 274.1' Fractured from 274.5' to 275.0'		
275									

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 5/31/84 FINISH: 6/1/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
245		NQ-9 continued		5	N/A		Periodic breaks and fractures	CLAYEY SILT/SILTY CLAY, with some fine sandy zones, medium gray, moist, hard, with periodic breaks and some fractured zones.	
		5.1'/6.5'	Core loss = 1.4'						
		78%					Bottom at 248.1'		
	End run at 249.5'								
		NQ-10					Break at 249.9'		
250		5.2'/5.5'					Break at 250.6' Fractured from 250.9' to 251.5'		
			Core loss = 0.3'						
		95%					Fractured from 252.4' to 254.7'		
				6					
	End run at 255.0'						Bottom at 254.7'		
255	Begin 6/1/84	NQ-11					Break at 255.3'	Not as fractured. Much better quality core. No sand.	
		5.2'/6.5'							
			Core loss = 1.3'				Slightly fractured at 258.0'		
		80%					Fractured at 258.9'		
							259.0' 259.2' Fractured at 259.5'	SAND LENSE	
260							Break at 260.0'		

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ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 5/31/84 FINISH: 5/31/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
230		NQ-7		4	N/A		Break at 230.2' Break at 230.4' Soft	FINE SANDY SILT, medium gray, moist, hard with some soft layers and organic layers	
		5.1'/6.0'					Lightly fractured Break at 231.8'		
			Core loss = 1.0'				Break at 232.1' Fractured at 233.0'		
		83%							
							Bottom at 235.0'		
235	End run at 236.0'								
	Photo labeled as 236.5 should be 236.0'						Break at 236.1' Break at 237.0'		
		5.0'/7.0'					Washed at 237.4' Break at 237.7'		
			Core loss = 2.0'				Fractured at 238.9'		
		71%					Fractured from 239.4' to 240.2'		
240				5			Bottom at 241.0'		
	Bottom at 243.0'								
	Shot sample beyond end of rods when removing from tube may not be in ~~correct order.~~	NQ-9					Periodic breaks with some fractured zones (not logged by depth ~~due to question of~~ accuracy)	Becoming more silty with less sand although some sand layers are still present	
		5.1'/6.5'							
245									

FORM D 2113A 5/78

HILL

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 5/31/84 FINISH: 5/31/84 INSPECTOR M. Christia

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: ROD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
215		NQ-4 continued		3	N/A		Bottom at 215.1'	FINE SANDY SILT, medium gray, moist, soft but more hard layers becoming apparent and becoming siltier at bottom of NQ-5. Organics still present	
	Bottom at 216.5'						Break at 216.7'		
		NQ-5					Break at 217.0'		
	Probably losing core recovery due to wash out at soft, sandy layers	5.1'/7.0'					Break at 217.6'		
							Break at 218.9'		
		73%	Core loss = 1.9'				Break at 219.5'		
							Break at 219.9'		
220							Rock from 220.6' to 220.7'		
							Bottom at 221.6'		
	End run at 223.5'								
		NQ-6					Break at 223.9'		
		4.8'/6.5'					Break at 224.2'		
							Break at 224.4'	Mushy	
225							Break at 225.6'	Still sandy, but becoming harder with less breaks	
			Core loss = 1.7'						
		74%							
				4			Bottom at 228.3		
	End run at 230.0'								
230									

HILL

B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 5/31/84 FINISH: 5/31/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	FRACTURES PER FOOT	DESCRIPTION: TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
200		NQ-2 continued	Core loss = 1.3'	1	N/A			FINE SANDY SILT, medium to gray, moist, soft with some hard spots, organic layers throughout	
		80%					Bottom at 201.7		
	End run at 203.0'								
		NQ-3		2			Multiple horizontal breaks from 203.0' to 204.5'		
		5.3'/7.0'							
205			Core loss= 1.7'						
		76%							
							Bottom at 208.3'		
210	End run at 210.0'								
		NQ-4							
		5.1'/6.5'							
			Core loss = 1.4'				Break and slight fracture		
		78%							
							Fractured and washed		
215				3					

FORM D 2113A 5/78

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B18066.A0

ROCK CORE LOG

PROJECT ESI GRANDVIEW WATER MONITORING WELLS LOCATION Grandview, Idaho

DRILLING METHOD NQ Wireline Core DRILLERS & EQUIPMENT Erickson-Ford/Longyear 44

ELEVATION _____ ORIENTATION Vertical BORE HOLE: D-10

WATER LEVEL N.M. DATE: _____ START: 5/31/84 FINISH: 5/31/84 INSPECTOR M. Christian

DEPTH	COMMENTS: TESTS, INSTRUMENTATION, CORING RATE AND SMOOTHNESS, CORING FLUID LOSS	CORE RUN LENGTH AND RECOVERY (%)	CORE LOSS ZONE	BOX NUMBER	DISCONTINUITIES: RQD	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (TIGHTNESS, PLANARITY, SMOOTHNESS, FILLING, STAINING, ORIENTATION)	LITHOLOGY: MINERALOGY, CLASSIFICATION, COLOR, GRAIN SIZE, ALTERATION; CEMENTATION, HARDNESS, WEATHERED STATE	GRAPHIC LOG
0									
	Bottom of existing hole = 190.0'								
190	Re-enter and begin coring at 190.0' after cleaning out ±8' of sluff.	NQ-1		1	N/A			FINE SANDY SILT/SILTY FINE SAND, brown to light gray, moist, becoming harder with depth, few horizontal breaks with layers or organics throughout	
		5.0'/6.5'							
			Core loss = 1.5'						
		77%							
							Bottom at 195.0'		
195									
	End run at 196.5'								
		NQ-2							
		5.2'/6.5'					Multiple horizontal breaks throughout run		
		80%							
200									

FORM D 2113A 5/78

HILL

D13066.00 | V-16 SHEET 1 OF 2

SOIL BORING LOG

PROJECT ESI GRANDVIEW MONITORING WELLS LOCATION ON N.E. BANK OF TRENCH 12 (NORTH)

ELEVATION _____ DRILLING CONTRACTOR HIDDLESTON DRILLING

DRILLING METHOD AND EQUIPMENT ROTARY AIR & WATER

WATER LEVEL AND DATE N/A START 10/22/84 1230 FINISH 10/23/84 1300 LOGGER CE JENKINS

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: TIME INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
10'					SANDY GRVL. - GRVLY SAND SOME FINES, 3/4" MINUS, ROCK CHIPS, MED. TO FINES SANDS		BEGAN @ 1230 10/22/84
20'	1320						
30'							
					38'		
40'	1415				SANDS, MED. TO CRSE GRAIN, SOME FINE GRAIN ROUNDED & ANGULAR, SOME CEMENTED SAND PARTICLES, SOME SML. ROCK CHIPS (SLIGHTLY GRVLY)		
50'							
					55'		
60'	1525				CLAY, TAN - BRN, SANDY, TUFF PARTICLES PRESENT & CEMENTED SAND - STONE, PLASTIC,		

REV 11/82 FORM D1586

HILL

D10066.00 | U-16 SHEET 2 OF 2

SOIL BORING LOG

PROJECT ESI GRANDVIEW MONITORING WELLS LOCATION ON N.E. BANK TRENCH 12 (NORTH)

ELEVATION _____ DRILLING CONTRACTOR HIDDLESTON DRILLING

DRILLING METHOD AND EQUIPMENT ROTARY AIR & WATER

WATER LEVEL AND DATE N/A START 10/22/84 1230 FINISH 10/23/84 1300 LOGGER CR JENKINS

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: TIME INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	70'					CLAY - SANDY, TAN-BRN. TUFF & CEMENTED SANDSTONE PARTICLES PRESENT		
	80'	1630				END OF DAY 10/22/84 — 80'		
						BEGIN DAY 10/23/84 1100		
	90'							
	100'	1300				— 100'		BOTTOM OF HOLE
	110'							
	120'							

REV 11/82 FORM D15

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
B18066.CO	D-15	SHEET 1 OF

SOIL BORING LOG

PROJECT ESI GRANDVIEW LOCATION Northwest Corner OUTSIDE FENCE

ELEVATION _____ DRILLING CONTRACTOR HIDDLESTON (KEN)

DRILLING METHOD AND EQUIPMENT SPEEDSTAR 15 ROTARY AIR T 7/8" TRICONE 8" dRIVEN CASING

WATER LEVEL AND DATE _____ START 10/8/84 @ 842 FINISH 10/9 @ 1222 LOGGER M. JEWETT

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL TIME	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	0842	✓			MEDIUM GRAVEL WITH SILT, TRACE COARSE SAND, BROWN TO CLEAR.		DRILLED WITH FOAM. BENTONITE ADDED ALONG ANNULUS OF OUTER CASING.
		✓			SILTY MED TO COARSE SAND, TRACE FINE GRAVEL		
10		✓			SILTY MED TO COARSE SAND AND FINE TO MED GRAVEL. WELL GRADED. ROCK CHIPS PRESENT. BROWN		cobbles in walls of slush pit.
					SAME		
20	0915 0946	✓			same. some SILT BALLS present. 20		Interbedded silts?
					SILT WITH SOME GRAVEL AND SAND SILT CONTAINS TRACE FINE SAND · TAN		Appears interbedded.
					SAME, LESS GRAVEL.		
30		✓			SAME COMPOSITION BUT DOES NOT APPEAR INTERBEDDED. TUFF CHIPS PRESENT, (HETEROGENOUS MIX).		CASING ADVANCING under own weight AT TIMES.
40	1017 1036	✓			AS ABOVE. PARTICLES of fine friable sandstone, trace gravel. 41		"
					fine silty sand, tuff chips, some coarse sand.		"
50		✓			fine sand, some silt. TRACE TUFF chips and coarse sand.		"
					SAME. TRACE LIGHTLY CEMENTED FINE TO MED SANDSTONE.		"
60	1105 1140	✓			AS ABOVE PLUS possible thin interbeds of SILT.		"

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
	D-15	2	

SOIL BORING LOG

PROJECT _____ LOCATION _____

ELEVATION _____ DRILLING CONTRACTOR _____

DRILLING METHOD AND EQUIPMENT _____

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION	DEPTH BELOW SURFACE	SAMPLE: INTERVAL (TIME)	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						AS ABOVE		DIFFICULT TO DISTINGUISH IF interbeds present. (CUTTINGS pulverized) CASING ADVANCES EASILY & under own weight.
	70		✓			SILT WITH TRACE FINE SAND. TRACE MED TO COARSE SAND. PARTICLES OF FINE SANDSTONE. APPEARS INTERBEDDED.		
						75		
	80	1215 1250	✓			SILTY FINE TO MED SAND. CHIPS OF FINE TO MED SANDSTONE AND TUFF.		
						SAME		
	90		✓			SAME, some BLACK PARTICLES.		
						92		
			✓			TAN SILT WITH FINE SAND. POSSIBLE interbeds. SANDSTONE CHIPS & till present.		
	100	1320 1345	✓			SAME.		
						SLIGHTLY MORE SANDY, More Sandstone chips.		
	110		✓			AS AT 92'. SILTSTONE AND SANDSTONE, AND TRACE BLACK PARTICLES present.		
						SAME.		
	120	1417	✓			SAME, some TUFF CHIPS.		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
	D-15	3	

SOIL BORING LOG

PROJECT _____ LOCATION _____

ELEVATION _____ DRILLING CONTRACTOR _____

DRILLING METHOD AND EQUIPMENT _____

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL (TIME)	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	1440				TAN AND BROWN FINE TO MED SAND STONE, SILTSTONE, SILT AND FINE SAND.		STILL APPEARS INTERBEDDED.
130		✓			SILT W/ FINE SAND (TRACE), SAND-STONE CHIPS, SILTSTONE CHIPS STILL PRESENT.		
					SAME		
	1506						
140	1533	✓			SAME		
					SAME		
					SAME. TRACE COARSE SAND GRAINS.		
150		✓					
					152		BLUE COLOR FROM HERE TO TD.
					SAME. TRACE BLUE CLAY BALLS.		
		✓			BLUE CLAY, WITH TAN SILT AND TRACE FINE SAND, SANDSTONE CHIPS.		
					158		TD CASING
	1603						
160	1620	✓			BLUE CLAY, SOME TAN SILT, SOME SANDSTONE CHIPS. BLUE CLAY CONTAINS TRACE FINE SAND		
	0910				SAME, TRACE ORGANIC PARTICLES		
170		✓			AS ABOVE.		
					AS ABOVE		
							INCREASE IN DRILL SPEED LAST FIVE FEET.
180	0925	✓			AS ABOVE		

REV 11/82 FORM D1586

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET 4 OF 5
	D-15	

SOIL BORING LOG

PROJECT _____ LOCATION _____

ELEVATION _____ DRILLING CONTRACTOR _____

DRILLING METHOD AND EQUIPMENT _____

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					AS ABOVE		
190		✓			BLUE CLAY w/ SOME FINE SAND. TRACE TAN CUTTINGS. ORGANICS STILL PRESENT. POSSIBLE INTERBEDS of BLUE CLAY WITH BLUE FINE SAND.		INCREASE IN SPEED
200	0943 1020	✓			SAME WITH TRACE WELL CEMENTED BLUE FINE SANDSTONE CHIPS. METALLIC OR MICA PARTICLES IN THE CHIPS. ORGANICS STILL PRESENT IN TRACE TO SOME AMOUNTS.		DECREASE IN DRILL SPEED
					222		CUTTINGS FULLY RECOVERED.
					MIX OF SILTY FINE SAND AND DARK ORGANIC MATERIAL.		
		✓			SILT AND SOME FINE SAND, ORGANICS.		
210					210		
					SILT OR CLAY, TRACE SAND. NUMEROUS ORGANICS, SOME FRIABLE DENSE FINES.		
					AS ABOVE.		
220	1108	✓					
					AS ABOVE.		
					AS ABOVE.		DIFFICULT TO RECOVER CUTTINGS. DRILL SPD. STILL SLOW.
230		✓					
					AS ABOVE		
240	1139	✓			AS ABOVE.		

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET 5 OF 5
	D-15	

SOIL BORING LOG

PROJECT _____ LOCATION _____

ELEVATION _____ DRILLING CONTRACTOR _____

DRILLING METHOD AND EQUIPMENT _____

WATER LEVEL AND DATE _____ START _____ FINISH _____ LOGGER _____

ELEVATION / DEPTH BELOW SURFACE	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SAMPLE: RECOVERY	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: NAME, GRADATION OR PLASTICITY, PARTICLE SIZE DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					AS ABOVE		
250		✓			AS ABOVE		PICKUP IN SPEED 250 to 260
					AS ABOVE.		
260	1200	✓			AS ABOVE. CUTTINGS SHOW DIFFERING DENSITIES.		SLOW DOWN IN SPEED.
					AS ABOVE		
270	1222	✓			AS ABOVE.		
					TD 270'		