DESIGN HYDROGEOLOGIC REPORT ADDENDUM
FOR
LANDFILL NO. 6
AREA D NORTH
CANTON, NORTH CAROLINA

Prepared for

EVERGREEN PACKAGING
CANTON, NORTH CAROLINA

August 2013

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8/15/13

SME
Sevee & Maher Engineers, Inc.

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DESIGN HYDROGEOLOGIC REPORT ADDENDUM
FOR LANDFILL NO. 6 – AREA D NORTH
BLUE RIDGE PAPER PRODUCTS INC. – CANTON MILL
DBA EVERGREEN PACKAGING
CANTON, NORTH CAROLINA

1.0 INTRODUCTION

1.1 Purpose and Scope

Blue Ridge Paper Products Inc. (Blue Ridge) retained Sevee & Maher Engineers, Inc. (SME) to prepare a design and North Carolina Department of Environment and Natural Resources (NCDENR) application to expand Landfill No. 6 at their Canton Mill with a new cell designated as Area D North. Landfill No. 6, is a "Sanitary Landfill", which receives "Industrial Solid Waste" from the pulp and paper manufacturing process as defined by NCDENR Solid Waste Management Regulations, specifically Rule 15A NCAC 13B.[1] Area D North is part of the previously investigated portion of Landfill No. 6 described in a report titled "Hydrogeologic Report for Landfill No. 6 Areas D and E" (SME, 2008). This Report documents the findings of additional investigative activities completed in 2013 that were completed in accordance with the Site Investigation Work Plan for Area D North (SME, 2012) (Work Plan), which was submitted to and approved by NCDENR. The 2013 Site Investigation supplements earlier investigations (SME, 2008) and is an addendum to the 2007 Landfill No. 6 design application to NCDENR.

The purpose of the site investigation was to gather additional hydrogeologic information to supplement the "Design Hydrogeologic Report – Landfill Areas D and E" (SME, 2008), specifically for design of Area D North. This investigation, along with the previously completed investigations, provided a minimum coverage of one piezometer per acre in the Area D North solid waste footprint. Furthermore, the site investigation also provided adequate information to demonstrate compliance required by Rule 15A NCAC 13B.0503 of the NCDENR for a minimum groundwater separation from the base of the Landfill.

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[1] 15A NCAC 13B .0503, SITING AND DESIGN REQUIREMENTS FOR DISPOSAL SITES, § 2.d.i, states: "A site, except for land clearing and inert debris landfills subject to Rule .0564(8)(e) of this Section, shall be designed so that the bottom elevation of solid waste will be a minimum of four feet above the seasonal high water table ."

The 2013 Site Investigation objectives were accomplished by performing the following activities:

- Complete additional borings and coring of bedrock;
- Install additional piezometers to supplement existing piezometers and monitoring wells to measure groundwater elevations in and adjacent to Area D North;
- Perform additional in-situ slug testing in select piezometers installed in Area D North to measure hydraulic conductivities beneath Area D North;
- Monitor groundwater levels over time to estimate the seasonal-high groundwater table specifically within Area D North; and,
- Prepare a seasonal-high groundwater table map and update the bedrock surface map using the new information.

1.2 Report Organization

This addendum Report is divided into six sections specific to Area D North: Section 2.0 provides a summary of background information. The regional hydrogeologic interpretation was previously described in SME, 2008, which was corroborated by the findings of the 2013 Site Investigation. The technical approach taken to complete the various tasks in the 2013 Site Investigation and the results of those efforts are presented in Section 3.0. A summary of the geologic and hydrogeologic characteristics specific to Area D North are discussed in Sections 4.0 and 5.0, and include an updated competent bedrock surface map and seasonal-high groundwater surface map. A summary of the major conclusions of the hydrogeologic addendum for Area D North are presented in Section 6.0.

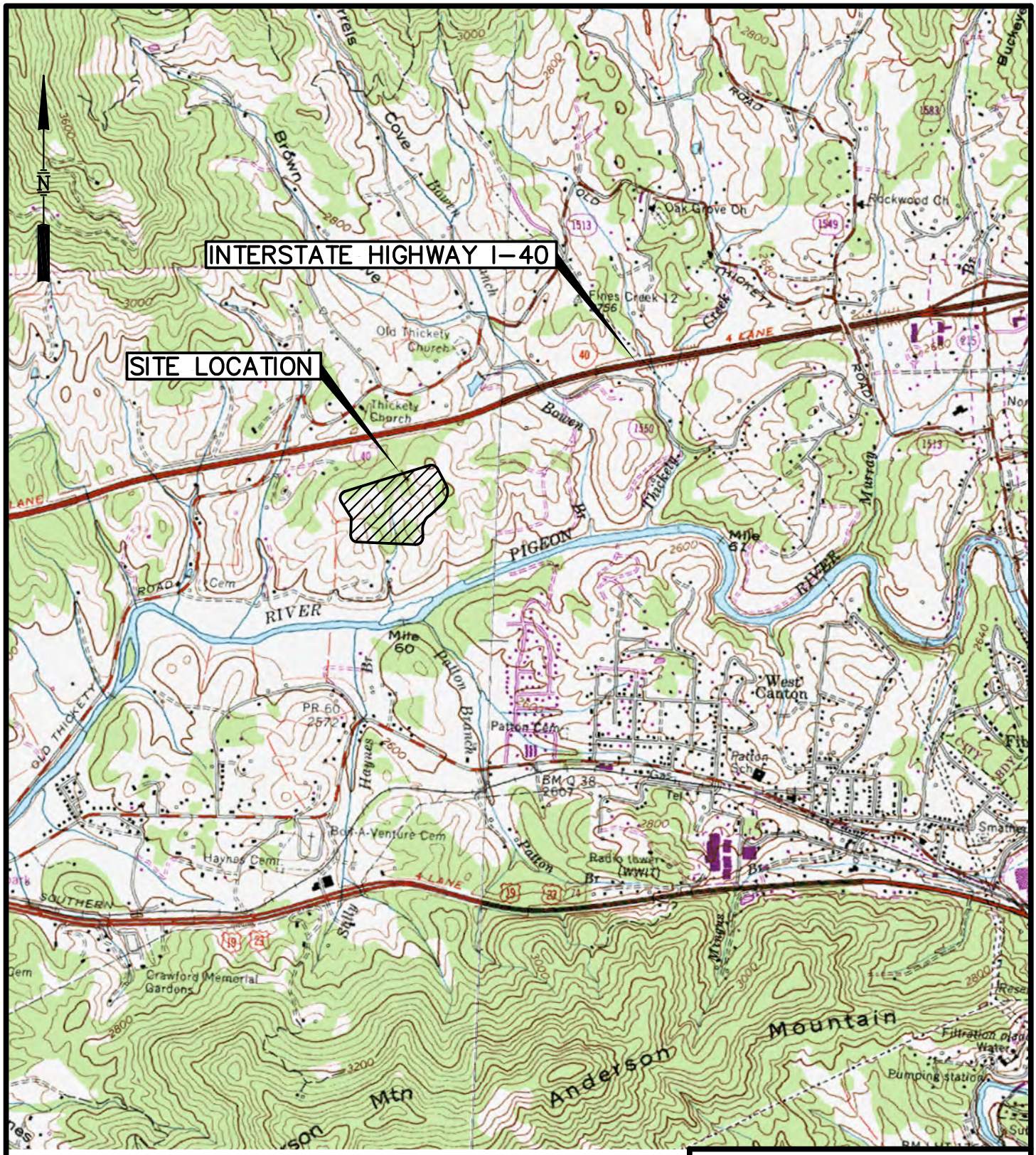
2.0 BACKGROUND SITE INFORMATION

Landfill No. 6 has been in operation since 1984 and currently consists of Areas A through D South. Areas A through C are currently inactive, have received final cover, and are considered to be closed as of 2013. Area D will include two phases known as Area D South and Area D North. Area D South was permitted as an Industrial Solid Waste Landfill Facility by NCDENR on July 17, 2009 (Facility Permit No. 44-06; Doc ID: 7823) and a modified permit issued October 27, 2009 (Facility Permit No. 44-06; Doc ID: 8791); it was constructed in 2009; and waste placement began in 2010 and continues in 2013. Area D North is the focus of this Report and has a solid waste footprint of approximately 15 acres. Area E is expected to be permitted and constructed in the future and would be located north of Area D North.

Area D North was included in past assessments and site investigations as part of earlier landfill permits. Law Engineering and Testing Company (Law) prepared an *Geotechnical Exploration and Evaluation and Conceptual Site Development Recommendations* for the entire Landfill No. 6 site in 1982, which included a detailed description of the interpreted hydrogeologic setting (Law, 1982). Also, Sirrine Environmental Consultants (Sirrine, 1989), Roy F. Weston, Inc. (Weston, 1995) and Sevee & Maher Engineers, Inc. (SME, 1995 and 2008) have prepared designs, construction documentation, and hydrogeologic reports which provide additional hydrogeologic information related to Landfill No. 6. Previous site investigations included Area D North.

2.1 Site Location

Area D North is located about two miles northwest of the City of Canton in Haywood County, North Carolina as shown in Figure 2-1. The original Landfill No. 6 incorporated eight landfill cells designated as Areas A through H, and an Asbestos-Containing Material cell. The proposed Area D North cell is located north of the currently active Area D South; and west of two closed landfill cells known as Area A West and Area C Upper (refer to Figure 3-1 for cell locations), as shown on Figure 2-2. Interstate Highway I-40 and the Pigeon River border the Site to the north and south, respectively (Figure 2-1). Ground surface elevations at Area D



BASE MAP ADAPTED FROM THE 7.5-MINUTE USGS CANTON, NC (1990) AND CLYDE (1978) TOPOGRAPHIC QUADRANGLE MAPS.

1000 0 2000 FEET

FIGURE 2-1
SITE LOCATION MAP
LANDFILL NO. 6 AREA D NORTH
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DWG: SITELOC LMN: NONE CTB: SME-STD REV: 7/19/2013

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North generally slope downward from a high of approximately 2,780 feet NGVD[2] in its northeast corner toward the south which is approximately 2,660 feet NGVD where it abuts Area D South.

2.2 Site Drainage

Because of the site topography, drainage of surface water is from north to south through various swales. A pond collects surface water at the lower end of Area D North. The lower end of Area D North abuts the north edge of Area D South. Surface water is currently diverted beneath Area D South through a culvert.

2.3 Regional Geology

Landfill No. 6 is located in the Blue Ridge Mountains. Soils have formed in-place from weathering of the underlying bedrock. The degree of weathering decreases with depth. The most shallow soils consist of saprolite which is a weathered-in-place soil (residuum) that is typically silty or clayey and contains relic fracture structure. This soil transitions to partially weathered rock (PWR), which may be soil-like between blocks of rock. The partial weathered rock becomes very fractured bedrock with little or no soil, eventually becoming competent bedrock with depth. There are local deposits of alluvial soils (alluvium) along the Pigeon River. Some localized spots of colluvium (mass transported soil and/or rock) exist atop the saprolite. Groundwater depth varies and is deeper beneath ridges and more shallow in valleys. Regionally, groundwater migrates from the higher topographic features towards the Pigeon River.

[2] Elevations in this report are referenced to the 1929 National Geodetic Vertical Datum (NGVD).

3.0 SUPPLEMENTAL 2013 SITE INVESTIGATION

The methods and procedures utilized to complete the supplemental 2013 Site Investigation are summarized in this section.

3.1 Soil Borings and Rock Coring

Soil borings and rock coring (Drilling) was completed by A.E. Drilling Services, LLC of Greenville, SC (A.E.) under the direction of SME. A.E. is certified and licensed for installing piezometers and drilling wells in North Carolina. Drilling was performed using a CME 550X high-torque ATV auger and core drill rig. The unconsolidated formation (i.e., soils) was drilled with 4.25-inch inside-diameter hollow-stem augers, typically to the depth of auger refusal at each location, as indicated on Table 3-1. Samples of the unconsolidated formation were generally collected at 5-foot intervals using Standard Penetration Sampling (SPT) techniques in general accordance with American Society for Testing and Materials (ASTM) D 1586. Rock core samples were collected from the borings with a dual-tube NX (2.16-inch inside-diameter) diamond bit core barrel in general accordance with the procedures described in ASTM D 2113. Soils were classified according to the Unified Soil Classification System (USCS) in SME, 2008; and those classifications were corroborated by the 2013 Site Investigation. Descriptive boring and bedrock core logs were prepared under the direction of a North Carolina-registered geologist based on visual observations and testing of the retrieved soil and rock core samples. Boring and rock core logs are presented in Attachment A and B, respectively.

TABLE 3-1

EXPLORATION DETAILS - 2013 SITE INVESTIGATION
LANDFILL No. 6, AREA D NORTH

Boring Designation	Auger Refusal	Bottom of Exploration	Surveyed Locations			Piezometer Designation	Geologic Unit Screened[6]	Top of Riser Elevation	Well Screen Interval[4]			Filter Pack					
			Northing	Easting	Ground				Top	Bottom	Length	Top		Bottom		Length	Diameter
	ft-bgs	ft-bgs	NC State Plane NAD		ft NGVD			ft NGVD	ft-bgs	ft-bgs	ft	ft-bgs	ft NGVD	ft-bgs	ft NGVD	ft	inches
B-13-101	NE	60.0	676766.7	845865.6	2732.8	P13-101	PWR	2736.18	47.5	57.5	10.0	45.5	2687.3	58.4	2674.4	12.9	8.5
B-13-102	34.0	34.2	677037.9	846259.8	2733.5	P13-102	Saprolite and PWR	2736.60	24.0	34.0	10.0	22.0	2711.5	34.0	2699.5	12.0	8.5
B-13-103	65.0	65.0	677142.2	846486.6	2761.0	P13-103	Saprolite and PWR	2764.48	55.0	65.0	10.0	53.0	2708.0	65.0	2696.0	12.0	8.5
B-13-104	23.0	30.9	--	--	2716.1	NI		NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
B-13-104R[1]	19.0	60.5	676460.8	845575.4	2716.1	P13-104	Frac Bedrock	2718.98	50.0	60.0	10.0	48.0	2668.1	60.1	2656.0	12.1	3.0
B-13-105	29.3	29.3	676638.3	846033.6	2690.6	P13-105	PWR	2693.79	19.3	29.3	10.0	17.3	2673.3	29.3	2661.3	12.0	8.5
B-13-106	20.5	40.5	676939.5	846443.2	2735.1	P13-106	Comp Bedrock	2738.12	30.5	40.5	10.0	25.0	2710.1	40.5	2694.6	15.5	3.0
B-13-107	12.0	76.0	676957.2	846670.9	2756.6	P13-107A	Comp Bedrock	2759.42	65.9	75.9	10.0	63.9	2692.7	76.0	2680.6	12.1	3.0
						P13-107B	Frac Bedrock	2759.41	30.0	40.0	10.0	28.0	2728.6	41.0	2715.6	13.0	3.0
B-13-107R[2]	4.0	50.3	676962.0	846663.5	2756.5	P13-107C	Frac and Comp Bedrock	2759.57	30.0	50.0	20.0	28.3	2728.2	50.3	2706.2	22.0	3.0
B-13-108	34.0	42.6	676780.8	846468.8	2727.8	P13-108	Frac Bedrock	2730.93	32.6	42.6	10.0	30.6	2697.2	42.6	2685.2	12.0	See Note 5
B-13-109	NE	80.1	676527.9	846625.6	2739.7	P13-109	PWR	2742.74	70.0	80.0	10.0	68.0	2671.7	80.1	2659.6	12.1	8.5
B-13-110	30.5	85.0	676357.3	846528.6	2728.8	P13-110A	Comp Bedrock	2731.75	75.0	85.0	10.0	70.0	2658.8	85.0	2643.8	15.0	3.0
						P13-110B	Comp Bedrock	2731.59	57.0	67.0	10.0	55.0	2673.8	67.5	2661.3	12.5	3.0
B-13-111	NE	26.0	676462.7	846306.3	2670.8	P13-111	Saprolite	2673.69	14.0	24.0	10.0	12.0	2658.8	26.0	2644.8	14.0	8.5
B-13-112	39	39.0	676441.9	846034.9	2681.6	P13-112	PWR	2684.48	28.3	38.3	10.0	26.3	2655.3	39.0	2642.6	12.7	8.5
B-13-113[3]	NE	17.5	676592.6	846308.4	2674.7	P13-113	Saprolite and PWR	2678.04	12.4	17.4	5.0	10.0	2664.7	17.5	2657.2	7.5	8.5
B-13-114	28.6	80.3	677185.9	846608.4	2779.4	P13-114A	Frac and Comp Bedrock	2782.35	70.3	80.3	10.0	65.6	2713.8	80.3	2699.1	14.7	3.0
						P13-114B	Comp Bedrock	2782.61	47.0	57.0	10.0	40.0	2739.4	58.0	2721.4	18.0	3.0

Notes:

1. Boring B-13-104 was abandoned due to core barrel malfunction, B-13-104R was drilled as a replacement and received a piezometer.
2. B-13-107R was drilled adjacent to B-13-107
3. B-13-113 was advanced adjacent to P-07-212, as a replacement piezometer for P-07-212A&B.
4. Piezometer Screens are all 0.75 inch inside-diameter, 0.01-inch machine slotted screens, with rubber "o"-rings and screw-on bottom caps.
5. Filter Pack Diameter: 8.5 inches from 30.6 to 34.0 ft-bgs; and 3 inches from 34.0 to 42.6 ft-bgs.
6. Bedrock lithologic zones definition:
   - PWR - Partially Weathered Rock (Augured, SPT N>50)
   - Comp Bedrock - Competent Bedrock (Cored, RQD > 75%)
   - Frac Bedrock - Fractured Bedrock (Cored, RQD <75%)

Abbreviations:

- NE - Not Encountered
- NI - Not Installed
- ft - feet
- bgs - below ground surface
- NAD - North American Datum (1983)
- NGVD - National Geodetic Vertical Datum (1929)
- RQD - Rock Quality Designation (ASTM D 6032-08)

TABLE 3-2

GROUNDWATER LEVELS
LANDFILL NO. 6 AREA D NORTH

Piezometer Designation	Groundwater Zone Screened[2]	Screened Interval			Filter Pack Interval			Range of Groundwater Elevations				Estimated Seasonal High Groundwater[1]
								10/2007 through 07/2008		01/2013 through 09/11/2013		
		Top	Bottom	Length	Top	Bottom	Length	High	Low	High	Low	
		ft bgs	ft bgs	ft	ft bgs	ft bgs	ft	ft NGVD	ft NGVD	ft NGVD	ft NGVD	ft NGVD
P-07-201A	PWR	95	100	5	93	100	7	2673.40	2671.09	2678.84	2673.67	
P-07-201B	PWR	62	67	5	59.5	67.5	8	2673.33	2671.29	2677.07	2673.19	
P-07-201C	Saprolite	23	38	15	18	38.5	20.5	2674.17	2672.24	2679.86	2674.85	2682
P-07-202A	PWR	60	70	10	58	71	13	2651.71	2650.27	2652.00	2650.09	
P-07-202B	Saprolite	5	15	10	3	16	13	2653.94	2651.99	2653.80	2651.52	2656
P-07-203A	Comp Bedrock	74.5	84.5	10	72	84.5	12.5	2679.98	2678.31	2683.94	2681.48	
P-07-203B	Frac Bedrock	39.5	44.5	5	38.5	45	6.5	2676.05	2674.10	2680.52	2678.47	
P-07-203C	Saprolite	5	15	10	3	16.5	13.5	2677.34	2675.38	2681.49	2679.64	2683
P-07-204A	Frac Bedrock	110	120	10	108	120.5	12.5	2691.45	2689.48	2694.89	2690.29	
P-07-204B	PWR	67	72	5	65.9	72.5	6.6	2691.68	2689.72	2695.10	2690.41	
P-07-204C	Saprolite	35	45	10	30	45	15	2692.15	2690.09	2695.53	2690.37	2697
P-07-205	PWR	48	68	20	44	69	25	2659.07	2657.31	2666.91	2659.13	2668
P-07-207	Frac Bedrock	69	89	20	66	89.3	23.3	2681.95	2680.06	2683.74	2679.79	2684
P-07-213	Frac Bedrock	55	75	20	51	75	24	2689.85	2685.66	2699.86	2694.86	2700
P-07-226A	Comp Bedrock	85	95	10	83	95.1	12.1	2632.38	2629.82	2633.58	2631.91	
P-07-226B	Frac Bedrock	50	53	3	49	53.5	4.5	2632.24	2629.53	2632.97	2630.87	
P-07-226C	Saprolite	10	20	10	4.3	20.5	16.2	2633.05	2630.44	2634.03	2632.70	2636
MW-1A	Bedrock	102.9	122.9	20	57.8	70.8	13	2704.03	2699.97	2704.50	2697.32	2704
MW-9	Bedrock	44.8	64.8	20	41	64.8	23.8	2647.51	2645.74	2653.15	2649.90	2655
MW-10	Bedrock	54	74	20	52.4	74	21.6	2642.30	2640.91	2647.10	2643.02	2649
MW-11	Bedrock	10.4	20.4	10	10	20.4	10.4	2630.76	2627.77	2632.47	2630.55	2634
P13-101	PWR	47.5	57.5	10	45.5	58.4	12.9	NI	NI	2693.45	2686.38	2693
P13-102	Saprolite/PWR	24	34	10	22	34	12	NI	NI	2705.80	2699.00	2706
P13-103	Saprolite/PWR	55	65	10	53	65	12	NI	NI	2719.21	2712.43	2721
P13-104R	Frac Bedrock	50	60	10	48	60.1	12.1	NI	NI	2680.94	2676.67	2682
P13-105	PWR	19.3	29.3	10	17.3	29.3	12	NI	NI	2683.61	2679.86	2684
P13-106	Comp Bedrock	30.5	40.5	10	25	40.5	15.5	NI	NI	2711.42	2706.11	2713
P13-107A	Comp Bedrock	65.9	75.9	10	63.9	76	12.1	NI	NI	2690.94	2688.12	2693
P13-107B	Frac Bedrock	30	40	10	28	41	13	NI	NI	2724.28	2717.34	
P13-107C	Frac/Comp Bedrock	30	50	20	28.3	50.3	22	NI	NI	2720.23	2717.34	
P13-108	Highly Frac Bedrock	32.6	42.6	10	30.6	42.6	12	NI	NI	2688.07	2685.20	2690
P13-109	PWR	70	80	10	68	80.1	12.1	NI	NI	2682.50	2678.02	2684
P13-110A	Comp Bedrock	75	85	10	70	85	15	NI	NI	2684.39	2659.08	
P13-110B	Comp Bedrock	57	67	10	55	67.5	12.5	NI	NI	2677.37	2673.44	2679
P13-111	Saprolite	14	24	10	12	26	14	NI	NI	2659.10	2655.11	2661
P13-112	PWR	28.3	38.3	10	26.3	39	12.7	NI	NI	2659.87	2657.04	2662
P13-113	Saprolite/PWR	12.4	17.4	5	10	17.5	7.5	NI	NI	2675.52	2669.75	2677
P13-114A	Frac/Comp Bedrock	70.3	80.3	10	65.6	80.3	14.7	NI	NI	2705.10	2704.55	2707
P13-114B	Comp Bedrock	47	57	10	40	58	18	NI	NI	2732.21	2727.55	

Notes:
1. Seasonal-high groundwater values were used to create the seasonal-high groundwater contours shown on Figure 5-2, based on "rounding-up" measurements as appropriate.
2. See Table 3-1 for lithologic descriptions.

3.2 Piezometer Installations

A total of 19 piezometers, designated as the P13-XXX series, were installed at 14 locations drilled between January 2 and January 24, 2013. The 19 piezometers include extra piezometers beyond the number specified in the Work Plan to provide additional characterization of groundwater and to replace a previously installed piezometer that had been damaged (P13-113 replaces P-07-212B). The locations of the P13-XXX series piezometers are shown in Figure 3-1, which also indentifies the locations of: piezometers previously installed as part of the Areas D and E Hydrogeologic Report (SME, 2008); four older monitoring wells positioned north and west of Area D North (MW-1A, -9, -10 and -11); and auger probes and borings (prefixed with an AP- and B-, respectively) drilled during previous investigations at and near Area D North.

Depths for the P13-XXX series piezometers ranged from about 17.5 feet to 85 feet below ground surface (ft-bgs). Multilevel clusters containing two piezometers per boring were installed at three locations (P13-107, -110, and -114). To differentiate between multiple instruments within a boring location, an “A” suffix designated the deepest piezometer, and the shallower piezometer is designated with a “B”, as indicated in Attachment A. For example, P13-114A signifies the deepest piezometer, P13-114B the shallow piezometer at the boring B-13-114 location. Each piezometer was constructed with ¾-inch or 1-inch inside-diameter flush-joint Schedule 40 polyvinylchloride (PVC) riser and was typically provided with a 10-foot-long 0.01-inch machine slotted PVC well screen per ASTM D 5092. A washed sand filter pack typically extended between about one and two feet above the top of the screen and the overlying annular space of the borehole was sealed with either bentonite chips and/or a cement-bentonite grout. A steel protective surface casing was installed around the portion of the riser pipe extending above the ground surface, and a well tag identifying the piezometer was affixed to the protective casing by the Driller. Details of the boring and piezometer installations are summarized in Table 3-1. Piezometer installation diagrams are included on the descriptive boring logs in Attachment A.

3.3 Elevation and Position Survey

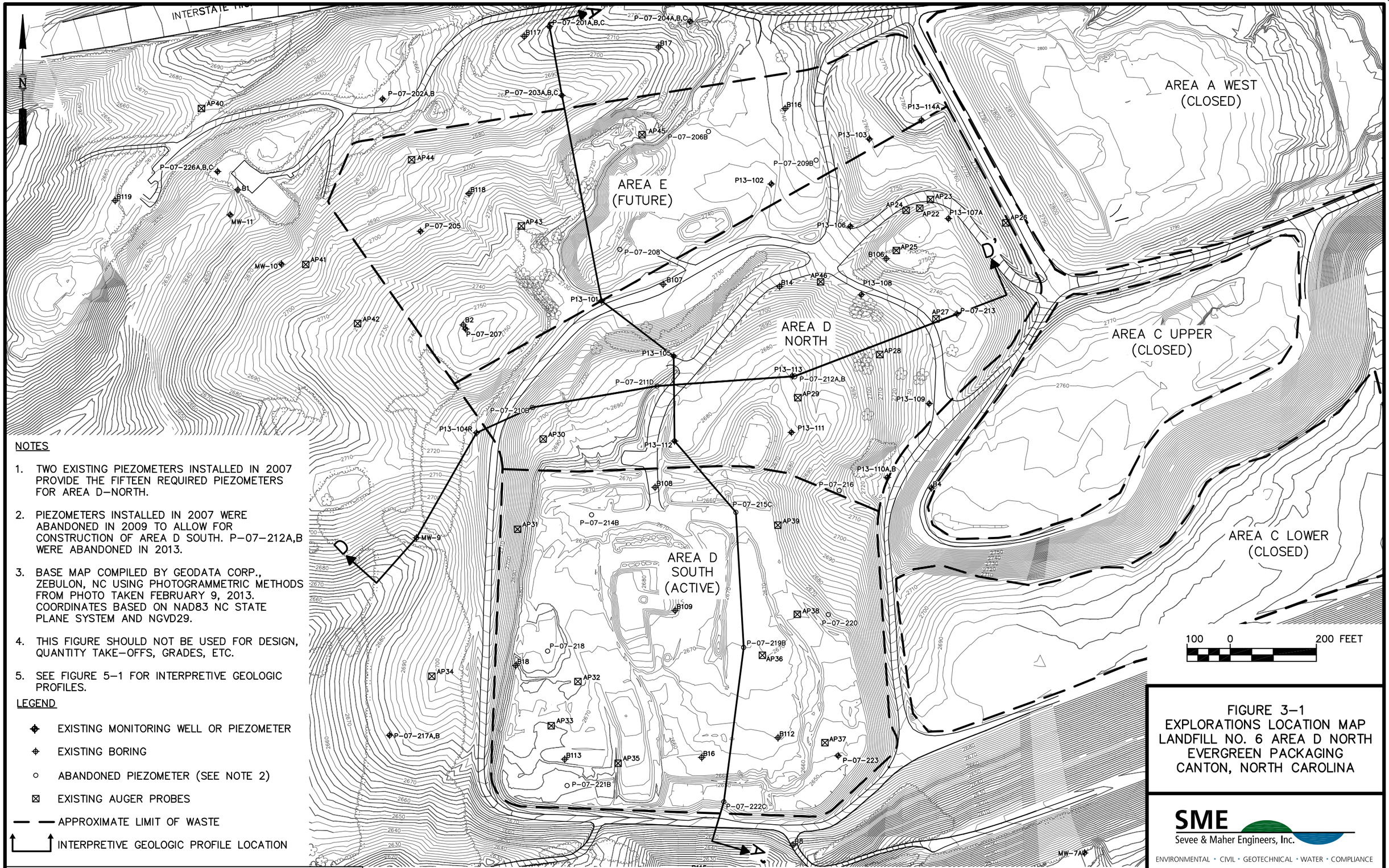
The ground surface elevation and horizontal coordinates of each boring and piezometer completed as part of the 2013 Site Investigation was surveyed by Lattimore and Peeler Surveying, a Registered Land Surveying firm located in Lawndale, NC. The top of each piezometer and monitoring well used in assessing water levels were also surveyed in 2013. The elevation of the top of each piezometer and monitoring well riser pipe was surveyed to the nearest 0.01 foot. Elevations presented herein are referenced to the 1929 National Geodetic Vertical Datum (NGVD). Horizontal locations were reported relative to the North Carolina State Plane Coordinate System NAD 1983. Table 3-1 provides the surveyed locations and elevations, for the borings and piezometers completed in 2013. Table 3-2 summarizes the construction details for each of the 57 piezometers and monitoring wells that have been installed in and near Area D North and the water levels measured at each location.

3.4 Water Level Monitoring

The approved Work Plan (SME, 2012) required that water level monitoring occur on a monthly basis for approximately six months (i.e., from the time the piezometers were installed through the end of June 2013), to capture measurements during the expected seasonal-high groundwater conditions. Due to unusually heavy and persistent rain in the summer of 2013, water level measurements were extended out to September 11, 2013 in order to capture seasonal-high groundwater conditions within Area D North, as shown on Figure 3-2.

To estimate seasonal-high groundwater elevations for Area D North, groundwater levels (i.e., water table)[3] were measured at 39 piezometers and wells between January 18, 2013 and September 11, 2013. The 39 monitored piezometers and wells included 21 of the piezometers and wells installed in 2007-2008 that remain at the Landfill and the 19 piezometers installed as part of the 2013 Site Investigation. Attachment C provides water elevations measured between 2007 and 2013 for each of the 39 locations measured in 2013 for Area D North. The range in

[3] Refer to Section 5.1 for a discussion related to a localized perched water condition that was encountered in Area D North.



NOTES

1. TWO EXISTING PIEZOMETERS INSTALLED IN 2007 PROVIDE THE FIFTEEN REQUIRED PIEZOMETERS FOR AREA D–NORTH.
2. PIEZOMETERS INSTALLED IN 2007 WERE ABANDONED IN 2009 TO ALLOW FOR CONSTRUCTION OF AREA D SOUTH. P–07–212A,B WERE ABANDONED IN 2013.
3. BASE MAP COMPILED BY GEODATA CORP., ZEBULON, NC USING PHOTOGRAMMETRIC METHODS FROM PHOTO TAKEN FEBRUARY 9, 2013. COORDINATES BASED ON NAD83 NC STATE PLANE SYSTEM AND NGVD29.
4. THIS FIGURE SHOULD NOT BE USED FOR DESIGN, QUANTITY TAKE–OFFS, GRADES, ETC.
5. SEE FIGURE 5–1 FOR INTERPRETIVE GEOLOGIC PROFILES.

LEGEND

- EXISTING MONITORING WELL OR PIEZOMETER
- EXISTING BORING
- ABANDONED PIEZOMETER (SEE NOTE 2)
- EXISTING AUGER PROBES
- APPROXIMATE LIMIT OF WASTE
- INTERPRETIVE GEOLOGIC PROFILE LOCATION

DWG: 6DN–BORINGS LMN: EXPLORATION–LOC CTB: SME–STD REV: 7/25/2013

FIGURE 3–1
EXPLORATIONS LOCATION MAP
LANDFILL NO. 6 AREA D NORTH
EVERGREEN PACKAGING
CANTON, NORTH CAROLINA

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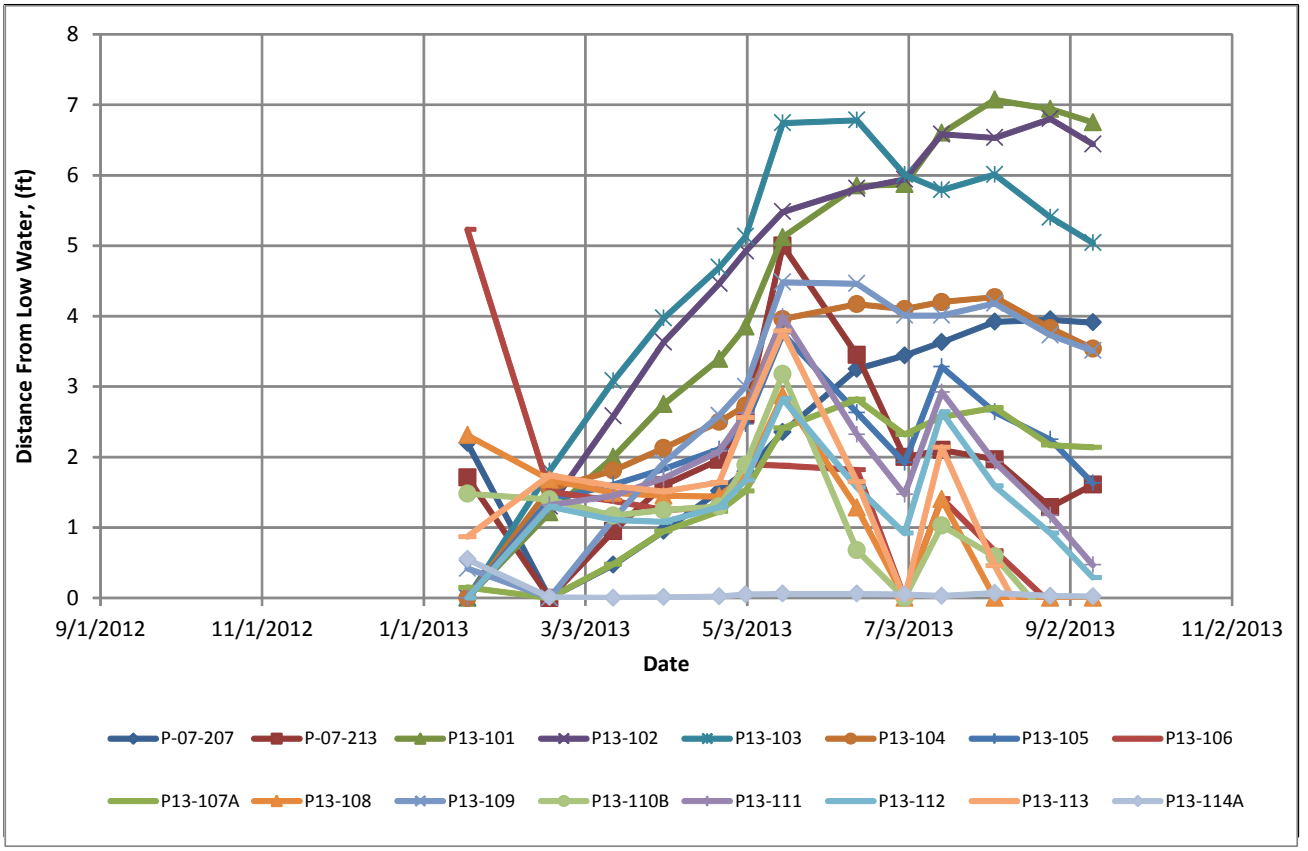

FIGURE 3-2
RANGE OF HISTORIC WATER LEVELS
LANDFILL NO. 6 AREA D NORTH
EVERGREEN PACKAGING
CANTON, NORTH CAROLINA

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DWG: HistoricWaterLevels LMN: NONE CTB: SME-STD REV: 10/31/2013

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measured water elevations in the 2007 to 2008 period and in 2013 are shown on Table 3-2, along with the seasonal-high groundwater elevation used to establish liner grades in Area D North.

3.5 In Situ Hydraulic Conductivity Testing

Rising- or failing-head slug tests were used to estimate hydraulic conductivity of soils and rock. Testing was conducted in eight (8) of the P13-XXX series piezometers as part of the 2013 Site Investigation. Fifteen of the P-07-XXX series piezometers installed in 2007 in and near Area D North were previously tested to measure the in situ hydraulic conductivity of the soils and bedrock at Area D North (SME, 2008). The static water level in the piezometers was displaced at the start of the test using one of the following procedures: (1) removing a solid metal rod placed below the level of static water (rising-head), (2) pumping a volume of water out of the piezometer (rising-head), or (3) adding a volume of water to the piezometer (falling-head). Water level displacement during the recovery period was measured with an automated pressure transducer. Slug test data was reduced and analyzed with the AQTESOLV™ computer software package, and the hydraulic conductivity calculated following the methods of Cooper et al., 1967 or Bouwer and Rice, 1973. Plots of the displacement over time for each test performed in 2013 are presented in Attachment D. AQTESOLV™ plots of previously tested wells are in SME, 2008. Calculated hydraulic conductivities for the encountered geologic units in Area D North are summarized in Table 3-3 and produced results consistent with those presented in SME, 2008.

TABLE 3-3

IN SITU HYDRAULIC CONDUCTIVITY TESTING
LANDFILL NO. 6, AREA D NORTH

Geologic Unit Screened[4]	Piezometer Designation	Well Screen Interval Depth			Year Test Performed (see Notes 2 and 3)	In Situ Hydraulic Conductivity		
		Top	Bottom	Length		Well	Geometric Mean	
		ft-bgs	ft-bgs	ft-bgs		cm/sec	cm/sec	ft/day
Colluvium	P-07-215B	23	24.3	1.3	2008	3.1E-02	$2.5x10^{-3}$	7.1
	P-07-215C	4	13	9	2008	2.0E-04		
Saprolite	P-07-211D	19	29	10	2008	2.2E-03	$1.3x10^{-4}$	0.36
	P-07-214B	25	40	15	2008	7.5E-06		
Saprolite and PWR	P13-103	55	65	10	2013	6.8E-05		
PWR	P-07-208	40	60	20	2007	4.4E-05	$7.1x10^{-4}$	2.0
	P-07-209B	25	35	10	2008	6.0E-03		
	P13-101	47.5	57.5	10	2013	4.9E-03		
	P13-105	19.3	29.3	10	2013	4.0E-04		
	P13-112	28.3	38.3	10	2013	3.5E-04		
Frac Bedrock	P-07-207	69	89	20	2008	1.3E-03	$4.0x10^{-4}$	1.1
	P-07-209A	50.3	60.3	10	2008	4.5E-05		
	P-07-210A	60	65	5	2008	3.4E-05		
	P-07-212A	28	30	2	2008	3.3E-03		
	P-07-213	55	75	20	2008	4.2E-03		
	P13-104R	50	60	10	2013	1.5E-04		
Comp Bedrock	P-07-211A	180	190	10	2008	4.5E-05	$1.7x10^{-5}$	0.049
	P-07-211B	80.8	85.8	5	2008	3.9E-05		
	P-07-214A	55.5	60.5	5	2008	2.6E-05		
	P-07-215A	55	65	10	2008	1.1E-04		
	P13-107A	65.9	75.9	10	2013	2.4E-06		
	P13-106	30.5	40.5	10	2013	8.6E-06		
	P13-110B	57	67	10	2013	4.3E-06		

Notes:
1. Piezometers are within 100 feet of Area 6 D North.
2. Tests performed in 2007 and 2008 were presented in the 2008 Hydrogeologic Report for Landfill No. 6 Areas D and E.
3. Tests performed in 2013 are presented in Attachment D.
4. See Table 3-1 for lithologic descriptions.

Abbreviations:
cm/sec - centimeters per second
ft/day - feet per day
ft-bgs - feet below ground surface

4.0 SITE GEOLOGIC CHARACTERISTICS

The geology within Areas D and E was previously described in SME, 2008, and has been confirmed by the supplemental 2013 Site Investigation. Soil borings from the earlier Investigation (SME, 2008) that were completed within or near Area D North include: P-07-207 through P-07-216. Since the geologic interpretation has not changed for that presented for Areas D and E, the geologic conditions described in this section of the Report present only minor refinements to the 2008 interpretation that are needed to better describe specific characteristics of Area D North compared to the whole of Areas D and E. The reader is referred to SME, 2008 for more detail on the site-specific geology, if needed.

4.1 Surficial Geology

The surficial geology encountered in borings drilled as part of the supplemental 2013 Site Investigation identified geologic conditions that were consistent with previous findings. The total thickness of the unconsolidated deposits (i.e., soils) encountered in borings (i.e., alluvium, colluvium, and saprolite) in Area D North ranged from about 4 feet to over 65 feet.

Surficial soils in portions of Area D North have been modified as a result of site activities (e.g., grading, road building, and construction of multiple phases of landfill development). Reworked soils and fill consist of redistributed saprolite, and were found to range in thickness from 10 to over 15 feet where encountered (localized thicknesses vary). The borings encountering the most reworked and fill soil are located along the eastern side of Area D North (B-07-213, B-07-216, B13-109, B13-110, and B13-114). Fill encountered at B13-109, B13-110, and B13-114 included vegetation, woody debris, and stumps. The relative density of the reworked soil and fill, as estimated using SPT N-values, ranged from soft to stiff at B13-109, -110, and -114; to medium dense to very dense at B-07-213 and -216 where rocky fill was encountered. These materials are believed to be a result of site grading activities after the dikes which support Area A West and Area C were completed, and are believed to have been placed primarily for landfill access roads. It is assumed that the dikes do not include layers of these soft materials; instead, these soft materials are believed to be isolated along the western flanks of the dikes supporting the adjacent. Care during the removal of these materials should be exercised to

prevent softening of underlying and adjacent materials. Use of reworked and fill soils as subgrade for the liner system should be evaluated by a qualified engineer during preparation of base grades for the liner system. Over-excavation of localized areas of reworked soils and fills and replacement with approximately two feet of a suitable engineered fill (i.e., silty sand or sandy silt free of roots, stumps, and deleterious matter) below the deepest landfill liner is recommended to provide protection to the liner system.

4.2 Bedrock

Bedrock cores recovered for the supplemental 2013 Site Investigation were similar to those previously recovered at the Landfill. Cores identified bedrock as gray to dark gray, coarse-grained mica schist interlayered with fine to medium-grained, white to light gray biotite gneiss and occasional metagraywacke typical of the Ash Metamorphic Suite, which have been mapped to underlie the landfill site (Wiener and Merschat, 1988). Accessory minerals associated with the bedrock included biotite, muscovite, garnet, quartz, and plagioclase feldspar. These findings are consistent with the previous site investigations.

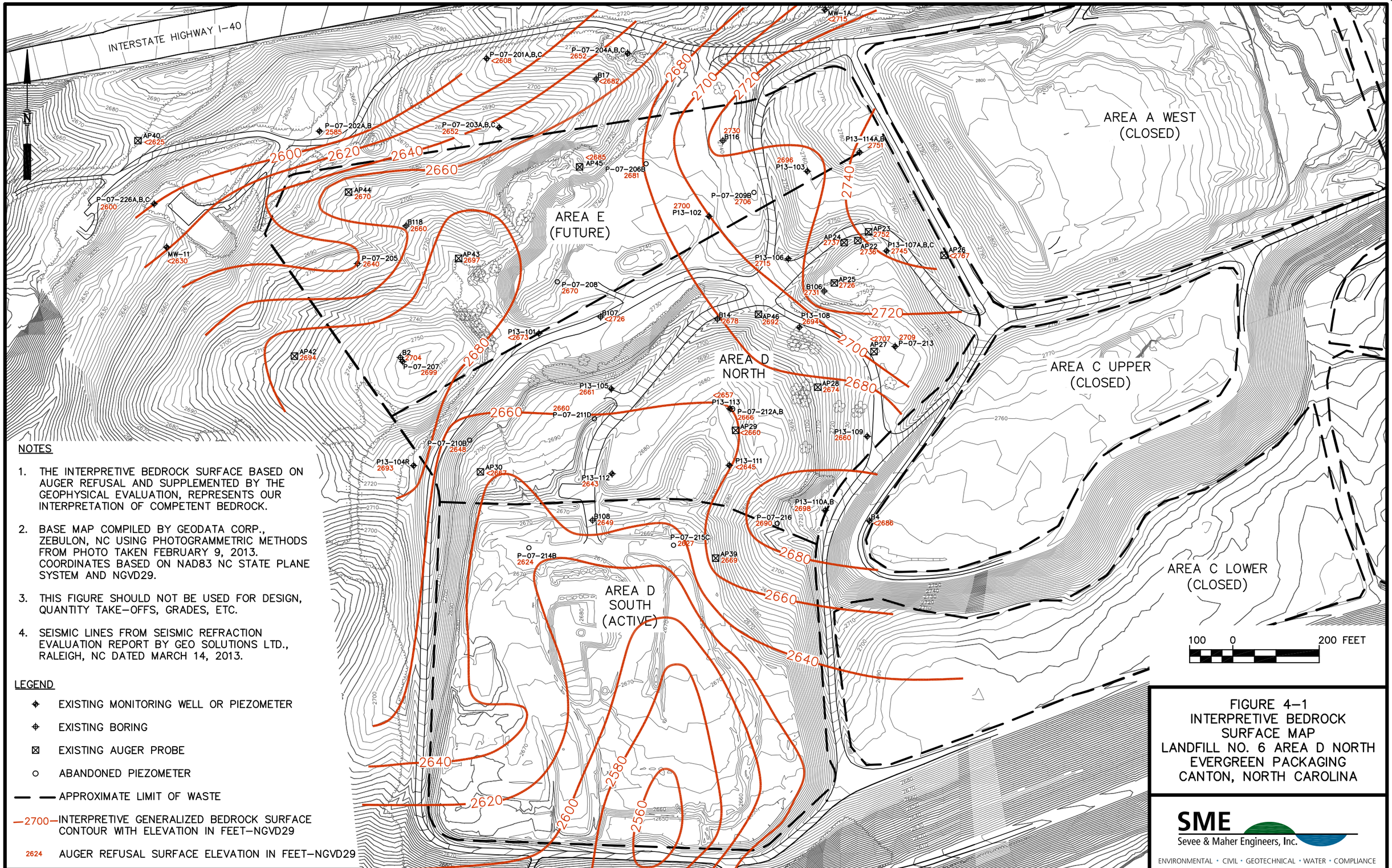
Approximately 295 lineal-feet of bedrock core was collected as part of the supplemental 2013 Site Investigation, which had Rock Quality Designations (RQDs) ranging from 0 to 100 percent. RQD is a measure of the relative degree of fracturing and weathering of the bedrock. Bedrock was identified as either fractured on the logs in Attachment A and B if the RQD of the retrieved core was less than 75 percent or competent bedrock if the RQD was more than 75 percent. Collectively, the rock core recovered in the supplemental 2013 Site Investigation had an average RQD of 77 percent. The upper bedrock was typically more fractured than the deeper bedrock.

Figure 4-1 presents an interpretive bedrock surface map, based on auger refusal.[4] This map was taken from the 2008 Hydrogeologic Report (SME, 2008) and updated by the new boring auger refusal data. It is essentially the same surface as provided in 2008. Figure 4-1 shows the bedrock surface is highest in the northern and eastern parts of Area D North, where its elevation

[4] 15A NCAC 13B .0538 (2) (C) states, in-part: "*Bedrock for the purpose of this rule is defined as material below auger refusal*."

reaches approximately 2,760 feet in elevation. The interpreted bedrock surface generally slopes downward beneath Area D North, toward the Pigeon River to the southwest, decreasing about 120 feet in elevation.

An important thing to recognize for Figure 4-1 is that localized variability of the bedrock surface cannot be illustrated. Locally, there are small-scale troughs, pinnacles, and ridges that exist at the bedrock surface. If present, these features may appear to conflict with the generalized map contours because they cannot be identified with the boring spacing used to map the bedrock surface. These troughs, pinnacles, and ridges are the result of localized in situ weathering of the bedrock surface. Therefore, Figure 4-1 should be viewed as depicting the “generalized” topography of the bedrock surface with varying conditions between explorations.



NOTES

1. THE INTERPRETIVE BEDROCK SURFACE BASED ON AUGER REFUSAL AND SUPPLEMENTED BY THE GEOPHYSICAL EVALUATION, REPRESENTS OUR INTERPRETATION OF COMPETENT BEDROCK.
2. BASE MAP COMPILED BY GEODATA CORP., ZEBULON, NC USING PHOTOGRAMMETRIC METHODS FROM PHOTO TAKEN FEBRUARY 9, 2013. COORDINATES BASED ON NAD83 NC STATE PLANE SYSTEM AND NGVD29.
3. THIS FIGURE SHOULD NOT BE USED FOR DESIGN, QUANTITY TAKE-OFFS, GRADES, ETC.
4. SEISMIC LINES FROM SEISMIC REFRACTION EVALUATION REPORT BY GEO SOLUTIONS LTD., RALEIGH, NC DATED MARCH 14, 2013.

LEGEND

- EXISTING MONITORING WELL OR PIEZOMETER
- EXISTING BORING
- EXISTING AUGER PROBE
- ABANDONED PIEZOMETER
- APPROXIMATE LIMIT OF WASTE
- 2700 INTERPRETIVE GENERALIZED BEDROCK SURFACE CONTOUR WITH ELEVATION IN FEET-NGVD29
- 2624 AUGER REFUSAL SURFACE ELEVATION IN FEET-NGVD29

DWG: 6DN-BORINGS LMN: TOP BEDROCK CTB: SME-STD REV: 7/25/2013

FIGURE 4-1
INTERPRETIVE BEDROCK SURFACE MAP
LANDFILL NO. 6 AREA D NORTH
EVERGREEN PACKAGING
CANTON, NORTH CAROLINA

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5.0 SITE HYDROGEOLOGIC CHARACTERISTICS

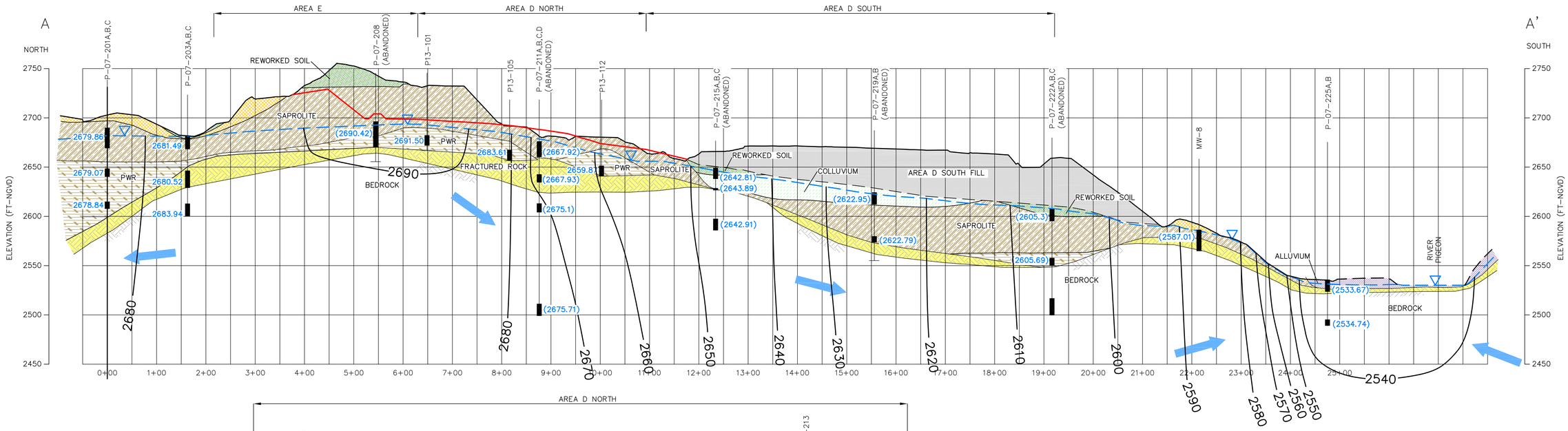
This section of the Report describes the hydrogeologic setting of Area D North. The regional geology and hydrogeology of Landfill No. 6 are described in detail in SME, 2008, and are not repeated herein. The supplemental 2013 Site Investigation findings were consistent with the hydrogeologic characteristics previously described in SME, 2008.

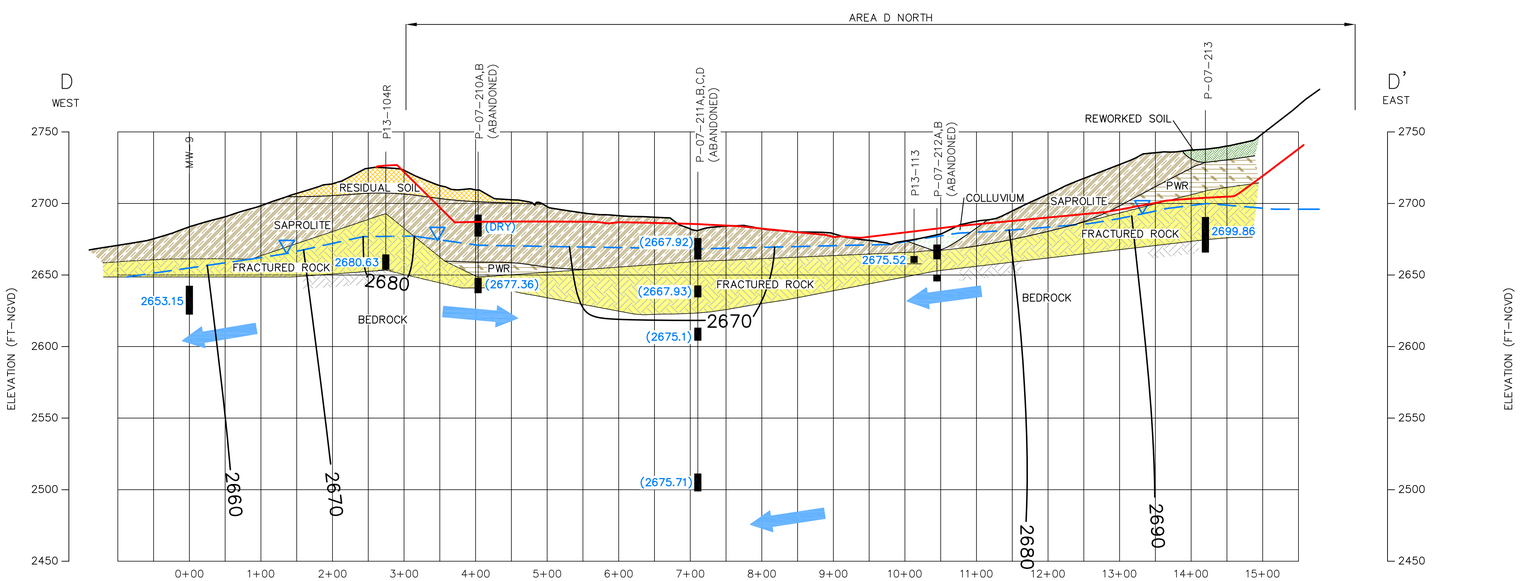
5.1 Hydrogeologic Setting

Seven (7) interpretive geologic profiles were presented through Landfill Areas D and E in the previous hydrogeologic study (SME, 2008). Two of those profiles went through Area D North, as indicated on Figure 3-1 (A-A' and D-D'). Figure 5-1 presents these same two profiles (A-A' and D D'), which have been updated with supplemental information from the 2013 Site Investigation. The profiles on Figure 5-1 have also been updated to reflect topographic conditions from 2013 and show the limits of Area D South. There are no significant subsurface changes to these two profiles from the 2008 work. They continue to show a variable residuum thickness over weathered and competent bedrock.

Groundwater equipotential contours are also shown on the profiles in Figure 5-1 along with generalized groundwater flow arrows illustrating the interpreted groundwater flow directions along each profile. Note that groundwater flow in the bedrock is essentially horizontal. Groundwater recharge occurs at the higher site elevations and discharges to the ground surface at the lower site elevations.

The NCDENR Solid Waste Rules 13A NCAC 13B 0.101 Definitions, item 52, defines the water table as: "*the upper limit of the portion of the ground wholly saturated with water*." Considering this definition; a perched groundwater condition, which is above the elevation where the ground is wholly saturated with water, was not included when determining the water table (i.e., seasonal-high groundwater) for determining separation of landfill liner from groundwater. Two soil borings (B13-107 and B13-114) identified the existence of a localized perched groundwater condition (shown on Figure 5-2 as dashed green contour lines) during piezometer installation, which had not been previously identified.





GEOLOGIC DESCRIPTION

- REWORKED SOIL – RESIDUAL SOIL AND SAPROLITE REDISTRIBUTED ON-SITE DURING GRADING OR CONSTRUCTION ACTIVITIES.
- ALLUVIUM – LOOSE, UNIFORM SILTY FINE SAND (BECOMING GRAVELLY WITH DEPTH) ASSOCIATED WITH THE FLOODPLAIN OF THE PIGEON RIVER.
- COLLUVIUM – LOOSE TO MEDIUM DENSE SILTY SAND ASSOCIATED WITH MASS TRANSPORT OF RESIDUAL SOIL/SAPROLITE DOWNSLOPE.
- RESIDUAL SOIL – FIRM TO STIFF SANDY SILT RESULTING FROM THE CONTINUED WEATHERING OF SAPROLITE. LACKS THE RELICT STRUCTURE OF THE SAPROLITE.
- SAPROLITE – LOOSE TO DENSE, FRIABLE, SILTY SAND EXHIBITING RELICT FEATURES OF THE BEDROCK PARENT MATERIAL. RELATIVE DENSITY INCREASING WITH DEPTH.
- PARTIALLY WEATHERED ROCK (PWR) – TRANSITIONAL ZONE BETWEEN FRIABLE SAPROLITE AND FRACTURED ROCK/BEDROCK. VERY DENSE (N-VALUES TYPICALLY GREATER THAN 50). RELICT STRUCTURE OF PARENT BEDROCK.
- FRACTURED ROCK – MODERATELY TO SEVERELY FRACTURED BEDROCK HAVING AN RQD TYPICALLY LESS THAN 75%.
- COMPETENT BEDROCK – COARSE-GRAINED MICA SCHIST INTERLAYERED WITH FINE TO MEDIUM-GRAINED, BIOTITE GNEISS AND OCCASIONAL METAGRAYWACKE. COMPETENT RQD TYPICALLY EXCEEDING 75%.
- AREA D SOUTH FILL

NOTES:

1. VALUE REPRESENTS HIGH VALUES MEASURED BETWEEN 01/2013 AND 09/11/2013, AS SHOWN ON TABLE 3-2.
2. WATER LEVEL DATA FROM 2007 TO 2008 USED FOR COMPLETENESS, SINCE PIEZOMETER ABANDONED DURING LANDFILL AREA D SOUTH CONSTRUCTION. VALUES SHOWN IN PARENTHESIS.
3. SEE FIGURE 3-1 FOR LOCATIONS OF INTERPRETIVE GEOLOGIC PROFILES.
4. GROUND SURFACE UPDATED WITH 2013 TOPOGRAPHY.

LEGEND

- INTERPRETED SEASONAL-HIGH WATER ELEVATION
- SEE NOTE 1 2700 / SEE NOTE 2 (2600) — PIEZOMETER/WELL SCREEN INTERVAL
- BOTTOM OF EXPLORATION
- 2660 — INTERPRETIVE VERTICAL GROUNDWATER EQUIPOTENTIAL CONTOUR IN FEET – NGVD29
- GENERALIZED GROUNDWATER FLOW DIRECTION
- LANDFILL BASEGRADE

HORIZONTAL SCALE
50 0 100 200 FEET

FIGURE 5-1
INTERPRETIVE GEOLOGIC PROFILES
LANDFILL NO. 6 AREA D NORTH
EVERGREEN PACKAGING
CANTON, NORTH CAROLINA

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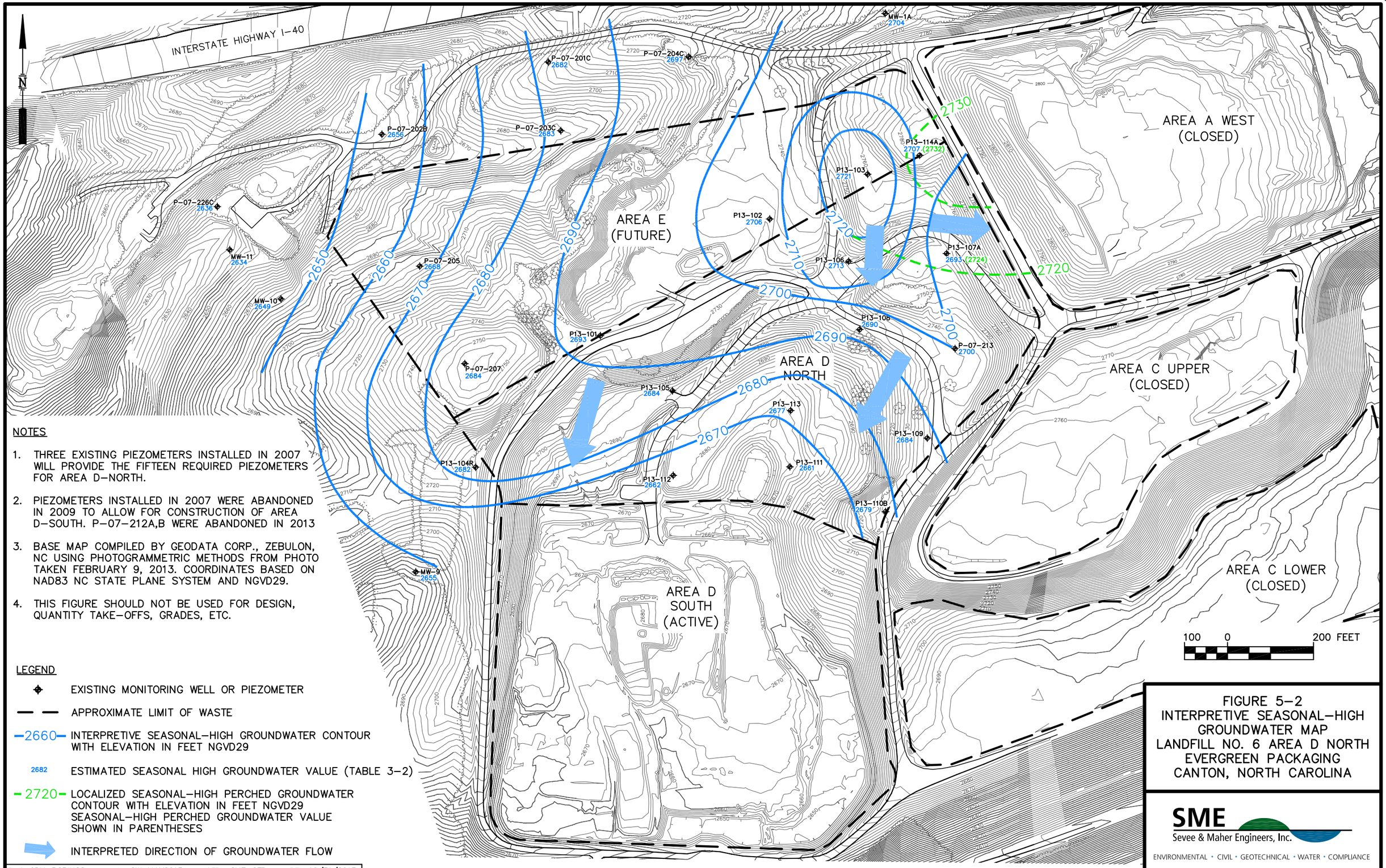
DWG: GEOPROF LMN: 6DN-GEOPROF CTB: PROF REV: 11/19/2013



NOTES

1. THREE EXISTING PIEZOMETERS INSTALLED IN 2007 WILL PROVIDE THE FIFTEEN REQUIRED PIEZOMETERS FOR AREA D-NORTH.
2. PIEZOMETERS INSTALLED IN 2007 WERE ABANDONED IN 2009 TO ALLOW FOR CONSTRUCTION OF AREA D-SOUTH. P-07-212A,B WERE ABANDONED IN 2013
3. BASE MAP COMPILED BY GEODATA CORP., ZEBULON, NC USING PHOTOGRAMMETRIC METHODS FROM PHOTO TAKEN FEBRUARY 9, 2013. COORDINATES BASED ON NAD83 NC STATE PLANE SYSTEM AND NGVD29.
4. THIS FIGURE SHOULD NOT BE USED FOR DESIGN, QUANTITY TAKE-OFFS, GRADES, ETC.

LEGEND

- EXISTING MONITORING WELL OR PIEZOMETER
- APPROXIMATE LIMIT OF WASTE
- 2660 — INTERPRETIVE SEASONAL-HIGH GROUNDWATER CONTOUR WITH ELEVATION IN FEET NGVD29
- 2682 — ESTIMATED SEASONAL HIGH GROUNDWATER VALUE (TABLE 3-2)
- 2720 — LOCALIZED SEASONAL-HIGH PERCHED GROUNDWATER CONTOUR WITH ELEVATION IN FEET NGVD29 SEASONAL-HIGH PERCHED GROUNDWATER VALUE SHOWN IN PARENTHESES
- INTERPRETED DIRECTION OF GROUNDWATER FLOW

FIGURE 5-2
INTERPRETIVE SEASONAL-HIGH GROUNDWATER MAP
LANDFILL NO. 6 AREA D NORTH
EVERGREEN PACKAGING
CANTON, NORTH CAROLINA

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DWG: 6DN-BORINGS LMN: GW-MAY2013 CTB: SME-STD REV: 10/31/2013

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At B13-107, water was heard cascading down the borehole when the hole was drilled to its final depth of 76 ft-bgs and before piezometer installation. Highly weathered and fractured bedrock zones were encountered in B13-107 at approximately 31 ft-bgs and was believed to be the source of the cascading water. At P13-107A, the measured water level was at a depth of approximately 67 ft-bgs, which is within the screened interval of approximately 66 to 77 ft-bgs. The water level in the shallow piezometer, which was set at about 40 ft-bgs, was measured at about 35 ft-bgs. The unsaturated portion of the screen of P13-107A (i.e., deeper piezometer) indicates that the shallow groundwater in P13-107B is perched.

At B13-114, iron stained fractures and weathered rock was encountered at 44 to 45 ft and at 52 ft-bgs which appeared to convey water. At P13-114A, the measured water level in 2013 was at a depth of approximately 74 ft-bgs, and within the screened interval, similar to P13-107A. P13-114A was set at about 80.3 ft-bgs. The upper portion of the screen of P13-114A was unsaturated similar to P13-107A. Thus, at both B13-107 and B13-114, a perched water condition was confirmed to be underlain by an intermediate unsaturated zone, which was in turn underlain by the permanent water table. The deep piezometers at these locations (P13-107A and P13-114A) were used to determine seasonal-high groundwater table conditions at Area D North (see Figure 5-2).

To further determine the likely cause for the perched water condition at B13-107, a third piezometer was installed (P13-107C), as summarized in Table 3-2. At P13-107B and C water depths in 2013 were both approximately 35 ft-bgs while the screened interval depths were approximately 30 to 40 and 30 to 50 ft-bgs, respectively. Furthermore, B13-107C terminated in competent bedrock, suggesting that a zone or layer of unweathered rock was locally creating the observed perched water table. The observed perched water table is a function of recent precipitation recharge. Once this area is covered by the lined landfill, recharge will no longer occur and the perched condition will disappear.

5.2 Groundwater Levels

Groundwater level measurements as described in Section 3.4 reveal that the water table predominantly resides within the saprolite within the footprint of Area D North (see Figure 5-2).

Artesian (i.e., above-ground) groundwater conditions were periodically observed at P13-113 in 2013, where the groundwater piezometric levels in the fractured bedrock were above the overlying ground surface. Piezometer P13-113 is located along a north-south trending surface water drainage that nearly bisects Area D North and empties into a stormwater control pond located just outside at the northern edge of Area D South. Data at P13-113 shows that groundwater is locally discharging to the nearby swale.

A seasonal-high groundwater table map, based on observations is provided as Figure 5-2. The depth of the water table, under seasonal-high conditions, varied from the ground surface to more than 70 feet below the existing ground surface. Groundwater was shallower in the piezometers installed along the ravines in the southern portion of Area D North (e.g., P13-111, -112, and -113). Variations in groundwater levels over the period of observation are illustrated in Figure 3-2. The groundwater table fluctuations were less than eight feet between low and high water conditions, with the largest change measured at P-07-212A in 2007-2008 and at P13-103 in 2013.

5.3 Horizontal Groundwater Flow Directions

Groundwater flow beneath Area D North is predominantly horizontal. Groundwater levels in the P-07-XXX series piezometers, P13-XXX series piezometers and older existing monitoring wells at Landfill No. 6 were measured as described in Section 3.4. The seasonal-high groundwater table elevation contours, are shown on Figure 5-2. The direction of groundwater flow in the subsurface is interpreted to flow from the higher potentiometric contours to lower potentiometric contours. Groundwater at Area D North currently flows from the northeastern corner toward the south, with a small component of flow on the eastern edge of Area D North moving toward the adjacent landfills, see Figure 5-2. Some groundwater beneath Area D North also migrates westerly before turning south towards the River. Underdrains below the adjacent landfill and reduced infiltration due to impermeable covers are the likely cause of this easterly groundwater flow.

5.4 Groundwater Seepage Rates

The rate of groundwater movement is a function of hydraulic conductivity, effective porosity, and the hydraulic seepage gradient in the direction of flow. Measurements of the hydraulic conductivity derived from in-situ slug testing of the lithologic units are summarized in Table 3-3. The supplemental hydraulic conductivities were generally consistent with previous testing. Thus, the previously estimated average groundwater velocities are still applicable to Area D North (SME, 2008). After the landfill is constructed, hydraulic gradients are expected to decrease due to loss of recharge, resulting in lower estimated average groundwater velocities.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the supplemental hydrogeologic investigation of Area D North, we conclude the following:

1. The supplement 2013 Site Investigation corroborated and refined previously interpreted understanding of the Area D North Landfill's geologic and hydrogeologic conditions.

2. The seasonal-high groundwater table and depth to bedrock have been updated for Landfill Area D North design and permitting.

3. As before with previous cells at Landfill No. 6, the borings confirmed that portions of the deeper saprolite and partially weathered rock (PWR) can be very dense and may be difficult to excavate or require blasting.

4. Bedrock depth is variable and subject to localized, small-scale ridges, troughs, and pinnacles. The ridges and pinnacles cannot be predicted and can only be discovered by excavation. There should be some expectation on the part of the contractor that they may encounter such localized competent bedrock features.

5. Reworked soils and fill remaining after excavation to establish landfill subgrades should be inspected by a qualified geotechnical engineer to determine if they constitute a potential stability concern and what mitigation measured are most appropriate (i.e., over-excavation and replacement with engineered materials).

6. Prior to or during landfill construction, any piezometer or well (including the drilled well) should be carefully removed and fully grouted to prevent a direct hydraulic route from the ground surface into the bedrock.

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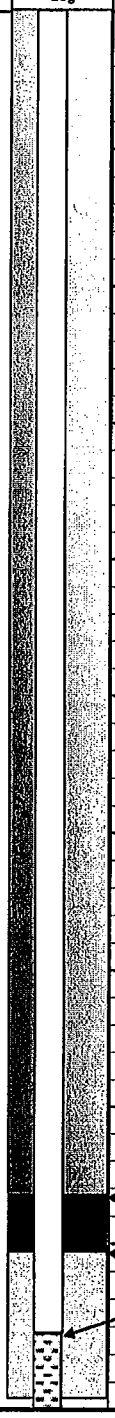
ATTACHMENT A

BORING LOGS AND PIEZOMETER INSTALLATION DETAILS

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-101
DATE STARTED: 01/08/2013	DATE FINISHED: 01/08/2013	DRILLING METHOD: 4.25 ID HSA	
GROUND SURFACE ELEVATION (FT): 2732.8	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: Not Encountered	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 1 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	~~Recovery~~ Penetration	RQD
5	S-1	4 - 6	Saprolite	Rust colored, white and black; Saprolite, dry.	5/6/6/7	12	2.0/2.0	
				Auger cuttings: Red and dry.				
10	S-2	9 - 11		Similar to above, dry to damp.	12/14/17/22	31	1.6/2.0	
				Auger cuttings: Red to brown.				
15	S-3	14 - 15.9		Brown, rust colored, white and black, saprolite to weathered rock, dry to damp.	14/21/38/ 50/0.4'	59 Ref at 15.9'	1.4/1.9	
20	S-4	19 - 21		Similar to above, thick white (quartz zones - not fully weathered out)	7/16/25/51	41	2.0/2.0	
25	S-5	24 - 26		Brown, tan, rust colored, black and white, mica rich, saprolite, dry-damp.	22/26/21/26	47	1.3/2.0	
30	S-6	29 - 31		Similar to above, more rust colored.	7/7/10/11	17	2.0/2.0	
35	S-7	34 - 36		Similar to above.	13/20/19/32	39	2.0/2.0	
40	S-8	39 - 39.4	Partially Weathered Rock	White (quartz) with rust staining, dry.	50/0.4'	Ref at 39.4'	0.4/0.4	
				Augering easy to 43, hard 43-44 (likely quartz zone)				
45	S-9	44 - 46		Rust, tan, black and white, mica rich, Weathered Rock; dry to damp.	20/18/21/31	39	2.0/2.0	
				Auger cuttings: damp to wet				
50	S-10	49 - 51		Black, tan and white; Weathered Rock; saturated.	33/46/43/31	89	2.0/2.0	

P13-101 Piezometer Log



DEPTH (FT): 43.5, 45.5, 47.5

NOTES: See Page 2 of 2

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-101
DATE STARTED: 01/08/2013	DATE FINISHED: 01/08/2013	DRILLING METHOD: 4.25 ID HSA	
GROUND SURFACE ELEVATION (FT): 2732.8		DRILLING CONTRACTOR: A & E Drilling	LOGGED BY: BBJ
Auger Refusal Depth: Not Encountered	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 2 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD	P-13-101 Piezometer Log	DEPTH (FT)
			Partially Weathered Rock	Water at 47.5 ft bgs in open hole to 49 ft bgs.						
55	S-11	54 - 54.9		Highly weathered rock, saturated.	22/50/0.4'	Ref at 54.9'	0.9/0.9			
				Auger cuttings: soupy soil/water mix.						57.5
										58.4
60	S-12	59 - 60		Rust colored with black and brown; weathered rock, saturated	41/50/0.5'	Ref at 60'	1.0/1.0		CAVE	

Bottom of Exploration at 60.0 feet Below Ground Surface

NOTES: Piezometer Stick-up = 3.4 ft Top of PVC Elevation = 2736.18

Piezometers: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen;

Filter Sand 58.4 to 45.5 feet; Screen 57.5 to 47.5 feet; Bentonite Seal 45.5 to 43.5 feet; Cement Bentonite Grout 43.5 to 0.0 feet.

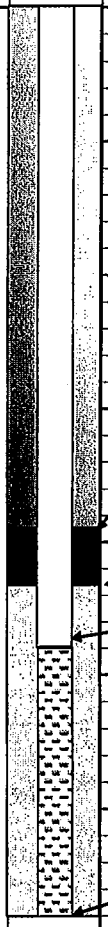
Piezometer development was completed on 1/10/2013

Slug Testing Completed on both piezometers (see Report)

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-102
DATE STARTED: 01/02/2013	DATE FINISHED: 01/02/2013	DRILLING METHOD: 4.25 ID HSA	
GROUND SURFACE ELEVATION (FT): 2733.5	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 34 ft bgs	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 1 OF 1

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD
5	S-1	4 - 6	Saprolite	Brown, Rust, Black and White; layered Saprolite; dry.	12/23/27/32	50	1.5/2.0	
10	S-2	9 - 11		Similar to above; with white (quartz) from 10.5 to 11.0 ft.	10/14/17/14	31	2.0/2.0	
15	S-3	14 - 16.5		Similar to above, near vertical bedding, hard piece in tip of spoon.	13/24/35	59	1.2/1.5	
20	S-4	19 - 21		19-19.5: similar to above. 19.5 - 21: Light Brown with black streaks, looks like sand stone, weathered, dry.	12/17/25/33	42	2.0/2.0	
25	S-5	24 - 26		Brown, rust colored, black and white, layered, dry.	7/8/8/13	16	2.0/2.0	
30	S-6	29 - 31		Similar to above, piece of weathered quartz.	12/15/34/52	49	2.0/2.0	
				Hard Augering started at 33 ft bgs.				
			Partially Weathered Rock	Auger Refusal at 34 ft bgs.				
35	S-7	34 - 34.2		Gray, Weathered Rock.	50/0.2'	Ref @ 34.2'	0.2/0.2	

P13-102 Piezometer Log



DEPTH (FT)

Bottom of Exploration at 34.2 feet Below Ground Surface

Hole sounded to 34 ft bgs, dry during piezometer installation.

NOTES: Piezometer Stick-up = 3.1 feet Top of PVC Elevation = 2736.60

Piezometer: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen; Filter Sand 34 to 22 feet; Screen 34 to 24 feet; Bentonite Seal 22 to 19.7 feet; Cement Bentonite Grout 19.7 to 0.0 feet.

Piezometer development was not completed (Piezo was dry from installation through at least 1/25/2013)

No Slug Tests performed, due to dry piezometer

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-103
DATE STARTED: 01/03/2013	DATE FINISHED: 01/03/2013	DRILLING METHOD: 4.25 ID HSA	
GROUND SURFACE ELEVATION (FT): 2761.0	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 65 ft bgs	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 1 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery	RQD	P13-103 Piezometer Log	DEPTH (FT)
5	S-1	4 - 5	Saprolite	Red/Brown; Silt/Sand on layered rock (likely a cobble/boulder), dry.	34/52	Ref at 5.0'	1.0/1.0			
				Augering hard to 9 ft bgs.						
10	S-2	9 - 11		Red, brown, black and white; Saprolite; dry.	16/30/46/49	76	2.0/2.0			
				Auger cuttings: Red/Brown.						
15	S-3	14 - 16		Similar to above, quartz seam 15.5 to 15.7 ft; mica rich, dry.	9/13/16/24	29	2.0/2.0			
20	S-4	19 - 21		Similar to above; quartz seam 19 to 19.2 ft; dry-damp.	9/19/27/43	46	2.0/2.0			
25	S-5	24 - 26		Similar to above, no quartz seam.	9/13/18/20	31	2.0/2.0			
30	S-6	29 - 31		Black, white, brown and red; mica rich; Saprolite; dry-damp; bedding 45-60 degrees from horizontal.	11/18/22/29	40	2.0/2.0			
35	S-7	34 - 36		Similar to above; slightly more red color, less white; dry-damp.	10/17/26/31	43	2.0/2.0			
40	S-8	39 - 41		Similar to S-6.	8/11/15/16	26	2.0/2.0			
45	S-9	44 - 46		Similar to above, approximately 30% quartz, crumbly, dry.	7/8/9/28	17	2.0/2.0			
50	S-10	49 - 51		Gray; Weathered Rock, medium grains of un-weathered quartz; dry to damp.	17/13/20/21	33	2.0/2.0			

NOTES: See Page 2 of 2

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-103
DATE STARTED: 01/03/2013	DATE FINISHED: 01/03/2013	DRILLING METHOD: 4.25 ID HSA	
GROUND SURFACE ELEVATION (FT): 2761.0	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 65 ft bgs	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 2 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD	P13-103 Piezometer Log	DEPTH (FT)
			Saprolite							51
										53
55	S-11	54 - 56		Similar to above.	14/18/27/27	45	2.0/2.0			55
				Auger cuttings: wet, balling up and sticky.						
60	S-12	59 - 61	Partially Weathered Rock	Gray; Weathered Rock; heavy rust staining; saturated.	7/14/40/49	54	2.0/2.0			
				Augured to refusal at 65 feet bgs, after S-13.						
65	S-13	64 - 64.3		Dark Gray; Weathered Rock; saturated.	50/0.3'	Ref at 64.3'	0.3/0.3			65

Bottom of Exploration at 65.0 feet Below Ground Surface

NOTES: Piezometer Stick-up = 3.5 feet Top of PVC Elevation = 2764.48

Piezometer: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen; Filter Sand 65 to 53 feet; Screen 65 to 55 feet; Bentonite Seal 53 to 51 feet; Cement Bentonite Grout 51 to 0.0 feet.

Piezometer development was completed on 1/4/2013

Slug Testing Completed (see Report)

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-104
DATE STARTED: 01/09/2013	DATE FINISHED: 01/10/2013	DRILLING METHOD: 4.25 ID HSA and NX Core	
GROUND SURFACE ELEVATION (FT): 2716.1	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 23.0	Rock Core Interval: 23 to 30.9 feet	SPT with Automatic Hammer	SHEET 1 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N VALUE (bpf)	~~Recovery~~ Penetration	RQD	Grouted	DEPTH (FT)
5	S-1	4 - 6	Saprolite	Red, brown, black and white; Saprolite; damp.	3/5/8/12	13	2.0/2.0			
10	S-2	9 - 11		Quartz in top of sample; Brown, black and white; Saprolite; dry to damp.	6/8/11/15	19	1.3/2.0			
			Partially Weathered Rock	Auger cuttings: Dark Brown, Weathered Rock (below 13 feet)						
15	S-3	14 - 14.3		White and brown; Weathered Rock (pulverized), high quartz content.	50/0.3'	Ref at 14.3'	0.3/0.3			
				Auger cuttings: Brown and red, Weathered Rock.						
20	S-4	19 - 19.9		White, black and brown; Weathered Rock, dry.	30/50/0.4'	Ref at 19.9'	0.7/0.9			
				Augering: light Brown to Tan; very hard, refusal at 23 feet.						
25	R-1	23 - 25.5	Competent Bedrock	See rock core log			2.42/2.5	75%		
30	R-2	25.5 - 30.5		See rock core log			4.9/5.0	98%		
	R-3	30.5 - 30.9		Bit on Core wore-out, re-drilled hole, see B-13-104R			0/0.4	0%		

Bottom of Exploration at 30.9 feet Below Ground Surface

NOTES: Core bit wore-out at 30.9, hole grouted to surface and hole moved south and re-drilled as B-13-104R.
Boring abandoned, filled with cement-bentonite grout to ground surface.

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-104R
DATE STARTED: 01/10/2013	DATE FINISHED: 01/11/2013	DRILLING METHOD: 4.25 ID HSA and NX Core	
GROUND SURFACE ELEVATION (FT): 2716.1	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 19 ft bgs	Rock Core Interval: 19 to 60.5 ft bgs	SPT with Automatic Hammer	SHEET 2 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery Penetration	RQD
			Saprolite	Auger to refusal at 19 feet below ground surface, see log for B-13-104 for materials encountered 0 to 19 feet at B-13-104				
20	R-1	19.0 - 25.5	Fractured Bedrock	See Bedrock Core Log			4.42/6.5	36%
25	R-2	25.5 - 30.7	Competent Bedrock	See Bedrock Core Log			4.83/5.2	87%
30	R-3	30.7 - 35.7	Fractured Bedrock	See Bedrock Core Log			2.69/5.0	29%
35	R-4	35.7 - 40.7	Competent Bedrock	See Bedrock Core Log			4.67/5.0	93%
40	R-5	40.7 - 45.7		See Bedrock Core Log			5.0/5.0	100%
45	R-6	45.7 - 50.7		See Bedrock Core Log			4.47/5.0	73%
50	R-7	50.7 - 55.7	Fractured Bedrock	See Bedrock Core Log			4.96/5.0	66%
55	R-8	55.7- 60.5		See Bedrock Core Log			3.65/4.8	65%
60								

Bottom of Exploration at 60.5 feet Below Ground Surface

NOTES: Piezometer Stick-up = 2.9 feet Top of PVC Elevation = 2718.98

Piezometers: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen;

Filter Sand 60.1 to 48 feet; Screen 60 to 50 feet; Bentonite Seal 48 to 45 feet; Cement Bentonite Grout 45 to 0.0 feet.

Piezometer development was completed on 1/14/2013

Slug Testing Completed on piezometer (see Report)

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-105
DATE STARTED: 01/17/2013	DATE FINISHED: 01/18/2013	DRILLING METHOD: 4.25 ID HSA	
GROUND SURFACE ELEVATION (FT): 2690.6	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 29.3 ft bgs	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 1 OF 1

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD
			Fill	Cuttings: red to brown silty sand.				
5	S-1	4 - 6	Saprolite	Brown with white (quartz) bands; dry, crumbly.	34/30/18/21	48	1.8/2.0	
10	S-2	9 - 11	Saprolite	Similar to above.	8/9/13/16	22	1.8/2.0	
15	S-3	14 - 16	Saprolite	Similar to above, mica rich, layered	3/8/11/17	19	2.0/2.0	
20	S-4	19 - 20.9	Partially Weathered Rock	Similar to above, when disturbed it appears sandy, wet to saturated.	7/20/40/ 50/0.4'	60 Ref at 20.9'	1.9/1.9	
25	S-5	24 - 25.4	Partially Weathered Rock	Similar to above, more mica.	32/31/ 50/0.4'	Ref at 25.4'	1.4/1.4	
				Auger Refusal at 29.3 ft bgs				
30	S-6	29.3 - 29.3	Partially Weathered Rock	No Recovery	Bouncing	Ref at 29.3'	0.0/0.0	

Bottom of Exploration at 29.3 feet Below Ground Surface

NOTES: Piezometer Stick-up = 3.2 feet Top of PVC Elevation = 2693.79

Piezometer: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen; Filter Sand 29.3 to 17.3 feet; Screen 29.3 to 19.3 feet; Bentonite Seal 17.3 to15.3 feet; Cement Bentonite Grout 15.3 to 0.0 feet.

Piezometer development was completed 1/21/2013.

Slug Testing Completed (see report)

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-106
DATE STARTED: 01/07/2013	DATE FINISHED: 01/08/2013	DRILLING METHOD: 4.25 ID HSA and NX Core	
GROUND SURFACE ELEVATION (FT): 2735.1	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 20.5 ft bgs	Rock Core Interval: 20.5 to 40.5 ft bgs	SPT with Automatic Hammer	SHEET 1 OF 1

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD
			FILL (Road)					
5	S-1	4 - 6	Partially Weathered Rock	Red, brown, white, with black flecks, Saprolite; dry.	17/30/41/44	71	2.0/2.0	
10	S-2	9 - 10.35		Tan, brown, with black flecks; Weathered Rock; dry.	17/35/ 54/0.35'	Ref at 10.35'	1.3/1.35	
				Auger cuttings: pieces of hard rock.				
15	S-3	14 - 16		Brown, Tan and rust colored; Saprolite and Weathe	5/7/13/14	20	1.7/2.0	
20	S-4	19 - 19.3		Gray to brown; Weathered Rock.	50/0.3'	Ref at 19.3'	0.3/0.3	
				Auger refusal at 20.5 ft bgs.				
25	R-1	20.5 - 30.5	Fractured Bedrock	See Bedrock Core Log			5.6/10.0	50%
30								
35	R-2	30.5 - 40.5	Competent Bedrock	See Bedrock Core Log			9.82/10.0	98%
40								

P13-106 Piezometer Log

Bottom of Exploration at 40.5 feet Below Ground Surface

NOTES: Piezometer Stick-up = 3.0 feet Top of PVC Elevation = 2738.12

Piezometer: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen; Filter Sand 40.5 to 25 feet; Screen 40.5 to 30.5 feet; Bentonite Seal 25 to 20.5 feet; Cement Bentonite Grout 20.5 to 0.0 feet.

Piezometer development was completed on 1/11/2013

Slug Testing Completed (see Report)

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-107
DATE STARTED: 01/03/2013	DATE FINISHED: 01/07/2013	DRILLING METHOD: 4.25 ID HSA and NX Core	
GROUND SURFACE ELEVATION (FT): 2756.6	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 12 ft bgs	Rock Core Interval: 12 to 76 ft bgs	SPT with Automatic Hammer	SHEET 1 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-Inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD
			Partially Weathered Rock	Augering started in exposed rock outcrop.				
5	S-1	4 - 4.9		Rust colored, brown, black and white; Weathered	34/ 50/0.4'	Ref at 4.9'	0.7/0.9	
10	S-2	9 - 10.9		Rust colored, brown, black, little white; Weathered Rock; dry.	4/32/36/ 50/0.4'	68 Ref at 10.9'	1.9/1.9	
				Auger Refusal at 12 ft bgs.				
15	R-1	12.0 - 14.8	Competent Bedrock	See Bedrock Core Log			2.8/2.8	91%
20	R-2	14.8 - 21.1		See Bedrock Core Log			5.93/6.3	79%
25, 30	R-3	21.1 - 31.1		See Bedrock Core Log			8.65/10.0	74%
35, 40	R-4	31.1 - 41.0	Fractured Bedrock	See Bedrock Core Log			8.3/9.9	81%
45, 50	R-5	41.0 - 50.0	Competent Bedrock	See Bedrock Core Log			9.0/9.0	100%

NOTES: See Page 2 of 2

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Inv.		JOB NO.: 12121.00	BORING NO.: B13-107
DATE STARTED: 01/03/2013	DATE FINISHED: 01/07/2013	DRILLING METHOD: 4.25 ID HSA and NX Core	
GROUND SURFACE ELEVATION (FT): 2756.6	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 12 ft bgs	Rock Core Interval: 12 to 76 ft bgs	SPT with Automatic Hammer	SHEET 2 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery Penetration	RQD	P13-107 A Piezometer Log	DEPTH (FT)
	R-6	50.0 - 51.5	Competent Bedrock	See Bedrock Core Log			1.36/1.5	91%		
55	R-7	51.5 - 60.0		See Bedrock Core Log			8.5/8.5	97%		
60	R-8	60.0 - 61.5		See Bedrock Core Log			1.5/1.5	100%		
65	R-9	61.5 - 71.0		See Bedrock Core Log			9.5/9.5	100%		63.9 / 65.9
70			Tight Fractures							
75	R-10	71.0 - 76.0	Competent Bedrock	See Bedrock Core Log			4.65/5.0	93%		75.9

Bottom of Exploration at 76.0 feet Below Ground Surface

NOTES: Piezometer Stick-up = A&B = 2.8 feet Top of PVC Elevation: A = 2759.42 & B = 2759.41

Piezometers: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen;

"B": Filter Sand 41 to 28 feet; Screen 40 to 30 feet; Bentonite Seal 28 to 24 feet; Cement Bentonite Grout 24 to 0.0 feet.

"A": Filter Sand 76 to 63.9 feet; Screen 75.9 to 65.9 feet; Bentonite Seal 63.9 to 41 feet.

Piezometer development was completed on 1/9/2013

Slug Testing Completed on both piezometers (see Report)

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation	JOB NO.: 12121.00	BORING NO.: B13-107R
DATE STARTED: 01/21/2013	DATE FINISHED: 01/21/2013	DRILLING METHOD: 4.25 ID HSA and NX Core
GROUND SURFACE ELEVATION (FT): 2756.5	DRILLING CONTRACTOR: A & E Drilling	LOGGED BY: BBJ
Auger Refusal Depth: 4 ft bgs.	Rock Core Interval: 4 to 50.3 feet	SPT with Automatic Hammer / SHEET 1 OF 1

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD
	See B-13-107 for conditions encountered above Auger Refusal.							
				Auger Refusal at 4 ft bgs.				
5	R-1	4.0 - 10.0	Fractured Bedrock	See Bedrock Core Log			1.75/6.0	8%
10	R-2	10.0 - 15.0	Competent Bedrock	See Bedrock Core Log			4.95/5.0	99%
15	R-3	15.0 - 20.0		See Bedrock Core Log			4.73/5.0	83%
20	R-4	20.0 - 25.0		See Bedrock Core Log			5.0/5.0	86%
25	R-5	25.0 - 30.0		See Bedrock Core Log			4.8/5.0	96%
30	R-6	30.0 - 35.0		See Bedrock Core Log			4.15/5.0	77%
35	R-7	35.0 - 40.0	Fractured Bedrock	See Bedrock Core Log			4.95/5.0	84%
40	R-8	40.0 - 45.0	Competent Bedrock	See Bedrock Core Log			5.0/5.0	100%
45	R-9	45.0 - 50.3		See Bedrock Core Log			4.54/5.3	86%
50								

P13-107C Piezometer Log

Bottom of Exploration at 50.3 feet Below Ground Surface

NOTES: Piezometer Stick-up = 3.1 feet Top of PVC Elevation = 2759.57

Piezometers: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen

"C": Filter Sand 50.3 to 28.3 feet; Screen 50 to 30 feet; Bentonite Seal 28.3 to 25 feet; Cement Bentonite Grout 25 to 0.0 feet.

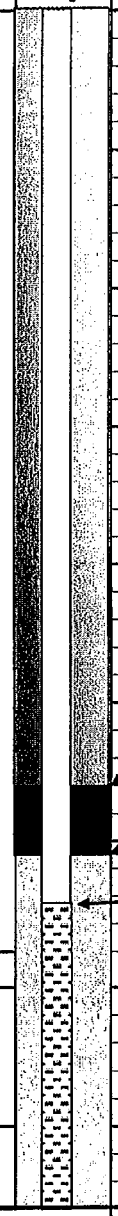
Piezometer development was completed on 1/23/2013

No Slug Testing was performed at this location

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-108
DATE STARTED: 01/23/2013	DATE FINISHED: 01/23/2013	DRILLING METHOD: 4.25 ID HSA and NX Core	
GROUND SURFACE ELEVATION (FT): 2727.8	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 34	Rock Core Interval: 34 to 42.6 ft bgs	SPT with Automatic Hammer	SHEET 1 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	~~Recovery~~ Penetration	RQD
5	S-1	4 - 6	Saprolite	Red, Tan, Black and White; Saprolite, horizontally banded, dry.	6/3/4/6	7	1.3/2.0	
10	S-2	9 - 11	Saprolite	Brown, Rust color, black and white; Saprolite; dry.	8/8/8/10	16	1.5/2.0	
15	S-3	14 - 16	Saprolite	Similar to above, more weathered rock like.	7/9/12/22	21	1.7/2.0	
20	S-4	19 - 20.3	Saprolite	Similar to above, water on rods. Water meter placed in boring was dry.	11/34/50/0.3'	Ref at 20.3'	1.0/1.3	
25	S-5	24 - 26	Saprolite	Brown, Black, rust colored, mica rich, near vertical bedding.	7/12/13/14	25	2.0/2.0	
30	S-6	29 - 31	Saprolite	Brown, rust color and black, Saprolite/Weathered Rock.	8/11/13/16	24	2.0/2.0	
			Partially Weathered Rock	Augering very hard 33 to 34 feet bgs. Auger Refusal at 34.0 feet bgs				
	S-7	34.0 - 34.1	Partially Weathered Rock	No recovery	50/0.1'	Ref at 34.1'	0.0/0.1'	
35	R-1	34 - 35	Competent Bedrock	See Bedrock Core Log			1.0/1.0	80%
	R-2	35 - 40	Highly Fractured Rock / Mud & Soil	See Bedrock Core Log			Rock: 2.95/5.0 Total: 3.4/5.0	26%
40	R-3	40 - 42.6	Highly Fractured Rock	See Bedrock Core Log			1.65/2.6	0%

P13-108 Piezometer Log



DEPTH (FT)

Bottom of Exploration at 42.6 feet Below Ground Surface

NOTES: Piezometer Stick-up = 3.1 feet Top of PVC Elevation = 2730.93

Piezometers: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen;

Filter Sand 42.6 to 30.6 feet; Screen 42.6 to 32.6 feet; Bentonite Seal 30.6 to 28 feet; Cement Bentonite Grout 28 to 0.0 feet.

Piezometer development was completed on 1/25/2013

No Slug Testing was performed at this location

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-109
DATE STARTED: 01/14/2013	DATE FINISHED: 1/15/2013	DRILLING METHOD: 4.25 ID HSA	
GROUND SURFACE ELEVATION (FT): 2739.7	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: Not Encountered	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 1 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD	P13-109 Piezometer Log	DEPTH (FT)
5	S-1	4 - 6	FILL	Red/brown; Clay; mixed with wood (0.5 ft thick); soft; wet	WOH/WOH/7/10	7	1.3/2.0			
				Auger cuttings: stumps and wood to 8 ft bgs.						
10	S-2	9 - 11		Brown and gray; mica-rich Clay; wet. Topsoil at 10 ft bgs with rootlets.	2/4/4/4	8	1.2/2.0			
				Auger cuttings: Rust colored to 12 ft bgs, then brown.						
15	S-3	14 - 16		Red with white seams and bands, with black flecks; Saprolite; dry.	7/8/7/11	15	1.3/2.0			
				Auger cuttings: red.						
20	S-4	19 - 21		White quartz (pulverized), and pink; Saprolite; dry.	7/8/8/9	14	1.0/2.0			
25	S-5	24 - 26		Red with white and black; Saprolite; dry.	5/5/7/14	12	1.6/2.0			
				Auger cuttings: brick-red color.						
30	S-6	29 - 31	Saprolite	Similar to above; black varves in bottom of spoon; saprolite to weathered rock.	5/10/13/12	23	1.7/2.0			
				Auger cuttings: similar to above						
35	S-7	34 - 36		Tan/brown, with rust colored, black flecks and varves and white; saprolite to weathered rock.	4/8/11/15	19	1.8/2.0			
				Auger cuttings: Weathered Rock (rock fragments), brick colored.						
40	S-8	39 - 41		Brown, black, and white; weathered rock; dry.	5/14/22/31	36	1.8/2.0			
45	S-9	44 - 46		Brown, black, and white; mica-rich; weathered rock; dry to moist.	4/7/12/22	19	2.0/2.0			
				Auger cuttings: brown						
50	S-10	49 - 51		Gray, darker with depth; weathered rock.	19/19/17/42	36	2.0/2.0			

NOTES: See Page 2 of 2

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-109
DATE STARTED: 01/14/2013	DATE FINISHED: 1/15/2013	DRILLING METHOD: 4.25 ID HSA	
GROUND SURFACE ELEVATION (FT): 2739.7	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: Not Encountered	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 2 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N VALUE (bpf)	Recovery / Penetration	RQD
			Saprolite	Augering: hard then softer again.				
55	S-11	54 - 55.8	Partially Weathered Rock	Gray, darker with depth; Weathered Rock.	17/28/44/ 50/0.3'	72 Ref at 55.8'	1.8/1.8	
				Augering: hard then softer again.				
60	S-12	59 - 61		Similar to above; more in-tact quartz grains.	6/8/11/18	19	1.5/2.0	
65	S-13	64 - 64.7		Similar to above; dry to damp.	14/ 50/0.2'	Ref at 64.7'	0.7/0.7	
70	S-14	69 - 69.4		Dark Brown; Weathered Rock; moist to wet.	50/0.4'	Ref at 69.4'	0.4/0.4	
				Augering very hard at 73.5, attempted spoon.				
	S-15	73.5 - 73.6		No recovery	50/0.1'	Ref at 73.6'	0.0/0.1	
75				Augering: easy drilling, cuttings were saturated brown. Water at 71 ft bgs in augers, hole open to 80 feet (after S-16 was collected)				
				Auger to refusal at 80.1 ft bgs, after collection of S-16				
80	S-16	79 - 79.1		No recovery, interpreted as Bedrock	50/0.1'	Ref at 79.1'	0.0/0.1	

P13-109 Piezometer Log

Bottom of Exploration at 80.1 feet Below Ground Surface

NOTES: Piezometer Stick-up = 3.0 feet Top of PVC Elevation = 2742.74

Piezometer: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen; Filter Sand 80.1 to 68 feet; Screen 80 to 70 feet; Bentonite Seal 68 to 66 feet; Cement

Piezometer development was completed on 1/21/2013

No Slug Testing was performed at this location

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-110
DATE STARTED: 01/15/2013	DATE FINISHED: 01/17/2013	DRILLING METHOD: 4.25 ID HSA and NX Core	
GROUND SURFACE ELEVATION (FT): 2728.8	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 30.5 ft bgs	Rock Core Interval: 30.5 to 85.0 ft bgs	SPT with Automatic Hammer	SHEET 1 OF 2

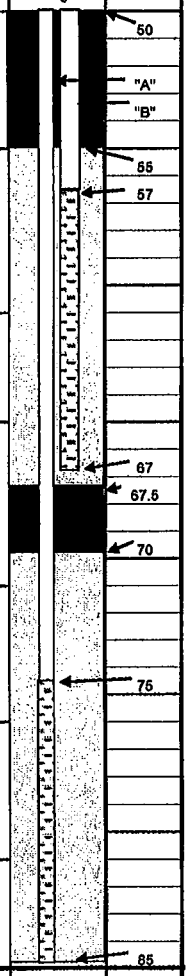
DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Penetration / Recovery	RQD	P13-110 A&B Piezometer Log	DEPTH (FT)
									"A" "B"	
5	S-1	4 - 6	FILL	Brown, Silty CLAY.	12/3/3/4	6	1.5/2.0			
10	S-2	9 - 11		Brown and Rust Color; Silty CLAY, sticky, wet.	2/3/2/3	5	1.5/2.0			
15	S-3	14 - 16		Similar to above, wood at 15 feet, underlain by Saprolite	7/6/7/16	13	1.0/2.0			
20	S-4	19 - 21	Saprolite	Black, Brown and Rust color; Weathered Rock; dry to damp.	5/7/6/8	13	2.0/2.0			
25	S-5	24 - 25.9		Rust stained with Brown and Black; Quartz rick Weathered Rock;	12/19/28/ 50/0.4'	47	1.6/1.9			
			Partially Weathered Rock	Auger Refusal at 30.5 ft bgs, after collection of S-6.						
30	S-6	29 - 30.4		Brown, Black and Rust colored; Sand; little streaking; tip of sample was hard rock.	4/12/50/0.4	Ref at 30.4'	1.0/1.4			
35	R-1	30.5 - 35.6	Highly Fractured Bedrock	See Bedrock Core Log			1.95/5.1	0.0%		
40	R-2	35.6 - 40.5	Fractured Bedrock	See Bedrock Core Log			3.55/4.9	65%		
45	R-3	40.5 - 45.2	Competent Bedrock	See Bedrock Core Log			2.7/4.7	55%		
50	R-4	45.2 - 50.5		See Bedrock Core Log			5.1/5.3	91%		

NOTES: See Page 2 of 2

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-110
DATE STARTED: 01/15/2013	DATE FINISHED: 01/17/2013	DRILLING METHOD: 4.25 ID HSA and NX Core	
GROUND SURFACE ELEVATION (FT): 2728.8	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 30.5 ft bgs	Rock Core Interval: 30.5 to 85.0 ft bgs	SPT with Automatic Hammer	SHEET 2 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-Inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD
55	R-5	50.5 - 55.5	Competent Bedrock	See Bedrock Core Log			4.95/5.0	95%
60	R-6	55.5 - 60.5		See Bedrock Core Log			4.88/5.0	98%
65	R-7	60.5 - 65.2		See Bedrock Core Log			4.7/4.7	100%
70	R-8	65.2 - 70.5		See Bedrock Core Log			5.3/5.3	90%
75	R-9	70.5 - 75.5		See Bedrock Core Log			4.9/5.0	98%
80	R-10	75.5 - 80.5		See Bedrock Core Log			5.0/5.0	100%
85	R-11	80.5 - 85.0		See Bedrock Core Log			4.45/4.5	99%

Bottom of Exploration at 85.0 feet Below Ground Surface



NOTES: Piezometer Stick-up: A = 2.9 & B = 2.8 feet Top of PVC Elevation: A = 2731.75 & B = 2731.59

Piezometer: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen.

"B": Filter Sand 57.5 to 55 feet; Screen 67 to 57 feet; Bentonite Seal 55 to 50 feet; Cement Bentonite Grout 50 to 0.0 feet.

"A": Filter Sand 85 to 70 feet; Screen 85 to 75 feet; Bentonite Seal 70 to 67.5.

Piezometer development was completed on 1/21/2013

Slug Testing Completed (see Report)

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-111
DATE STARTED: 01/22/2013	DATE FINISHED: 12/22/2013	DRILLING METHOD: 4.25 ID HSA	
GROUND SURFACE ELEVATION (FT): 2670.8	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: Not Encountered	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 1 OF 1

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD	P13-111 Piezometer Log	DEPTH (FT)
5	S-1	4 - 6	Saprolite	Tan, Black, Red, layered, Saprolite.	3/5/8/12	13	1.6/2.0			
10	S-2	9 - 11		Red, Brown, Black and White; layered; Weathered Rock.	4/5/7/8	12	1.7/2.0			9
										12
										14
15	S-3	14 - 18		Brown and Rust colored; SAND, little structure (looks like weathered rock at 15.5 to 16 feet bgs	6/7/7/10	14	2.0/2.0			
				Cuttings wet to saturated						
20	S-4	19 - 21		White with Black specks and streaked with Brown and Rust bands, (looks like weathered rock)	8/7/8/8	13	2.0/2.0			
										24
25	S-5	24 - 26		Gray, Rust colored, and black; weathered rock	8/11/13/16	24	1.8/2.0			26

Bottom of Exploration at 26 feet Below Ground Surface.

NOTES: Piezometer Stick-up = 2.9 feet Top of PVC Elevation = 2673.69

Piezometer: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen.

Filter Sand 26 to 12 feet; Screen 24 to 14 feet; Bentonite Seal 12 to 9 feet; Cement Bentonite Grout 9 to 0.0 feet.

Piezometer development was completed on 1/25/2013

No Slug Testing Completed.

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-112
DATE STARTED: 01/11/2013	DATE FINISHED: 01/11/2013	DRILLING METHOD: 4.25 ID HSA and NX Core	
GROUND SURFACE ELEVATION (FT): 2681.6	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: 39 ft bgs.	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 1 OF 1

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD
5	S-1	4 - 6	Saprolite	Red, brown, black and white; Saprolite; layered; dry to damp. White in tip of spoon.	13/13/15/11	28	1.8/2.0	
				Auger cuttings: red / brown				
10	S-2	9.0 -9.9	Partially Weathered Rock	Black, tan and white; Weathered Rock; layered; damp.	18/ 50/0.4'	Ref at 9.9'	0.9/0.9	
				Auger cuttings: light brown.				
15	S-3	14 - 16		Rust colored, brown, black and white; layered; damp.	15/27/34/45	61	2.0/2.0	
20	S-4	19 - 20.4		Similar to above.	24/31/ 50/0.4'	Ref at 20.4'	1.2/1.4	
				Auger cuttings: Brown and Rust; moist to wet.				
25	S-5	24 - 26		Quartz and mica (0.3 ft thick); over, Brown, black, rust colored, and white; Weathered Rock; damp.	13/17/17/20	34	1.8/2.0	
				Auger cuttings: moist to wet.				
30	S-6	29 - 31		Similar to above; mica rich; wet to saturated.	6/12/24/28	36	2.0/2.0	
35	S-7	34 - 35.6		Similar to above; gray at 38 ft bgs; very hard.	4/7/36/ 50/0.1'	43 Ref at 35.6'	1.6/1.6	
				Augured to refusal at 39 ft bgs, after collection of S-7.				

P13-112 Piezometer Log

Bottom of Exploration at 39.0 feet Below Ground Surface

NOTES: Piezometer Stick-up = 2.9 feet Top of PVC Elevation = 2684.48

Piezometer: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen; Filter Sand 39 to 26.3 feet; Screen 38.3 to 28.3 feet; Bentonite Seal 26.3 to 23.8 feet; Cement Bentonite Grout 23.8 to 0.0 feet.

Piezometer development was completed 1/11/2013.

No Slug Tests performed, due to dry piezometer

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation		JOB NO.: 12121.00	BORING NO.: B13-113
DATE STARTED: 01/22/2013	DATE FINISHED: 01/22/2013	DRILLING METHOD: 4.25 ID HSA	
GROUND SURFACE ELEVATION (FT): 2674.7	DRILLING CONTRACTOR: A & E Drilling		LOGGED BY: BBJ
Auger Refusal Depth: Not Encountered	Rock Core Interval: None	SPT with Automatic Hammer	SHEET 1 OF 1

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD	P13-113 Piezometer Log	DEPTH (FT)
	No Sampling See P-07-212		Saprolite	Auger Cuttings: Brown, silty SAND.						
5										
				Auger Cuttings: Red-Brown; silty clay with mica.						7
10										10
										12.4
15			Partially Weathered Rock	Auger Cuttings; Brown-red, silty clay with gravel and sand, (interpreted as Weathered Rock)						17.4
				Bottom of Exploration at 17.5 feet Below Ground Surface						17.5

NOTES: Installed as a replacement for P-07-212A&B, which were damaged during landfill operations.

Piezometer Stick-up = 3.3 feet Top of PVC Elevation = 2678.04

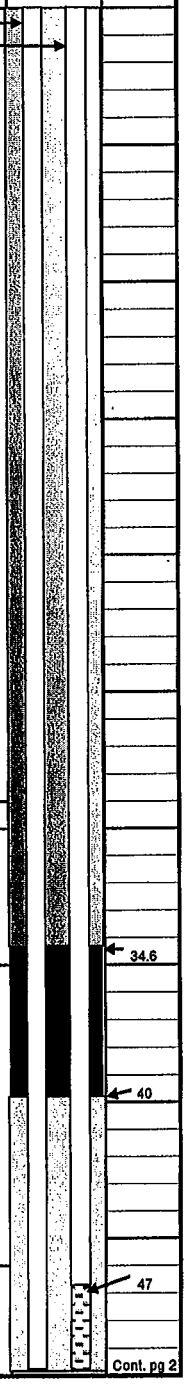
Piezometer: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen; Filter Sand 17.5 to 10 feet; Screen 17.4 to 12.4 feet; Bentonite Seal 10 to 7 feet; Cement Bentonite Grout 7 to 0.0 feet.

Piezometer development was completed1/25/2013

No Slug Tests performed

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Investigation	JOB NO.: 12121.00	BORING NO.: B13-114
DATE STARTED: 01/23/2013	DATE FINISHED: 01/24/2013	DRILLING METHOD: 4.25 ID HSA and NX Core
GROUND SURFACE ELEVATION (FT): 2779.4	DRILLING CONTRACTOR: A & E Drilling	LOGGED BY: BBJ
Auger Refusal Depth: 28.6 ft bgs	Rock Core Interval: 28.6 to 80.3 ft bgs	SPT with Automatic Hammer / SHEET 1 OF 1

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery / Penetration	RQD
5	S-1	4 - 8	FILL	Brown, SILT, trace organics and fine sand, wet. Pocket Penetrometer: 0.6 to 1.25 TSF.	1/1/2/2	3	2.0/2.0	
10	S-2	9 - 11	FILL	Brown; SILT; trace organics with rootlets, appears to be fill; moist. Pocket Penetrometer: 2.0 to 2.5 TSF.	3/3/4/4	7	2.0/2.0	
15	S-3	14 - 16	FILL	Similar to above, with more vegetation. Pocket Penetrometer: 3.0 to 3.5 TSF. At 15.8 feet: Red-Brown Clayey.	2/3/4/4	7	2.0/2.0	
20	S-4	19 - 20.4	Saprolite	White, red, black and brown; Saprolite.	5/6/13/17	19	2.0/2.0	
25	S-5	24 - 26	Saprolite	Red, white and black to all white with rust staining; Saprolite to weathered rock.	16/14/7/9	21	2.0/2.0	
			Partially Weathered Rock	Augured to refusal at 28.6 ft bgs, after collection of S-6.				
	S-6	28.5 - 28.6	Partially Weathered Rock	Red and Brown; Weathered Rock.	50/0.2'	Ref at 28.6'	0.2/0.2	
30	R-1	26.6 - 30.3	Fractured Bedrock	See Bedrock Core Log			1.7/1.7	100%
	R-2	30.3 - 35.3	Fractured Bedrock	See Bedrock Core Log			3.75/5.0	49%
35								
40	R-3	35.3 - 45.5	Fractured Bedrock / Competent Bedrock	See Bedrock Core Log			9.4/10.2	77%
45								
	R-4	45.5 - 55.5	Competent Bedrock	See Bedrock Core Log			9.9/10.0	97%
50								



DEPTH (FT)

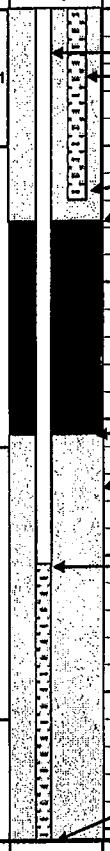
Cont. pg 2

NOTES: See Page 2 of 2

PROJECT: Evergreen Packaging Phase 6D-North Hydrogeologic Inv.		JOB NO.: 12121.00	BORING NO.: B13-114
DATE STARTED: 01/23/2013	DATE FINISHED: 01/24/2013	DRILLING METHOD: 4.25 ID HSA and NX Core	
GROUND SURFACE ELEVATION (FT): 2779.4		DRILLING CONTRACTOR: A & E Drilling	LOGGED BY: BBJ
Auger Refusal Depth: 28.6 ft bgs	Rock Core Interval: 28.6 to 80.3 ft bgs	SPT with Automatic Hammer	SHEET 2 OF 2

DEPTH (FT)	SAMPLE NO.	Sample Interval	Geologic Unit	MATERIAL DESCRIPTION	SPT Blows per 6-inch Interval	SPT N-VALUE (bpf)	Recovery Penetration	RQD
55	R-4 (cont)	45.5 - 55.5	Competent Bedrock	See Page 1			See page 1	See page 1
60	R-5	55.5 - 65.5		See Bedrock Core Log			9.73/10.0	97%
65								
70	R-6	65.5 - 75.5		See Bedrock Core Log			9.75/10.0	88%
75								
80	R-7	75.5 - 80.3		See Bedrock Core Log			4.75/4.8	99%

Bottom of Exploration at 80.3 feet Below Ground Surface



DEPTH (FT): 55, 60, 65, 70, 75, 80

NOTES: Piezometer Stick-up: A = 2.9 & B = 3.2 feet Top of PVC Elevation: A = 2782.35 & B = 2782.61

Piezometer: 3/4 inch ID PVC; 10 feet of 0.010 inch slotted screen.

"B": Filter Sand 58 to 40 feet; Screen 57 to 47 feet; Bentonite Seal 40 to 34.6 feet; Cement Bentonite Grout 34.6 to 0.0 feet.

"A": Filter Sand 80.3 to 65.6 feet; Screen 80.3 to 70.3 feet; Bentonite Seal 65.6 to 56 feet.

Piezometer development was completed on 1/25/2013

No Slug Tests performed

ATTACHMENT B

ROCK CORE LOGS

BEDROCK CORE LOG

PROJECT Evergreen Phase 6D-Worta BORING NO. B-13-104 PAGE 1 OF 1

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2693.1-2685.2 DEPTH (FT) INTERVAL 23-30.9

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING SL - SLIGHT MOD - MODERATE SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
23	R-1, 23-25.5	45°	2.42/2.5 97%	1.87/2.5 75%	Fe Staining into Rock next to Fracture	Gray, Gneiss with quartz bedded at ~45° Vuggy and Iron (Fe) Staining adjacent to Fratures with Rust
24	Rust, D, Fe, Fe next to Fracture, Fe					
25						
26	R-2, 25.5-30.5	45°	4.9/5.0 98%	4.82/5.0 96%	next to Fracture	Staining at Natural Contacts, and some black/green film on Contacts.
27	D					
28						
29	Fe next to Fracture					
30						
31	R-3 30.5-30.9		0/0.4 0%			Bottom of Exploration at 30.9. Bit on core barrel wore-out, re-drilled approx 10Ft south of of this location, Name: B-13-104R

5/90

SEVEE & MAHER ENGINEERS

BEDROCK CORE LOG

PROJECT Evergreen Phase 6D-North BORING NO. B-13-104R PAGE 1 OF 3

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2697.1-2683.1 DEPTH (FT) INTERVAL 19-33.5

AZIMUTH _____ INCLINATION _____ LOGGED BY B. Johnson (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
19	R-1, 19-25.5 ~Rubble, sev. wx		4.42/6.5	2.45/6.5	Highly Weathered	Severely Weathered, rust stained Gneiss
20			68%	38%		
21						Gray, Gneiss,
22	Fe adjacent to Fracture					Slightly Vuggy with Iron (Fe) staining adjacent to some Fractures, some fractures have black/green film on contacts.
23					Iron stained	
24	No Recovery, likely lost upper part of core					
25						
26	R-2, 25.5-30.7	45°	4.83/5.2	4.53/5.2		
27	D		93%	87%		
28	Fe adjacent to Fract. ← Dark Red in Fract	45°				
29	D					
30	D D Fe adjacent to Fracture	45°				
31	R-3, 30.7-35.7		2.69/5	4.45/5		
32	Fe adjacent to Fract		54%	29%	Iron Staining ↓	Highly Fractured, weathered 31.7-34 feet, No recovery
33						

BEDROCK CORE LOG

PROJECT Evergreen Phase 6 D-North BORING NO. B-13-104R PAGE 2 OF 3

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2683.1 2664.1 DEPTH (FT) INTERVAL 33-48

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE
CHIPS, CAVITY, LOST CORE
MEASURED HIGH-ANGLE JOINT (JT = JOINT)
D CORE BROKEN BY DRILLER
M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
33		See pg 1				Iron Staining	
34		No Recovery, likely lost ~ 31.7-34					
35.7							
36	D	R-4, 35.7-40.7		4.67/5	4.67/5		Gray, Gneiss, with Quartz & Mica, medium grained
	D	No iron Staining, All breaks are mechanical by Driller.		93%	93%		
38	D						
40		Natural					
		R5, 40.7-45.7 Fe on surface		5/5	5/5		
42		0.1' Quartz Seam	50°	100%	100%		
44		Fe at Fract Heavy Fe in Rock				Iron Stained	
	D						
46	D	R-6, 45.7-50.7		4.47/5	3.67/5		
	D			89%	73%		
48	D						

BEDROCK CORE LOG

PROJECT Evergreen Phase 6D-North BORING NO. B-13-104R PAGE 3 OF 3

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) 1½X ELEVATION (FT) 2655.6 (2668.1) INTERVAL DEPTH (FT) 48-60.5 INTERVAL

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
48	See pg 2 — D @ 48.1 — Fe on Fracture		See pg 2	See pg 2		
50	Fe Staining — No Recovery				Iron in Rock More with depth	Fracture Zone
	R-7, 50.7-55.7		4.98/5	3.3/5		Simmilar to above
52			100%	66%		
54	Iron Staining in Rock, Soft	50°				
	Rec all but 0.02 Driller Break					
56	R-8, 55.7-60.5		3.65/4.8	3.1/4.8		High Quartz Zone
			76%	65%		
58	D — Mud in Seam Fe stained Rock	50°			MUD	Thin Mud seam at Fracture
60	No Recovery, possibly lost at mud seam					
61	Bottom of Exploration at 60.5 ft bgs					

5/90

SEVEE & MAHER ENGINEERS

BEDROCK CORE LOG

PROJECT Evergreen Phase 6D-North BORING NO. B-13-106 PAGE 1 OF 2

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2715.6-2703.1 DEPTH (FT) INTERVAL 20.5-33

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
19						
20						
	R-1, 20.5-30.5 D		5.6/10.0	4.95/10.0	Weathered Rock	High Quartz content Rock at 20.5 to 21.5 Then Highly to Moderate weathering with repeated core barrel plugging. Voids interpreted as highly weathered/ Saprolite to 26 ft. b.g.s.
22	Vugg and rust stained rock		56%	50%		
	Partial Run, (1A) no recovery core barrel plugged					
24						
26	highly Fractured Rust stained *				Highly Fractured	* Partial Run, 25.5-26' core barrel plugged.
	D					
28	Partial Run, (1B) no recovery core barrel plugged					
30	last partial Run (1C) D				Competent Bedrock	
	R-2, 30.5-40.5		9.82/10	9.82/10		
32			98%	98%		
33						

BEDROCK CORE LOG

PROJECT Evergreen Phase 6D-North BORING NO. B-13-106 PAGE 2 OF 2

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) Nx ELEVATION (FT) INTERVAL 2703.1-2695.6 DEPTH (FT) INTERVAL 33-40.5

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE / CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
33	See pg 2.				Competent Bedrock	
34	Rust staining & Black film.					High Quartz content
36						
	D					
38		75°				Dip on Quartz seam
40						
41						Bottom of Exploration at 40.5 ft b.g.s. See Boring Log for Piezometer details

BEDROCK CORE LOG

PROJECT Evergreen Phase 6D-North BORING NO. B-13-107 PAGE 1 OF 5

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) ELEVATION (FT) INTERVAL 2744.6-2730.6 DEPTH (FT) INTERVAL 12-26

AZIMUTH INCLINATION LOGGED BY BBJ (NAME) (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE
CHIPS, CAVITY, LOST CORE
MEASURED HIGH-ANGLE JOINT (JT = JOINT)
D CORE BROKEN BY DRILLER
M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC. From Horizontal

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
12		R-1, 12-14.8'		2.8/2.8 100%	2.54/2.8 91%	Comp, Tight Fract. Competent Bedrock	Gray, Gneiss, medium grained.
		Black, green film Fract not on bedding plane	20°				
14		+ little Rust on Fract.					
		R-2, 14.8-21.1 on bedding	45	5.93/6.3 94%	4.98/6.3 79%		
16							
18							
		D (To fit Box)					
20		D on Quartz seam					
		D					
		R-3, 21.1-31.1'		8.65/10 87%	7.35/10 74%		
22		Rust at seam					
24							
		Thick Rust accum. on seam	70°				
26							Nearly all quartz

5/90

SEVEE & MAHER ENGINEERS

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-107 PAGE 2 OF 5

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) Nx ELEVATION (FT) ~~2714.6~~ 2730.6 INTERVAL DEPTH (FT) 26-42 INTERVAL

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
26	R-3 (cont.)					Gray, Gneiss
28	D Rust at seam					
30					Fracture Zone	
32	R-4, 31.0-41.0 Fracture Zone, Highly Weathered (likely location of lost core recovery)		7.3/9.9 74%	6.75/9.9 68%	and Poor Recovery	
34			including 1' from R-5		Little to no Natural fractures	
36	D Quartz seam		8.3/9.9			
38	38.15-38.4 D		84%	81%		
40	1.6' Not Recovered — Recovered 1' from R-5					
42	R-5, 41.0-50.0 ~ 2.35' piece, Top 1' was from R-4		9/9 100%	9/9 100%		

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-107 PAGE 3 OF 5

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) Nx ELEVATION (FT) 2714.6 2700.6 INTERVAL DEPTH (FT) 42-56 INTERVAL

AZIMUTH _____ INCLINATION _____ LOGGED BY RBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING SL - SLIGHT MOD - MODERATE SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
42	D	R-5 (cont.)				Little to No Natural Fractures	
44	D						
46	D						
48		Little to no Iron, weathering					
	D D						
50	D						
		R-6, 50.0-51.5		1.36/1.5 91%	1.36/1.5 91%		*Values reflect 0.31' recovered in R-7
		N Fe on Seam					
	D	Recovered 0.31' in R-7					
		R-7, 51.5-60.0		8.5/8.5	8.25/8.5		
52	D						
		Black, green film on thin Fract.		100%	97%		
54	D						
	D						
56	D						

5/90

SEVEE & MAHER ENGINEERS

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-107 PAGE 4 OF 5

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) Nx ELEVATION (FT) INTERVAL 2700.6 / 2696.6 DEPTH (FT) INTERVAL 56-70

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
56	R-7 (cont.)				Little to No Natural Fractures	Gray, Gneiss
	-Thin Fracture Black Stain					
58	D					
	-Thin Fracture, Black Stain.					
60	R-8, 60.0-61.5		1.5/1.5 100%	1.5/1.5 100%		
	D					
62	R-9, 61.5-71.0		9.5/9.5 100%	9.5/9.5 100%	Competent Bedrock	
64	D					
66	D					
68	D	45°				
70						

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-107 PAGE 5 OF 5

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) 2686.0 2680.0 INTERVAL DEPTH (FT) 70-76 INTERVAL

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE
CHIPS, CAVITY, LOST CORE
MEASURED HIGH-ANGLE JOINT (JT = JOINT)
D CORE BROKEN BY DRILLER
M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
70		R-9 (Cont.) IN				Comp Rock Fractured Bedrock	Gray Gneiss - Tight
		R-10, 71.0-76.0		4.65 / 5.0 = 93%	4.65 / 5.0 = 93%		
72							
74	D						
76							Bottom of Exploration at 76 ft bgs

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-107R PAGE 1 OF 4

JOB NO. 12127.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) Nx ELEVATION (FT) INTERVAL 2752.6-2738.6 DEPTH (FT) INTERVAL 4-18

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
4	R-1, 4.0-10.0 Highly Fractured		1.75/6.0 29%	0.45/6.0 8%	Weathered Rock	Quartz, Rust Stained Quartz and Gneiss ← 0.45' Gray Gneiss
6	No Recovery (Weathered Bedrock)					
8						
10	R-2, 10.0-15.0 D		4.95/5.0 99%	4.95/5.0 99%	9.5' Competent Bedrock	
12						
14	D					
16	R-3, 15.0-20.0 D		4.73/5.0 95%	4.15/5.0 83%		
18	D					

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-10TR PAGE 2 OF 4

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2738.6 2724.6 DEPTH (FT) INTERVAL 18-32

AZIMUTH _____ INCLINATION _____ LOGGED BY RJT (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
18		R-3, (See pg 1)				Comp. Bedrock	Gray Gneiss with mica and quartz
20		R-4, 20.0-25.0		5.0/5.0 100%	4.38/5.0 88%		
22	D D						
24	D						
26		R-5, 25.0-30.0		4.80/5.00 96%	4.80/5.0 96%		
28	D D						
30		R-6, (see pg 3					
32	D						

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-107R PAGE 3 OF 4

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2724.6-2710.6 DEPTH (FT) INTERVAL 32-46

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE
CHIPS, CAVITY, LOST CORE
MEASURED HIGH-ANGLE JOINT (JT = JOINT)
D CORE BROKEN BY DRILLER
M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
32		R-6, 30.0-35.0		4.15 / 5.0 = 83%	3.85 / 5.0 = 77%		Gray, Gneiss
	D						
34						Fractured Bedrock	
		R-7, 35.0-40.0		4.95 / 5.0 = 99%	4.2 / 5.0 = 84%		
36	D					Competent Bedrock	
		Multiple Driller breaks, due to possible damaged over reamer induced chattering of Rods that damaged core					
38							
40		R-8, 40.0-45.0		5.0 / 5.0 = 100%	5.0 / 5.0 = 100%		
D							
	D						
42							
	D D						
	D	Rust on seam					
44							
		R-9 (see pg 4)					
46	D						

5/90

SEVEE & MAHER ENGINEERS

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-107R PAGE 4 OF 4

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2710.6-2706.3 DEPTH (FT) INTERVAL 46-50.3

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
46	D	R-9, 45-50.3		4.54/5.3 86%	4.54/5.3 86%		Gray, Gneiss.
	D						
	D						
48	D	Rust & Black					
	D						
	D						
50							
51							Bottom of Exploration at 50.3 ft b.g.s.

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-108 PAGE 1 OF 1

JOB NO. 12127.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) Nx ELEVATION (FT) INTERVAL 2693.8-2685.2 DEPTH (FT) INTERVAL 34-42.6

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS ON PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
34	R-1, 34.0-35.0 D		1.0/1.0 100%	0.8/1 80%		Gray, Gneiss
	R-2, 35-40		Rock 2.95/5	1.3/5		
36	Vuggy, Rust Stained		58% Total 3.4/5	26%	Highly Weathered Rock	Rust Stained, Vuggy Gneiss
38	Mud/Soil		68%		Mud & Soil	Mud and Soil
	No Recovery					
40	R-3, 40-42.6 Vuggy, Rust Stained		1.85/2.6 71%	0/2.6 0%	Highly Weathered Rock	Rust Stained Vuggy Gneiss
42						
43	Bottom of Exploration at 42.6 ft bgs					

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-110 PAGE 1 OF 4

JOB NO. 12227.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2698.8-2684.8 DEPTH (FT) INTERVAL 30-44

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC. From Horizontal

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
30	Soil. (see boring Log)					
30.5	R-1, 30.5-35.6 Vuggy, Iron stained on Fractures		1.95 / 5.1	0 / 5.1	Weathered Rock Interbedded with Soil	Layered Highly Weathered Rock, Interbedded with Soil (Saprolite)
32	Soil, mostly clay & Mica		38% Total	0%		
	Rust Stained Rock		Rock: 0.95 / 5.1			
34	No Recovery (likely Soil)		19%			
36	R-2, 35.6-40.5 Rust stained Rock	60°	3.55 / 4.9	3.2 / 4.9	37	Gray, Gneiss, Highly Fractured and moderately weathered
			72%	65%	Fractured	
38	Fracture Zone Rust on seams and in Rock					Mostly quartz pieces with heavy rust staining.
40	No Recovery					Possibly Ripable to 42'
	R-3, 40.5-45.2 Rust stained Rock		2.7 / 4.7	2.6 / 4.7		
42			57%	55%		
44	No Recovery					

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D North BORING NO. B-13-110 PAGE 2 OF 4

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) Nx ELEVATION (FT) INTERVAL 2684.8-2670.8 DEPTH (FT) INTERVAL 44-58

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
44	R-3, (see pg. 1) 2 No Recovery					
	R-4, 45.2-50.5		5.1 / 5.3 = 96%	4.8 / 5.3 = 91%	Little Fractures	Gray, Gneiss, medium Grained
46						
48	D					
50	D					
	R-5, 50.5-55.5		4.95 / 5.0 = 99%	4.75 / 5.0 = 95%		
52	D					
54	D					High quartz, large grain
	R-6, 55.5-60.5		4.88 / 5.0 = 98%	4.88 / 5.00 = 98%		
56	← No Fract, see pg 3					
58						

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-110 PAGE 3 OF 4

JOB NO. 12127.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2670.8-2656.8 DEPTH (FT) INTERVAL 58-72

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

MEASURED BREAKS OR PARTINGS ACROSS CORE
CHIPS, CAVITY, LOST CORE
MEASURED HIGH-ANGLE JOINT (JT = JOINT)
D CORE BROKEN BY DRILLER
M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING
SL - SLIGHT
MOD - MODERATE
SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
58		R-6, (See pg 2)					Gray, Gneiss
	D		45°			Tight Fract.	
60	D	} Recovered in R-7				No Fract.	
		R-7, 60.5-65.2		4.7/4.7 100%	4.7/4.7 100%		
62		No Fractures					
	D						
64							
		R-8, 65.2-70.5		5.3/5.3 100%	4.77/5.3 90%	Fractured	
66		Fracture Zone Iron Stained					
68						Little Fract	
70	D					No Natural Fractures	
	D	R-9, (See pg 4)					
72							

5/90

SEVEE & MAHER ENGINEERS

BEDROCK CORE LOG

PROJECT Evergreen Phase 6 D-North BORING NO. B-13-110 PAGE 4 OF 4

JOB NO. 12127.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) Nx ELEVATION (FT) INTERVAL 2656.8-2643.8 DEPTH (FT) INTERVAL 72-85

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
72	R-9, 70.5-75.5		4.9/5.0 98%	4.9/5.0 98%	No Natural Fractures	Gray, Gneiss with high quartz content.
74	D, D, D					
76	R-10, 75.5-80.5		5.0/5.0 100%	5.0/5.0 100%		
78	D, D, D, D, D, D					
80	D, D				Fracture No Natural Fractures	
82	R-11, 80.5-85.0		4.45/4.5 99%	4.45/4.5 99%		
84	D					
85						Bottom of Exploration at 85.0 ft b.g.s.

BEDROCK CORE LOG

PROJECT Evergreen, Phase 6D-North BORING NO. B-13-14 PAGE 1 OF 4

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) Nx ELEVATION (FT) INTERVAL 2751.4 2737.4 DEPTH (FT) INTERVAL 28.0-42

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
28	See Boring Log 0-28.6					
	R-1, 28.6-30.3 No Breaks		1.7/1.7 100%	1.7/1.7 100%		Gray, Gneiss
30	D					
	R-2, 30.3-35.3		3.75/5 75%	2.45/5 49%		
32	D					
	Slight soil in seam, possible location of not recovered core					High quartz content
34						
	R-3, 35.3-45.5		9.4/10.2 92%	7.88/10.2 77%		
36						
	Break post recovery					
38						
40	Rust Stained Rock				Fracture Zone likely 0.8 more	Fracture Zone 39'-42'
42						

BEDROCK CORE LOG

PROJECT Evergreen Phase 6D-North BORING NO. B-13-114 PAGE 2 OF 4

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2737.9 2723.4 DEPTH (FT) INTERVAL 42-56

AZIMUTH _____ INCLINATION _____ LOGGED BY BBJ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	BREAKS IN CORE	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
42		R-3, see pg 1					
44	D D	Rust stained Rock. No Recovery, likely ~40'					
46		R-4, 45.5-55.5		9.9/10.0 99%	9.7/10 97%	Fracture Free Rock	
48							
50	D D						
52		Iron Stained Seam " " "				Small Frac Fracture Free Rock	
54	D	0.1 Not Rec.					
56		R-5, see pg 3					

BEDROCK CORE LOG

PROJECT Evergreen Phase 6D-North BORING NO. B-13-114 PAGE 3 OF 4

JOB NO. 12121.01 DRILLER A&E Drilling Services

CORE DIAMETER (IN.) NX ELEVATION (FT) INTERVAL 2723.4-2709.4 DEPTH (FT) INTERVAL 56-70

AZIMUTH _____ INCLINATION _____ LOGGED BY _____ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
56	R-5, 55.5-65.5		9.73/10	9.73/10	Fracture Free Rock	Gray Gneiss
	D		97%	97%		
58	D					
60	D					
62	D					
64	D					
	M D					
66	R-6, 65.5-75.5		9.75/10	8.8/10		
	D		98%	88%		
68	D					
	D					
70	D					

BEDROCK CORE LOG

PROJECT Evergreen Phase 6D-North BORING NO. B-13-1/4 PAGE 4 OF 4

JOB NO. 12121.01 DRILLER A&E Drilling

CORE DIAMETER (IN.) Nx ELEVATION (FT) INTERVAL 2709.4-2699.1 DEPTH (FT) INTERVAL 70-80.3

AZIMUTH _____ INCLINATION _____ LOGGED BY _____ (NAME) _____ (DATE)

BREAKS IN CORE: MEASURED BREAKS OR PARTINGS ACROSS CORE; CHIPS, CAVITY, LOST CORE; MEASURED HIGH-ANGLE JOINT (JT = JOINT); D CORE BROKEN BY DRILLER; M CORE PARTED ALONG MICA CONCENTRATION

WX: WEATHERED - WEATHERING; SL - SLIGHT; MOD - MODERATE; SEV - SEVERE

DIP: DIP OF LAYERING, TEXTURE, FOLIATION, BEDDING, ETC.

DEPTH	CONDITION OF CORE, WX, ETC.	DIP	RECOVERY (%)	RQD (%)	GRAPHIC LOG	ROCK TYPE, GRAIN SIZE, COLOR, TEXTURE, ETC.
70	D, N, Rust in seam; Rust and Rock in healed seam; Black on seam				Rust Stained and Black on Seams	Gray, Gneiss
72	D, Green on seam; Iron					
74	Iron; D; D; D				Fracture Free Rock	
76	R-7, 75.5-80.3; D		4.75/4.8 99%	4.75/4.8 99%		
78						
80	D; D					
81	Bottom of Exploration at 80.3 ft bgs.					

5/90

SEVEE & MAHER ENGINEERS

ATTACHMENT C

(REVISED 11/01/2013)

WATER ELEVATIONS LANDFILL No. 6 AREA D NORTH

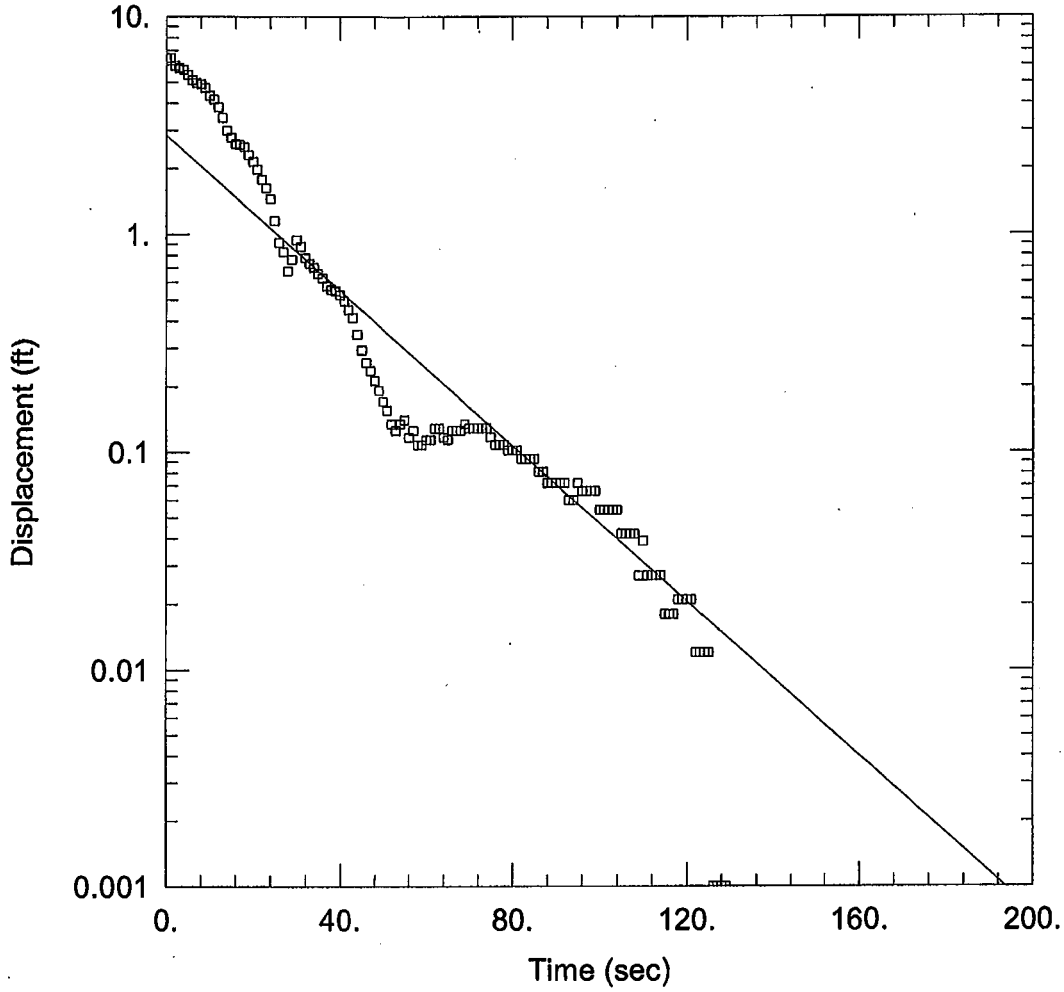
Date:	1/18/2013	2/18/2013	3/14/2013	4/2/2013	4/23/2013	5/3/2013	5/17/2013	6/14/2013	7/2/2013	7/16/2013	8/5/2013	8/26/2013	9/11/2013	ESTIMATED SEASONAL-HIGH WATER TABLE[2]
P-07-201A	2673.67	2674.84	2675.61	2676.20	2676.89	2677.41	2678.84	2677.62	2676.67	2677.42	2676.61	2676.61	2675.32	-
P-07-201B	2673.89	2673.19	2674.22	2674.83	2675.29	2675.59	2677.07	2677.03	2676.93	2676.90	2676.88	2676.82	2676.72	-
P-07-201C	2674.85	2675.48	2676.69	2677.46	2678.15	2678.56	2679.86	2679.45	2678.44	2678.62	2678.30	2677.59	2677.03	2682
P-07-202A	2652.00	2650.20	2650.42	2650.52	2650.85	2651.26	2651.30	2651.06	2650.61	2651.30	2650.54	2650.63	2650.09	-
P-07-202B	2653.80	2651.58	2651.82	2651.88	2652.08	2652.87	2652.56	2652.54	2652.21	2652.78	2651.99	2652.08	2651.52	2656
P-07-203A	-	-	2681.48	2682.02	2682.73	2683.05	2683.94	2683.72	2683.35	2683.84	2683.29	2683.05	2682.55	-
P-07-203B	-	-	2678.90	2679.31	2679.73	2680.02	2680.52	2679.99	2679.44	2679.97	2679.22	2679.14	2678.47	-
P-07-203C	-	-	2680.25	2680.48	2680.85	2681.09	2681.49	2681.07	2680.57	2681.06	2680.34	2680.32	2679.64	2683
P-07-204A	2692.21	2690.29	2691.06	2691.75	2692.62	2693.25	2694.24	2694.51	2694.09	2694.89	2694.42	2694.07	2693.52	-
P-07-204B	2692.43	2690.41	2691.19	2691.87	2692.76	2693.37	2694.43	2694.67	2694.33	2695.10	2694.67	2694.31	2693.79	-
P-07-204C	2692.35	2690.37	2691.34	2692.09	2692.90	2693.48	2694.54	2695.03	2694.80	2695.53	2695.16	2694.79	2694.35	2697
P-07-205	2660.83	2659.13	2660.83	2662.08	2663.31	2664.06	2665.79	2666.91	2666.13	2665.80	2665.20	2664.46	2663.86	2668
P-07-207	2681.99	2679.79	2680.26	2680.74	2681.31	2681.58	2682.14	2683.04	2683.23	2683.42	2683.71	2683.74	2683.70	2684
P-07-213	2696.57	2694.86	2695.81	2696.46	2696.82	2697.46	2699.86	2698.31	2696.86	2696.96	2696.83	2696.15	2696.47	2700
P-07-226A	2633.06	2631.98	2632.25	2632.44	2632.82	2633.16	2633.58	2633.20	2632.71	2633.31	2632.59	2632.35	2631.91	-
P-07-226B	2632.33	2631.52	2631.77	2631.87	2632.31	2632.64	2632.97	2632.42	2631.90	2632.48	2631.73	2631.50	2630.87	-
P-07-226C	2633.81	2632.75	2632.99	2633.09	2633.43	2633.70	2634.03	2633.47	2633.00	2633.66	2632.89	2632.70	2633.23	2636
MW-1A	-	2697.32	2697.77	2698.47	2699.20	2699.52	2700.07	2701.23	2701.97	2702.62	2703.45	2704.10	2704.50	2704
MW-9	-	2649.90	2650.29	2650.34	2650.52	2650.80	2653.15	2653.11	2652.77	2652.57	2652.42	2651.77	2651.35	2655
MW-10	-	2643.02	2643.68	2644.31	2644.93	2645.45	2646.68	2647.10	2646.56	2646.35	2645.76	2645.27	2644.82	2649
MW-11	-	-	2631.40	2631.50	2631.91	2632.26	2632.47	2631.71	2631.25	2631.98	2631.13	2630.96	2630.55	2634
P13-101	2686.38	2687.59	2688.38	2689.13	2689.77	2690.23	2691.50	2692.23	2692.25	2692.98	2693.45	2693.32	2693.13	2693
P13-102	2699	2700.30	2701.58	2702.63	2703.46	2703.92	2704.48	2704.81	2704.94	2705.58	2705.53	2705.80	2705.44	2706
P13-103	2712.43	2714.23	2715.51	2716.40	2717.12	2717.56	2719.17	2719.21	2718.44	2718.22	2718.44	2717.83	2717.47	2721
P13-104R	2676.67	2678.22	2678.48	2678.80	2679.17	2679.40	2680.63	2680.84	2680.77	2680.87	2680.94	2680.50	2680.21	2682
P13-105	2679.86	2681.25	2681.47	2681.69	2681.97	2682.33	2683.61	2682.49	2681.78	2683.14	2682.50	2682.11	2681.49	2684
P13-106	2711.42	2707.70	2707.57	2707.44	2707.48	2708.09	2708.07	2708.01	2706.19	2707.60	2706.86	2706.12	2706.11	2713
P13-107A	2688.27	2688.12	2688.60	2689.07	2689.35	2689.64	2690.53	2690.94	2690.44	2690.69	2690.82	2690.29	2690.26	2693
P13-107B	2724.28	2719.68	2719.56	2719.39	2719.69	2720.11	2719.51	2720.02	2718.14	2720.31	2718.43	2718.76	2717.34	-
P13-107C	2719.95	2719.67	2719.55	2719.42	2719.63	2720.06	2719.50	2719.99	2718.15	2720.23	2718.43	2718.76	2717.34	-
P13-108	2687.51	2686.88	2686.69	2686.65	2686.64	2686.95	2688.07	2686.48	<2685.20	2686.60	2685.20	2685.20	2685.20	2690
P13-109	2678.44	2678.02	2679.14	2679.94	2680.61	2681.02	2682.50	2682.48	2682.03	2682.03	2682.20	2681.75	2681.53	2684
P13-110A	2682.03	2659.08	2663.69	2667.04	2670.17	2672.05	2675.34	2678.20	2679.79	2681.90	2679.88	2682.57	2684.39	-
P13-110B	2675.67	2675.59	2675.36	2675.44	2675.49	2676.08	2677.37	2674.87	2674.19	2675.22	2674.78	2673.87	2673.44	2679
P13-111	2655.11	2656.43	2656.56	2656.81	2657.19	2657.73	2659.10	2657.43	2656.58	2658.03	2657.04	2656.28	2655.58	2661
P13-112	2657.04	2658.34	2658.15	2658.12	2658.33	2658.71	2659.87	2658.61	2657.96	2659.68	2658.63	2657.96	2657.33	2662
P13-113	2672.6	2673.47	2673.32	2673.24	2673.37	2674.29	2675.52	2673.38	2671.73	2673.87	2672.19	2670.74	2669.75	2677
P13-114A	2705.1	2704.56	2704.55	2704.56	2704.57	2704.60	2704.61	2704.61	2704.60	2704.58	2704.62	2704.58	2704.57	2707
P13-114B	2732.21	2731.56	2731.25	2731.03	2730.81	2731.09	2732.13	2729.87	2728.55	2729.50	2729.22	2727.85	2727.55	-

NOTES:

1. Water level at P-13-108 on 7/2/2013 represents the base of the screen. This well was dry and the water level is actually lower that the value reported.
2. Estimated seasonal-high water table used for landfill groundwater separation. Based on "rounding-up" measurements.

ATTACHMENT D

IN SITU SLUG TEST RESULTS



P-13-101 TEST 3 (PWR)

Data Set: C:\...\B-13-101-T3.aqt
Date: 03/05/13 Time: 09:05:06

PROJECT INFORMATION

Company: Sevee & Maher Engineers, Inc.
Client: Evergreen Packaging
Project: 12121.00
Location: Canton, NC
Test Well: P-13-101
Test Date: 1/12/2013

AQUIFER DATA

Saturated Thickness: 11. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (P-13-101)

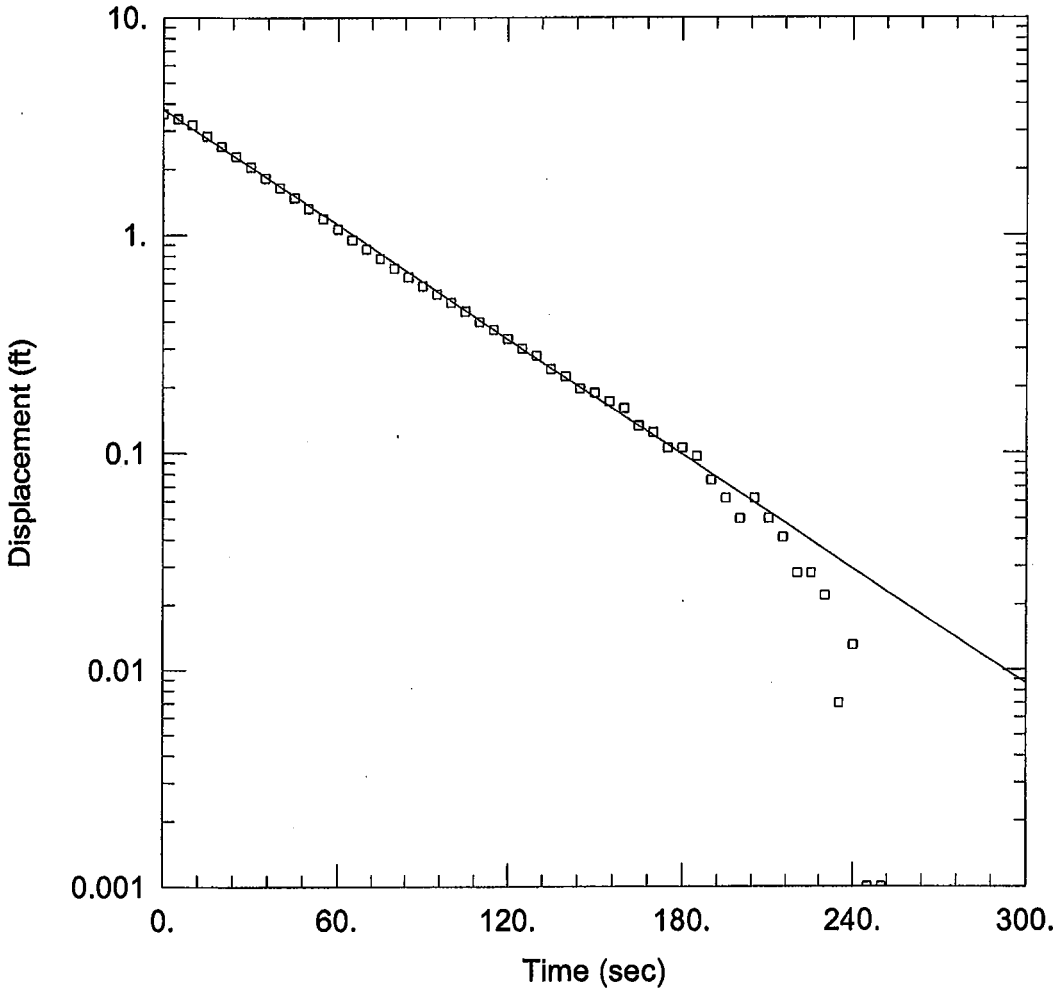
Initial Displacement: 6.463 ft
Total Well Penetration Depth: 11. ft
Casing Radius: 0.03125 ft
Static Water Column Height: 11. ft
Screen Length: 12.9 ft
Wellbore Radius: 0.3542 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.004893 cm/sec y0 = 2.856 ft

The correction for a partially saturated screen was applied.



P-13-103 TEST 1 (Saprolite / PWR)

Data Set: C:\...\B-13-103-T1.aqt
Date: 03/05/13 Time: 09:03:18

PROJECT INFORMATION

Company: Sevee & Maher Engineers, Inc.
Client: Evergreen Packaging
Project: 12121.00
Location: Canton, NC
Test Well: B-13-103
Test Date: 1/7/2013

AQUIFER DATA

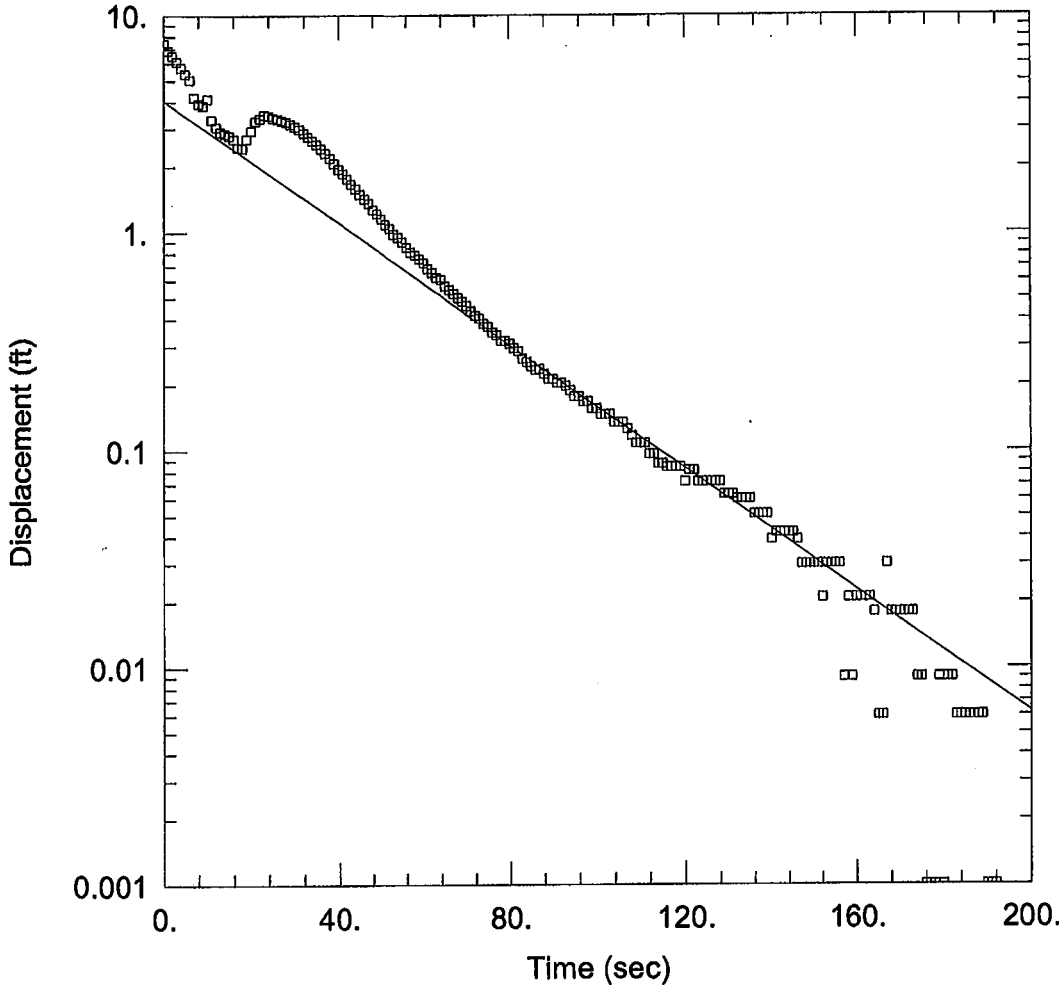
Saturated Thickness: 13.05 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (P-13-103)

Initial Displacement: 3.591 ft
Total Well Penetration Depth: 13.05 ft
Casing Radius: 0.03125 ft
Static Water Column Height: 13.05 ft
Screen Length: 12. ft
Wellbore Radius: 0.3542 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 6.844E-5 cm/sec
y0 = 3.757 ft



P-13-104 TEST 2 Fractured Bedrock

Data Set: C:\...\B-13-104-T2.aqt
Date: 03/05/13 Time: 09:09:11

PROJECT INFORMATION

Company: Sevee & Maher Engineers, Inc.
Client: Evergreen Packaging
Project: 12121.00
Location: Canton, NC
Test Well: P-13-104
Test Date: 1/16/2013

AQUIFER DATA

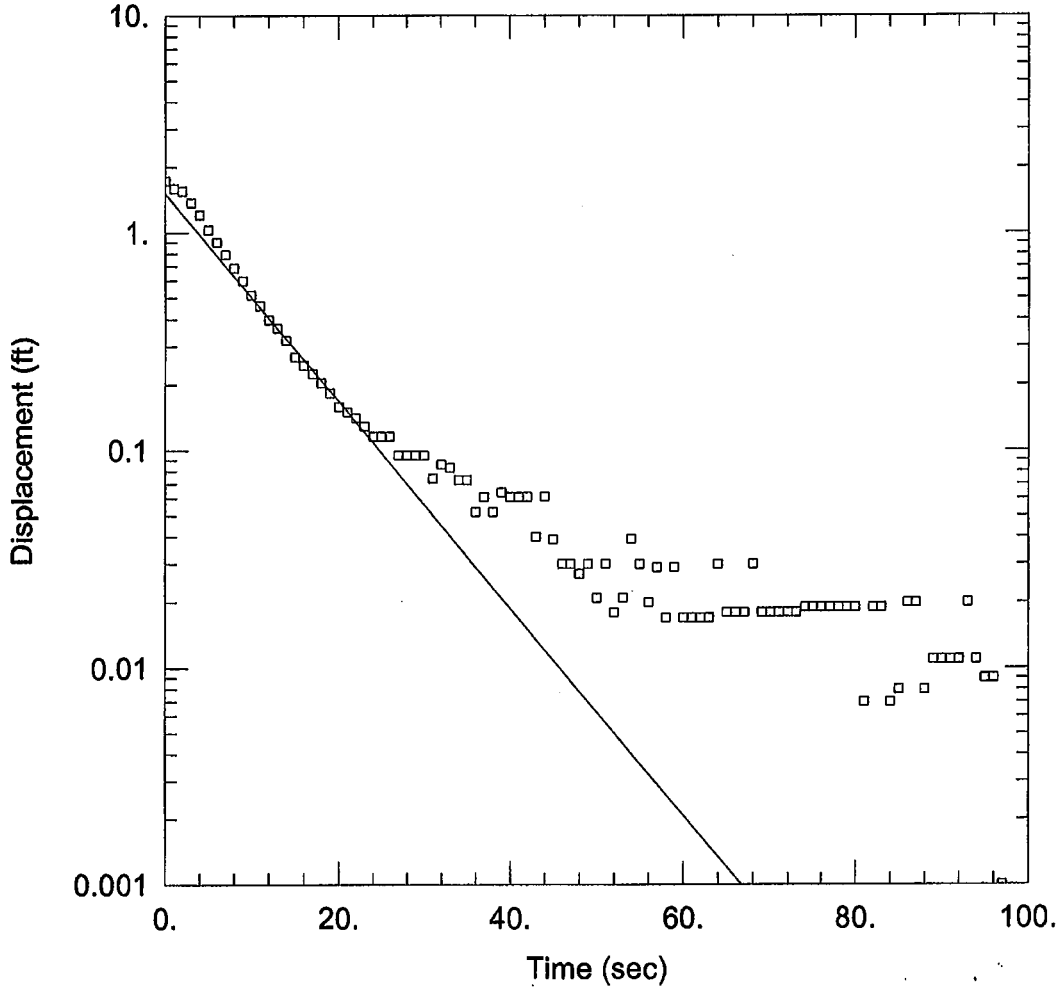
Saturated Thickness: 20.1 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (P-13-104)

Initial Displacement: 7.431 ft
Total Well Penetration Depth: 20.1 ft
Casing Radius: 0.03125 ft
Static Water Column Height: 20.1 ft
Screen Length: 12.1 ft
Wellbore Radius: 0.125 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.000153 cm/sec
y0 = 4.059 ft



P-13-105 TEST 2

Data Set: C:\...\B-13-105-T2.aqt
Date: 03/05/13 Time: 09:08:38

PROJECT INFORMATION

PWR

Company: Sevee & Maher Engineers, Inc.
Client: Evergreen Packaging
Project: 12121.00
Location: Canton, NC
Test Well: P-13-105
Test Date: 1/22/2013

AQUIFER DATA

Saturated Thickness: 18.3 ft Anisotropy Ratio (Kz/Kr): 1.

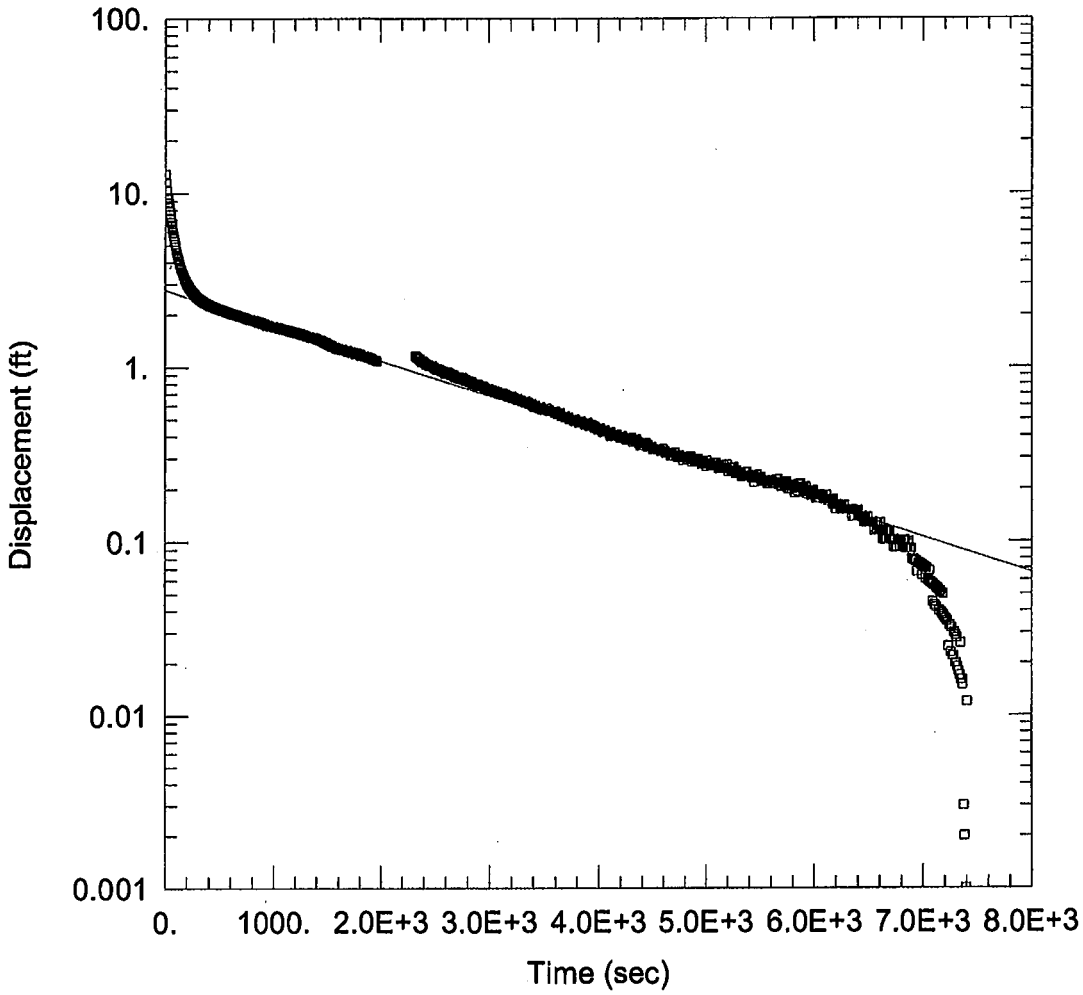
WELL DATA (P-13-105)

Initial Displacement: 1.736 ft
Total Well Penetration Depth: 18.3 ft
Casing Radius: 0.03125 ft
Static Water Column Height: 18.3 ft
Screen Length: 12. ft
Wellbore Radius: 0.3542 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.0003999 cm/sec y0 = 1.518 ft



P-13-106 TEST 1 Comp. Bedrock

Data Set: C:\...\B-13-106-T1.aqt
Date: 03/05/13 Time: 09:06:44

PROJECT INFORMATION

Company: Sevee & Maher Engineers, Inc.
Client: Evergreen Packaging
Project: 12121.00
Location: Canton, NC
Test Well: P-13-106
Test Date: 1/12/2013

AQUIFER DATA

Saturated Thickness: 11.2 ft
Anisotropy Ratio (Kz/Kr): 1.

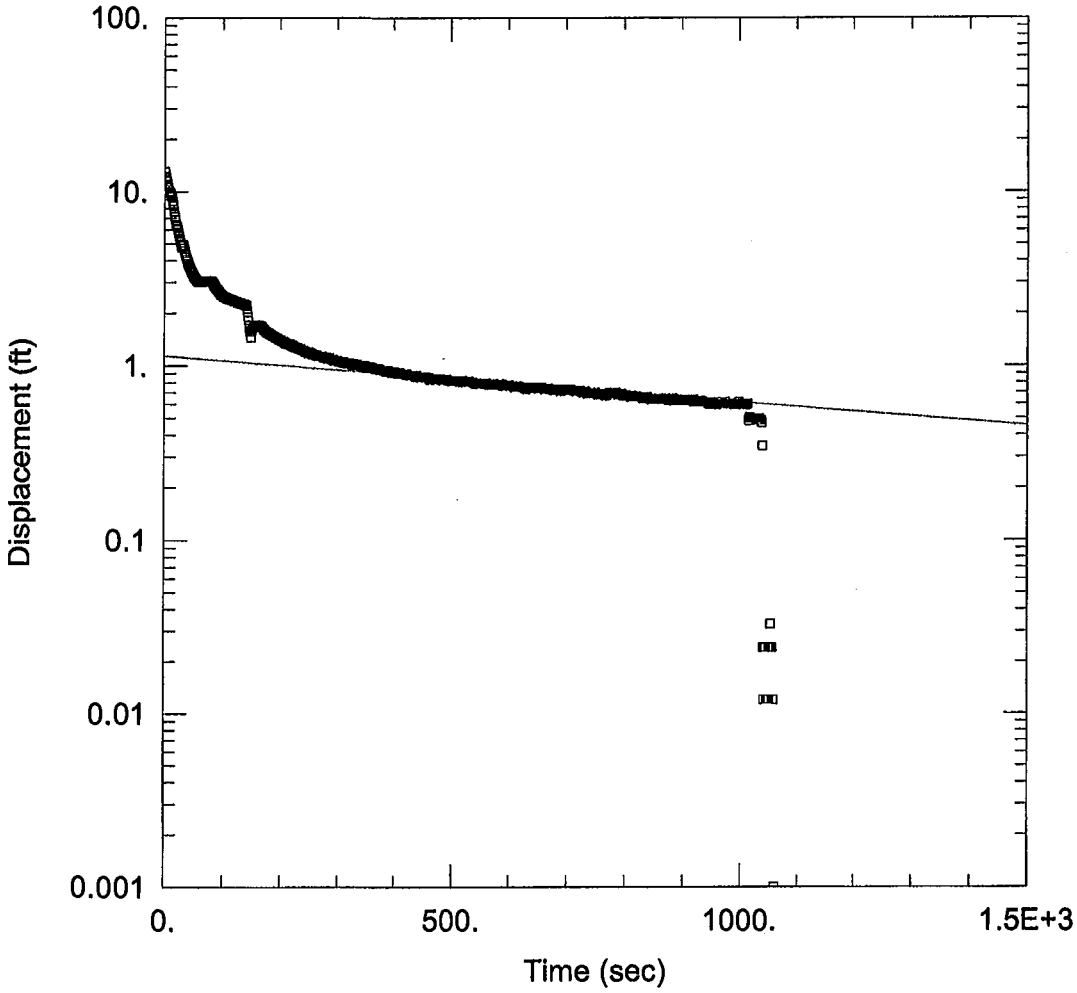
WELL DATA (P-13-106)

Initial Displacement: 12.85 ft
Total Well Penetration Depth: 11.2 ft
Casing Radius: 0.03125 ft
Static Water Column Height: 11.2 ft
Screen Length: 15.5 ft
Wellbore Radius: 0.125 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.621E-6 cm/sec
y0 = 2.761 ft

The correction for a partially saturated screen was applied.



P-13-107A TEST 3 Comp. Bedrock

Data Set: C:\...\B-13-107a-T3.aqt
Date: 03/05/13 Time: 09:06:23

PROJECT INFORMATION

Company: Sevee & Maher Engineers, Inc.
Client: Evergreen Packaging
Project: 12121.00
Location: Canton, NC
Test Well: P-13-107A
Test Date: 1/12/2013

AQUIFER DATA

Saturated Thickness: 7.3 ft
Anisotropy Ratio (Kz/Kr): 1.

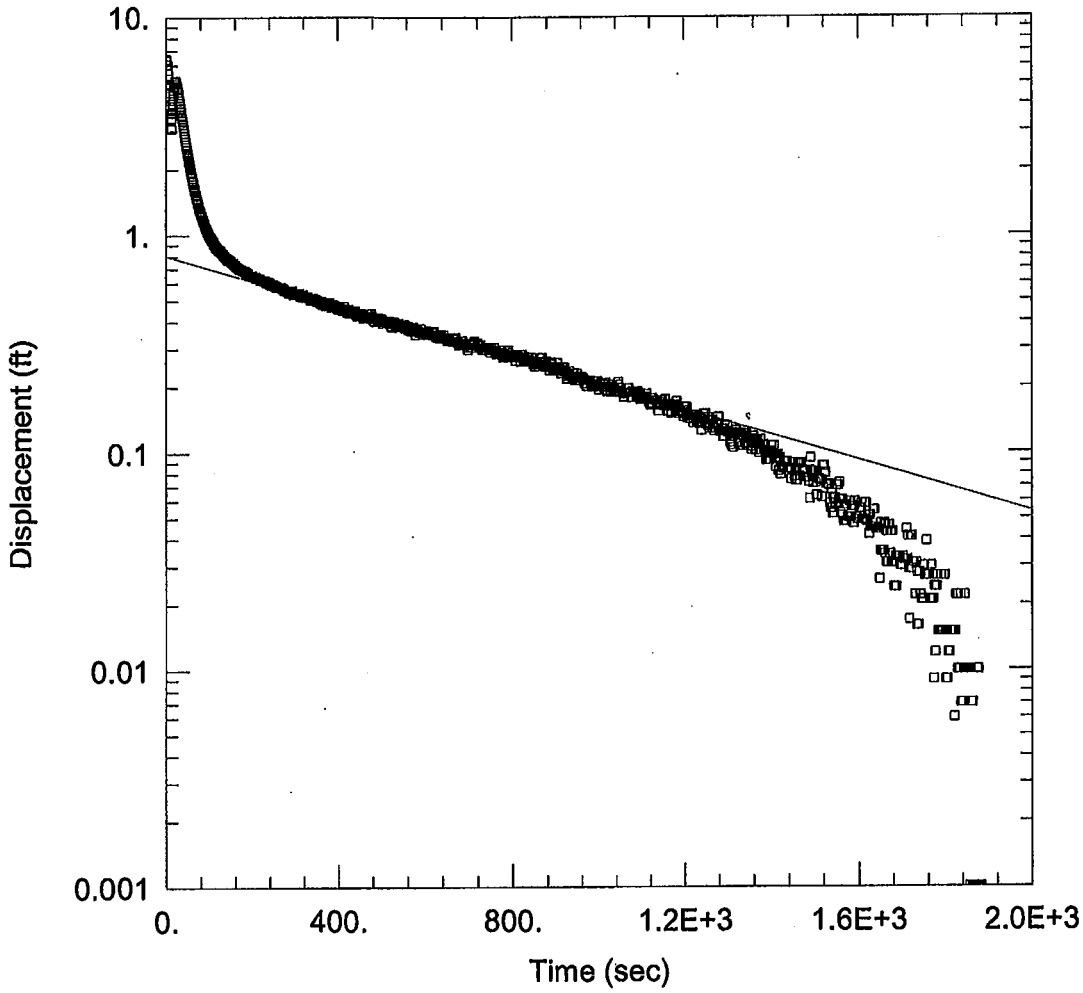
WELL DATA (P-13-107A)

Initial Displacement: 13.05 ft
Total Well Penetration Depth: 7.3 ft
Casing Radius: 0.03125 ft
Static Water Column Height: 7.3 ft
Screen Length: 12.1 ft
Wellbore Radius: 0.125 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.394E-6 cm/sec
y0 = 1.134 ft

The correction for a partially saturated screen was applied.



P-13-110B TEST 2 Comp. Bedrock

Data Set: C:\...\B-13-110B-T2.aqt
Date: 03/05/13 Time: 09:06:02

PROJECT INFORMATION

Company: Sevee & Maher Engineers, Inc.
Client: Evergreen Packaging
Project: 12121.00
Location: Canton, NC
Test Well: P-13-110B
Test Date: 1/22/2013

AQUIFER DATA

Saturated Thickness: 11.9 ft
Anisotropy Ratio (Kz/Kr): 1.

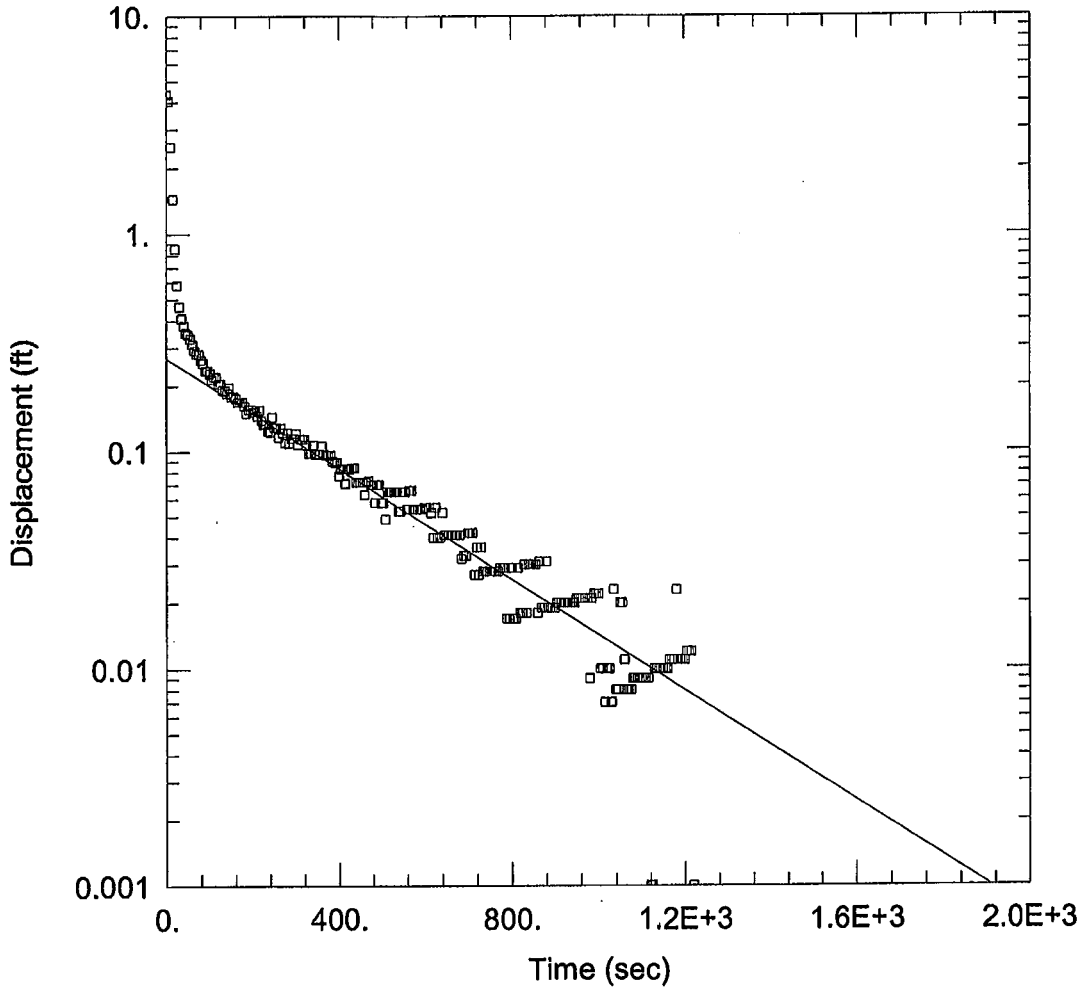
WELL DATA (P-13-110B)

Initial Displacement: 6.42 ft
Total Well Penetration Depth: 11.9 ft
Casing Radius: 0.03125 ft
Static Water Column Height: 11.9 ft
Screen Length: 12.5 ft
Wellbore Radius: 0.3542 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 4.316E-6 cm/sec
y0 = 0.8038 ft

The correction for a partially saturated screen was applied.



P-13-112 TEST 1 PWR

Data Set: C:\...\B-13-112-T1.aqt
Date: 03/05/13 Time: 09:05:35

PROJECT INFORMATION

Company: Sevee & Maher Engineers, Inc.
Client: Evergreen Packaging
Project: 12121.00
Location: Canton, NC
Test Well: P-13-112
Test Date: 1/12/2013

AQUIFER DATA

Saturated Thickness: 9.9 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (P-13-112)

Initial Displacement: 4.363 ft
Total Well Penetration Depth: 9.9 ft
Casing Radius: 0.03125 ft
Static Water Column Height: 9.9 ft
Screen Length: 12.7 ft
Wellbore Radius: 0.3542 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0003451 cm/sec
y0 = 0.2687 ft

The correction for a partially saturated screen was applied.