

ATTACHMENT 2

Boring Logs

The boring logs are provided in a separate pdf on SharePoint due to size restrictions.

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Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 2
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-19-11/1014	Date/Time Total Depth Reached: 9-19-11/1021	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: 3oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70003) (1020)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Kulwan Robbins-Holdman 10/28/11</i>			

Radiological Background: 21, 137	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	22 28 111 cpm	Sandy silt with rock fragments, (10 YR, 5/4), light brown, 50% silt, 35% fine to medium grained sand, 15% sandstone rock fragments, dry, soft, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 3
Drilling Company: HGL		Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-19-11/1118	Date/Time Total Depth Reached: 9-19-11/1126	
Type of Sampling Device: stainless steel shovel/ trowel			Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#70005) (1125)		
Geologist: Chelsea Carmichael			Checked By / Date: LaDean Robbins-Hedman 11/11		

Radiological Background: 24, 279	Radiological Equipment Used: Micro R Downhole Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	24	Silty sand, (10 YR, 4/4), brown, 70% fine to medium grained sand, 25% silt, 5% sandstone rock fragments, dry, loose, no plasticity, hardness or odor.	SM	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0					No GW reached.			

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 4
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-19-11/1518	Date/Time Total Depth Reached: 9-19-11/1526	
Type of Sampling Device: stainless steel shovel/ trowel		Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70007) (1525)		
Geologist: Chelsea Carmichael		Checked By / Date: <i>Rudolph Robbins</i> 11/11		

Radiological Background: 24, 118	Radiological Equipment Used: Micro R² Downhole Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	25 93 cpm	Sandy silt, (10 YR, 4/3), greyish-brown, 60% silt, 35% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff no plasticity, hardness or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 4		
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 13"		
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10-10-11/1343		Date/Time Total Depth Reached: 10-10-11/1306		
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70008) (a/a)				
Geologist: Chelsea Carmichael				Checked By / Date: Linda Robbins / 11/1/11				
Radiological Background: 22, 95, 4070		Radiological Equipment Used: Micro R Downhole Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	142	Silty sand with rock fragments, C10YR, 4/4), 55% fine to medium grained sand, 30% silt, 15% sandstone rock fragments, concrete and asphalt fragments, dry, medium dense, no plasticity, hardness or odor.	SM		
			0.0	102				
1.0			0.0	77				
2.0					Refusal at 13" - bedrock			
					No GW reached			
					No sample collected			
3.0								
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 5	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-20-11 / 1105		Date/Time Total Depth Reached: 9-20-11 / 1113	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#70009) (1112)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Justin Robbins, 11/1/11</i>			
Radiological Background: 24, 99		Radiological Equipment Used: Micro R / Downhole Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	22 107 cpm	Sandy silt with rock fragments, (10YR, 5/4), light brown, 55% silt, 30% fine to medium grained sand, 15% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor. No GW reached.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 5
Drilling Company: HGL	Driller: I-Stone	Ground Elevation: NA	Total Depth Drilled: 1'10" <i>CL</i> <i># bgs.</i>	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 10/2/11 0820	Date/Time Total Depth Reached: 10/7/11 0400	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70010 (0530)			
Geologist: C. L. Knight	Checked By / Date: Lubian Robinson Goldman 11/1/11			

Radiological Background: 14 p / 3790 / 61	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			136		Fill: Silty sand with gravel: light olive brown (2.54 5/16), dry, medium dense, no odor, 20% silt, 52% coarse sand, 10% medium sand, 10% sand	AF	4428
0.5			71		55% fine sand, trace rootlets, trace asphalt	SM	5512
1.0			85		Fill: Poorly graded sand with silt: light olive brown (2.54 5/16), moist, medium dense, no odor, 15% silt, 57% fine angular sand, trace gravel, 10% medium sand, 70% fine sand	AF/SM	5573
2.0			77		Same as above		5690
3.0					- Refusal on Sandstone Cobble Bedrock at 1'10"		
4.0					- No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 6
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-20-11/1037	Date/Time Total Depth Reached: 9-20-11/1046	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70011) (1045)			
Geologist: Chelsea Carmichael		Checked By / Date: Dan Kottim Fieldman 11/11		

Radiological Background: 22, 77	Radiological Equipment Used: Micro B / Downhole Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	23 72 cpm	Sandy silt, (10 YR, 4/4), brown, 60% silt, 40% fine to medium grained sand, trace sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 6
Drilling Company: HGL	Driller: I. Stone	Ground Elevation: NA	Total Depth Drilled: 2'4" 2'4" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 10/7/11 0926	Date/Time Total Depth Reached: 10/7/11 2:4" 1001	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		70012 (0935)	
Geologist: A. Lawrence	Checked By / Date: <u>John Robinson Goodman</u> 11/1/11			

Radiological Background: 18/1407/67	Radiological Equipment Used: 1800 Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description of: <u>Ar h Ficial F:V</u> (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	111	Fill: Silty sand w/ gravel: dark yellowish brown (10Y2.5/6)	SM	4022
0.5			0.0	85	medium dense, no odor, 15% silt, 5% coarse sand, 10% medium sand, 15% gravel, 55% fine sand. some rootlets. Gravel angular to subangular 1/4", 1" diam moist		5191
1.0			0.0	130			5866
2.0			0.0	82	Silty sand w/ gravel: yellowish brown (10Y2, 7/4) medium dense, no odor, 15% silt, 10% gravel 70% fine sand, 5% medium sand. some rootlets, Gravel: Angular to subangular 1/4" to 1.5" diam dry	HF/SM	5674
2.4			0.0	91			5628
2.4					same as above		
3.0					- Refusal on sandstone at 2'4"		
3.0					- no groundwater encountered		
4.0							
5.0							
6.0							

SSFL BORING LOG

RG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 7
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-16-11/0737	Date/Time Total Depth Reached: 9-16-11/0746	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70013) (0745)		Checked By / Date: John Robbins / 11/1/11	
Geologist: Chelsea Carmichael				

Radiological Background: 20, 97	Radiological Equipment Used: Micro R Downhole (Pancake Meters)	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	20	Silty sand with rock fragments, (10YR, 5/4), 50% fine to medium grained sand, 30% silt, 20% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor, trace asphalt pieces found.	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 7
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2ft 7in bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/27/11 0928	Date/Time Total Depth Reached: 10/27/11 0941	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		70014 - 0948	
Geologist: Ian Stone	Checked By / Date: Ludlow Robert Feldman 11/5/12			

Radiological Background: 16 / 3852 / 97	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings 0.5' = 3949 (CPM)
0.5			0.0	138	Silty Sand, Yellowish Brown (10% 5/6) 80% fine sand, 20% silt, trace gravel (max=1.5'), dry, low dense, no odor or staining	SM	4428
1.0			0.0	69			5045
1.5			0.0	88			5286
2.0			0.0	123			5447
2.5			0.0	69			5474
3.0			0.0	72			5453
3.0					TD = 2ft 7in no gw encountered, no anomalies refers to sandstone		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 106	Location ID: 8	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-15-11/1343		Date/Time Total Depth Reached: 9-15-11/1357	
Type of Sampling Device: stainless steel shovel/trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70015) (1355)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Jim Dean</i> / <i>11/11</i>			
Radiological Background: 23, 95		Radiological Equipment Used: Micro R Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	22 108 cpm	Silty, gravelly sand, (10 YR, 5/4), light brown, 50% fine to medium grained sand, 30% sandstone/siltstone rock fragments, 20% silt, dry, soft, no plasticity, hardness or odor. 1 iron bolt found. No GW reached.	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 8
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2ft 10.1 in ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/27/11 1:25	Date/Time Total Depth Reached: 10/27/11 115L	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		70016 - 1205	
Geologist: Ian Stone	Checked By / Date: Subkank Robbins Hedman 1/5/12			

Radiological Background: 15 / 3807 / 99	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings 0.5 = 3800 (CPM)
0.5			0.0	113	<p>Silty Sand, Yellowish Brown (10YR 5/6) w/cobbles 80% fine sand, 20% silt, trace gravel (max size=1.5in) trace cobbles (max size 3") dry, low-med dense, no odor or staining</p>	SM		4181
1.0		0.0	81					4870
1.5		0.0	69					5332
2.0		0.0	85					5344
2.5		0.0	76					5433
3.0		0.0	78					5299
3.5					<p>TD=2ft 10in no gw encountered no anomalies</p>			
4.0								
5.0								
6.0								



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 9
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1002	Date/Time Total Depth Reached 9-16-11/1011
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#70017) (1010)		
Geologist C. Carmichael	Checked by/Date Julian Robbins/Yaldren 11/11		

Radiological Background 25, 105	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				20 25 113	Silty sand with rock fragments, (10YR, 5/4), light brown, 55% fine to medium grained sand, 25% silt, 20% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.	SM		
					No GW reached.			

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 9
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 9 in @ bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/26/11 1110	Date/Time Total Depth Reached: 10/26/11 1117	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: 70015 - no sample (1) 1/2 Gallon Bag (Approx. 8 lbs.)			
Geologist: Ian Stone	Checked By / Date: Lakshmi Reddy / 1/3/12			

Radiological Background: 22/5186 / 99	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings NM (CPM)
0.0			0.0	103	Silty Sand, Yellowish Brown (10YR 5/6), 80% fine sand, 20% silt, trace gravel, trace roots, dry, low-mud dense, no odor or staining	Sm		NM
0.5			0.0	81				NM
1.0					TD = 9 in bgs no gw encountered refusal on sandstone		1	
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a 1	Location ID: 10	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-15-11/1105		Date/Time Total Depth Reached: 9-15-11/1113	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70019) (1112)			
Geologist: Chelsea Carmichael				Checked By/ Date: John Rottions Feldman 11/1/11			
Radiological Background: 28, 109		Radiological Equipment Used: Micro RY Downhole Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft. bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	30 103 cpm	Silty, gravelly sand, (10 YR, 5/4), light brown, 50% fine to medium grained sand, 30% sandstone rock fragments, 20% silt, dry, loose, no plasticity, hardness or odor.	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 11	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-22-11 / 1037		Date/Time Total Depth Reached: 9-22-11 / 1045	
Type of Sampling Device: stainless steel shovel/trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#7002,) (1045)			
Geologist: Chelsea Carmichael				Checked By / Date: Luca Robbins & Melman 11/1/11			
Radiological Background: 27, 121		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		0.0 ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	26 106 cpm	Sandy silt with rock fragments, (10 FR, 5/4), light brown, 50% silt, 35% fine to medium grained sand, 15% sandstone rock fragments, trace asphalt fragments, dry, soft, no plasticity, hardness or odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 11
Drilling Company: HGL	Driller: J. Harris	Ground Elevation: NA		Total Depth Drilled: 1' 0" bgs.
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/17/11 1040	Date/Time Total Depth Reached: 10/17/11 1054	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70022) (NO sample)			
Geologist: To Morse	Checked By / Date: Julian Robbins/Gelman 1/5/12			

Radiological Background: 181 4471 1128	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	77	Surface: Sandstone cobbles, Soil		0.5	10.5
0.5			0.0	85	Sandy silt w/gravel; Dark Yellowish Brown (10YR 4/6) 40% fine-grained sand, 5% medium grained sand, 50% silt, 5% subangular sandstone gravel, dry, no odor, low plasticity, cohesive	ML SM		
1.0			0.0	64	Refusal on Sandstone Bedrock at 1' 0" bgs. NO GW encountered NO Sample collected due to depth	Bedrock		
2.0								
3.0								
4.0								
5.0								
6.0								

NO GAMMA due to lack of depth
↓

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 12			
Drilling Company: HGL		Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-22-11 / 1105		Date/Time Total Depth Reached: 9-22-11 / 1113			
Type of Sampling Device: stainless steel shovel/ trowel			Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70023) (1112)					
Geologist: Chelsea Carmichael			Checked By / Date: <i>Jean Robbins, Goldman 11/11</i>					
Radiological Background: 25, 101		Radiological Equipment Used: <u>Micro R</u> Downhole <u>Pancake Meters</u>		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	26 107 cpm	Sandy silt with rock fragments (10YR, 5/3), light pale brown, 55% silt, 30% fine to medium grained sand, 15% sandstone rock fragments, dry, soft, no plasticity, hardness or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								
					No GW reached			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 13			
Drilling Company: HGL		Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-22-11 / 1138		Date/Time Total Depth Reached: 9-22-11 / 1146			
Type of Sampling Device: stainless steel shovel/ trowel			Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70025) (1145)					
Geologist: Chelsea Carmichael			Checked By / Date: <i>John Robertus Heldman</i> 11/1/11					
Radiological Background: 26 89		Radiological Equipment Used: Micro RA Downhole Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	25 109	Sandy silt with rock fragments, (10YR, 5/3), light pale brown, 50% silt, 35% fine to medium grained sand, 15% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								
					No GW reached.			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 14		
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 22 21"		
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10-12-11/0930		Date/Time Total Depth Reached: 10-12-11/1007		
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs) (#70028) (1012)				
Geologist: Chelsea Carmichael				Checked By / Date: LuDean Kallins, Yelman 11/1/11				
Radiological Background: 21, 65, 5513		Radiological Equipment Used: Micro R/Downhole Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	114	Silty sand, (10YR, 5/4), light brown, 60% fine to medium grained sand, 35% silt, 5% sandstone rock fragments. Dry, medium dense, no plasticity, hardness or odor.	SM		5024
			0.0	81			5054	
1.0			0.0	86			5166	
			0.0	98			5284	
2.0					Refusal at 21" - bedrock		2	
					No GW reached			
3.0							3	
4.0							4	
5.0							5	
6.0							6	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 16	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-22-11 / 1421		Date/Time Total Depth Reached: 9-22-11 / 1426	
Type of Sampling Device: stainless steel shovel/trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70031) (1425)			
Geologist: Chelsea Carmichael				Checked By / Date: J. Dan Robbins Goldman 11/1/11			
Radiological Background: 24, 102		Radiological Equipment Used: Micro R Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	23 108	Sandy silt, (10 YR, 5/4), light brown, 65% silt, 30% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 17
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1109	Date/Time Total Depth Reached 9-16-11/1117
Type of Sampling Device trowel/shovel	Samples Collected 1- 1/2 gall bag (#70033) (1115)		
Geologist C. Carmichael	Checked by/Date LaDon Robbins Moldman 11/11		

Radiological Background 26, 85	Radiological Equipment Used up R meter, pancake meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5'			0.0	26 107	Silty sand with rock fragments, (10YR, 5/4)SM light brown, 50% fine to medium grained sand, 35% silt, 15% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor. No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 17
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/26/11 0946	Date/Time Total Depth Reached: 10/26/11 0956	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: 70034-1005 (1) 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: Ian Stone	Checked By / Date: <i>Ludlow Robbins Goldman</i> 1/6/12			

Radiological Background: 20 / 4838 / 106	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 0.5' = 5746 (CPM)
0.5			0.0	114	Silty Sand, Yellowish Brown (10YR 5/6) 80% fine sand, 20% silt, trace gravel (sandstone), dry, low-med dense, no odor or staining	SM	5304
			0.0	101			5447
1.0			0.0	133			5349
			0.0	98			5165
2.0			0.0	106			5065
3.0					TD = 2ft bgs no gw encountered, no anomalies refusal on sandstone		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7		Group: n/a		Location ID: 18	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-15-11/0824		Date/Time Total Depth Reached: 9-15-11/0831			
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 2 lbs.) #70035, (0830)					
Geologist: Chelsea Carmichael				Checked By / Date: <i>Judean Robbins-Holdman 9/1/11</i>					
Radiological Background: 32, 109		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)	
0.5			0.0	32 73 cpm	Sandy silt with rock fragments, (104R, 4/4), brown, 50% silt, 30% fine to medium grained sand, 20% sandstone rock fragments, trace pieces of rubber & tar, dry, soft, no plasticity, hardness or odor.	ML			
1.0									
2.0									
3.0									
4.0									
5.0									
6.0									

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: <u>18</u>		
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: <u>17.5"</u>		
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10-12-11/1217		Date/Time Total Depth Reached: 10-12-11/1232		
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70036) (n/a)				
Geologist: Chelsea Carmichael				Checked By / Date: <i>Dr. Dan Robbins</i> 4/1/11				
Radiological Background: <u>2094, 5139</u>		Radiological Equipment Used: <u>Micro R / Downhole Pancake Meters</u>			PID Used: Mini Rae 2000 - Background: <u>0.0 ppm</u>			
Depth (ft bgs.)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	<u>28</u> <u>132</u>	Silty sand, (10 YR, 4/3), pale brown, 55% fine to medium grained sand, 40% silt, 5% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor. ← piece of wire found (~1ft)	SM		
0.5			0.0	86				
1.0			0.0	126				
2.0			0.0	96	Refusal at 17.5" - bedrock No GW reached <u>No sample</u>			
3.0								
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 19
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-23-11/1207	Date/Time Total Depth Reached: 9-23-11/1214	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70037) (1215)			
Geologist: Chelsea Carmichael		Checked By / Date: Julie Robbins Goldman 11/11		
Radiological Background: 22, 72	Radiological Equipment Used: Micro R Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	20 III cpm	Sandy silt, (10 YR, 4/4), brown, 65% silt, 30% fine sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor, trace rootlets.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 20	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-22-11/1007		Date/Time Total Depth Reached: 9-22-11/1015	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs) (# 70039) (1015)			
Geologist: Chelsea Carmichael				Checked By: <i>John Robbins</i> <i>Moldman</i> 12/11			
Radiological Background: 22, 70		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	23 107 cpm	Sandy silt with rock fragments, (10YR, 4/4), orangeish-brown, 55% silt, 30% fine grained sand, 15% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 20
Drilling Company: HGL	Driller: J. Harris	Ground Elevation: NA		Total Depth Drilled: 10' 0"
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/18/11 1112	Date/Time Total Depth Reached: 10/18/11 1415	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70040), (1230)		Checked By / Date: William Collins, Edman 1/6/12	
Geologist: To Morse				

Radiological Background: 163904 / 97	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs	Borehole Gamma Readings (CPM)
			0.0	99	Surface: wood chips, soil			+0.5' 3598
0.5			0.0	73	Sandy Silt of silt : Dark Yellowish Brown (10YR 4/6), 40% fine grained sand, 55% silt, trace 5% gravel, dry, no odor, low plasticity, low toughness, cohesive	ML		3973
1.0			0.0	76				5087
			0.0	65				5347
			0.0	92	same as above. 2'-3' sandstone concretions present			5628
			0.0	87				5686
			0.0	61	3' 0" ---			5448
3.0			0.0	81	Sandy Silt: Dark Yellowish Brown (10YR 4/6), 40% fine grained sand, 60% silt sandstone concretions present, slightly moist, no odor, low plasticity, cohesive	ML		5756
			0.0	71				5639
			0.0	62				5613
			0.0	62				5612
5.0			0.0	69	5' 0" ---			5728
			0.0	75	Silty Sand: Dark Yellowish Brown (10YR 4/6) 55% fine grained sand, 5% medium grained sand, 40% silt, moist, medium dense, no odor,	SM		5521
			0.0	59	6' 0" ---			5694

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04.03		7	1	20	
Radiological Background:			Radiological Equipment Used:		PID Used:		
1613904177			Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5 (CPM)
6.0			0.0	59	Same as 5'-6'	SM	5694
			0.0	62	Light olive brown (2.5Y 5/4)		5875
7.0			0.0	70	7'0" -----	SM	5628
			0.0	63	Silty sand w/clay: Dark Yellowish Brown (10YR)(4/4), 25% silt, 60% fine grained sand, 5% medium grained sand, 10% clay. Cohesive, moist, medium dense, iron oxide deposits/staining through out, no odor		5586
8.0			0.0	73		SM	5715
			0.0	80	8'6" -----		5992
9.0			0.0	62	Sand with silt: Dark Yellowish Brown (10YR 2.5Y 5/4) (10YR 5/4), 15% silt, 5% medium grained sand, 80% fine grained sand, moist, medium dense, iron oxide deposits/staining, no odor	SM	6232
			0.0	69			6555
10.0			0.0	75	10'0" -----	Bedrock	6232
					Reached full bore depth (10') NO GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a (1)	Location ID: 21	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-15-11/0740		Date/Time Total Depth Reached: 9-15-11/0751	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70041) (0750)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Subankobins Helman</i> 11/2/11			
Radiological Background: 34 36 91		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	30 107 cpm	Sandy silt with rock fragments, (10YR, 4/4), brown, 50% silt, 35% fine to coarse grained sand, 15% sandstone rock fragments, dry, some rootlets, semi-cemented, no plasticity, hardness or odor, trace asphalt, 1 piece of glass. No GW reached.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 21
Drilling Company: HGL	Driller: J. Harris	Ground Elevation: NA	Total Depth Drilled: 3' 4" bgs.	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/13/11 0848	Date/Time Total Depth Reached: 10/13/11 0942 3' 4" bgs.	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70042) (0955)			
Geologist: T. Morse	Checked By / Date: Julia Rollins Ledman 10/12			

Radiological Background: 20 w / 5177 / 133	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs.
			0.0	116	Surface: soil and grass		+0.5 5371 (CPM)
0.5			0.0	108	Silty Sand w/ gravel: dark yellowish brown (10YR 4/4) dry, no odor, medium dense to loose, 20% silt, 60% fine grained sand, 10% coarse grained sand, 10% gravel. Presence of metal wire at ~10" bgs. Large piece of paper/concrete tile at ~16" bgs.	AF/SM	0.0 5195
1.0			0.0	84		5195 TM 5023	
1.5			0.0	103	Sand with silt and gravel: Yellowish brown (10YR 5/6) dry, no odor, medium dense, 80% fine grained sand, 10% silt, 5% medium grained sand, 5% sub angular gravel	SM	5023 TM 4912
2.0			0.0	105		4912 TM 5421	
2.5			0.0	115			5421 TM 5363
3.0			0.0	120			5363 TM 5615
3.5			0.0	112			5615 TM 6067
4.0					Refusal on sandstone bedrock at 3' 4" bgs. NO GW encountered	Bedrock	(6654)
5.0							
6.0							



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 22
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1433	Date/Time Total Depth Reached 9-16-11/ 1433 1440
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#70043) (1440)		
Geologist C. Carmichael	Checked by/Date Mike Rabinovich/11/2/11		

Radiological Background 19, 87	Radiological Equipment Used up R meter, pancake meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.0 20 132	Silty sand with rock fragments, (10YR, 5/4), light brown, 55% fine to medium grained sand, 30% silt, 15% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 23			
Drilling Company: HGL		Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-21-11 / 1411	Date/Time Total Depth Reached: 9-21-11 / 1420				
Type of Sampling Device: stainless steel shovel/ trowel			Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70045) (1420)					
Geologist: Chelsea Carmichael			Checked By/ Date: Ludwin Robinson/Gelman 11/2/11					
Radiological Background: 24, 86		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	24	Sandy silt, (10 YR, 4/4), brown, 60% silt, 40% fine to medium grained sand, dry, soft, some rootlets, no plasticity, hardness or odor.	ML	1	
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								
No GW reached.								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a (US) i	Location ID: 24
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-14-11 / 1057	Date/Time Total Depth Reached: 9-14-11 / 1105	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70047) (1105)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Judean Robbins</i> <i>Malden</i> 11/2/11			

Radiological Background: 20	Radiological Equipment Used: Micro R Downhole Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	22	Silt with sand, (10 YR, 4/3), pale brown, 85% silt, 15% fine to medium grained sand, trace sandstone fragments, trace rootlets, dry, soft, very low plasticity, hardness, no odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 24
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2.5 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/25/11 1020	Date/Time Total Depth Reached: 10/25/11 1039	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: 70048 - 1045 (1) 1/2 Gallon Bag (Approx 8 lbs.)		Checked By / Date: Julian Robbins & Goldman 1/6/12	
Geologist: Ian Stone	Radiological Background: 17 / 3974 / 69		Radiological Equipment Used: Micro R / Downhole / Pancake Meters	
Radiological Background:		PID Used: Mini Rae 2000 - Background:		0.0 ppm

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			73		Silty Sand, Dark yellowish brown (10YR 3/4) 60% fine sand, 40% silt, trace gravel, trace roots, low dense, no odor or staining	SM	4354
0.5			112				4949
1.0			91				5117
1.7			120				4804
2.0			74		SAND weathered yellowish brown (10YR 5/6) sandstone, 95% fine grained sand, 5% silt, dry, dry, med-high dense, no odor or staining	SP, Bedrock	4705
3.0			65		TD= 2.5 ft bgs no gas encountered, no anomalies refusal on sandstone		4795
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 25
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-23-11/ 0806	Date/Time Total Depth Reached: 9-23-11/ 0814	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: Field DUP: 70304		One 1/2 Gallon Bag (Approx 8 lbs.) (#70049) (0812)	
Geologist: Chelsea Carmichael		Checked By / Date: <i>Julian Robbins Feldman</i> "12/11"		

Radiological Background: 22, 96	Radiological Equipment Used: Micro R / Downhole Paracake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	21 116 cpm	Silt with sand, (10 YR, 4/3), pale brown, 85% silt, 15% fine sand, trace sandstone rock fragments, dry, medium stiff, some rootlets, very low hardness, no plasticity, no odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 25	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9-19-11 1430		Date/Time Total Depth Reached: 9-19-11 1515	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70050 (1440)			
Geologist: C. Knight				Checked By / Date: Julian Robinson Meldman - 11/2/11			
Radiological Background: 174R/3213/52		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					surface soil and plants		4050
0.5			0.0	63	Fill: Silty Sand: light yellowish brown (104R 6/4), dry, medium dense, no odor, 35% silt, 5% medium sand, 5% coarse sand, 55% fine sand, mottled, trace rootlets	AR / SM	5047
1.0			0.0	72			5530
			0.0	80	16"		5891
2.0			0.0	73	Fill: Partly graded sand with silt: Brownish yellow (104R 6/6), dry, medium dense, no odor, 10% silt, 5% medium sand, 85% fine sand, trace rootlets, mottled	AR / SP	5725
			0.0	65			5803
3.0			0.0	72			5815
			0.0	85			5884
4.0			0.0	92			5979
			0.0	72	16" trace fine angular sandstone		5836
5.0			0.0	63			5988
			0.0	66	Fill: Same as above: Partly graded sand with silt	AR / SP	5729
6.0			0.0	80			5966

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 26
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-14-11/1530	Date/Time Total Depth Reached: 9-14-11/1537	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#70051) (1535)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Julien Robbins Goldman</i> 11/2/11			

Radiological Background: 17, 90	Radiological Equipment Used: Micro R / Downhole (Pancake Meters)	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	17	Sandy silt, (10 YR, 4/3), pale brown, 70% silt, 30% fine to medium grained sand, dry, soft, trace rootlets, piece of styrofoam found, no plasticity, hardness or odor.	ML	0.5	
1.0							1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0							5.0	
6.0							6.0	

No GW reached.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 26	
Drilling Company: HGL		Driller: J. Harris/I. Stone		Ground Elevation: NA		Total Depth Drilled: 2'2" bgs	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10/24/11 0835		Date/Time Total Depth Reached: 10/24/11 0852	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70052) (0900)			
Geologist: Timothy Morse				Checked By / Date: Subhan Robins / Helman 1/6/12			
Radiological Background: 20/3588 / 112		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	74	Surface: soil + veg. Sandy Silt: Dark Yellowish Brown (10YR 4/4), 20% fine graind sand, 5% medium-coarse graind sand, 70% silt, 5% subangular sandstone gravel, dry, no odor, low plasticity, low toughness, Same as above. 2'2"		3763
0.5			0.0	74		ML	4683
1.0			0.0	141			5471
			0.0	106			5724
2.0			0.0	94			5741
3.0					Refusal on sandstone at 2'2" NO GW encountered	Brock	
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1A 1	Location ID: 28
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-14-11/0728	Date/Time Total Depth Reached: 9-14-11/0736	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: 1-8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70055), (0735)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Julian Robbins, Goldman</i> "12/11"			

Radiological Background: 16, 77	Radiological Equipment Used: (Micro R) Downhole (Pancake Meters)	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	15	2" of asphalt on top			
0.5					Silty sand with gravel, (10 YR, 4/4), brown, 55% fine to medium grained sand, 30% silt, 15% gravel fill rock, asphalt and sandstone fragments, semi-moist, medium dense, no plasticity, hardness or odor.	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 28
Drilling Company: <i>Bart</i> Bart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: <i>CK 40.0 9.0</i> ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/23/11 1355	Date/Time Total Depth Reached: 9/23/11 1500	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<i>70056 (1400)</i>	
Geologist: <i>C. L. Knight</i>	Checked By / Date: <i>Judith Robbins Feldman 11/3/11</i>			

Radiological Background: <i>20uR/2372/41</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: <i>0.0</i> ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)			
					Surface: Asphalt			
			0.0	53		AF		10.5' = 2835 (CPM)
			0.0	55	3" Asphalt			2990
0.5			0.0	55	Fill: Silty Sand with gravel: light yellowish brown (A-5 Y 6/4), dry, medium dense, no odor, 20% silt, 10% fine subangular to subrounded gravel (fill rock and sandstone), 5% coarse sand, 10% medium sand, 55% fine sand, mottled, trace roots	AF / SM		3868
1.0			0.0	49				4493
			0.0	50				5157
2.0			0.0	62				5739
			0.0	51	2' 6" Same as above: Fill: Silty Sand with gravel, but moist	AF / SM		5521
3.0			0.0	54				5606
			0.0	58				5670
			0.0	68	3' 8" to 3' 10" Sandstone gravel ~ 2" thick			5418
4.0			0.0	73	3' 10" —————			5671
			0.0	73	Fill: Silty Sand; yellowish brown (10uR 5/4), moist, medium dense, no odor, 30% silt, 5% coarse sand, 10% medium sand, 5% fine (pea size) gravel, 50% fine sand, mottled	AF / SM		5540
5.0			0.0	75				5663
			0.0	57				5707
6.0			0.0	62				

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: NA 1	Location ID: 29
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-14-11/0746	Date/Time Total Depth Reached: 9-14-11/0756	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70057) (0755)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>John Robbins/Holdman</i> 11/3/11			

Radiological Background: 18, 69 Radiological Equipment Used: Micro R / Downhole / Pancake Meters PID Used: Mini Rae 2000 - Background: 0.0 ppm

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	18	3-4" asphalt on top Silty sand with gravel, (10 YR, 5/4), light brown, 50% fine sand, 30% silt, 20% fine to coarse gravel, asphalt, gravel fill rock, trace sandstone cobbles, dry, semi-cemented, some rootlets, medium dense, no plasticity, hardness or odor.	SM	0.5	
1.0							1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0							5.0	
6.0							6.0	

No GW reached

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 29
Drilling Company: <i>Bart</i> <i>Bart Longyear</i>	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: <i>2.5</i> ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: <i>9/23/11 105</i>	Date/Time Total Depth Reached: <i>9/23/11 1150</i>	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) <i>70058 (1120)</i>			
Geologist: <i>C. Knight</i>	Checked By / Date: <i>William Robbins Hedman 11/2/11</i>			
Radiological Background: <i>16uR / 53-2575 / 53</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Ra6 2000 - Background: <i>0.0</i> ppm		

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	75	Surface: Asphalt		705' 3744
			0.0	66	3' Asphalt		4349
0.5			0.0	66	Fill: Silty Sand: Brown (104R 5/3), clay, medium dense, no odor, 5% fine subrounded gravel (fill rock), 20% silt, 10% coarse sand, 20% medium sand, ^{ck} 45% fine sand, extremely mottled	AF / SM	CK 4399 5309
1.0		0.0	71	5456			
		0.0	68	5565			
2.0			0.0	90			5629
3.0			0.0	93	2'4" Sandstone Bedrock: Pale yellow (2.5Y 8/3) dry, very dense, no odor, fine grained sandstone, 5% medium sand, 5% fine sand	Bedrock	5573
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a	Location ID: 30	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-13-11 / 1448		Date/Time Total Depth Reached: 9-13-11 / 1455	
Type of Sampling Device: stainless steel shovel/trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70059) (1455)			
Geologist: Chelsea Carmichael				Checked By/ Date: <i>John Robbins Melman</i> 11/3/11			
Radiological Background: 20, 100		Radiological Equipment Used: Micro R Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	20	Sandy silt, (10 YR, 4/3), greyish-brown, 60% silt, 30% fine to coarse grained sand, 10% gravel fill rock and asphalt, dry, semi-cemented, common rootlets, medium stiff, no plasticity, hardness, no odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7		Group: 1		Location ID: 30	
Drilling Company: <i>Bort</i> Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 5.51 ft bgs.			
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/23/11 0820		Date/Time Total Depth Reached: 9/23/11 0826			
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) # 70060 (0830)					
Geologist: <i>L. Robbins Goldman</i>				Checked By / Date: <i>(Signature) 9/23/11 L. Robbins Goldman 11/3/11</i>					
Radiological Background: <i>20/3935/45</i>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm				

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Gamma Readings (CPM)
			0.0	66	Surface: soil + grass		0.5 = 3695	Borehole Gamma Readings
				66	Silty sand (fill): dark yellowish brown (10yr 3/6), dry, dense, no odor, 80% fine sand, 5% med.	AF	3885	
				93	Sandy, 15% silt, non cohesive, med. dilatancy, trace rootlets, small sub-rounded granitic gravel (~10mm)	SM / AF	5756	
				77			5978	
				74			6089	
				85			6056	
				69			5975	
				86	3'9" - Silty sand (fill): dark brown (10yr 3/3), moist, dense, no odor, 85% fine sand, 15% silt, non cohesive, med. dilatancy, mica flecks.	SM	5844	
				70			6000	
				90			5904	
				86			5946	
				88	5'3" Sandstone: light yellowish brown (10yr 6/4), fine to med. grains.		5878	
			0.0	79	Total depth = 5.51 bgs no GW encountered, no anomalies	Bedrock	5934	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: <u>n/a</u>	Location ID: <u>31</u>
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-14-11/ 1412	Date/Time Total Depth Reached: 9-14-11/ 1417	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: Field DUP: #76302		One 1/2 Gallon Bag (Approx 8 lbs.) (#70061) (1415)	
Geologist: Chelsea Carmichael		Checked By / Date: <u>Julian Robbins/ 11/3/11</u>		

Radiological Background: <u>18, 113</u>	Radiological Equipment Used: <u>Micro R / Downhole / Pancake Meters</u>	PID Used: Mini Rae 2000 - Background: <u>0.0 ppm</u>
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	18	Gravelly, sandy silt, (10 YR, 5/4), light brown, 50% silt, 25% sandstone rock fragments, 25% fine to medium grained sand, dry, stiff, trace rootlets, no plasticity, hardness, or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 31	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9-19-11 0940		Date/Time Total Depth Reached: 9-19-11 1010	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70062 (0920)			
Geologist: C. Knight				Checked By / Date: John Robert Melman 11/3/11			
Radiological Background: 10mR/3311/49		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface: Soil and grain		10.587 3317 (CPM)
0.5			0.0	84	Fill: ^{CL} Poorly graded sand with silt: Pale yellow (2.5Y 8/4), dry, medium dense, no odor, 10% silt, 5% coarse sand, 5% medium sand, 80% fine sand, mottled	AF/SP	3997
1.0			0.0	71			5215
2.0			0.0	74	6" to 1" Sandstone cobbled Pale yellow (2.5Y 7/3), mechanically weathered to SP, fine grained sandstone, dense, dry, no odor	AF/Sandstone	5619
3.0			0.0	64			5681
4.0			0.0	53	Fill: Silty Sand: Brown (10YR 4/3), dry, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand, trace rootlets, mottled	AF/SM	5618
5.0			0.0	73			5764
6.0			0.0	65			5928
			0.0	58			5924
			0.0	95			5938
			0.0	71			5920
			0.0	57	Same as above: Fill: Silty Sand	AF/SM	5894
			0.0	56			5857
			0.0				6022

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 31		
Radiological Background: 16pA/33i1/49		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	56	Same as above: Fill, silty sand	AF	6022
			0.0	53		SM	5885
7.0			0.0	77	Fill: Poorly graded sand with silt: Pale yellow (2.54 7/3), dry, medium dense, no odor, 5% coarse sand, 57% medium sand, 90% fine sand, mottled	AF	6033
			0.0	70		SP	5844
8.0			0.0	61	Fill: Silty sand, silt: Dark yellowish brown (104R 4/4), moist, medium stiff, no odor, 40% fine sand, 60% silt, noncohesive, low plasticity, low toughness	AF	6064
			0.0	60		ML	5941
9.0			0.0	48			5844
			0.0	75			5859
10.0			0.0	81	Total Depth: 10' bgs No GW encountered		5827
11.0							
12.0							
13.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 32
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-14-11/1506	Date/Time Total Depth Reached: 9-14-11/1513	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70063) (1512)			
Geologist: Chelsea Carmichael		Checked By / Date: <i>Julian Robbins-Heldman</i> 11/3/11		

Radiological Background: 18, 72	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	18	Sandy silt with rock fragments, (10YR, 4/3) 55% silt, 30% fine to coarse grained sand, 15% sandstone rock fragments, asphalt fragments and gravel fill rock, dry, medium stiff, trace rootlets, no plasticity, hardness, or odor. 1 iron nail found.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 32
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-14-11 0800	Date/Time Total Depth Reached: 9-19-11 0910	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70064 (0810)			
Geologist: C. Knight	Checked By / Date: John Ruffin Feldman 11/3/11			

Radiological Background: 17AR/3330/52	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	60	Surface: soil and grass		70.5' 3696
0.5			3.0	73	Fill: Poorly graded sand with silt; light yellowish brown (2.54 6/4), dry, medium dense, no odor, 10% silt, 5% medium sand, 85% fine sand, mottled	AF/SP	4398
1.0			2.3	82			5365
			2.3	75			5721
			1.9	68			5697
2.0			1.9	58	2'2" Fill: Silty sand: Dark yellowish brown (104R 4/4), dry, medium dense, no odor, 30% silt, 5% clay, 85% fine sand, mottled	AF/SM	5788
			1.9	52	2'6" Fill: Silty sand Poorly graded sand with silt: Light yellowish brown (2.54 6/4), dry, medium dense, no odor, 5% sandstone fine gravel, 10% silt, 5% medium sand, 80% fine sand, mottled	AF/SP	5691
3.0			1.9	59			5908
			1.9	64	3'10" Fill: Silty sand: Dark yellowish brown (104R 4/4), dry, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand, mottled	AF/SM	5706
4.0			1.5	67			5689
			1.9	55	4'5" Fill: Poorly graded sand with silt: Light yellowish brown (104R 6/4), moist medium dense no odor, 10% silt, 5% fine sandstone sub angular gravel, 85% fine sand, mottled	AF/SP	5790
5.0			2.5	60			5959
			2.5	67			5822
6.0			2.0	67			5781

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: <u>1</u> ²⁵	Location ID: 33
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-14-11/1333	Date/Time Total Depth Reached: 9-14-11/1341	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70065) (1340)			
Geologist: Chelsea Carmichael		Checked By / Date: <u>LuDean Robbins-Heldman</u> 11/3/11		

Radiological Background: 19, 77	Radiological Equipment Used: <u>Micro R</u> Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	18	Sandy silt, (10 YR, 4/3), pale brown, 60% silt, 35% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, trace rootlets, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 33
Drilling Company: HGL	Driller: J. HARRIS/I. STONE	Ground Elevation: NA	Total Depth Drilled: 9'9"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/24/11 1325	Date/Time Total Depth Reached: 10/24/11 1411	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx. 8 lbs.) #70066 (1400)		Checked By / Date: Julian Dobson / Medman 10/12	
Geologist: Timothy Morse		Radiological Background: 20 / 3822 / 62		
Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm		

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	106	Surface: Soil + veg.			4243
0.5			0.0	113	Silty Sandy silt: Dark Yellowish Brown (10YR 3/4), 15% fine grained sand, 5% medium grained sand, 80% silt, dry, no odor, slightly cohesive, low toughness, low strength	ML		5843
1.0			0.0	143				5944
			0.0	130				5779
2.0			0.0	108 86			2'0" - yellowish	
			0.0	102	Sandy silt: Dark Brown (10YR 4/4) 20% fine grained sand, 80% silt, slightly moist, no odor, slightly cohesive, low toughness, low strength, soft	ML		6157
3.0			0.0	119				1542
			0.0	84				6492
4.0			0.0	90	4'0" - Same as above..	ML		6498
			0.0	96	Color change - Dark Brown (10YR 3/3)			6319
5.0			0.0	120				6295
			0.0	173	- presence of trace sandstone concretions 5'6" - 6"			6097
6.0			0.0	112				6135

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	7	1	33		
Radiological Background:		Radiological Equipment Used:		PID Used:			
		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	112	Same as above...	ML	6135
			0.0	121			5826
7.0			0.0	123	7'0" -----		5526
			0.0	95	Sandy Silt: Dark Yellowish Brown (10YR 3/4) 30% fine grained sand, 70% silt, slightly moist, no odor, cohesive, low strength, low toughness,		5928
8.0			0.0	153		ML	6017
			0.0	127			5798
2.0			0.0	136			5822
			0.0	129	9'3" ----- Mechanically weathered sandstone to SP: Dark yellowish brown (10YR 4/6), dry, no odor, dense	SP	5624
			0.0 (118)	9'9"	Refusal on sandstone at 9'9" bgs. NO GW encountered	Bedrock	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a (18)	Location ID: 34	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-13-11/1200		Date/Time Total Depth Reached: 9-13-11/1212	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70067) (1210)			
Geologist: Chelsea Carmichael				Checked By: <i>Julie Ann Robbins Goldman</i> 11/3/11			
Radiological Background: 20, 97		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	18	Gravelly silt with sand, (10 YR, 6/4), light brown, 50% silt, 30% gravel fill rock, asphalt and sandstone rock fragments, 20% fine to medium grained sand, dry, compact, stiff, no plasticity, hardness or odor, trace plastic, 1 iron nail found.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0					No GW reached.		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 34	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9-16-11 1010		Date/Time Total Depth Reached: 9-16-11 1115	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 20068 (1020)			
Geologist: C. Knight				Checked By / Date: Laurie Robinson Feldman 11/3/11			
Radiological Background: 16mR/3207/54		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	82	Surface: soil and gravel		0.5	3291
0.5			0.0	64	Fill: Poorly graded sand with silt; pale yellow (2.5 7/4), dry, medium dense, no odor, 10% silt, 5% fine subangular gravel, 10% medium sand; 75% fine sand, mottled	AF/SP	1	3930
1.0			0.0	71			5120	
2.0			0.0	100			5631	
3.0			0.0	61	Fill: Silty sand: strong brown (2.5 4R 4/6), moist, medium dense, no odor, 30% silt, 5% coarse sand, 5% medium sand, 60% fine sand, pockets of fine sand (pale yellow 2.5 7/4), mottled	AF/SM	2	5595
4.0			0.0	84			5614	
5.0			0.0	84			5779	
6.0			0.0	75			5907	
7.0			0.0	67			5750	
8.0			0.0	60	Fill: Silty sand: Dark brown (10 4R 3/3), moist, medium dense, no odor, 40% silt, 5% medium sand, 55% fine sand, trace fine subangular sandstone gravel	AF/SM	4	5842
9.0			0.0	64			5786	
10.0			0.0	76			5895	
			0.0	72			5	5747
			0.0				6	5755

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 126 126	Location ID: 35	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-13-11/1401		Date/Time Total Depth Reached: 9-13-11/1409	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70069) (1408)			
Geologist: Chelsea Carmichael				Checked By: <i>J. Dean Robbins, J. Goldman</i> 11/3/11			
Radiological Background: 16, 93		Radiological Equipment Used: (Micro R) Downhole (Pancake Meters)		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	68	Gravelly silt with sand, (10 YR, 5/3), light brown, 50% silt, 30% gravel fill rock, concrete and sandstone rock fragments, 20% fine to medium grained sand, dry, medium stiff, compact, no plasticity, hardness or odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 35
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 8.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-16-11 0845	Date/Time Total Depth Reached: 9-16-11 1000	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		70670	(0850)
Geologist: C. Knight	Checked By / Date: Muller Robbins Holdman		11/3/11	
Radiological Background: 17mR / 2552 / 46	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0:0 ppm		

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
			0-0	60	Surface: Soil		705' 3162
0.5			0.0	55	Fill: Silty Sand: Strong brown (2.5YR 4/6), moist, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand, mottled	AF / SM	3770
1.0			0.0	58			5314
			0.0	60	17" Same as above: Yellowish brown (10YR 5/6)	AF / SM	5527
2.0			0.0	58			5987
			0.0	65	2'8" Same as above: Brown (10YR 4/3)	AF / SM	5511
3.0			0.0	53	3'1" to 3'3" Sandstone medium gravel: Pale yellow (2.5Y 7/3), fine grained sandstone	AF / SM	5744
			0.0	44	3'3" Fill: Silty Sand: High to live brown (2.5Y 5/4), moist, medium dense, no odor, 15% silt, 10% medium sand, 5% fine sand, mottled	AF / SM	5950
4.0			0.0	53	Sandstone fine gravel, 20% fine sand, mottled	AF / SM	5886
			0.0	59	3'8" Same Sandstone fine gravel	AF / SM	5832
5.0			0.0	65	4'8" Sandstone gravel (fine) grayish brown (2.5Y 5/2) fine grained sandstone	AF / SM	5815
			0.0	48		AF / SM	5861
6.0			0.0	53		AF / SM	5863
						AF / SM	5848

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	7	1	35		
Radiological Background:		Radiological Equipment Used:		PID Used:			
17m R / 2552 / 46		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	53	Same as above: Fill: Silty Sand: Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 20% silt, 5% sandstone gravel, 5% medium sand, ^{cl} 20% fine sand, trace rootlets	Af SM	5848
			0.0	55			5830
7.0			0.0	62			5824
			0.0	67			5954
8.0			0.0	59	2'6" Sandstone: Grayish brown (2.5Y 4/2), dry, dense, no odor, fine grained sandstone	Bd Bk	5940
					Refusal on sandstone at 8.0' bgs No GWC encountered		
9.0							
10.0							
11.0							
12.0							
13.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a <i>LP6</i>	Location ID: <i>3b</i>
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: <i>9-14-11/0835</i>	Date/Time Total Depth Reached: <i>9-14-11/0843</i>	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70071) (0842)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Julian Robbins, Moldman 11/4/11</i>			

Radiological Background: <i>22, 105</i>	Radiological Equipment Used: <i>Micro R / Downhole (Pancake Meters)</i>	PID Used: Mini Rae 2000 - Background: <i>0.0 ppm</i>
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	20	Silty sand with gravel, (10 YR, 5/4), light brown, 50% fine to coarse grained sand, 35% silt, 15% gravel fill rock, asphalt and sandstone rock fragments, trace rootlets, dry, medium dense, no plasticity, hardness or odor.	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0					No GW reached.			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a 1-26	Location ID: 37
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-13-11/1004	Date/Time Total Depth Reached: 9-13-11/1011	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70073) (1010)			
Geologist: Chelsea Carmichael	Checked By/! Date: <i>Julian Robbins Goldman 11/4/11</i>			

Radiological Background: 28, 133	Radiological Equipment Used: <u>Micro R</u> Downhole <u>Pancake Meters</u>	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	30	Silt with sand, (10 YR, 4/4), brown, 85% silt, 15% fine to medium grained sand, dry, medium stiff, very low plasticity, very low hardness, no odor.	ML		
1.0					No GW reached			
2.0								
3.0								
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 37
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 5.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-15-11 0822	Date/Time Total Depth Reached: 9-15-11 0915	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) + 8oz Jar 70074 (0840)			
Geologist: C. Knight	Checked By / Date: Juliana Robbins / Goldman 11/4/11			

Radiological Background: 30, R / 5131 / 45	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 105' 5083 (CPM)
0.0			0.0	88	Silty Sand: Pale yellow ^{CLF} Brown (10YR 6/3), dry, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand, trace rattlets	SM	7057
0.5			0.0	100			6157
1.0			0.0	80 79 CK			4906
1.5			0.0	75 75 CK			4711
2.0			0.0	55 67 CK	Weathered CLC	SP	4705
2.5			0.0	63 59 CK			4742
3.0			0.0	53 CK 57	Weathered Sandstone Bedrock: light yellowish brown (10YR 6/4), moist, dense, no odor, fine grained sandstone, trace iron oxide staining	SP	4802
3.5			0.0	57 CK 66			4720
4.0			0.0	68			4964
4.5			0.0	75			4846
5.0			0.0	68			5728
Refusal on Sandstone at 5.0 bgs No GW encountered							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a-186 1	Location ID: 38
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-14-11 / 1146	Date/Time Total Depth Reached: 9-14-11 / 1153	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.) (# 70075) (1152)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Justin Robbins Baldwin</i> 11/4/11			

Radiological Background: 20, 57	Radiological Equipment Used: Micro R Downhole Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	184	Sandy silt, (10 YR, 4/4), brown, 55% silt, 40% fine to coarse grained sand, 5% sandstone rock fragments and concrete fragments, dry, soft, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0					No GW reached			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a 103	Location ID: 39	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-14-11/0853		Date/Time Total Depth Reached: 9-14-11/0906	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.) (# 70077) (0905)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Dublan Robbins Feldman 11/4/11</i>			
Radiological Background: 16, 11		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	16	Sand with silt and gravel, C10YR, 5/6, orange-ish brown, 75% fine to medium grained sand, 15% rounded sandstone fragments and gravel fill rock, semi-moist, medium dense, no plasticity, hardness or odor.	SW	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 39	
Drilling Company: Ben Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 7.0 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/22/11 1110		Date/Time Total Depth Reached: 9/22/11 1155	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx. 8 lbs.) 70078 (1120)			
Geologist: C. Knight				Checked By / Date: Juliana Robbins Feldman 11/4/11			
Radiological Background: 14/2783/49		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface: Asphalt		105' 3150
			0.0	66	3" Asphalt	AF	3749
0.5			0.0	69	Fill: Silty Sand: Brownish yellow (10YR 5/6), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand, mottled	AF/SM	3423
1.0			0.0	72			4622
			0.0	55			5404
2.0			0.0	49	2'2" to 2'6" Sandstone cobble (Yellow 2.5Y 7/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone cobble	AF	5800
			0.0	50			5981
3.0			0.0	63	Same as above: Fill: Silty Sand	AF/SM	5770
			0.0	68	Same as above: Fill: Silty Sand (Dark brown 7.5YR), 40% silt, 5% medium sand, 55% fine sand, mottled		5754
4.0			0.0	77	Sandy silt: Strong brown (2.5YR 4/6), moist, medium stiff, no odor, 20% fine sand, 5% medium sand, 5% coarse sand, 5% pea size gravel, 65% silt, low plasticity, low toughness, cohesive	ML	5902
			0.0	84			5665
5.0			0.0	86	4'10" Poorly graded sand with silt: Olive yellow (2.5Y 6/6), moist, medium dense, no odor, 10% silt, 90% fine sand, some iron oxide staining	SP	5831
			0.0	63			5646
6.0			0.0	68			5782

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 39		
Radiological Background: 14mR / 2783/49		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	68	Weathered Sandstone Bedrock: yellow (2.5Y 7/6), moist, very dense, no odor, mechanically weathered to SP, fine grained sandstone, some Iron oxide staining, trace coarse and medium grained sand in a lens @ 6.6"	GpMn	5782
			0.0	87			5824
7.0			0.0	94			5921
8.0					Refusal on Sandstone at 7.0' bgs No GW encountered		
9.0							
10.0							
11.0							
12.0							
13.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 40
Drilling Company: HGL	Driller:	Ground Elevation: NA	Total Depth Drilled: n/a ft bgs.	
Drilling Equipment: Hand Auger <u>LAG</u>	Borehole Diameter: 2.75 inches <u>LAG</u>	Date/Time Drilling Started:	Date/Time Total Depth Reached:	
Type of Sampling Device: Handauger <u>LAG</u>	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		76080 (n/a)	
Geologist:	Checked By / Date:			

Radiological Background:	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:
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Depth (ft bgs) Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
						Feet bgs.	(CPM)
0.5				<p><u>no sample collected</u> archeological site - JRA</p>			
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a (LR6)	Location ID: 41	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-13-11/0905		Date/Time Total Depth Reached: 9-13-11/0911	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: 1-8-cz jar			
Geologist: Chelsea Carmichael				One 1/2 Gallon Bag (Appox 8 lbs.) (# 70081) (0910)			
Radiological Background: 16, 75				Radiological Equipment Used: Micro R Downhole / Pancake Meters		Checked By / Date: Julia Robinson / 11/7/11	
PID Used: Mini Rae 2000 - Background: 0.0 ppm				Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	16	ML		
Silt with sand, (10 YR, 3/3), dark brown, 80% silt, 20% fine to medium grained sand, dry, soft, Very low plasticity, very low hardness, no odor, trace carbon.							
No GW reached.							
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 41
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 7.5 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-14-11 1149	Date/Time Total Depth Reached: 9-14-11 1250	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		70082 (1200)	
Geologist: C. Knight	Checked By / Date: Julie Ann Robbins / 11/7/11			

Radiological Background: 204R / 2859 / 53	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 145 3351 (CPM)
			0.0	53	Surface: soil		
0.5			0.0	67	Silty Sand: Dark brown (104R 3/3), dry, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand.	SM	3786
1.0			0.0	73			4579
2.0			0.0	66			4936
			0.6	88			5191
			0.0	45			5290
3.0			0.0	43	Silty Sand: Brown (104R 4/3), dry, medium dense, no odor, 20% silt, 5% medium sand, 75% fine sand.	SM	5036
4.0			0.0	79			5071
			0.0	83			5043
			0.0	89			4933
			0.0	94			5037
5.0			0.0	59	Poorly graded sand with silt: light olive brown (2-5Y 5/3), moist, medium dense, 10% silt, 90% fine sand, trace iron oxide staining	SP	4997
			0.0	72			5009
6.0			0.0				5089

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 42	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-19-11/0901		Date/Time Total Depth Reached: 9-19-11/0911	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70083) (0910)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Ted Robbins / Hedman 1/9/12</i>			
Radiological Background: 23, 108		Radiological Equipment Used: Micro R / Downhole (Pancake Meters)		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	22 116 cpm	Sandy silt with rock fragments, (10% 5/4) light brown, 50% silt, 35% fine to coarse grained sand, 15% sandstone rock fragments and concrete fragments, dry, medium stiff, no plasticity, hardness or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 42	
Drilling Company: <i>Boart</i> <i>Boart Longyear</i>		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 2'10" ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/29/11 1405		Date/Time Total Depth Reached: 9/29/11 1500	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70104 (1410)			
Geologist: C. Knight				Checked By / Date: <i>J. Dean Robbins</i> 1/9/12			
Radiological Background: 20 pA / 3559 / 50		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 00 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings +0.5' 3922 (CPM)
			0.0	60	Surface: soil and grass			
0.5			0.0	67	Fill: Silty Sand: Pale brown (10YR 6/3), dry, medium dense, no odor, 5% subangular gravel, 10% coarse sand, 20% silt, 10% medium sand, 55% fine sand	SM		4074
1.0			0.0	78				5107
2.0			0.0	85				5487
2.0			0.0	64				5579
3.0			0.0	64	Sandstone Bedrock: V. pale brown (10YR 7/3), dry, very dense, no odor, fine grained sandstone	BS	2'7"	5448
3.0			0.0	64			2'10"	5505
4.0					Refusal on Sandstone at 2'10" No CW encountered		3	
5.0							4	
6.0							5	
6.0							6	

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 173 43
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-20-11/1349	Date/Time Total Depth Reached: 9-20-11/1400	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70085) (1400)		Checked By / Date: Julian Robbins Feldman 1/9/12	
Geologist: Chelsea Carmichael				

Radiological Background: 18	Radiological Equipment Used: Micro R Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	18	Sandy silt, (10YR, 5/3), light brown, 55% silt, 40% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML	0.5	
1.0							1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0							5.0	
6.0							6.0	

No GW reached

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 43	
Drilling Company: Boart Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 1.5 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 10/10/11 11:35		Date/Time Total Depth Reached: 10/10/11 12:00	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx. 8 lbs.) 70086 (SAMPLE) ^{NO}			
Geologist: C. Knight				Checked By / Date: Sh. Dan Robbins Hoelzman 1/9/12			
Radiological Background: ILM/3094/56		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			53	Surface Soil	Artificial Fill	AF		NO downhole gamma data recorded
0.5			57	4"	Fill: 5:1 by sand; Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 25% silt, 10% medium sand, 65% fine sand, mottled	SM		
1.0			62		Weathered Sandstone Bedrock: light yellowish brown (2.5Y 6/4), dry, very dense, no odor, mechanically weathered to SP, fine grained sandstone	bedrock	1	
2.0			58				2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

NO GW encountered
Refusal on sandstone at 1.5' bgs



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 44
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1148	Date/Time Total Depth Reached 9-16-11/1153
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#70087) (1152)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Feldman 1/9/12		

Radiological Background 25	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	26	Silty sand with rock fragments, light brown, 60% fine sand, 25% silt, 15% sandstone rock fragments and asphalt fragments, dry, medium dense, no plasticity, hardness or odor.	SM		
No GW reached.								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a (US)	Location ID: 45
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-15-11/1425	Date/Time Total Depth Reached: 9-15-11/1434	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70089) (1432)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Ludvan Petrov Feldman</i> 1/9/12			

Radiological Background: 21	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	21 24 22	Silty sand with gravel, (10YR, 4/4), brown, 55% fine to medium grained sand, 30% silt, 15% pea gravel, dry, loose, no plasticity, hardness or odor.	SM	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 46
Drilling Company: HGL		Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-20-11/1011	Date/Time Total Depth Reached: 9-20-11/1019	
Type of Sampling Device: stainless steel shovel/ trowel			Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs) (#70091) (1018)		
Geologist: Chelsea Carmichael			Checked By / Date: John Robbins Helman 1/9/12		

Radiological Background: 21	Radiological Equipment Used: (Micro R) Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	20	Sandy silt, (10 YR, 5/4), light brown, 60% silt, 35% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 46
Drilling Company: HGL	Driller: C. Knight	Ground Elevation: NA	Total Depth Drilled: 3' 10" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 10/7/11 1010	Date/Time Total Depth Reached: 10/7/11 1056 3' 10"	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		70092, 1038	
Geologist: A. Lawrence	Checked By / Date: Liz Dan Robbins, Gledman 1/9/12			

Radiological Background: 16/3730/76	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	107	Fill: Silty sand w/ gravel; yellowish brown (10YR 5/4) slightly moist, medium dense, 15% silt, 5% coarse, 10% sandstone gravel (angular - subangular 1/4" - 1.5" diam), 70% fine, no odor or staining	AF/SM		5257
			0.0	104				5736
			0.0	72	Fill: Silty sand w/ gravel; light olive brown (2.5Y, 9/4) moist, medium dense, 15% silt, 5% med rum, 10% sandstone & granite gravel (1/4" - 1.5" diam), 70% fine, no odor or staining	AF/SM		5634
			0.0	95				5770
			0.0	105				5871
			0.0	112	same as above			5748
			0.0	85				5789
			0.0	104				5715
					refusal on sandstone			
					3' 10" Total Depth to 3' 10" refusal on sandstone			
					No groundwater encountered			
					Piece of copper wire found during sample prep.			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 47	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-20-11/0859		Date/Time Total Depth Reached: 9-20-11/0906	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70093) (0905)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Sullivan Robbins, Helman '19/12</i>			
Radiological Background: 23		Radiological Equipment Used: Micro R _y Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	21	Sandy silt, (10 VR, 5/3), light pale brown, 60% silt, 30% fine to medium grained sand, 10% sandstone rock fragments, dry, medium stiff, trace rootlets, no hardness, plasticity or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 47	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 1'	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10-11-11/0901		Date/Time Total Depth Reached: 10-11-11/0913	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70094) (n/a)			
Geologist: Chelsea Carmichael				Checked By / Date: Julian Polaris Feldman 1/9/12			
Radiological Background: 108, 3670		Radiological Equipment Used: Micro R / Downhole Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	115	Silty sand with rock fragments, (10YR, 4/4), brown, 70% fine to coarse grained sand, 15% silt, 15% sandstone rock fragments, semi-moist, medium dense, no plasticity, hardness or odor.	SM	
1.0			0.0	109	Refusal at 1' - bedrock		
2.0					No GW reached		
3.0					<u>No sample collected</u>		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 48	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-19-11/0950		Date/Time Total Depth Reached: 9-19-11/1001	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70095) (0955)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Ludlow Robbins Helman 11/9/12</i>			
Radiological Background: 20		Radiological Equipment Used: Micro R Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	20	Sandy silt, (10YR, 5/4), light brown, 65% silt, 30% fine to medium grained sand, 5% sandstone, asphalt and cement fragments, trace rootlets, dry, medium stiff, no plasticity, hardness or odor. 1 iron nail found. No GW reached.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 49			
Drilling Company: HGL		Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-20-11/1151	Date/Time Total Depth Reached: 9-20-11/1200				
Type of Sampling Device: stainless steel shovel/ trowel			Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#70097) (1200)					
Geologist: Chelsea Carmichael			Checked By / Date: Julia Robinson Sedman 1/10/12					
Radiological Background: 20		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	20	Sandy silt, (10 YR, 4/4), brown, 60% silt, 35% fine to coarse grained sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor, trace gravel rocks.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								
					No GW reached			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 50
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-20-11/0719	Date/Time Total Depth Reached: 9-20-11/0732	
Type of Sampling Device: stainless steel shovel/ trowel		Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70099) (0725)		
Geologist: Chelsea Carmichael		Checked By / Date: <i>Judith Robinson Goldman</i> 1/10/12		

Radiological Background: 20	Radiological Equipment Used: Micro R Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	20	Sandy silt with rock fragments, (10YR, 4/4), brown, 50% silt, 35% fine to medium grained sand, 15% gravel fill rock, asphalt fragments, sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 51
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-20-11/0939	Date/Time Total Depth Reached: 9-20-11/0946	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70101) (0945)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Julian Robby Selman</i> 1/10/12			

Radiological Background: 21	Radiological Equipment Used: Micro R Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	21	Sandy silt, (10 YR, 4/4), brown, 60% silt, 35% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7		Group: 1		Location ID: 51	
Drilling Company: HGL		Driller: I. Stenc		Ground Elevation: NA		Total Depth Drilled: 2' 7" ft bgs.			
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: 10/7/11 1326		Date/Time Total Depth Reached: 10/7/11 1340			
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70102 (1338)					
Geologist: A. Lawrence				Checked By / Date: Julian Robbin Feldman 1/10/12					
Radiological Background: 1713465/61		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)		
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		+05 3445		
0.5			0.0	76	Fill: Silty Sand w/ trace gravel, dark yellowish brown (10YR 3/4) moist, medium dense, small pieces of asphalt debris, 5% gravel 1/4" diam, 15% silt, 80% fine sand	AF/SM	3672		
1.0			0.0	118	Fill: Sand w/ trace silt & gravel, light yellowish brown (10YR 6/4), moist, dense to medium, no odor, no staining, 15% sandstone & 5% silt, 80% fine sand.	AF/SP	5020		
1.5			0.0	118			5552		
2.0			0.0	76		AF/SP	5590		
2.5			0.0	96			5546		
3.0			0.0	120	Same as above		5576		
					Refusal at 2' 7"				
					Total depth 2' 7"				
					Refusal on sandstone				
					No ground water encountered				



BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 52
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1043	Date/Time Total Depth Reached 9-16-11/1050
Type of Sampling Device trowel/shovel	Samples Collected Field DUP: #70303 (1) 1/2 gal bag (#70103) (1048)		
Geologist C. Carmichael	Checked by/Date Julian Roberts Jeddman 1/10/12		

Radiological Background 23	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	25	<p>Silty sand with rock fragments, (10 YR, 5/3), light brown, 60% fine to medium grained sand, 25% silt, 15% ^{sandstone} rock fragments, dry, medium dense, no plasticity, hardness or odor.</p> <p>No GW reached.</p>	SM		



BORING LOG

Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 53
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1129	Date/Time Total Depth Reached 9-16-11/1137
Type of Sampling Device trowel/shovel	Samples Collected (1) 1/2 gall bag (#70105) (1135)		
Geologist C. Carmichael	Checked by/Date Julian Robbins, Goldman 1/10/12		

Radiological Background 30	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.026	Silty sand with rock fragments (10YR, 5/4), light brown, 55% fine to medium grained sand, 25% silt, 20% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.	SM		
					No GW reached.			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 53
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2 ft 2 in ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/26/11 0907	Date/Time Total Depth Reached: 10/26/11 0915	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: 70106 - 0925 (1) 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: Ian Stone	Checked By / Date: Julian Robins Goldman 11/10/12			

Radiological Background: 21 / 5842 / 115	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	112	Silty sand, yellowish brown (10YR 5/6) 80% fine sand, 20% silt, trace gravel (sandstone), dry; low-med dense, no odor or staining max gravel size 1.5 inches	SM	0.5' = 6076
0.5			0.0	88			5317
1.0			0.0	89			5549
1.5			0.0	99			5613
2.0			0.0	98			5564
2.5					TD: 2ft 2in bgs no gas encountered refused on sandstone		
3.0							
4.0							
5.0							
6.0							



BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 54
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1353	Date/Time Total Depth Reached 9-16-11/1401
Type of Sampling Device trowel/shovel	Samples Collected (1) 1/2 gall bag (#70107) (1400)		
Geologist C. Carmichael	Checked by/Date Julian Robins/Gelman 1/10/12		

Radiological Background 17	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.020	Silty sand with rock fragments, (10YR, 5/3) light brown, 55% fine to medium grained sand, 30% silt, 15% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor. No GW reached	SM	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 55	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-22-11/0756		Date/Time Total Depth Reached: 9-22-11/0803	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70109) (0802)			
Geologist: Chelsea Carmichael				Checked By/ Date: Cliff Knight 1-6-12			
Radiological Background: 23		Radiological Equipment Used: Micro R Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	24	Fill: Sandy silt with rock fragments, (10YR, 9/2) pale dark brown, 50% silt, 30% fine to medium grained sand, 20% sandstone to rock fragments/ cobbles, dry, soft, no plasticity, common vegetation/wood fragments, no hardness or odor. Barbed wire, wood plank, metal pieces, plastic found. No GW reached.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 56
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 5.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-21-11 0817	Date/Time Total Depth Reached: 9-21-11 0915	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		+ 802 Jar 70110 (0830)	
Geologist: C Knight	Checked By / Date: Will Kumpke 1-6-12			

Radiological Background: 14NR/3101/51	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: gravel & soil		+0.5' 3579
0.0			60		Fill: silty sand; Light yellowish brown (104R 6/4), moist, medium dense, no odor, 25% silt, 5% fine grained angular sandstone gravel, 5% medium sand, 65% fine sand, mottled	AF/SM	4170
0.5			71				5152
1.0			75				5231
			75				5398
2.0			66		Same as above: Fill: silty sand	AF/SM	5270
			83				5303
3.0			70		2' 8" Fill: Poorly graded sand with silt: Dark yellowish brown (104R 4/6), moist, medium dense, no odor, 10% silt, 5% fine gravel (sandstone and volcanic gravel), 5% medium sand, 80% fine sand, mottled, trace rutlets	AF/SP	5392
			57				5396
4.0			65		4" sandstone whittle ~ 2" thick Same as above: Poorly graded sand with silt		5289
			76		Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), dry, very dense, no odor, 5% medium sand, 95% fine sand, fine grained sandstone	AF/SP	5338
5.0			69		4" 11"		5421
					Refusal on Sandstone at 5' bgs No GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 57
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 4.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-21-11 0730	Date/Time Total Depth Reached: 9-21-11 0815	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		+ Bor Jar 70111 (0740)	
Geologist: C Knight	Checked By / Date: Will Knight 1-6-12			

Radiological Background: 15AR/3087/47	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface Soil and grass		+0.5' 3759
0.5			0.0	60	Fill: Silt; Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 35% silt, 5% clay, 60% fine sand, mottled, trace extremely iron oxide staining	Af/SM	4343
			0.0	61			5237
1.0			0.0	76	11" clayey silt with sand: Olive brown (2.5Y 4/3), moist, medium stiff, no odor, 35% clay, 45% silt, 20% fine sand, low plasticity, medium toughness, cohesive, mottled	Af/ML	5432
			0.0	67	Fill: Silt; Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 35% silt, 5% clay, 60% fine sand, mottled	Af/SM	5446
2.0			0.0	82	1'10" Sandstone Cobble: Light olive brown (2.5Y 5/6), moist, dense, no odor, fine grained sandstone cobble		5259
			0.0	69	Poorly graded Sand with silt: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 10% silt, 5% medium sand, 85% fine sand, some iron oxide staining	Af/SP	5374
3.0			0.0	63	2'11" trace charcoal		5288
			0.0	62			5293
4.0			0.0	67	3'9" weathered Sandstone Bedrock: Dark yellowish brown (10YR 4/4), moist, very dense, no odor, fine grained sandstone, traces silt, iron oxide staining		5083
					Refusal on Sandstone at 4.0' bgs NO GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 59
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 6.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-20-11 1200	Date/Time Total Depth Reached: 9-20-11 1300	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		↑ 8oz Jar 20311 (107) Field dup 70113 (1215)	
Geologist: C. Knight	Checked By / Date: W. Handout 1-6-12			

Radiological Background: 17mB / 3678 / 49	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	55	Surface: soil and grass		10.5'	3642
0.5			0.0	57	Sandy silt: yellowish brown (10YR 5/4), dry, medium stiff, no odor, 35% fine sand, 5% medium sand, 60% silt, cohesive, low plasticity, low toughness	ML		3794
1.0			0.0	64			1	4942
			0.0	76	14" Silty Sand: light olive brown (2.5Y 5/3), moist, medium dense, no odor, 20% silt, 5% medium sand, 5% coarse sand, 70% fine sand.	SM		5474
2.0			0.0	89			2	5488
			0.0	78	2' 8" Poorly graded sand with silt: light yellowish brown (2.5Y 6/4), moist, medium dense, no odor, 10% silt, 5% coarse sand, 5% medium sand, 80% fine sand, iron oxide staining	SP		5307
3.0			0.0	61			3	5619
			0.0	68			4	5448
4.0			0.0	71				5434
			0.0	76	- increasing density		4	5384
5.0			0.0	69	Weathered sandstone bedrock: light olive brown (2.5Y 5/6) and Gray (2.5Y 5/1), moist, very dense, mechanically weathered to SP, fine grained sandstone, trace mottling with the two colors	Bedrock	5	5449
6.0			0.0	67			6	5493
								5436
								5621

NO GW

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 60
Drilling Company: HGL	Driller: J. Harris	Ground Elevation: NA		Total Depth Drilled: 3'7"
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/20/11 0630	Date/Time Total Depth Reached: 10/20/11 1113	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70114, 1130)			
Geologist: To Morse	Checked By / Date: Cliff Thayer			

Radiological Background: 3724 / 72	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: woodchips		+0.5' 3618
			0.0	75	Sandy silt: Dark Yellowish Brown		3664
0.5			0.0	69	(10YR 3/6), 30% fine grained sand, 70% silt, trace sandstone gravel, medium ^{firm} dense to ^{soft} loose , NO plasticity, dry, no odor, (TM)	ML	4853
1.0			0.0	72	1'0" (TM) Same as above... color change to Dark Yellowish Brown (10YR 4/6)		5373
			0.0	89		ML	5750
2.0			0.0	73	Silty sand: Light olive brown (2.5Y 5/6)		5777
			0.0	74	45% silt, 55% fine grained sand, medium toughness, slightly moist, no odor, no plasticity, slightly cohesive, medium dense	SM	6008
3.0			0.0	81	3'0" Sandy silt with clay: olive brown (2.5Y 4/4)		5787
			0.0	68	40% fine grained sand, 45% silt, 15% clay, slightly moist, no odor, cohesive, soft, low plasticity	ML	5376
4.0					3'7" Refusal on sandstone at 3'7" bgs. NO GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 61		
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs		
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-21-11 / 1142		Date/Time Total Depth Reached: 9-21-11 / 1151		
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70115) (1150)				
Geologist: Chelsea Carmichael				Checked By/ Date: <i>[Signature]</i> 1-6-12				
Radiological Background: 23		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	24	Sandy silt Silty sand (10 YR, 3/4), dark brown, 65% silt, 35% fine to medium grained sand, dry, soft, some sticks/vegetation, no plasticity, no hardness or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								
					No GW reached.			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 62	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-23-11/ 0834		Date/Time Total Depth Reached: 9-23-11/ 0842	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70117) (0842)			
Geologist: Chelsea Carmichael				Checked By/ Date: Cliff Knight 1-6-12			
Radiological Background: 19		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	18	<p>Fill:</p> <p>Sandy silt with rock fragments, (10 VR, 4/3), pale brown, 55% silt, 30% fine to medium grained sand, 15% sandstone rock fragments, asphalt and concrete fragments, dry, soft, some rootlets, no plasticity, hardness or odor.</p> <p>No GW reached.</p>	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 65
Drilling Company: HGL	Driller: J. Harris	Ground Elevation: NA	Total Depth Drilled: 3'0"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/2/11 1005	Date/Time Total Depth Reached: 10/2/11 1025	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70120) (1100)			
Geologist: To Morse	Checked By / Date: Will Knight 1-6-12			

Radiological Background: 3407 / 102	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet +0.5' 3886 (CPM)
			0.0	78	Surface: Soil, fill gravel		
0.5			0.0	115	Sandy silt w/ gravel: Yellowish Brown (10YR 5/6), 35% fine grained sand, 5% medium grained sand, 15% subangular gravel and concrete debris, 45% silt, dry, no odor, no plasticity, medium dense stiff	AF / ML	4473 4880
1.0			0.0	113			5003
2.0			0.0	78	Sandy silt: Yellowish Brown (10YR 5/6), 30% fine grained sand, 5% medium grained sand, 5% coarse grained sand, trace subangular gravel, dry, medium dense stiff, no plasticity, 60% silt, large coiled copper wire found at 1' bgs, fibrous white, stucco-like material also found @ 1' 6"	AF / ML	5444
			0.0	91	Same as above...		5548
			0.0	68	no building material/debris found at this depth	ML	5526
3.0			0.0	80	3'0" refusal on sandstone at 3'0" bgs. NO GW encountered		5382
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 66
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-23-11/1414	Date/Time Total Depth Reached: 9-23-11/1421	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70121) (1420)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Chris Kumbert</i> 1-6-12			

Radiological Background: 23	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	21	Sandy ck Silt with sand, (10 YR, 3/3), dark brown, 85% silt, 15% fine to medium grained sand, some charcoal/carbon from fire residue, dry, soft, trace sandstone rock fragments, very low hardness, no plasticity, no odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached



7_067



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 67
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-23-11/1453	Date/Time Total Depth Reached 9-23-11/1501
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#70123) (1500)		
Geologist C. Carmichael	Checked by/Date Cliff Knight 1-6-12		

Radiological Background Z1	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	Z3	Sandy ck Silt with sand, (10 YR, 2/2), dark brown, 80% silt, 20% fine sand, common organic matter, soft, semi-moist, no plasticity, hardness or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 67
Drilling Company: HGL	Driller: J. Harris	Ground Elevation: NA	Total Depth Drilled: 9'	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/2/11 1452	Date/Time Total Depth Reached: 10/2/11 1502	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70124) (NS)		Checked By / Date: [Signature]	
Geologist: To Morse		Radiological Background: 4637 / 90		

Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	86	Surface: Wood chips + soil		+0.5
0.5			0.0	82	Sandy Silt: Dark Brown (10YR 3/3) 20% fine grain sand, trace medium grain sand, 80% silt, soft, slightly moist, low plasticity, 90 no odor	ML	No gamma to shallow refusal
1.0					Refusal on sandstone at 9" bgs. NO GW encountered NO sample collected due to lack of Recovery	Refusal	
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 68
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-23-11/1433	Date/Time Total Depth Reached: 9-23-11/1440	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70125) (1440)			
Geologist: Chelsea Camichael	Checked By / Date: <i>W. Thum</i> 1-6-12			

Radiological Background: 19	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	21	Sandy silt with sand, (10 YR, 4/3), brown, 80% silt, 15% fine to medium grained sand, 5% sandstone rock fragments, dry, soft, very low hardness, no plasticity, or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 68
Drilling Company: HGL	Driller: J. Harris	Ground Elevation: NA		Total Depth Drilled: 2'0"
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/21/11 14:52:13	Date/Time Total Depth Reached: 10/21/11 14:28	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70126) (1430)			
Geologist: To Morse	Checked By / Date: cliff harris 1-6-12			

Radiological Background: 3997 / 110	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' 3859 (CPM)
			0.0	84	Surface: Soil, mulch, veg.		
0.5			0.0	96	Sandy silt Silty sand; Dark Yellowish Brown (10YR 4/4), 30% fine grained sand, 70% silt, trace gravel, dry, no odor, Low plasticity, soft to firm, loose to medium dense soft to firm	ML	4044
1.0			0.0	135			5419
2.0			0.0	129	Same as above... except firm consistency and trace sandstone concretions	ML	6284
			0.0	77	2'0" Refusal on sandstone at 2'0" bgs. NO GW encountered		6561
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 69
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-23-11/1230	Date/Time Total Depth Reached: 9-23-11/1239	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70127) (1238)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Chad Threlkeld</i> 1-6-12			

Radiological Background: 20	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	21	Fill Sandy silt, (10 YR, 4/4), brown, 60% silt, 35% fine to medium grained sand, 5% sandstone fragments and gravel fill rock, dry, soft, no plasticity, hardness, or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 69
Drilling Company: HGL	Driller: J. Harris	Ground Elevation: NA		Total Depth Drilled: 3'7"
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/20/11 1457	Date/Time Total Depth Reached: 10/20/11 1525	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70128), (1530)			
Geologist: To Morse	Checked By / Date: [Signature] 1-6-12			

Radiological Background: 4045 / 112	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	93	Surface: Gravel, Soil		+0.5' 3841
0.5			0.0	91	Sandy Silt: Yellowish Brown (10YR 5/6) 40% fine grained sand, 5% sub angular gravel, sandstone concretions, trace rootlets, dry, no odor, non cohesive, no plasticity, loose to medium dense, soft to medium stiff	ML	3839
1.0			0.0	89			4552
			0.0	76	Sandy Silt: Dark Yellowish Brown (10YR 3/4) 25% fine grained sand, 75% silt, trace rootlets, cohesive, low to no plasticity, medium dense, no odor, trace sandstone concretions, dry	ML	5779
2.0			0.0	67			6134
			0.0	80			6207
3.0			0.0	75	3'0" Same as above. Color change: Yellowish Brown (10YR 5/6)		6226
			0.0	68	3'7" Refusal on Sandstone at 3'7" bgs. NO GW encountered		6198
4.0							6144
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a 1	Location ID: 70	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-13-11/1028		Date/Time Total Depth Reached: 9-13-11/1035	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: +8 ₆₂ Jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70129) (1035)			
Geologist: Chelsea Carmichael				Checked By./ Date: <i>CMW 7/13/12</i> 1-6-12			
Radiological Background: 22			Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	22	Sandy silt with sand, (10 YR, 4/3), greyish-brown, 80% silt, 20% fine to medium grained sand, dry, medium stiff, trace rootlets, trace gravel rock, no plasticity, very low hardness, no odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 70
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 4.5 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-15-11 0923	Date/Time Total Depth Reached: 9-15-11 1020	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 702 Jar 70130 (0930)			
Geologist: C. Knight		Checked By / Date:		

Radiological Background: 19NR/3386/46	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	55	surface: soil and grass		405' 3732
0.5			0.0	63	Fill: Silty Sand with gravel: light olive brown (10YR 5/4), dry, medium dense, no odor, 35% silt, 15% subangular to subrounded fine gravel (~3/4" diameter), 5% coarse sand, 10% medium sand, 35% fine sand, gravel is fill rock	AF/SM	4327
1.0			0.0	81			5288
			0.0	79	1'5" Magnetite fine gravel.		4920
2.0			0.0	75			4678
			0.0	67	2'4" Poorly graded sand with silt: Pale yellow (2.5Y 7/4), dry, medium dense, no odor, 10% silt, 5% medium sand, 85% fine sand, some iron oxide staining	SP	4624
3.0			0.0	74			5081
			0.0	67			4967
4.0			0.0	60	3'10" Weathered sandstone Bedrock: Yellow (2.5Y 7/6), dry, dense, no odor, 5% silt, 95% fine sand, fine grained sandstone, some iron oxide staining	Bd/blk	5274
			0.0	66			5502
5.0					Refusal on sandstone at 4-5' bgs		NM
					No GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a	Location ID: 71	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-13-11/0923		Date/Time Total Depth Reached: 9-13-11/0929	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: + 8oz Jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70131) (0928)			
Geologist: Chelsea Carmichael				Checked By/ Date: Cliff Knight 1-9-12			
Radiological Background: 15			Radiological Equipment Used: Micro R Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	17	Fill: Silt with sand, (10YR, 4/4), brown, 80% silt, 15% fine sand, 5% gravel fill rock, dry, medium stiff, very low plasticity, very low hardness, no odor, trace rootlets.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 71
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 2'4" <i>CK</i> ft. bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-14-11 1420	Date/Time Total Depth Reached: 9-14-11 1515	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		+8oz Jar 70132 (1430)	
Geologist: C. Knight	Checked By / Date: Cliff Knight 1-9-12			

Radiological Background: 18mR/2809/56	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	59	Surface soil analysis			+0.5' 3164
0.5			0.0	88	Silty Sand: Dark yellowish brown (10YR 4/6), dry, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand, trace rootlets	SM		3328
1.0		0.0	90					4259
2.0		0.0	74					4923
		0.0	88					4926
		0.0	80					4855
3.0			0.0	66	2'3" dashed	SM		4983
		0.0	80	Silty Sand: Brown (10YR 4/3), dry, medium dense, no odor, 20% silt, 5% medium sand, 75% fine sand			4963	
4.0			0.0	66	3'1" Poorly graded sand with silt: Pale brown (10YR 6/3), dry, medium dense, no odor, 10% silt, 5% medium sand, 85% fine sand, trace iron oxide staining	SP		4946
		0.0	68					4978
		0.0	74					5061
5.0			0.0	71				
			0.0	66				5091
6.0			0.0	71				5371

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 72	
Drilling Company: Bart Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 8.5 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/22/11 0943		Date/Time Total Depth Reached: 9/22/11 0950	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) + (1) 8oz jar 70133(0945)			
Geologist: L. Robbins Goldman				Checked By / Date: Cliff Knight 1-9-12			
Radiological Background: 14/359/46		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
			0.0	46	Surface: grass + soil AF = artificial fill		10.5 = 3371
0.5				55	Bandy silt: dark yellowish brown (10yr 4/4), dry, dense, no odor, 80% silt, 20% fine sand, trace rootlets, pinhole pores, ^{slow} dilatancy	ML / AF	3466
1.0				77			4420
2.0				92			5400
				98			5650
				94			5746
3.0				78	27" silt w/ sand: very dark brown (10yr 2/2), moist, dense, no odor, 90% silt, 10% sand (fine sand), trace CaCO ₃ nodules, pinhole pores, ^{no} dilatancy	ML / AF	5655
				74	31" silt: dark yellowish brown (10yr 3/6), moist, dense, no odor, 95% silt, 5% fine grained sand, tough, no dilatancy, slightly mottled, trace iron oxide staining.	ML / AF	5632
4.0				86			5256
				91			5164
5.0				77			4901
				58			4910
6.0			0.0	59	51" sandy silt → see next page	AF / ML	4828

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 2473
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-13-11/1423	Date/Time Total Depth Reached: 9-13-11/1426	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70134) (1430)		Checked By/ Date: <i>Cliff Thum</i> 1-9-11	
Geologist: Chelsea Carmichael				

Radiological Background: 16	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5					Fill: Silty Sand with gravel Silty, gravelly sand, (10YR, 4/3), greyish-brown, 50% fine to medium grained sand, 30% silt, 20% gravel fill rock, asphalt and sandstone rock fragments, dry, dense, trace rootlets, no plasticity, hardness or odor.	SM	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 73
Drilling Company: <i>Bort</i> <i>Bort</i> Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 5.5 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/23/11 0915	Date/Time Total Depth Reached: 9/23/11 0920	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) #70135 (0920)			
Geologist: <i>L. Robbins Goldman</i>	Checked By / Date: <i>Cliff Humble</i> 1-9-12			

Radiological Background: 18/2688/46	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 6.0	ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Gamma Readings (CPM)
			0.0	48	surface: grass + soil, AF = artificial fill	AF	+0.5 = 3329 Borehole	
				52	asphalt	AF		3389
0.5				52	3 1/2" silty sand: brown (10YR 4/2), dry, dense, no odor, 85% fine grained sand, 15% silt, non cohesive, rapid dilatancy, trace rootlets, trace sandstone gravel	SM		3796
1.0				70				5386
				73				5698
2.0				79				6154
				69	2 1/4" fine grained sandstone: pale yellow (2.5Y 7/3), sm. beds, mica flecks.	cobble		6187
3.0				62	2 1/4" silty sand: dark brown (10YR 3/3), semi-moist, dense, no odor, 85% fine grained sand, 15% silt, non cohesive, rapid dilatancy; trace rootlets, trace sandstone cobble.	SM		5897
				88				5857
4.0				41				5838
				67				5829
5.0				76				5689
				89	5 1/3" fine grained SANDSTONE: yellowish brown (10YR 5/6), mechanically weathered to SP	SP		5744
6.0			10.0		Total depth = 5.5' no GW encountered, no anomalies			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 74
Drilling Company: East Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 7.5 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/22/11 12:10	Date/Time Total Depth Reached: 9/22/11 12:50	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		+8025r 70136 (1220)	
Geologist: C. Knight	Checked By / Date: Cliff Knight			

Radiological Background: 15mR/275B/47	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0	ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)			
					Surface Soil and grass		0.5	3318
0.5			0.0	84	Fill: Silty Sand with gravel: Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 10% fine pea size subangular gravel, 20% fine sand, 5% medium sand, 65% silt, cohesive, low plasticity, low toughness	AF		3444
			0.0	80		ML		4264
1.0			0.0	83			1	5232
					13'			
			0.0	87	Fill: Silty Sand with gravel (Pale brown (10YR 6/3), dry, medium dense, no odor, 10% fine subangular gravel (sandstone & fill rock), 30% silt, 5% medium sand, 55% fine sand, trace rootlets, very mottled	AF		5249
2.0			0.0	102		SM	2	5517
					2" trace charcoal			
			0.0	92	Fill: Silty Sand with gravel			5589
3.0			0.0	94			3	5577
			0.0	69				5545
4.0			0.0	73	Fill: Silty Sand with gravel			5542
			0.0	78		AF		5620
			0.0	84		SM		5659
5.0			0.0	64	Fill: Silty Sand ^{w/ gravel} (Brown (10YR 4/3), moist, medium dense, no odor, 15% silt, 10% fine subangular gravel (fill rock), 75% fine sand, mottled	AF		5793
			0.0	79		SM	5	5697
6.0			0.0	79			6	

Project Name: SSFL Area IV Radiological Study				Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 74
Radiological Background: 15mR/2758/47			Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
6.0			0.0	79	Same as above: S. lfy Sand with gravel	AF	6 5699
			0.0	84		SM	5695
7.0			0.0	78	6" 1/2" Weathered Bedrock Sandstone: light to live brown (2.5Y 5/3), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	B P S S S S	7 5692
			0.0	82			
8.0					Refusal on Sandstone at 7.5' bgs		8
					No GW encountered		
9.0							9
10.0							10
11.0							11
12.0							12
13.0							13

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 75
Drilling Company: Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/22/11 0735	Date/Time Total Depth Reached: 9/22/11 0745	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		70137(0740)	
Geologist: L. Robbins Goldman	Checked By / Date: W. Humphreys 1-9-12			

Radiological Background: 14/2756/55	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings 70.5 = 3445 (CPM)
			0.0	69	Surface: grass + soil AF = artificial fill			4245
0.5				77	Sandy silty sand (fill): light yellowish brown (10 gr 6/4), dry, med. dense, no odor, 8% 10% med. sand, 70% fine sand, 20% silt, non-cohesive, mottled, trace fine sub-rounded gravel	SM / AF		5357
1.0				56			1	5435
				49				5494
2.0				78			2	5545
				79				5615
3.0				88			3	5622
				86				5660
4.0				81	3" 10" Sandstone cobble (fill): pale yellow (2.5Y 7/4), dry, dense, no odor, fine grained sandstone cobble.	AF	4	5635
				75	4" 3" Sand w/ silt, poorly graded (fill) w/ gravel: dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 10% silt, 10% angular sandstone gravel, 80% fine sand	AF / SP		5657
5.0				77			5	5480
				83				5369
6.0				75			6	5306

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 76
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-14-11/0810	Date/Time Total Depth Reached: 9-14-11/0821	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.) (# 70138) (820)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Ch. Carmichael</i> 9-12			

Radiological Background: 16	Radiological Equipment Used: Micro R/ Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	16	Fill: Silty sand with gravel, (10YR, 6/4), light orangeish brown, 60% fine to coarse grained sand, 25% silt, 15% gravel fill rock, asphalt and sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.	Sm	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 77
Drilling Company: Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 51 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/22/11 0855	Date/Time Total Depth Reached: 9/22/11 0905	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) + (1) 8oz. jar 70141 (0855)			
Geologist: L. Robbins Goldman	Checked By / Date: Will Throught 1-9-12			

Radiological Background: 16/3229/60	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			6.0	51	Surface: grass + soil	AF	0.5	3469
				54	Silty sand (fill): dark yellowish brown (10YR 3/6), med. dense, dry, no odor, noncohesive, 80% fine to med. grained sand, 15% silt, 5% angular gravel, trace rootlets, trace calcium carbonate nodules	AF/SM		3796
				85			1	5453
				73				5574
				77			2	5586
				79				5511
				88	3'6" sandstone cobble (fill): pale yellow (2.5Y 7/4), dry, dense, no odor, fine grained sandstone cobble.	AF	3	5310
				91	3'5" silty sand (fill): dark yellowish brown (10YR 3/4), med. dense, moist, no odor, 85% sand (fine to med. grained), 15% silt, non cohesive, slightly mottled	AF/SM	4	5246
				103				5186
				88	4'8" fine grained sandstone, (10YR 6/8), brownish yellow, mechanically weathered to SP	Bedrock	5	5422
			0.0	76	total depth = 51.0' bgs no GW encountered no anomalies			NM

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a	Location ID: 78	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-14-11/0955		Date/Time Total Depth Reached: 9-14-11/1001	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: 1 8oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70142) (1000)			
Geologist: Chelsea Carmichael				Checked By / Date:			
Radiological Background: 18		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5	0.0 - 0.5	100%	0.0	18	Sandy silt with rock fragments, (10 YR, 4/4), brown, 50% silt, 35% fine to medium grained sand, 15% sandstone rock fragments, dry, semi-cemented, trace rootlets, no plasticity, hardness or odor.	ML	
1.0	0.5 - 1.0						
2.0	1.0 - 2.0						
3.0	2.0 - 3.0						
4.0	3.0 - 4.0						
5.0	4.0 - 5.0						
6.0	5.0 - 6.0						
					No GW reached		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: <u>7</u>	Group: <u>1</u>	Location ID: <u>78</u>		
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: <u>8.0</u> ft bgs.		
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: <u>9-2-11 1110</u>		Date/Time Total Depth Reached: <u>9-2-11 1215</u>		
Type of Sampling Device: 1.75 inch Macrocore		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		+ 802 jar <u>70143</u>		<u>(1120)</u>		
Geologist: <u>C. Knight</u>		Checked By / Date: <u>Cliff Throught 1-9-12</u>						
Radiological Background: <u>15mR/3167/55</u>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: <u>0.0</u>		ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description <u>AF: Artificial Fill</u> (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol	Borehole Gamma Readings Feet bgs. <u>3384</u> (CPM)
0.5			0.0	71	Surface Soil and gravel			3384
1.0			0.0	83	Fill: Sandy silt: Brown (10YR 5/3), clay, medium stiff, no odor, 35% fine sand, 5% coarse sand, 60% silt, cohesive, low plasticity, low toughness, mottled		AR / ML	5195
2.0			0.0	93				5667
3.0			0.0	95				5665
4.0			0.0	87	2' 2"			5462
5.0			0.0	76	Silty Sand: Dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand, trace coarse sand, some iron oxide staining		SM	5464
6.0			0.0	82				5392
			0.0	90				5274
			0.0	80				5181
			0.0	93				5228
			0.0	87			SM	5051
			0.0	84	5' 2"		SP	5192
			0.0	77	Poorly graded Sand: Olive yellow (2.5Y 6/6), moist, medium dense to dense (deeper), no odor, 5% silt, 95% fine sand, trace coarse sand, some iron oxide staining			5507

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 78			
Radiological Background: 16 mR / 3167 / 55		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	77	Same as above: Poorly graded Sand	SP	6	5507
			0.0	72			5600	
7.0			0.0	81			7	5744
			0.0	65			5606	
8.0			0.0	62	<p>7' 8" weathered Sandstone Bedrock: light yellowish brown (2.54 b/s), moist, very dense, no odor, fine grained sandstone, some iron oxide staining</p> <p>Refusal on sandstone at 8.0' bgs No GW encountered</p>	B B B B B B B B B B B B B	8	5765
					9			
					10			
					11			
					12			
					13			
13.0								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 79	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 3.0 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9-16-11 0745		Date/Time Total Depth Reached: 9-16-11 0830	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70144 (0750)			
Geologist: C. Knight				Checked By / Date: C. Knight 1-9-12			
Radiological Background: 16mR/2767/55		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		+0.5' 3079
				Surface: Soil			
0.5			0.0	55	Fill: Silty Sand; Pale Yellow (2.5Y), dry, medium dense, no odor, 15% silt, 5% subangular fine gravel, 5% medium sand, 75% fine sand, mottled	AF / sm	3926
1.0			0.0	75			5293
1.0			0.0	68			5720
2.0			0.0	70	14" weathered sandstone bedrock: light brownish gray (2.5Y 6/2), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone, trace iron oxide staining	Bedrock	5865
2.0			0.0	75			5796
3.0			0.0	75			5514
3.0			0.0	81			5279
4.0					Refusal on sandstone at 3' bgs		
4.0					No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: <u>1</u>	Location ID: <u>80</u>
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: <u>10.0</u> ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: <u>9-16-11 1125</u>	Date/Time Total Depth Reached: <u>9-16-11 1220</u>	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<u>70145</u>	<u>(1130)</u>
Geologist: <u>C. Knight</u>	Checked By / Date: <u>(with Knight) 1-9-12</u>			

Radiological Background: <u>16AR / 2730 cpm / 50cpm</u>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: <u>0.0</u> ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)	
					Surface: soil & gravel		0.5'	3165	
0.5			0.0	82	Fill: Silty Sand: Strong brown (7.5 YR 4/6), clay medium stiff, no odor, 30% fine sand, 5% medium sand, 65% silt, cohesive, low plasticity, low toughness	AF / ML		3487	
			0.0	65				5122	
1.0			0.0	69				5634	
			0.0	63				5820	
2.0			0.0	77	Fill: Silty Sand: yellowish brown (10YR 5/6), dry, medium dense, no odor, 25% silt, 10% medium sand, 65% fine sand, mottled	AF / SM	2	5742	
			0.0	74	2'2" Sandstone gravel piece (grayish brown 10YR 5/4)			5678	
3.0			0.0	63			3	5633	
			0.0	53	3'3" trace sandstone ^{sub} angular gravel			5591	
4.0			0.0	62	3'9" to 3'11" Sandstone ~3" thick, fine grained sandstone medium gravel		4	5800	
			0.0	66	Fill: Silty Sand: Brown (10YR 4/4), moist, medium dense, no odor, 35% silt, 5% clay, 60% fine sand, mottled	AF / SM		5741	
5.0			0.0	53				5	5677
			0.0	55				5826	
6.0			0.0	59			6	5675	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 2	Location ID: 81
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-15-11 1125	Date/Time Total Depth Reached: 9-15-11 1230	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70146 (1140)			
Geologist: C. Knight	Checked By / Date: C. Knight 1-9-12			

Radiological Background: MAR/27/11/44	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description of: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 10.5 3144 (CPM)
			0.0	58	Surface 1 Soil and gravel rock		
0.5			0.0	59	Sandy silt with gravel: light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 10% sandstone gravel, 35% fine sand, 5% medium sand, 50% silt, low plasticity, low toughness, cohesive, mottled	AF/ML	4350
1.0			0.0	60	1'2" Sandstone gravel - 3" thick		5253
			0.0	73			5552
2.0			0.0	61	17" Fill: Silty Sand: Very pale brown (10YR 7/4), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand, mottled with other colors: Dark yellowish brown (10YR 3/6), Pale yellow (2.5 Y 7/4) and strong brown (7.5 YR 4/6)	AF/SM	5425
			0.0	47			5445
3.0			0.0	62	2'10" - soil becomes moist		5564
			0.0	61			5832
4.0			0.0	78			5685
			0.0	43			5688
5.0			0.0	83			5665
			0.0	53			5829
			0.0	57	Same as above: Fill: Silty Sand	AF/SM	5774
6.0			0.0	57			5900

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 82
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 6 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/25/11 0830	Date/Time Total Depth Reached: 10/25/11 0906	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: 70147 - 0900 (1) 1/2 Gallon Bag (Approx 8 lbs.)		Checked By / Date: Cliff Knight 1-9-12	
Geologist: Ian Stone				

Radiological Background: 13 / 2924 / 98	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	72	Asphalt		0.5 = 2927
0.5			0.0	88	Sand w/ silt, Dark yellowish brown (4/6 104R), 90% fine sand, 10% silt, trace gravel, moist, low dense, no odor or staining, subangular grains, max gravel size = 1.5"	SP	3697
1.0			0.0	65	(F.I.I.)		5126
2.0			0.0	89	Silty Sand, Dark brown (104R 3/3)		5530
2.0			0.0	83	60% 70% fine sand, subangular sand, 40% 30% silt, trace clay, trace gravel, low-med dense, no odor or staining, moist	SM	5639
3.0			0.0	78			5788
3.0			0.0	91			5928
4.0			0.0	88	Silty Sand, Yellowish Brown (104R 5/8)	SM	6244
4.0			0.0	87	75% fine sand, 25% silt, moist, low dense, no odor or staining	SM	5822
5.0			0.0	97			5588
5.0			0.0	107			5569
6.0			0.0	89			5544
6.0			0.0	99	95% fine sand, 5% silt, dry, high dense, no odor. weathered sandstone / sand, yellowish brown (104R 5/6) " fine gr.	Sp/Bedrock	5520
							5656

TO = 64 bgs



BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 83				
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment trowel/shovel		Borehole Diameter NA	Date/Time Drilling Started 9-16-11/0938	Date/Time Total Depth Reached 9-16-11/0948				
Type of Sampling Device trowel/shovel		Samples Collected (1) 1/2 gall bag (#70148) (0945)						
Geologist C. Carmichael		Checked by/Date Cliff Knight 1-9-12						
Radiological Background 25		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.022	<p>~1-2" of weathered asphalt on top</p> <p>Silty sand with rock fragments, (10YR 5/4), light brown, 60%. fine to medium grained sand, 20% silt, 20% sandstone, rock fragments, dry, medium dense, no plasticity, hardness or odor.</p> <p>No GW reached.</p>	SM		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 85	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-20-11/1419		Date/Time Total Depth Reached: 9-20-11/1427	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70151) (1425)			
Geologist: Chelsea Carmichael				Checked By / Date:			
Radiological Background: 18		Radiological Equipment Used: Micro R _y Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	21	Sandy silt, (10YR, 4/4), brown, 60% silt, 35% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, trace rootlets, no plasticity, hardness or odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 85	
Drilling Company: HGL		Driller: J. Harris/I. Stone		Ground Elevation: NA		Total Depth Drilled: 1'8"	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 11/2/11 0827		Date/Time Total Depth Reached: 11/2/11 1025	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70152) (0900)			
Geologist: Timothy Morse				Checked By / Date: Cliff Wright			
Radiological Background: 13 / 3464 / 67		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 cpm		

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
			0.0	85	Surface: Soil + veg.		+0.5' 3298
0.5			0.0	55	Silty Sand: Light olive Brown (to 2.5' 5/6), 20% silt, 75% fine grained sand, 5% med to coarse grained sand, trace sandstone concretions, loose, dry, no odor, trace rootlets	SM	3502
1.0			0.0	74			5471
			0.0	79	1'3" mechanically weathered sandstone to SP fine grained sandstone, trace med-coarse grained sand, trace silt, loose, dry, no odor		5861
2.0					1'8" Refusal on Sandstone Bedrock at 1'8" bgs. NO GV encountered	Bedrock	
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a	Location ID: 86	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-16-11/0803		Date/Time Total Depth Reached: 9-16-11/0811	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70153) (0810)			
Geologist: Chelsea Carmichael				Checked By / Date: WJL/7/11/12 1-9-12			
Radiological Background: 18		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	18	Gravelly silt with sand, (10 YR, 5/2), greyish-brown, 50% silt, 35% asphalt fragments, sandstone fragments, 15% fine to medium grained sand, dry, medium stiff, no plasticity, hardness or odor, 1 3-inch metal pipette found.		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 86
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 4 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/26/11 1445	Date/Time Total Depth Reached: 10/26/11 1513	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		70154 - 10515 1515	
Geologist: Ian Stone		Checked By / Date: Chiff Knapton 1-10-12		

Radiological Background: 13 / 3137 / 68	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 0.5' = 3180 (CPM)
0.5			0.0	85	Silty Sand, Yellowish brown (10YR 5/6) 70% fine sand, 30% silt, trace gravel (debris @ surface), dry, low dense (S) low-med dense, no odor or staining, max gravel size = 1/8"	SM	3483
			0.0	88			4406
1.0			0.0	123			5116
			0.0	60			5305
2.0			0.0	106	Silty Sand, Yellowish brown (10YR 5/6) 80% fine sand, 20% silt, trace gravel, dry; med dense, no odor or staining	SM	5381
			0.0	76			5365
3.0			0.0	74			5608
			0.0	78			5664
4.0			0.0	70	TD = 4 ft bgs no gw encountered, no anomalies Refused on sandstone		5652
5.0							
6.0							



7_087



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 87
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/0834	Date/Time Total Depth Reached 9-16-11/0849
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#70155) (0845)		
Geologist C. Carmichael	Checked by/Date Cliff Knight 1-9-12		

Radiological Background 50	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'					<p>Fill: (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</p> <p>Concrete cobbles/boulders at surface</p> <p>Gravelly, silty sand, (10 YR, 5/4), light brown with iron oxide tinting, 50% fine to medium grained sand, 35% concrete, asphalt, sandstone, gravel fill and iron ore fragments, dry, loose, no plasticity, hardness or odor, 15% silt</p> <p>(Cl)</p> <p>No GW reached</p>	SW SM		

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 87
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/27/11 0837	Date/Time Total Depth Reached: 10/27/11 0857	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.) 70156 - 0900		Checked By / Date: Cliff Knight 1-9-12	
Geologist: Ian Stone	Radiological Background: 17 / 4149 / 83		Radiological Equipment Used: Micro R / Downhole / Pancake Meters	
PID Used: Mini Rae 2000 - Background: 0.0 ppm				

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 0.5' = 3888 (CPM)
0.0			0.0	99	Fill: Silty Sand, Yellowish Brown (10YR 5/6) 70% fine sand, 25% silt, 5% gravel, trace asphalt, trace concrete, trace metal (construction debris), dry, low dense, no odor or staining	SM	4316
0.5		0.0	105	4757			
1.0		0.0	100	4760			
1.5		0.0	75	5022			
2.0		0.0	81	5051			
2.0	TD = 2ft bgs				no gas encountered, no anomalies		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 88	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-22-11 / 0854		Date/Time Total Depth Reached: 9-22-11 / 0903	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70157) (0902)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Cliff Knight</i> 1-10-12			
Radiological Background: 22		Radiological Equipment Used: Micro R Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	22	<p>Fill:</p> <p>Sandy silt, (10YR, 5/4), light orange-ish brown, 55% silt, 40% fine to medium grained sand, 5% sandstone rock fragments and concrete fragments, dry, no plasticity, hardness or odor.</p> <p>No GW reached.</p>	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 88	
Drilling Company: HGL		Driller: J. Harris		Ground Elevation: NA		Total Depth Drilled: 2' 3" bgs.	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10/14/11 0841		Date/Time Total Depth Reached: 10/14/11 0920	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70158), (0930)			
Geologist: To Morse				Checked By / Date: Cliff Knight 1-10-12			
Radiological Background: 4145 / 92 cpm		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM) Tm
			0.0	108	Surface: vegetation, large concrete rubble		405
0.5			0.0	64	Silty sand; yellowish brown (10YR 5/6) 35% silt, 65% SP fine grained sand, slightly moist, no odor, medium dense	MF/SM	4252
1.0			0.0	85			5313
1.6			0.0	78	1'6" Sand w/ silt: Brownish yellow (10YR 6/6) 15% silt, 65% fine grained sand, 20% fine to medium grained sand, dry, no odor, medium dense to dense	SM/SP	6134
2.0			0.0	75			6276
2.3					Refusal on sandstone bedrock at 2' 3" bgs. NO GW encountered	Bedrock	6321
3.0							6121
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 89	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-23-11/0950		Date/Time Total Depth Reached: 9-23-11/1005	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70159) (1005)			
Geologist: Chelsea Carmichael				Checked By/ Date: Jeff Knight 1-10-12			
Radiological Background: 19		Radiological Equipment Used: Micro R Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	17	<p>Fill: Brown @</p> <p>Sandy silt with gravel, (10 YR, 4/3), 50% silt, 30% fine to medium grained sand, 20% gravel fill rock and cobbles, semi-moist, medium stiff, no plasticity, hardness or odor, plastic pieces found, some rootlets.</p> <p>No GW reached.</p>	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a	Location ID: 90	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-15-11/ 1451		Date/Time Total Depth Reached: 9-15-11/ 1459	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70161) (1455)			
Geologist: Chelsea Carmichael				Checked By / Date: Cliff Doughty 1-10-12			
Radiological Background: 21		Radiological Equipment Used: (Micro R) Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	24	<p>Fill</p> <p>Silty, gravelly sand, (10 YR, 5/4), light brown, 50% fine to medium grained sand, 25% silt, 25% gravel fill rock, concrete and asphalt fragments, some sandstone fragments, some fill has iron-oxide tinting, dry, loose, no plasticity, hardness or odor.</p> <p>~ 3" bgs is concrete</p> <p>No GW encountered</p>	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 90
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2ft 8in ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/27/11 1004	Date/Time Total Depth Reached: 10/27/11 1015	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		70162-1020	
Geologist: Ian Stone		Checked By / Date: Cliff Knight 1-10-12		

Radiological Background: 16 / 3874 / 98	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings 0.5' = 4051 (CPM)
0.5			0.0	104	Silty Sand, Yellowish Brown (10YR 5/6) 70% fine sand, 30% silt, trace gravel (max lin), dry, low dense, no odor or staining	SM		4702
1.0			0.0	98				5234
2.0			0.0	125				5525
3.0			0.0	112				5708
4.0			0.0	115				5534
5.0			0.0	101				5535
TD= 2ft 8in					no gw encountered, no anomalies			
					refused on sandstone			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 91
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 3.5 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/27/11 1538	Date/Time Total Depth Reached: 10/27/11 1604	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		70164-1610	
Geologist: Ian Stone	Checked By / Date: <i>[Signature]</i> 1-10-12			

Radiological Background: 16 / 3862 / 100	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (GPM)
0.5			0.0	82	Silty Sand, Yellowish Brown (109R 5/6), 80% fine sand, 20% silt, trace gravel (max size = 1/16") dry, low-med dense, no odor or staining.	SM	0.5' = 3940
			0.0	85			4445
1.0			0.0	93			5155
			0.0	120			5711
2.0			0.0	101			5759
			0.0	110			5700
3.0			0.0	111			5673
			0.0	45	5658		
4.0					TD = 3.5 ft bgs no gw encountered, no anomalies refusal on sandstone		5794
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 92
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-15-11/1043	Date/Time Total Depth Reached: 9-15-11/1051	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70165) (1050)			
Geologist: Chelsea Carmichael		Checked By/ Date: <i>Cliff Knight</i> 1-10-12		

Radiological Background: 22	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	20	Silty sand with gravel, (10YR, 5/4), light brown, 50% fine to medium grained sand, 30% silt, 20% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.	Sm		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 92
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 1ft 10.2 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/27/11 1427	Date/Time Total Depth Reached: 10/27/11 1440	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		70166-1445	
Geologist: Ian Stone	Checked By / Date: Cliff Knight 1-10-11			

Radiological Background: 15 / 3810 / 90	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 0.5 = 3771 (CPM)
0.0			0.0	76	Silty Sand, Yellowish brown (10YR 5/6) 80% fine sand, 20% silt, trace gravel (max 1/16), dry, low-med dense, no odor or staining	SM	4102
0.5			0.0	90			5088
1.0			0.0	80			5315
1.5			0.0	92			5229
2.0					TD = 1ft 10.2 in bgs no gw encountered, no anomalies refused on sandstone		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 93
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-15-11/1013	Date/Time Total Depth Reached: 9-15-11/1017	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70167) (1016)		Checked By / Date: <i>Will Thuyet</i> 1-10-12	
Geologist: Chelsea Carmichael				

Radiological Background: 22	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	20	Fill; ^{with gravel} Silty sand, (15 YR, 6/4), light brown, 65% fine to medium grained sand, 25% silt, 10% gravel fill rock and sandstone rock fragments, dry, medium dense, no plasticity hardness or odor.	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 94
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-15-11 / 0959	Date/Time Total Depth Reached: 9-15-11 / 1004	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70169) (1002)			
Geologist: Chelsea Carmichael		Checked By / Date: <i>W. Thompson</i> 1-10-12		

Radiological Background: 27	Radiological Equipment Used: Micro R Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	25	Silty sand with rock fragments, (10YR, 5/4) ^{cl} yellowish brown 50% fine to coarse grained sand, 35% silt, 15% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.	Sm	0.5	
1.0							1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0							5.0	
6.0							6.0	
No GW reached								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 94	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 9"	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10-12-11/0911		Date/Time Total Depth Reached: 10-12-11/0920	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70170) (N/A)			
Geologist: Chelsea Carmichael				Checked By / Date: With Knight 1-10-12			
Radiological Background: 96, 4011		Radiological Equipment Used: Micro R / Downhole Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	74	Silty sand, (10YR, 4/4), brown, 70% fine to medium grained sand, 30% silt, semi-moist, medium dense, no plasticity, hardness or odor.	SM	No downhole gamma readings collected
			0.0	69			
1.0					Refusal at 9" - bedrock No GW reached		
2.0							
3.0							
4.0					<u>No sample collected</u>		
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 95
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-15-11/0922	Date/Time Total Depth Reached: 9-15-11/0926	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70171) (0925)		Checked By / Date: W. H. H. 1-10-12	
Geologist: Chelsea Carmichael		PID Used: Mini Rae 2000 - Background: 0.0 ppm		

Radiological Background: 28	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	28	Dark yellowish brown (CL) Sandy silt, (10YR, 4/4), 55% silt, 40% fine to medium grained sand, 5% sandstone rock fragments, dry, soft, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 95
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 19"
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10-12-11/1047	Date/Time Total Depth Reached: 10-12-11/1105	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70172) (n/a)		Checked By / Date: djh Knight 1-10-12	
Geologist: Chelsea Carmichael				

Radiological Background: 96, 5335	Radiological Equipment Used: Micro R / Downhole Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	96	Dark yellowish @			
0.5			0.0	85	Silty sand, (10YR, 4/4), brown, 60% fine to medium grained sand, 40% silt, dry, medium dense, trace rootlets in top 2", no plasticity, hardness or odor, trace sandstone rock fragments.	SM	1	No down-hole gamma collected
1.0		0.0	87					
2.0		0.0	73					
3.0								
4.0					Refusal at 19" - bedrock No GW reached <u>No sample</u>		2	
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 96
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-15-11/0848	Date/Time Total Depth Reached: 9-15-11/0856	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70173) (0855)			
Geologist: Chelsea Carmichael	Checked By / Date: [Signature] 9-10-12			

Radiological Background: 25	Radiological Equipment Used: Micro RY Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	28	Sandy ^{ck} Silt with sand, (10YR, 3/4), dark brown, 80% silt, 20% fine to ^{yellowish} medium grained sand, dry, soft, very low plasticity, hardness, no odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 97
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-15-11/0804	Date/Time Total Depth Reached: 9-15-11/0810	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70175) (0810)		Checked By / Date: <i>Will Ruff</i> 9-15-11	
Geologist: Chelsea Carmichael				

Radiological Background: 30	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	32	Silty sand with rock fragments, ^{Pale Brown} (10YR, 6/3), tight ^(C) brown, 55% fine to coarse grained sand, 30% silt, 15% sandstone rock fragments, dry, no plasticity, hardness or odor, medium dense.	SM	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.



7_098



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 98				
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment trowel/shovel		Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1521	Date/Time Total Depth Reached 9-16-11/1529				
Type of Sampling Device trowel/shovel			Samples Collected 1 1/2 gall bag (#70177) (1525)					
Geologist C. Carmichael			Checked by/Date Will Knight 1-11-12					
Radiological Background 16		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkg: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	20	Silty sand with rock fragments, (10 VR, 5/4), light brown, 55% fine to medium grained sand, 30% silt, 15% sandstone rock fragments, trace iron found, dry, medium dense, no plasticity, hardness or odor. No GW reached.	Sm		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 98
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA		Total Depth Drilled: 2ft 4in ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/25/11 1538	Date/Time Total Depth Reached: 10/25/11 1553		
Type of Sampling Device: 2.75" Hand Auger		Samples Collected: 70178 - 655 (1) 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: Ian Stone		Checked By / Date: <i>[Signature]</i> 1-10-14			

Radiological Background: 14 / 3849 / 105	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	76	Silty Sand, Yellowish Brown (10YR 5/6) 80% fine sand, 20% silt, trace gravel, dry, low-med dense, no odor or staining	SM	0.5 = 3390
0.5			0.0	90			4179
1.0			0.0	89			4763
1.5			0.0	50			5053
2.0			0.0	83			5425
2.4							5462
2.4	TD = 2ft 4in						
2.4	No gw encountered, no anomalies						
2.4	refusal on sandstone						

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 7, group 1		Location ID 100	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 9-16-11/1411		Date/Time Total Depth Reached 9-16-11/1419	
Type of Sampling Device trowel/shovel				Samples Collected 1 1/2 gall bag (#70181)(1417)			
Geologist C. Carmichael				Checked by/Date Cliff Knight 1-11-12			
Radiological Background 17		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>		USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0 17	~1" of weathered asphalt Silty sand with rock fragments, (10YR 5/4), sm 55% fine to medium grained sand, 30% silt, 15% sandstone rock fragments and asphalt fragments, dry, no plasticity, hardness or odor.			
No GW reached.							

SSFL BORING LOG

7_101

... 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 101	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-22-11 / 0923		Date/Time Total Depth Reached: 9-22-11 / 0930	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.) (# 70183) (0930)			
Geologist: Chelsea Carmichael				Checked By / Date: 1-10-2011			
Radiological Background: 23		Radiological Equipment Used: Micro R Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 5.2 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	23	Sandy silt with rock fragments, (10YR, 4/3), pale brown, 50% silt, 35% fine to medium grained sand, 15% sandstone rock fragments, dry, soft, no plasticity, hardness or odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 101
Drilling Company: HGL		Driller: J. Harris	Ground Elevation: NA		Total Depth Drilled: 1' 1" bgs.
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/18/11 1051	Date/Time Total Depth Reached: 10/18/11 1' 1" bgs. (1100)	
Type of Sampling Device: 2 3/4" hand auger			Samples Collected: One 1/2 Gallon Bag (Approx 3 lbs.) (# 70184) (MS)		
Geologist: To Morse			Checked By / Date: [Signature] 1-10-2011		
Radiological Background: 4652 / 96		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0.7	44	Surface: soil, sticks, sandstone boulders		+0.5'
0.5			0.0	128	Silty Sand w/ gravel: Dark Yellowish Brown (10YR 4/4), 40% silt, 50% fine grained sand, 5% medium grained sand, 5% gravel no odor, low plasticity, dry, loose to slightly dense	SM	NM
1.0			0.0	133	1' 1"		
2.0					Refusal on Sandstone at 1' 1" bgs. NO GW encountered NO sample due to lack of depth	Bottom	
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 102			
Radiological Background: 7/3413/43		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	94	Same as above: silty sand	SM	6	5605
			0.0	66			7	5533
7.0			0.0	41			8	5208
			0.0	58			9	5461
8.0			0.0	78			7/8" silt w/ sand: dark brown (10yr 3/3), moist, stiff, no odor, 90% silt, 10% fine sand, mottled, iron oxide staining, tough, no dilatancy.	ML
			0.0	82	9	5196		
9.0			0.0	80	10	5244		
			0.0	87	11	5148		
10.0			0.0	67	12	5540		
					total depth = 10' bgs no GW encountered		13	
11.0								
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: ^{CLC} 7	Group: 1	Location ID: 103
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 19.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/28/11 1400	Date/Time Total Depth Reached: 9/28/11 1530	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		(1041) 203 (8 L1415) 70186 (1410)	
Geologist: C. Knight	Checked By / Date: A 1-10-12			

Radiological Background: 15MR/2949/42	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					Surface: grass and soil			+0.5' 337
					AF Artificial Fill			(CPM)
0.5			0.0	70	Fill: Silty Sand: Yellowish brown (10YR 5/4), dry, dense, no odor, 70% fine sand, 10% medium sand, 15% silt, 5% gravel, non-adhesive, low liquidity, slow dilatancy, some rootlets, 50mm black plastic debris, trace asphalt fragment	AF / SM		4326
			0.0	71				5316
1.0			0.0	89				5649
			0.0	90				5596
2.0			0.0	88				5810
			0.0	87				5760
3.0			0.0	79				5710
			0.0	48				5708
4.0			0.0	51				5668
			0.0	69				5490
5.0			0.0	54	41911 Fill: Silty Sand: Light olive brown (2.5Y 5/4), moist, dense, no odor, 80% fine sand, 15% silt, 5% medium sand, trace gravel granitic (<50mm diameter)	AF / SM		5530
			0.0	52				5628
6.0			0.0	48				5568

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	7	1	103		
Radiological Background:		Radiological Equipment Used:		PID Used:			
15 / 2949 / 42		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	48	Same as above; Fill: Silty Sand	AF SM	5568
			0.0	43			5728
7.0			0.0	90			5662
			0.0	107			5744
8.0			0.0	98	8'9" — 1" thick siltstone beds, light yellowish brown (2.5Y 6/3), mottled, trace iron oxide staining		5775
			0.0	72			5694
9.0			0.0	76			5619
			0.0	65			5732
10.0			0.0	60	Same as above; Fill: Silty Sand	AF SM	5757
			0.0	64			5521
11.0			0.0	55			5544
			0.0	59			5829
12.0			0.0	56	Fill: Silty Sand with gravel: Brown (10YR 4/3), moist, medium dense, no odor, 25% silt, 5% coarse sand, 10% medium sand, 10% angular to subangular fine gravel (fill rock), 50% fine sand, mottled	AF SM	5803
			0.0	47			5766
13.0			0.0	60			5902

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 103		
Radiological Background: 1572949/47		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
13			0.0	60	Same as above: Fill: Silty Sand with gravel	AF SM	5902
			0.0	65			5952
14			0.0	75			5826
			0.0	81			5718
15			0.0	96			5075
			0.0	80	16'6" Fill: Clay with silt and sand; Brown (10YR 4/3), moist, stiff, no odor, 10% silt, 10% fine sand, 80% clay, cohesive, medium plasticity, medium toughness	AF CL	5532
16			0.0	68	5456		
			0.0	67	5458		
17			0.0	52			5572
			0.0	65	17'5" Fill: Silty Sand: yellowish brown (10YR 5/4), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand, trace asphalt	AF SM	5586
18			0.0	57	Fill: Sandy Clay with silt; Dark yellowish brown (10YR 4/4), moist, stiff, no odor, 20% fine sand, 10% silt, 70% clay, cohesive, medium plasticity, medium toughness, mottled, PVC pipe in shoe		NM
			0.0	64	18'8" weathered sandstone bedrock; Pale yellow (2.5Y 7/4) dry, very dense, no odor, mechanically weathered to SP, fine grained sandstone	AF CL Bedrock	NM
19			0.0	80	18'10"		NM
20					Refusal on sandstone at 19.0' bgs No GW encountered Downhole logging to 17.5' due to PVC obstruction and widening efforts that were difficult		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: <u>7</u>	Group: <u>1</u>	Location ID: <u>104</u>
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: <u>20.0</u> ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/28/11 0816	Date/Time Total Depth Reached: 9/28/11 1015	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<u>(10-19-11) 20319 (1430)</u> <u>70187 (0830)</u>	
Geologist: <u>C. Knight</u>	Checked By / Date: <u>[Signature]</u> 1-10-12			

Radiological Background: <u>14/3104/38</u>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: <u>0.0</u> ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	115	Surface: Soil and grass		+0.5' 3349
0.5			0.0	78	Fill: S. 1/2 Sand; Yellowish brown (10YR 5/4), dry, dense, no odor, 15% silt, 10% medium sand, 75% fine sand, trace fine subangular gravel, mottled	AF / SM	4640
1.0			0.0	72			5390
			0.0	79			5648
			0.0	79			5682
2.0			0.0	77			5523
			0.0	68			5777
3.0			0.0	76	2' 10" Concrete debris		5676
			0.0	79	87" Concrete debris		5635
4.0			0.0	92	3' 9" Sandstone Cobble: Yellowish brown (10YR 5/6), fine grained sand stone, dry dense, no odor		5690
			0.0	93			5460
5.0			0.0	128	4' 7" Fill: S. 1/2 Sand with clay: Brown (10YR 5/3), moist, medium dense, no odor, 10% clay, 20% silt, 10% medium sand, 60% fine sand, trace fine subangular gravel, mottled, trace asphalt	AF / SM	5433
			0.0	109			5352
6.0			0.0	91			5561

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 104					
Radiological Background: 14/2004 / 38		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm						
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)		
6.0			0.0	45	Same as above ! Fill : S: 1/2 Sand with clay	AF SM	6	5561		
			0.0	78					5602	
				87						
7.0			6.0	7					7	5628
				86						
			0.0	86						5817
8.0			0.0	59					8	5582
			0.0	30						5825
9.0			0.0	50					9	5741
			0.0	57						5740
10.0			0.1	58			10	5825		
			0.1	79				5869		
11.0			0.1	80			11	5875		
			0.1	57				5650		
12.0			0.1	55	12" trace concrete debris		12	5831		
			0.1	78				5700		
13.0			0.1	45	Same as above ! Fill : S: 1/2 Sand with clay	AF SM	13	5674		
				contact						

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 104			
Radiological Background: 14/3104/38		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
13			0.1	45	Fill: Silty clay with sand ^{con tact} light olive brown (2.5Y 5/4), moist, medium stiff, no odor, 15% fine sand, 25% silt, 60% clay, cohesive, low plasticity, low toughness	AF CL		5674
			0.1	55	13' 8" trace asphalt debris			5734
14			0.1	57	Fill: Silty Sand: light yellowish brown (2.5Y 6/4), moist, medium dense, no odor, 25% silt, 10% medium sand, 65% fine sand, trace fine subangular gravel (fill rock)	AF SM		5865
			0.1	74				5688
15			0.1	73				5501
			2.0	47				5678
16			2.1	71				5750
			2.2	43				5609
17			1.9	66				5562
			1.5	62				5578
18			1.3	69	17' 10" Angular fine gravel (fill rock, volcanic)			5629
			1.1	61	18' 2" sub-angular quartzite fine gravel			5643
19			0.4	57	Fill: Silty Sand: yellowish brown (10YR 5/4), moist, dense, no odor, 15% silt, 10% coarse sand, 15% medium sand, 5% angular fine gravel (fill rock), 55% fine sand, trace granitic gravel	AF SM		5571
			0.8	58	Sandstone Bedrock: Olive yellow (2.5Y 6/6), moist, very dense, no odor, 5% coarse sand, 10% medium sand, 85% fine grained, sandstone fine grained			5594
20			0.7	46				5856

Refusal on Sandstone at 20' bgs

Bed

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 105	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 5.0 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/27/11/400		Date/Time Total Depth Reached: 9/27/11 1500	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 20188 (1430)			
Geologist: L. Robbins ^{CL} Goldman C. Knight				Checked By / Date: [Signature] 1-10-12			
Radiological Background: 14MR/3050/52		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: Soil and grass		+0.5' 3185
0.5			0.0	65	Silty Sand Fill: light yellowish brown (10YR 6/4), dry, dense, nodular, 5% coarse sand, 10% medium sand, 25% silt, 5% subangular fine gravel, 55% fine sand, mottled, trace asphalt	AS / SM	3645
			0.0	67			4822
1.0			0.0	43			5485
			0.0	65			5578
2.0			0.0	67			5675
3.0			0.0	56	3'0" - some asphalt debris		5818
			0.0	77			5446
4.0			0.0	80	Same as above: Fill: Silty Sand		5649
			0.0	115	trace subangular granitic gravel, trace sandstone gravel	AS / SM	5836
			0.1	108	NO Recovery		
5.0					Refusalon Sandstone (Cobble?) at 5' bgs NO GW encountered	NR	MM
6.0							

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: <u>7</u>	Group: <u>1</u>	Location ID: <u>106</u>
Drilling Company: <u>Bart</u> <u>Don Longyear</u>	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: <u>17.5</u> ft bgs.	
Drilling Equipment: <u>Bart</u> <u>CK</u> Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: <u>9/28/11 1040</u>	Date/Time Total Depth Reached: <u>9/28/11 1230</u>	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<u>(10-19-11) 20320 (1445)</u> <u>20189 (1050)</u>	
Geologist: <u>C. Knight</u>	Checked By / Date: <u>[Signature]</u> <u>1-10-12</u>			

Radiological Background: <u>15mR/5856/56</u>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: <u>C.1</u> ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					Surface: Soil and grass		+0.5'	3596
0.5			0.0	97	Fill: Sandy silt with gravel: light yellowish brown (10% 2 6/4), dry, medium stiff, no odor, 5% medium sand, 35% fine sand, 60% silt, 10% angular to sub angular gravel (fill rock), mottled, trace rutlets, low plasticity, low toughness, cohesive	Af / ML		4163
1.0			0.0	89				5148
			0.0	63			1	5526
			0.0	103				5773
2.0			0.0	77			2	5724
			0.0	54				5927
3.0			0.0	81	3" trace asphalt		3	5792
			0.0	86	Fill: Silty Sand with gravel: light olive brown (2-5% 5/4), dry, medium dense, no odor, 10% sub angular gravel (fill rock), 30% silt, 10% medium sand, 50% fine sand, mottled	Af / SM		5867
4.0			0.0	70			4	5859
			0.0	56	4" 6" Asphalt debris ~ 1" thick	Af / SM		5720
			0.0	73	Same as above: Fill: Silty Sand with gravel		5	5541
5.0			0.0	72				5543
			0.0	70	Fill: Silty Sand: Yellowish brown (10% 2 5/4), moist, medium dense, no odor, 5% sub angular fine gravel, 20% silt, 5% coarse sand, 15% medium sand, 55% fine sand, mottled	Af / SM	6	5603

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 106		
Radiological Background: 15mR/5856/56		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	70	Same as above: Silty Sand & Fill 7'6" trace asphalt debris	AF SM	6 5603
			0.0	64			7 5772
7.0			0.0	84			8 5622
			0.0	90			9 5711
			0.0	81			10 5637
			0.0	63			11 5838
			0.0	56			12 5824
8.0			0.0	54			13 5905
			0.0	46			
			0.0	59			
9.0			0.0	54	Fill: Silty Sand: Yellowish brown (10R 4/5), moist, medium dense, no odor, 15% silt, 5% medium sand, 80% fine sand, mottled	AF SM	6 5603
			0.0	63			7 5772
			0.0	56			8 5622
			0.0	54			9 5711
			0.0	46			10 5637
			0.0	59			11 5838
			0.0	50			12 5824
			0.0	47			13 5905
10.0			0.0	55			
			0.0	86			
11.0			0.0	50	Same as above: Fill: Silty Sand	AF SM	6 5603
			0.0	47			7 5772
			0.0	55			8 5622
			0.0	86			9 5711
			0.0	75			10 5637
			0.0	59			11 5838
			0.0	50			12 5824
			0.0	47			13 5905
12.0			0.0	55			
			0.0	86			
13.0			0.0	75			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 107
Drilling Company: HGL	Driller: I. STONE James Harris	Ground Elevation: NA	Total Depth Drilled: 14' 0" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/4/08 8:30	Date/Time Total Depth Reached: 11/4/11 1100	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		DVP. (70317) (70321) (1200) ^{no time}	
Geologist: Timothy Morse	Checked By / Date: 1-10-12 70190 (1215)			

Radiological Background: 12 / 3348 / 60	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)	
			0.0	77	(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: soil + veg.			3420	
0.5			0.0	112	Silty Sand (fill): Olive Brown (2.54 4/4), 20% silt, 70% fine grained sand, 5% medium to coarse grained sand, 5% gravel debris material (AF), dry, medium dense, no odor, nonplastic, non-cohesive, trace rootlets, trace concrete debris and sandstone concretions	AF / SM		4061	
1.0			0.0	86				5060	
			0.0	83				5517	
			0.0	83				5658	
2.0			0.0	68				5652	
			0.0	75				5730	
3.0			0.0	107			3' 0" ----- ↳ same as above, except slightly moist and presence of trace clay pockets		5557
			0.0	74			3' 6" -----		5564
4.0			0.0	89			Silty Sand (fill): Olive Brown (2.54 4/4), 20% silt, 75% fine grained sand, 5% med. to coarse grained sand, trace artificial fill concrete and other debris material, presence of clay pockets (trace), slightly moist, medium dense, no odor, nonplastic, non-cohesive.	AF / SM	5435
			0.0	77					5533
5.0			0.0	75		5555			
			0.0	67		5364			
6.0			0.0	84			5567		

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04:03	7	1	107		
Radiological Background:		Radiological Equipment Used:		PID Used:			
12 / 3398 / 10		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	84	Same as above...		
			0.0	84	↳ 6' to 7' subrounded quartzite gravel (trace)	AF/SM	5567
			0.0	85	-----		5553
7.0			0.0	85			5588
			0.0	74	Fin-Silty Sand: Dark Yellowish Brown (10YR 4/6), 15% silt, 80% fine grained sand, 5% med. to coarse grained sand, trace clay pocket, trace sandstone concretions, trace fill gravel, slightly moist, no odor, non-cohesive, medium dense to dense		5684
			0.0	70		AF/SM	5747
			0.0	93			5672
			0.0	75			5611
			0.0	76			5645
10.0			0.0	83	10'0"		
			0.0	109	Same as above, except now dense		5693
			0.0	109	↳ Large concrete gravel and sandstone gravel		5826
11.0			0.0	66			5792
			0.0	77			5798
12.0			0.0	79			5890
			0.0	81			5914
13.0			0.0	106	Same as above...		5729

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 107				
Radiological Background: 12/3348/60		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm					
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)	
13.0			0.0	106	Silty Sand: Dark Yellowish Brown (10YR 4/6), 15% silt, 75% fine grain sand, 5% med. to coarse grain sand, 5% rounded/subrounded sandstone gravel, trace fill concrete and asphalt debris, slightly moist, no odor, dense	AF SM		5729	
			0.0	93					5859
14.0			0.0	93					5780
					Refusal on debris/Boulder at 14' 6" bgs. NO GW encountered				
15.0									
16.0									

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 108
Drilling Company: HGL	Driller: J. HARRIS / I. STONE	Ground Elevation: NA	Total Depth Drilled: 3'9" bgs.	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 11/3/11 0836	Date/Time Total Depth Reached: 11/3/11 0907	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70191) (0925)			
Geologist: Timothy Morse	Checked By / Date: 1-10-12			

Radiological Background: 13 / 3450 / 87	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' 3478 (CPM)
0.0			0.0	120	Surface: SOIL + veg.		
0.5			0.0	81	Silty Sand with gravel: OLIVE BROWN (2.54 1/4), 25% silt, 65% fine grained sand, 5% med. to coarse grained sand, 5% subrounded sandstone and fill gravel, trace rootlets, dry, no odor, low to no plasticity, medium dense, noncohesive	AF / SM	3650
1.0			0.0	115		1	4649
2.0			0.0	88			5370
2.0			0.0	108		2	5544
3.0			0.0	101	Silty Sand with gravel: OLIVE BROWN (2.54 1/4) ↳ same as above, but slightly moist ↳ less than 50% med. to coarse grained sand ↳ artificial debris, concrete pieces	AF / SM	5645
3.0			0.0	95		3	5705
4.0			0.0	104			5683
4.0					Refusal on debris/boulder at 3'9" bgs. NO groundwater encountered	Rock & Debris	5743
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 109
Drilling Company: <i>Bart</i> <i>Bart Longyear</i>	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/24/11 1138	Date/Time Total Depth Reached: 9/26/11 1143	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) + (1) 8oz jar 70192(1145)		Checked By / Date: <i>[Signature]</i> 1-10-12	
Geologist: <i>L. Robbins Goldman</i>				

Radiological Background: <i>16/3118/47</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	104	Surface = soil + grass AF = artificial fill		10.5	3308
0.5			0.0	78	Silty sand (fill): yellow (2.5Y 7/6), moist, dense, no odor, 85% fine fine sand: 75% fine sand, 10% gravel (sandstone + granitic), 10% silt, 5% med. sand, non cohesive, low toughness, low clay strength, med. dilatancy, slightly mottled w/ grayish med. grained sand pockets, trace asphalt chunks (~5mm), trace rootlets.	AF		4065
1.0			0.0	78		SM		5110
			0.0	62				5540
2.0			0.0	56				5918
			0.0	52				5863
3.0			0.0	81				5795
			0.0	75				5713
4.0			0.0	100				5889
			0.0	88				5751
5.0			0.0	93				6050
			0.0	77			5691	
6.0			0.0	82			5872	
							5905	

unit continued on next page

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04.03		7	1	109	
Radiological Background:		Radiological Equipment Used:		PID Used:			
16/3(187)47		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
6.0			0.0	78 ⁽¹⁸⁾ 82	Silty sand (same as above)	AF SM	5905
			0.0	45 ⁽¹⁸⁾ 78			5610
7.0			0.0	76 ⁽¹⁸⁾ 45	Silt w/ sand: dark brown (10YR 3/3), semi-moist, stiff, no odor, 85% silt, 15% fine sand, non cohesive, med. toughness, ^{low} dry strength, mottled, trace iron oxide staining, trace CaCO ₃ nodules (> 2.0mm)	ML	5616
			0.0	76			5819
8.0			0.0	88			5815
			0.0	91			5732
9.0			0.0	77			5597
			0.0	93			5681
10.0			0.0	55			5736
					total depth = 10' bgs no GW encountered no anomalies		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 110	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-19-11/0833		Date/Time Total Depth Reached: 9-19-11/0841	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#70193) (0840)			
Geologist: Chelsea Carmichael				Checked By / Date: [Signature] 1-10-12			

Radiological Background: 23	Radiological Equipment Used: (Micro R) Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	25	Sandy silt, (10YR 5/4), light brown, 55% silt, 35% fine to medium grained sand, 10% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 111			
Drilling Company: HGL		Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-19-11/1452	Date/Time Total Depth Reached: 9-19-11/1501				
Type of Sampling Device: stainless steel shovel/ trowel		Samples Collected: Bag + Jar Field SUP: 70316 70316 One 1/2 Gallon Bag (Approx 8 lbs.) (# 70194) (1500)						
Geologist: Chelsea Carmichael		Checked By / Date: <i>ac</i> 1-10-12						
Radiological Background: 22		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5	<i>Wavy lines</i>		0.0	24	Sandy silt, (10YR, 4/3), pale brown, 65% silt, 35% fine sand, dry, soft, some rootlets, no plasticity, hardness or odor.	ML		
1.0					No GW reached.			
2.0								
3.0								
4.0								
5.0								
6.0								

70316 *ac*
70304 *ac*

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 112
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 1.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/10/11 1005	Date/Time Total Depth Reached: 10/10/11 20195 (CL) 1020	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		70195 1020 NO SAMPLE	
Geologist: C. Knight	Checked By / Date: a 1-10-12			

Radiological Background: 10MR/2852/57	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	50	Surf. soil and gravel			
0.5			0.0	58	Fill: 58 Silty Sand: Olive brown (2-5/4/3), moist, medium dense, no odor, 5% subangular fine gravel (pec. gravel), 30% silt, 10% medium sand, 55% fine sand, mottled, trace pebbles	AF / SM		No down hole gamma collected
1.0			0.0	60	8" Sandstone Bedrock: Olive (5/4 5/3), dry, very dense, no odor, fine grained sandstone, mechanically weathered to SP	Bedrock	1	
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

No laboratory sample collected
 No GW encountered
 Refusal on sandstone at 1' bgs

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 113	
Drilling Company: Boart Boart Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 1'4" 25 bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/30/11 1400		Date/Time Total Depth Reached: 9/30/11 1420	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 7096 (SAMPLE)			
Geologist: C. Knight				Checked By / Date: [Signature] 1-10-12			
Radiological Background: 15, R/3298/54		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 00 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			60		Surface: soil and wood chips		
0.5			58		Fill: silty sand: light to live brown (2.54 5/8), dry, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand	AF / SM	NM
1.0			63		Bedrock Sandstone: Pale yellow (2.54 7/4), dry, ^{fine} dense, no odor, fine grained sandstone	Bedrock	
1.4					Refusal on sandstone at 1'4" bgs No GW encountered No laboratory samples collected		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 114	
Drilling Company: <i>Boart</i> Boart Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 1.5 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/30/11 1055		Date/Time Total Depth Reached: 9/30/11 1115	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70197 (SAMPLE)			
Geologist: <i>C. Knight</i>				Checked By / Date:			
Radiological Background: <i>LSR/3133/59</i>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description <i>AF: Artificial Fill</i> (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	58	Surface: Soil Fill: Silty Sand: Pale yellow (2.5Y 7/3), dry, medium dense, no odor, 40% silt, 5% medium, 55% fine sand, mottled	<i>AF / SM</i>	No down-hole gamma collected
0.5			0.0	59	8" hgs		
1.0			0.0	60	Sandstone Bedrock: light yellowish brown (2.5Y 6/4), dry, dense, no odor, fine grained sandstone	<i>Bedrock</i>	
2.0			0.0	60	Refusal on Sandstone 1.5' hgs No GW encountered No Laboratory Sample collected		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 115	
Drilling Company: <i>Boart</i> <i>Boff Longyear</i>		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: <i>1.5'</i> <i>at</i> <i>1.5' bgs.</i>	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: <i>9/30/11 12/3</i>		Date/Time Total Depth Reached: <i>9/30/11 12:30</i>	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) <i>70198 (SAMPLE)</i> <i>NO</i>			
Geologist: <i>C. Knight</i>				Checked By / Date: <i>Julian Robbins, Goldman 1/10/12</i>			
Radiological Background: <i>15mR/3146/37</i>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: <i>0.0</i>		ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					<i>Surface: Soil and wood chips</i>		
			<i>0.0</i>	<i>55</i>	<i>Fill: 5:1 Hz Sand with gravel: Brownish yellow (10YR 6/6), dry, dense, no odor, 15% sandstone fine gravel, 25% silt, 5% medium sand, 55% fine sand, mottled</i>	<i>AF/SM</i>	<i>No down-hole gamma collected</i>
<i>0.5</i>			<i>0.0</i>	<i>63</i>			
<i>1.0</i>			<i>0.0</i>	<i>65</i>	<i>8" Sandstone Bedrock: Pale yellow (2.5Y 7/4), dry, very dense, no odor, fine grained sandstone</i>	<i>Sp. Co. 1/4</i>	
			<i>0.0</i>	<i>72</i>			
<i>2.0</i>					<i>Refusal on Sandstone at 1.5' bgs</i>		
					<i>No GW encountered</i>		
					<i>No Laboratory sample collected</i>		
<i>3.0</i>							
<i>4.0</i>							
<i>5.0</i>							
<i>6.0</i>							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 116
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2' 7" <i>OK</i>	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/28/11 0452	Date/Time Total Depth Reached: 10/28/11 1030	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.) 70199 (1015)			
Geologist: <i>Jan Stone C. Knight</i>	Checked By / Date: <i>John Robinson Feldman 11/12</i>			

Radiological Background: 13AR/3256/85	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0:0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0:0	129	surface: soil & vegetation		3891
0.5			0:0	85	2" bgs thin asphalt emulsion layer Fill: silty sand: light yellowish brown (10YR 6/4), dry, medium dense, no odor, 15% subangular fine gravel (sandstone and fill rock up to 3/4" diameter), 20% silt, 5% coarse sand, 15% medium sand, 45% fine sand, trace asphalt debris	AF SM	4781 5248 <i>(CIC)</i>
1.0			0:0	78			5248
			0:0	87	Silty clay with sand: Dark yellowish brown (10YR 3/6), moist medium sh (F) no odor, 30% silt, 5% coarse sand, 5% subangular gravel, 5% medium sand, 10% fine sand, 45% clay, non cohesive, low plasticity, low toughness, mottled, possible fill material	CL	5311
2.0			0:0	83			5289
			0:0	68	2' 7"		5270
3.0					Refusal at 2' 7" on sandstone		
					No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 118
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 5' 2" CL ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/28/11 1053	Date/Time Total Depth Reached: 10/28/11 1200	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		70201 (1110)	
Geologist: Ian Stone	Checked By / Date: <u>Julian Roberts/Jeldmen</u> 1/10/12			

Radiological Background: 13mR / 3231 / 113	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0	ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings 100' 3454 (CPM)
0.0			83		Surface soil and grass		4248
0.5			80		Fill: Silty Sand: Yellowish brown (10YR 5/4), dry, medium dense, no odor, 20% silt, 5% subangular fine gravel up to 1/2" diameter, 5% coarse sand, 10% medium sand, 60% fine sand, mottled, trace pieces of clay pebbles, trace rootlets	AF / SM	5113
1.0			81		Fill: Silty Clay with Sand: Dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 20% silt, 5% medium sand, 20% fine sand, 55% clay, cohesive, medium plasticity, medium toughness, mottled, trace fine gravel	AF / CL	5321 5312 CL
2.0			82		2' 3" trace asphalt debris		5372
			85		Same as above: very mottled		5397
3.0			82		Fill: Silty Sand with clay: Yellowish brown (10YR 5/4), slightly moist, no odor, 15% silt, 5% fine subangular gravel up to 1/4" diameter, 5% coarse sand, 10% clay, 10% medium sand, 55% fine sand, mottled,	AF / SM	5435
			79				5448
4.0			92				5436
			75				5452
5.0			64		sandstone encountered		5521
5.2					Refusal at 5' 2" bgs on sandstone		
					No LW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 119	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-21-11/1029		Date/Time Total Depth Reached: 9-21-11/1038	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70202) (1038)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Julian Rodriguez Ledman</i> 1/15/12			
Radiological Background: 18		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
0.5			0.0	18	Silt with sand, (10 YR, 4/4), brown, 75% silt, 20% fine to medium grained sand, 5% sandstone fragments and gravel fill rocks, dry, medium stiff, very low hardness, no plasticity or odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 119
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 5' 10" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/28/11 1400	Date/Time Total Depth Reached: 10/28/11 1510	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.) 70203(1410)			
Geologist: Ian Stone C-12wistht		Checked By / Date: [Signature] 1/10/12		

Radiological Background: 2MR/3145/1107	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' 3146 (CPM)
0.0			63		Fill: Silty Sand with clay: light yellowish brown (10YR 6/4), dry, medium dense, no odor, 5% subangular fine gravel, 5% coarse sand, 10% medium sand, 25% silt, 10% clay fragments/pockets, 50% fine sand, mottled, trace asphalt	AF SM	3316
0.5			69				4747
1.0			75		3" Sandstone Cobble		5574
			66				5622
2.0			89				5808
			97				5943
3.0			75		Same as above: Fill: Silty Sand with clay	AF SM	5860
			76		3' 6" Sandstone cobble: pale brown (2.5Y 7/4), dry, very dense, no odor, fine grained sandstone cobble w 4" thick and cobbles hand auger through		5547
4.0			78		Fill: Silty Sand with clay: light yellowish brown (10YR 6/4), moist, medium dense, no odor, 20% silt, 10% clay, 10% coarse sand, 15% medium sand, 45% fine sand, clay is in pockets	AF SM	5672
			82				5780
5.0			77				5541
			92				5500
5.0					5' 10"		
NO GW encountered, Refusal at 5' 10" on Fill							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 120
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-21-11/0957	Date/Time Total Depth Reached: 9-21-11/1009	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70204) (1005)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Julian Robins / 10/12</i>			
Radiological Background: 18	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm		

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	16	Silt with sand, (10YR, 3/4), dark brown, 75% silt, 20% fine to medium grained sand, 5% sandstone rock and asphalt fragments, dry, medium stiff, trace rootlets, very low hardness, no plasticity or odor.	ML	1	
1.0								
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

No GW reached

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 120	
Drilling Company: HGL		Driller: J. Harris/C. Knight		Ground Elevation: NA		Total Depth Drilled: 10'0"	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10/31/11 0905		Date/Time Total Depth Reached: 10/31/11 1035	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70205) (0930)			
Geologist: Timothy Morse				Checked By / Date: J. Dean Robbins / J. Dean 11/10/12			
Radiological Background: 11/29/11 78		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' 3232 (CPM)
			0.0	65	Surface: Soil + veg.		3857
0.5			0.0	72	Silty Sand w/ gravel: Light olive brown (2.5Y 5/4), 20% silt, 55% fine grained sand, 5% medium grained sand, 5% coarse sand, 15% subangular gravel, dry, medium dense to loose, no odor	AF / SM	5063
1.0			0.0	82	1'0" ---		5746
			0.0	89	Silty Sand: Light olive brown (2.5Y 5/4) 20% silt, 65% fine grained sand, 5% medium grained sand, 5% coarse grained sand, 5% subangular gravel, dry, medium dense, no odor	AF / SM	5747
2.0			0.0	91			5530
			0.0	86	1'6" ---		5506
3.0			0.0	102	Silty sand w/ clay: Dark yellowish brown (10YR 4/4), 30% silt, 50% fine grained sand, 5% medium grained sand, 15% clay pockets, dry, no odor, medium dense, cohesive	AF / SM	5440
			0.0	100			5689
4.0			0.0	112			5556
			0.0	126			5546
5.0			0.0	116			5606
			0.0	99	5'6" clayey silt w/ sand: Dark yellowish brown (10YR 3/4) 25% clay, 60% silt, 15% fine grained sand, low-med. plasticity, cohesive, 6'0" medium fine, dry, no odor	ML	5453
6.0			0.0	103			5306

Project Name:		Project Number:	Subarea:	Group:	Location ID:			
SSFL Area IV Radiological Study		EP038.01.22.04.03	7	1	120			
Radiological Background:		Radiological Equipment Used:		PID Used:				
11/29/17 78		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	103	6'0" clayey sand w/silt: Dark Yellowish Brown (10YR 4/6), 30% clay, 50% fine grained sand, 5% medium grained sand, 15% silt, dry, no odor, cohesive, medium dense, trace rootlets	SC	6	5306
			0.0	70			7	5443
7.0			0.0	85	7'0" silty clay w/sand: Dark Yellowish Brown (10YR 3/6), 30% silt, 50% clay, 20% fine grained sand, trace medium grained sand, dry, no odor, cohesive, low to med. plasticity, firm ^{TA} stiff	CL	7	5246
			0.0	74			8	5075
8.0			0.0	110			8	4979
			0.0	110				5093
9.0			0.0	115			9	5161
			0.0	66				5103
10.0			0.0	75	10'0"		10	5105
					10' bgs. depth reached, no refusal NO GW encountered			
11.0							11	
12.0							12	
13.0							13	

Sample Depth Reached

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 121	
Drilling Company: HGL		Driller: J. Harris/C. Knight		Ground Elevation: NA		Total Depth Drilled: 10' 0"	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10/31/11 1120		Date/Time Total Depth Reached: 10/31/11 1133	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70107) (1200)			
Geologist: Timothy Morse				Checked By / Date: Sub Paul Robbins Feldman 10/11/12			
Radiological Background: 12 / 322 / 90		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	64	Surface: Soil + veg.		3533
1.0			0.0	113	Silty Sand w/ gravel: Dark Yellowish Brown (10YR 4/6), 25% silt, 55% fine grained sand, 5% medium grained sand, 5% coarse grained sand, 10% subangular gravel, dry, no odor, slightly cohesive, loose to medium dense	AF / SM	4132
1.5			0.0	77			5158
2.0			0.0	111	16" - - - - -		5453
2.5			0.0	93	Silty Sand: Dark Yellowish Brown (10YR 4/6), 30% silt, 60% fine grained sand, 5% medium grained sand, 5% coarse grained sand, trace pockets of clay, dry, no odor, cohesive, loose to medium dense	AF / SM	5383
3.0			0.0	98			5562
3.5			0.0	113			5509
4.0			0.0	93	Clayey Sand w/silt: Dark Yellowish Brown (10YR 4/4), 35% clay, 50% fine grained sand, 5% medium grained sand, 20% silt, dry, no odor, cohesive, medium dense	AF / SC	5444
4.5			0.0	83			5418
5.0			0.0	105			5436
5.5			0.0	108			5594
6.0			0.0	80			5436 ck
6.5			0.0	114			5817
							5607
							5573

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	7	1	121		
Radiological Background:		Radiological Equipment Used:		PID Used:			
121 3232 / 90		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	118	same as above...	AF/SC	5573
			0.0	126	6' 3" Sandy clay w/silt: Dark Yellowish Brown (10YR 4/4), 25% fine grained sand, 5% medium grained sand, 45% clay, 25% silt, no odor, slightly moist, cohesive, Firm, med. plasticity	CL	5553
7.0			0.0	90			5376
			0.0	85	7' 6" - - - - -		5264
8.0			0.0	81	Silty clay w/sand: Dark Brown (7.5YR 3/4), 25% silt, 55% clay, 15% fine grained sand, 5% medium grained sand, no odor, slightly moist, cohesive, med. plasticity, Firm, trace rootlets	CL	5172
			0.0	85			5265
9.0			0.0	86	↳ Presence of Calcium carbonate and mottling 8' 6" to 9' bgs.		5103
			0.0	64			5139
10.0			0.0	97	10' 0"		5149
					Total Sample Depth reached, no refusal NO GW encountered Total depth 10' bgs.		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 123			
Drilling Company: HGL		Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-21-11/0835	Date/Time Total Depth Reached: 9-21-11/0843				
Type of Sampling Device: stainless steel shovel/ trowel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70209) (0842)						
Geologist: Chelsea Carmichael		Checked By / Date: Judean Robbins / 1/11/12						
Radiological Background: 18		Radiological Equipment Used: Micro R _y Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	18	Silt, (10 YR, 4/4), brown, 95% silt, 5% fine sand, dry, semi-cemented, some rootlets, medium stiff, no odor, very low plasticity, low hardness.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								
No GW reached.								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 123
Drilling Company: HGL	Driller: J. Harris / I. Stone	Ground Elevation: NA		Total Depth Drilled: 10' 0"
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 11/01/11 1031	Date/Time Total Depth Reached: 11/01/11	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs) (# 70210) (100)		DUP: 70308 (NT)	
Geologist: Timothy Morse	Checked By / Date: Ludvan Robbins Feldman 1/11/12			

Radiological Background: 13 / 3124 / 70	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs	Borehole Gamma Readings +0.5" 3340 (CPM)
			0.0	77	Surface: Soil + Veg.			3540
0.5			0.0	80	Silty Sand w/ gravel: Olive Brown (2.5Y 4/4) 25% silt, 55% fine grained sand, 10% med. grained sand, 5% coarse grained sand, 5% sub-angular gravel, gravel fill, and concrete debris, dry, no odor, loose	AF / SM		4514
1.0			0.0	67	- 1' large concrete debris		1	5124
			0.0	105	1' 6" -----			5166
2.0			0.0	65	Silty Sand: Dark Yellowish Brown (10YR 3/4); 40% silt, 55% fine grained sand, 5% med. to coarse grained sand, dry, no odor, slightly cohesive, trace rootlets, loose	AF / SM	2	5237
			0.0	70				5406
3.0			0.0	72	3' 3" -----		3	5602
			0.0	78	Silty Sand: Olive Brown (2.5Y 4/4), 30% silt, 60% fine grained sand, 10% coarse to med. grained sand, trace sandstone concretions, dry, no odor, slightly cohesive, medium dense to loose			5513
4.0			0.0	99			4	5676
			0.0	94	- 4' 6" - 5' same as above, except presence of clay pockets (trace)	SM		5769
5.0			0.0	77	5' 3" -----		5	5709
			0.0	70	Clayey Sand w/ silt: Dark Yellowish Brown (10YR 3/4), 25% clay, 50% fine grained sand, 5% med. grained sand, 20% silt, dry, no odor, med. dense, cohesive	SC		5550
6.0			0.0	71			6	5537

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 124	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-21-11/0817		Date/Time Total Depth Reached: 9-21-11/0825	
Type of Sampling Device: stainless steel shovel/trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70211) (0825)			
Geologist: Chelsea Carmichael				Checked By / Date: Julian Kellis Hedman 1/11/12			
Radiological Background: 200		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	22	Silt, (10 YR, 4/3), pale brown, 90% silt, 10% fine sand, semi-cemented, trace rootlets, dry, soft, very low plasticity, low hardness, no odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 7, group 1		Location ID 125	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 9-20-11/ 1510		Date/Time Total Depth Reached 9-20-11/ 1520	
Type of Sampling Device trowel/shovel				Samples Collected (1) 1/2 gall bag, (1) 8-oz jar (#70212) (1520)			
Geologist C. Carmichael				Checked by/Date J. Deane Robbins / 11/12			
Radiological Background 21		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bgdt: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 22	<p>Sandy silt, (10 YR, 5/4), light brown, 65% silt, 30% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.</p> <p style="text-align: center;">No GW reached.</p>	ML	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 125	
Drilling Company: Beart Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 5 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/24/11 1418		Date/Time Total Depth Reached: 9/26/11 1428	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Appx 8 lbs.) + (1) 8oz. jar 70213(1430)			
Geologist: L. Robbins Goldman				Checked By / Date: L. Robbins Goldman 1/11/12			
Radiological Background: 14 uR, 3220 cpm, 47cpm		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs. Gamma Readings (CPM)
			0.0	88	Surface = soil + grass AF = artificial fill		+0.5 = 3358 Borehole Gamma Readings
			0.0	101	Sandy silty sand (fill): pale yellow (2.5Y 7/4), semi-moist, dense, no odor, 80% fine sand, 10% silt, 5% med. sand, 5% subangular gravel + asphalt, non cohesive, low toughness, no plasticity, low dry strength, trace rootlets in upper 2' of silty unit, trace CaCO ₃ nodules (<5mm), trace gray sand pockets.	AF	4086
0.5			0.0	77		SM	5301
1.0			0.0	53	} 2'5" - 2'8": very angular asphalt pieces		5490
			0.0	58			5548
2.0			0.0	68			5658
			0.0	49			5816
3.0			0.0	71			5899
			0.0	75	same as above	AF	5618
4.0			0.0	65		SM	5753
			0.0	90			5789
5.0					refusal @ 5.0' bgs on sandstone no GW encountered no anomalies		5739
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 126	
Drilling Company: <i>Boart</i> <i>Boff Longyear</i>		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 7.0 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/29/11 1040		Date/Time Total Depth Reached: 9/29/11 1135	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) <i>70214 (1050)</i>			
Geologist: <i>Carl Knight</i>				Checked By / Date: <i>Julian Robbin Goldman 1/11/12</i>			
Radiological Background: <i>15 pA / 2820 / 50</i>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface: grass and soil		+0.5' 3022
0.5			0.0	50	Fill: silt. Sand: Light yellowish brown (10YR 6/4),	AF	3267
			0.0	56	dry, medium dense, no odor, 5% coarse sand, 10% medium dense sand, 25% silt, 60% fine sand, trace	SM	4154
1.0			0.0	62	fine subangular gravel, mottled		4596
			0.0	57			5262
2.0			0.0	63			5400
			0.0	74			5403
3.0			0.0	66			5526
			0.0	58	3' 7" Sandstone Cobble: Pale yellow (2.5Y 8/3), dry, dense, no odor		5505
4.0			0.0	58	3' 7" Sandy silt: Yellowish brown (10YR 5/3), dry, medium stiff, no odor, 20% fine sand, 50% silt cohesive, low plasticity, low toughness, trace red (light reddish brown 5YR 6/4) sandstone	ML	5677
			0.0	81			5754
5.0			0.0	64	4' 7" Poorly graded sand: Pale yellow (2.5Y 7/4) dry, dense, no odor, fine grained sand, possible sandstone cobble weathered by macrocore	SP	5576 5576 cu
			0.0	52	5' 5" Sandy silt: Brown (10YR 5/3), moist, medium stiff, no odor, 20% fine sand, 52% medium sand, 75% silt, cohesive, low plasticity, low toughness	ML	5430
6.0			0.0	53			5578

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 127
Drilling Company: Boart Boff Longyear	Driller: Don Hansen	Ground Elevation: NA		Total Depth Drilled: 7.5 ft bgs.
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/29/11 0910	Date/Time Total Depth Reached: 9/29/11 1015	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70215 (0920)			
Geologist: C. K. Knight	Checked By / Date: [Signature] 1-11-12			

Radiological Background: 14AR/2664/39	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					Surface: Soil and gravel		+0.5	2809
0.5			0.0	49	Fill: Silty Sand: Pale yellow (2.5Y 7/4) clay, medium dense, no odor, 15% silt, 5% coarse sand, 5% subangular fine gravel (granitic), 10% medium sand, 65% fine sand, some mottling	AF / SM		3030
			0.0	50				3703
1.0			0.0	43				4654
			0.0	48				5133
2.0			0.0	62	3'0" fine granitic fine gravel			5357
			0.0	67				5319
3.0			0.0	83				5398
			0.0	45				5384
4.0			0.0	85	Same as above: Fill: Silty Sand	AF / SM		5451
			0.0	75	4'4"			5502
5.0			0.0	65	Sandy silt: Dark yellowish brown (10YR 4/6), moist, medium stiff, no odor, 20% fine sand, 5% clay, 75% silt, cohesive, low plasticity, low toughness	ML		5554
			0.0	72				5638
6.0			0.0	58				5735

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 127		
Radiological Background: 19MRA/2684/39		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
5			0.0	58	Same as above:		
6			0.0	65	6'3" Siltstone Bedrock: Pale yellow (2.5Y 8/4), moist, hard, no color, interbedded siltstone layers		5739
7			0.0	43			6064
			0.0	51			6186
8					Refusal on ^{Siltstone} Sand at 2.5' bgs (OK)		6133
9					No GW encountered		
10							
11							
12							
13							

BSP 204

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 128
Drilling Company: HGL	Driller: J. Harris / I. Stone	Ground Elevation: NA	Total Depth Drilled: 10'0" bgs.	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 11/3/11 0943	Date/Time Total Depth Reached: 11/3/11 1040	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70314 (1100) 70216)			
Geologist: Timothy Morse	Checked By / Date: [Signature] 1-11-12			

Radiological Background: 13 / 3370 / 90	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	81	Surface: Soil + Veg.			+0.5' 3584
0.5			0.0	91	Silty Sand with TM gravel: Olive Brown (2.54 1/4), 25% silt, 65% fine grained sand, 5% medium grained sand, 5% coarse grained sand, TM 5% subrounded gravel and fill debris, trace sandstone concretions, dry, no odor, low to no plasticity, medium dense	AF / SM		4705
1.0			0.0	75				5286
			0.0	85				5587
			0.0	85				5600
2.0			0.0	78	2'0" --- Same as above, but slightly moist ↳ trace rootlets 1' to 4' bgs.		2	5610
			0.0	80		AF / SM		5721
3.0			0.0	97			3	5641
			0.0	94				5797
4.0			0.0	77			4	5641
			0.0	76	4'3" --- Silty Sand: Dark Yellowish Brown (10YR 3/4) 30% silt, 60% fine grained sand, 5% med. to coarse grained sand, 5% clay and/or clay pockets, trace sandstone concretions and artificial debris/gravel, slightly moist, medium dense, no odor, cohesive, low plasticity	AF / SM		5446
5.0			0.0	84			5	5548
			0.0	80				5550
6.0			0.0	80	6'0" ---		6	5581

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04:03	Subarea: 7	Group: !	Location ID: 128			
Radiological Background: 13 / 3370 / 90		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs, Borehole Gamma Readings (CPM)	
6.0			0.0	80	<p>Silty Sand: Dark Yellowish Brown (10YR 2/6) 20% silt, 70% fine grained sand, 5% med. to coarse grained sand, 5% subangular gravel and artificial fill gravel, slightly moist, no odor, medium dense to dense, low to no plasticity</p> <p>↳ 7'-10.5' same as above, but trace nodules of clay present</p> <p>↳ 8'-10.8' same as above, but soil is moist</p>	AF / SM	6	5581
			0.0	76			7	5693
7.0			0.0	107			7	5608
			0.0	88				5642
8.0			0.0	81			8	5660
			0.0	78				5688
9.0			0.0	92			9	5787
			0.0	95				5743
10.0			0.0	104			10	5627
							10' 0" bgs., Total sample depth reached NO groundwater encountered	
11.0								
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 129
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-20-11/1127	Date/Time Total Depth Reached: 9-20-11/1136	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70217) (1135)			
Geologist: Chelsea Carmichael		Checked By / Date: <i>[Signature]</i> 1-11-12		

Radiological Background: 22	Radiological Equipment Used: Micro RY Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	22	Sandy silt with rock fragments, (10 YR, 4/4), brown, 55% silt, 30% fine to medium grained sand, 15% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 130
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-19-11/ 1138	Date/Time Total Depth Reached: 9-19-11/ 1146	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70219) (1145)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>ah</i> 1-11-12			

Radiological Background: 23	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	22	Sandy silt, (10 YR, 4/4), brown, 55% silt, 40% fine sand to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 130
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 19 2'
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10-10-11/ 1125	Date/Time Total Depth Reached: 10-10-11/ 1145	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8lbs.) (#70220) (1150)			
Geologist: Chelsea Carmichael	Checked By / Date: 1-11-12			

Radiological Background: 81, 3847	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	90	Silty sand with rock fragments, (0.04R, 5/4), ^{medium} tight brown, 70% fine to medium grained sand, 15% silt, 15% rock fragments - sandstone, siltstone, trace gravel/concrete, dry, medium dense, no plasticity, hardness or odor, trace asphalt fragments, some rootlets.	SM	0.5	4189
0.5			0.0	119			6359	
1.0			0.0	99			6698	
1.5			0.0	134			6115	
2.0			0.0	83			5906	
2.0	Refusal at 2' - bedrock							
3.0	No GW reached.							
4.0								
5.0								
6.0								

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 131	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-19-11/1405		Date/Time Total Depth Reached: 9-19-11/1413	
Type of Sampling Device: stainless steel shovel/ trowel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70221) (1412)					
Geologist: Chelsea Carmichael		Checked By / Date: <i>[Signature]</i> 1-11-12					
Radiological Background: 22		Radiological Equipment Used: Micro R Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	25	Sandy silt with rock fragments, (10 YR, 5/4) light brown, 50% silt, 35% fine to medium grained sand, 15% sandstone rock fragments, dry, soft, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 131		
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 2'2"		
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10-10-11/1035		Date/Time Total Depth Reached: 10-10-11/1057		
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70222) (1100)				
Geologist: Chelsea Carmichael				Checked By / Date: <i>[Signature]</i> 1-11-12				
Radiological Background: 125, 3894			Radiological Equipment Used: Micro R / <u>Downhole</u> Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	120	Silty sand, (10YR, 5/4), ^{yellowish} tight brown, 85% fine to medium grained sand, 15% silt, semi-moist, medium dense, no plasticity, hardness or odor.	SM		3863
			0.0	78			5220	
1.0			0.0	124	Gradational Contact Sand with silt and rock fragments, (10YR, 5/4), tight brown, 80% fine to medium grained sand, 10% silt, 10% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.	SW		6132
			0.0	98			6710	
2.0			0.0	150			7046	4190
3.0					Refusal at 2'2" - bedrock			
					No GW reached			
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 132
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 9.5 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/30/11 0750	Date/Time Total Depth Reached: 9/30/11 0900	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		(50223) (0800)	
Geologist: C. Knight	Checked By / Date: [Signature] 1-11-12			

Radiological Background: 16pR/3202/40	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	69	Surface: Soil and grass		+0.5'	3274
0.5			0.0	71	Fill; Silty Sand with ^{ck} gravel; light yellowish brown (10YR 6/4), dry, medium dense, no odor, 35% silt, 52% medium sand, 60% fine sand, trace fine subangular gravel	AF/SM		3908
1.0			0.0	70			1	5534
2.0			0.0	66	18" Fill; Silty Sand with gravel; Very pale brown (10YR 7/4), dry, medium dense, no odor, 10% fine subangular gravel (fill rule), 20% silt, 5% medium sand, 65% fine sand, mottled	AF/SM	2	5640
			0.0	72	3' 5" ^{trace} granitic fine angular gravel			5705
3.0			0.0	74			3	5577
			0.0	70				5468
4.0			0.0	82	Same as above; Silty Sand with gravel; Fill	AF/SM	4	5557
			0.0	85	46"			5571
5.0		NR	0.0	90	5' 0" NO Recovery		5	5554
			0.0	61	Same as above; Silty Sand with gravel; Fill	AF/SM		5626
6.0			0.0	57			6	5067

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 134	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-20-11/0920		Date/Time Total Depth Reached: 9-20-11/0928	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70226) (0925)			
Geologist: Chelsea Carmichael				Checked By / Date: [Signature] 1-11-12			

Radiological Background: 20	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5	Interval	Recovery	0.0	22	Sandy silt, (10 YR 4/4), brown, ⁶⁵ 70% silt, 30% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML	0.5	
1.0					No GW reached.		1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0							5.0	
6.0							6.0	

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 134
Drilling Company: HGL	Driller: C. Knight	Ground Elevation: NA	Total Depth Drilled: 11'3" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 10/7/11 1427	Date/Time Total Depth Reached: 10/7/11 1441	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70227 (No sample)			
Geologist: A. Lawrence	Checked By / Date: [Signature] 1-11-12			

Radiological Background: 17/3626/82	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			110		Fill: Silty Sand w/ Gravel; yellowish brown (10YR 5/4) slightly moist, medium dense, no odor, no staining	AF/SM		NM
0.5			95		+ 15% gravel, 25% silt, 10% medium, 65% fine, 10% gravel			
1.0			106		silty sand w/ gravel: dark yellowish brown (10YR 4/4) moist, medium dense; no odor, no staining, 15% silt, 10% gravel, >5% fine sand	SM		
0.0			102					
0.0			102		Refusal on sandstone			
					Total depth 11'3"			
					No groundwaters encountered			
					No sample			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 135
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-20-11/0804	Date/Time Total Depth Reached: 9-20-11/0812	
Type of Sampling Device: stainless steel shovel/ trowel		Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70228) (0810)		
Geologist: Chelsea Carmichael		Checked By / Date: 1-11-12		

Radiological Background: 2.0	Radiological Equipment Used: (Micro R) Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	22	Sandy silt, (10 YR, 4/4), brown, 60% silt, 30% fine to medium grained sand, 10% sandstone rock fragments, dry, medium stiff, trace rootlets, no plasticity, very low hardness, no odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 135
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 22"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10-7-11/1356	Date/Time Total Depth Reached: 10-7-11/1407	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: 1 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 70229) (1415)			
Geologist: Chelsea Carmichael		Checked By / Date: <i>[Signature]</i> 1-11-12		

Radiological Background: 88,3425	Radiological Equipment Used: Micro R <u>Downhole Pancake Meters</u>	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	75	Sand with rock fragments, ⁵ (10 1R, 3/4), dark reddish brown, 75% fine to medium grained sand, 20 15% sandstone rock fragments, 10% clay, moist, no plasticity, hardness etc odor.	SW		05-3464
1.0		0.0	59					5267
		0.0	54					5511
2.0		0.0	60					5772
3.0					Refusal at 22" - bedrock No GW reached			
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 136	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-20-11/0832		Date/Time Total Depth Reached: 9-20-11/0841	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: 8-cz jar One 1/2 Gallon Bag (Approx. 8 lbs.) (#70230) (0840)			
Geologist: Chelsea Carmichael				Checked By / Date: [Signature] 1-11-12			
Radiological Background: 22		Radiological Equipment Used: (Micro R) Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	20	Sandy silt, (10YR, 5/4), light brown, 60% silt, 35% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness on order.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 137	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-19-11/1338		Date/Time Total Depth Reached: 9-19-11/1346	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#70232) (1345)			
Geologist: Chelsea Carmichael				Checked By / Date: 1-11-12			
Radiological Background: 020-22		Radiological Equipment Used: (Micro R) Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	21	Silty sand with rock fragments, (10YR, 5/4), light brown, 50% fine sand, 35% silt, 15% sandstone rock fragments, dry, loose, no plasticity, hardness or odor.	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 138
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-19-11/1424	Date/Time Total Depth Reached: 9-19-11/1431	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#70234) (1430)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>dm</i>			

Radiological Background: 20	Radiological Equipment Used: Micro B / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	24	Silty sand (loam), (10 YR, 3/3), dark brown, 60% fine to medium grained sand, 35% silt, 5% sandstone rock fragments, moist, porous / low density, loose, no plasticity, hardness or odor.	SM	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached
(Surface water flow caused moisture)

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 139
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-22-11 / 1437	Date/Time Total Depth Reached: 9-22-11 / 1446	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70236) (1445)		Checked By / Date: [Signature] 1-11-12	
Geologist: Chelsea Carmichael				

Radiological Background: 22	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	22	Sandy silt, (10 YR, 4/3), brown, 55% silt, 45% fine to medium grained sand, trace sandstone fragments, dry, medium stiff, no plasticity, hardness, or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 140
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-22-11 / 1342	Date/Time Total Depth Reached: 9-22-11 / 1351	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70238) (1350)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Judith Robbins Feldman 1/1/12</i>			

Radiological Background: 24	Radiological Equipment Used: Micro R Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	24	Silt with sand, (10XR, 4/4), brown, 80% silt, 20% fine sand, dry, some rootlets, medium stiff, no plasticity, very low hardness, no odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 141
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-21-11/1440	Date/Time Total Depth Reached: 9-21-11/1448	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70240) (1447)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Judean Robins Alderman 7/11/12</i>			
Radiological Background: 22	Radiological Equipment Used: Micro R Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm		

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	22	Sandy silt with rock fragments, (10YR, 4/4) ^{dark yellowish} brown, 50% silt, 35% fine to coarse grained sand, 15% sandstone rock fragments, dry, soft, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 142
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-21-11/1352	Date/Time Total Depth Reached: 9-21-11/1400	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70242)		Checked By/Date: Julie Ann Robinson / Goldman 7/11/12	
Geologist: Chelsea Carmichael		PID Used: Mini Rae 2000 - Background: 0.0 ppm		

Radiological Background: 22	Radiological Equipment Used: Micro R Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	22	Sandy silt, (10 YR, 4/3), pale brown, 60% silt, 40% fine to medium grained sand, dry, very soft, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 142
Drilling Company: HGL	Driller: J. Harris	Ground Elevation: NA		Total Depth Drilled: 8'0" bgs.
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/19/11 1415	Date/Time Total Depth Reached: 10/19/11 1706 6'6" bgs. 1550	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70243) (1500)		Checked By / Date: Julian Keltner Haldan 1/11/12	
Geologist: To Morse		Radiological Background: 3995 / 65		
Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm		

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	93	Surface: Soil, sticks		+0.5' 3702
0.5			5.5	122	Sandy silt: Dark Yellowish Brown (10YR 3/4), 30% fine grained sand, 5% medium grained sand, 65% silt, trace rootlets, dry, cohesive, low plasticity and toughness, no odor	ML	4063
1.0			10.2	75			5377
			19.4	128			5672
2.0			22.2	123			5914
			31.0	112	2'6" -----		6073
3.0			8.5	149	Sandy silt: Dark Yellowish Brown (10YR 4/4), 30% fine grained sand, 70% silt, dry, cohesive, low plasticity, medium toughness and strength, no odor	ML	6383
			4.2	97			6122
4.0			11.5	104			6114
			9.0	149			6086
5.0			4.9	116	5'0" -----		6062
			3.2	140	Sandy silt: Dark Yellowish Brown (10YR 4/6), 40% fine grained sand, 5% medium grained sand, 55% silt, cohesive, dry, medium toughness, low to no plasticity, no odor	ML	6157
			7.3	92			6271
6.0							6258

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04.03		7	1	142	
Radiological Background:		Radiological Equipment Used:			PID Used:		
3995 / 65		Micro R / Downhole / Pancake Meters			Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
6.0			7.3	92	same as above...	ML	6258
			5.5	117			6048
7.0			3.0	73	-----		5899
			8.4	123	Sandy Silt: Dark Yellowish Brown (OYR 4/4), 40% fine grained sand, 5% medium grained sand, 55% silt, cohesive, dry, medium-medium/high toughness, no plasticity, no odor		5965
8.0			2.9	140	Refusal at Sandstone Bedrock at 8'0" bgs. NO GW encountered	Bedrock	5905
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 143
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-21-11/1334	Date/Time Total Depth Reached: 9-21-11/1341	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70244) (1340)			
Geologist: Chelsea Carmichael	Checked By / Date: Julien Potting / Gelman 9/12/12			

Radiological Background: 22	Radiological Equipment Used: Micro R ₁ Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	22	Sandy silt, (10 YR, 4/4), brown, 60% silt, 40% fine to medium grained sand, dry, medium stiff, no plasticity, very low hardness, no odor.	ML	0.5	
1.0							1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0							5.0	
6.0							6.0	

No GW reached.

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	7	1	143		
Radiological Background:		Radiological Equipment Used:		PID Used:			
3862 / 64		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm.			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			80	108	Same as above... elevated PID readings	ML	5724
			24.1	91			5464
7.0			29.0	125			5443
			1.6	87			5753
8.0			1.9	110	Silty Sand: Brownish Yellow (10YR 6/6), 45% silt, 55% fine grained sand, slightly moist, medium dense, no odor,	SM	5845
8.5			1.3	100			5967
9.0			2.9	155			6079
			0.0	115	same as above... -dry		6235
10			0.1	85	10'0"	Bedrock	6400
					10'0" Bone attempt successful NO GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 144			
Drilling Company: HGL		Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-14-11/1432	Date/Time Total Depth Reached: 9-14-11/1440				
Type of Sampling Device: stainless steel shovel/trowel			Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70246) (1440)					
Geologist: Chelsea Carmichael			Checked By / Date: J.P. Sedman 9/12/12					
Radiological Background: 17		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	16	Sandy silt, (10YR, 5/4), light brown, yellowish 65% silt, 30% fine to medium grained sand, 5% sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								
No GW reached.								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 144
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-16-11 1030	Date/Time Total Depth Reached: 9-16-11 1130	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70247 (1040)		Checked By / Date: Shelley Robbins / 1/12/12	
Geologist: C. Knight		PID Used: Mini Rae 2000 - Background: 0.0 ppm		

Radiological Background: 16mR/3332/45	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
			0.0	67	Surface: soil and gravel		4354
0.5			0.0	74	Fill: Poorly graded sand with silt: Light yellowish brown (2.5Y 6/4), dry, medium dense, no odor, 10% silt, 8% coarse sand, 10% medium sand, 75% fine sand, mottled	AF/SP	5320
1.0			0.0	70			5682
			0.0	55			5616
2.0			0.0	87	Fill: Silty Sand: Dark yellowish brown (10YR 4/4), dry, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand, mottled, trace rootlets	AF/SM	5723
			0.0	82			5897
3.0			0.0	86			5843
			0.0	72	3/2" trace angular sandstone gravel		5932
4.0			0.0	76			6067
			0.0	65			5920
5.0			0.0	60			6067
			0.0	58	Same as above: Fill: Silty Sand	AF/SM	6142
6.0			0.0	80			6149

Project Name:		Project Number:	Subarea:	Group:	Location ID:			
SSFL Area IV Radiological Study		EP038.01.22.04.03	7	1	144			
Radiological Background:		Radiological Equipment Used:		PID Used:				
16AR/3332/45		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)	
6.0			0.0	80	Same as above: Fill: Silty Sand	AF	6149	
			0.0	77	6" trace angular fine sandstone gravel	SM	5926	
			0.0	90	6" trace angular fine sandstone gravel		5785	
7.0			0.0	75			5923	
			0.0	77			5981	
8.0			0.0	64			5984	
			0.0	77	8" 10" Sandstone cobble w/ 3" thick, fine grained sandstone		5915	
9.0			0.0	97	Same as above: Fill: Silty Sand	AF	5840	
			0.0	76		SM	5918	
10.0	Total Depth = 10.0' bgs							
	No GW encountered							
11.0								
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 145	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9-14-11 1145		Date/Time Total Depth Reached: 9-19-11 1255	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70249 C(200)			
Geologist: C. Knight				Checked By / Date: Julian Ralim Helman 1/12/12			
Radiological Background: M.R. / 3139 / 42		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	89	Surface: Soil and gravel		3537
0.5			0.0	93	Fill: Poorly graded Sand with silt; Pale yellow (2-5 $7/4$), dry, medium dense, no odor, 10% silt, 5% coarse sand, 10% medium sand, 75% fine sand, mottled	AF / SP	4387
1.0			0.0	66			5367
			0.0	77	Fill: Silty Sand: Dark yellowish brown (10% R 4/6), dry, medium dense, no odor, 30% silt, 5% coarse sand, 5% medium sand, 60% fine sand, trace fine subangular gravel, mottled	AF / SM	5684
2.0			0.0	75	2" fill rock, volcanic subangular gravel		5770
			0.0	64			5619
3.0			0.0	73			5771
			0.0	80	35" trace fine subangular sandstone gravel		5821
4.0			0.0	67			5747
			0.0	59			5848
5.0			0.0	63	Same as above: Fill: Silty Sand		5883
			0.0	62			5912
6.0			0.0	66		AF / SM	6013
							6016

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 145		
Radiological Background: 14mR/3139/42		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	66	Same as above: Fill: Silty Sand	AF SM	6016
			0.0	72			5820
7.0			0.0	75	74" to 78" Sandstone cobbles, mechanically weathered to SP, fine grained sandstone		5806
			0.0	72			5959
8.0			0.0	95	8' Red electrical wire ~0.5mm thick		5957
			0.0	85			5997
9.0			0.0	88	Same as above: Fill: Silty Sand	AF SM	5779
			0.0	80			5740
10.0			0.0	87			5890
					Total Depth: 10.0' bgs No GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: n/a	Location ID: 146
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-13-11/1135	Date/Time Total Depth Reached: 9-13-11/1145	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70250) (1145)		Checked By / Date: Linda Robbins Aldman 4/12/12	
Geologist: Chelsea Carmichael				

Radiological Background: 18, 95	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	19	Sandy silt with gravel, (10YR, 5/3), light brown, 55% silt, 30% fine to medium grained sand, 15% gravel fill rock, asphalt, trace glass, dry, stiff, no plasticity, hardness or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 146
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-16-11 1100	Date/Time Total Depth Reached: 9-16-11 1450	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70251 (1410)			
Geologist: C. Knight	Checked By / Date: JR Goldman 1/12/12			

Radiological Background: 16pR / 2487 / 50	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings 3355 = 40.5 (CPM)
			0.0	66	Surface: Soil and gravel			
0.5			0.0	61	Fill: Poorly graded sand with silt (2.5% silt), dry, medium dense, no odor, 10% silt, 5% fine sandstone gravel, 5% medium sand, 80% fine sand, mottled.	AF / SP		4318
1.0			0.0	70				5425
			0.0	67				5499
2.0			0.0	58	Fill: Silty Sand: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 35% silt 5% medium sand, 60% fine sand, mottled with (yellowish brown 10YR 5/6)	AF / SP		5598
			0.0	62				5767
3.0			0.0	61				5811
			0.0	75				5813
4.0			0.0	62				5742
			0.0	54	4'6" trace charcoal			5658
5.0			0.0	61	Fill: Silty Sand: Brown (7.5YR 4/4), moist, medium dense, no odor, 25% silt, 75% fine sand, mottled heavily	AF / SP		5752
			0.0	62				5816
			0.0	86				5976
6.0			0.0	Stick				5649

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 146			
Radiological Background: 16mR/2987/60		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	86	Same as above: Fill: Silty Sand	AS	6	5649
			0.0	68		SM		5901
7.0			0.0	64			7	5815
			0.0	63				5676
8.0			0.0	74	7'10" Fill: Poorly graded sand with silt: Pale yellow (2.5 & 7/4), moist, dense, no odor, 10% coarse sand, 60% medium sand, 5% silt, 25% fine sand, well sorted	AS	8	5694
			0.0	67	8'7" Fill: Silty sand: Dark brown (2.5 & 7/4) moist, medium dense, no odor, 40% silt, 60% fine sand	SP		5553
9.0			0.0	78			9	5640
			0.0	74	9'5" weathered sandstone with cobble: Pale yellow (2.5 & 7/4), moist, dense, no odor, fine grained sandstone 9'5" cobble ~4" thick			5786
10.0			0.0	67	Same as 8'7" silty sand: Fill	AS	10	5907
						SM		
11.0							11	
12.0							12	
13.0							13	

Total Depth: 10.0' bgs
No GW encountered

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 147
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 2'4" CIL x bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/11/11 1055	Date/Time Total Depth Reached: 10/11/11 1130	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70252 (1100)			
Geologist: C. Knight	Checked By / Date: Julian Robbins / Goldman 1/12/12			

Radiological Background: BmR / 2975 / 64	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: Soil and gravel		+0.5' 3189
0.5			0.0	51	Fill; Silty sand with gravel; Yellowish brown (10YR 5/6), dry, medium dense, no odor, 10% fine volcanic angular gravel, 20% silt, 70% fine sand	AF	3512
			0.0	54		SM	4537
1.0			0.0	52	8" Poorly graded sand with silt; Yellowish brown (10YR 5/6), dry, medium dense, no odor, 10% silt, 10% medium sand, 80% fine sand.	SP	5180
			0.0	48			5328
2.0			0.0	52	2'2" weathered sandstone bedrock: Yellow (10YR 7/6), dry, 2'4" very dense, no odor, trace silt, mechanically weathered to SP, fine grained sandstone	Bedrock or boulder	5368
3.0							
4.0							
5.0							
6.0							

Refusal on sandstone at 2'4" bgs
NO LW encountered

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 151
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-22-11 / 0733		Date/Time Total Depth Reached: 9-22-11 / 0740
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70256) (0740)		Checked By / Date: <i>JR Feldman</i> 9/22/11	
Geologist: Chelsea Carmichael				

Radiological Background: 23	Radiological Equipment Used: Micro R Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	24	Sandy silt, (10 YR, 4/3), pale brown, 55% silt, 40% fine to coarse grained sand, 5% sandstone rock fragments, dry, soft, common sticks and vegetation, no plasticity, hardness or odor.	ML	0.5	
1.0							1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0							5.0	
6.0							6.0	

No GW reached

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 151	
Drilling Company: HGL		Driller: J. Harris		Ground Elevation: NA		Total Depth Drilled: 1'0"	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10/19/11 0845		Date/Time Total Depth Reached: 10/19/11 0903	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70257) (MS)			
Geologist: To Morse				Checked By / Date: Ludov Robinson / Jeldman 1/2/12			
Radiological Background: 3991 / 109		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' (CPM)
			0.0	101	Surface: Sandstone, no bed vegetation		
0.5			0.0	94	Silty sand w/ gravel: Light olive brown (2.54 5/4), 30% silt, 60% fine grained sand, 5% medium grained sand, 5% subangular gravel, dry, medium dense to loose, no odor	SM	NM
1.0			0.0	107			
2.0					Refusal on sandstone at 1'0" BGS.	B P a n c a k e	
3.0					NO GW encountered		
4.0					NO sample collected due to shallow refusal		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 152	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-23-11/ 1116		Date/Time Total Depth Reached: 9-23-11/ 1125	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Appox, 8 lbs.) (# 70258) (1125)			
Geologist: Chelsea Carmichael				Checked By / Date: J. J. Helman 1/2/12			
Radiological Background: 22		Radiological Equipment Used: Micro R ₁ Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	22	<p>light pale Silty sand, (10 YR, 6/3), light brown, 70% fine to medium grained sand, 25% silt, (10 YR, 3/3), very dark grayish brown @ 5" there is a dark peat layer with vegetation) 5% sandstone rock fragments, trace gravel fill rock, dry, loose, no plasticity, hardness or odor.</p> <p>No GW reached.</p>	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 155	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 2.5 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 10/11/11 1155		Date/Time Total Depth Reached: 10/11/11 1230	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70261 (1205)			
Geologist: C. Knight				Checked By / Date: Robbin Feldman 1/12/12			
Radiological Background: LSMR/3425/60		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface: Soil and gravel		+0.5' 3300
			0.0	69	Fill: Sandy Silt: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% subangular fine gravel, 5% medium sand, 30% fine sand, 60% silt, cohesive, low plasticity, low toughness, mottled	AR / ML	3548
			0.0	71			4898
			0.0	62	Sand with silt: Light olive brown (2.5Y 5/4), moist, medium dense, no odor, 10% silt, 10% medium sand, 80% fine sand, some roots		5607
			0.0	71	1'6" root (a live) 1" diameter		5881
			0.0	67	2'1" weathered sandstone bedrock: light yellowish brown (2.5Y 6/4), dry, very dense, no odor, fine	AR / SP	5703
			0.0	65	2'2" garnet sandstone	Bedrock	5536
					Refusal on sandstone at 2.5' bgs No GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 156	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 8.5 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9-4-11 1345		Date/Time Total Depth Reached: 9-21-11 1500	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70262 (1350)			
Geologist: C. Knight				Checked By / Date: 1-12-12			
Radiological Background: 13MR/3131/53		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface: Soil and gravel		405' 3159 (CPM)
0.5			0.0	58	Fill: Sandy silt: Pale yellow (2.5Y 7/4) dry, medium stiff, no odor, 25% fine sand, 5% medium sand, 70% silt, cohesive, low plasticity, low toughness, mottled	AF	3889
			0.0	57		ML	5128
1.0			0.0	60			5259
			0.0	76	12" Fill: Sand with silt: Pale yellow (2.5Y 8/3) dry, dense, no odor, 10% coarse sand, 5% fine sand, 85% gravel, 10% silt, 20% medium sand, 65% fine sand, mottled	AF/SP	5576
2.0			0.0	63	110" Fill: Silty Sand: Dark yellowish brown (10YR 4/4) moist, medium dense, no odor, 30% silt, 5% coarse sand, 10% medium sand, 55% fine sand, trace fine sandstone gravel, mottled	AF/SM	5548
			0.0	65			5530
3.0			0.0	67			5625
			0.0	73	4 1/3" Sandstone Cobble ~ 1" thick Same as above: Fill: Silty Sand		5580
			0.0	69			5555
4.0			0.0	70			5738
			0.0	67	5 1/2" Sandstone cobble ~ 1" thick Same as above: Fill: Silty Sand		5705
5.0			0.0	74			5456
			0.0	90			5212

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 156	
Radiological Background: 13MR/3131/53			Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0+0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
6.0			0+0	90	6'2" Same as above: Fill: Silty Sand	AF/SM	6 5212
			0+0	100	Silty Sand: Dark yellowish brown (10YR 4/4) moist, medium dense, nodular, 15% silt, 5% medium sand, 5% coarse sand, 75% fine sand	SM	5499
7.0			0+0	95	6'11" Sandstone cobbles: Pale yellow (2.5Y 7/4): fine grained 7'2" sandstone ~ 3" thick		7 5398
			0+0	74	Same as above: Silty Sand	SM	5507
8.0			0+0	60	8' to 8'2" Sandstone cobbles ~ 2" thick weathered sandstone bedrock: light gray (2.5Y 7/2), dry, very dense, no color, 5% medium sand, 5% coarse sand, 80% fine sand, fine grained sandstone	Bedrock	8 5555
			0+0	65			5733
9.0					Refusal on Sandstone at 8.5' bgs No GW encountered		9
10.0							10
11.0							11
12.0							12
13.0							13



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 157
Drilling Company HGL	Driller	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/0915	Date/Time Total Depth Reached 9-16-11/0923
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#70263) (0922)		
Geologist C. Carmichael	Checked by/Date [Signature] 1-12-12		

Radiological Background 18	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.021		<p>Silty sand with rock fragments, 50% fine to medium grained sand, 35% silt, 15% sandstone rock fragments, iron-rock and gravel rock fragments, dry, medium dense, no plasticity, hardness or odor.</p> <p>Yellowish Brown (10YR, 5/4)</p> <p>No GW reached.</p>	SM	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 157
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 3ft 10 in ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/26/11 1344	Date/Time Total Depth Reached: 10/26/11 1409	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		70264 - 1415 DUP - 70307 6 1/2 gallon bag	
Geologist: Ian Stone	Checked By / Date: <i>[Signature]</i> 1-12-12			

Radiological Background: 15 / 3663 / 112	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			88		Silty Sand, Yellowish Brown (10YR 5/6) 80% fine sand, 20% silt, trace gravel (sandstone), max gravel size = 2in, dry, low-red dense, no odor and staining	SM		4392
0.5			74				5181	
1.0			78				5401	
1.2			85				5548	
2.0			66				5449	
3.0			89				5454	
3.0			78				5394	
4.0			96		5520			
4.0					TD = 3ft 10 in no gw encountered, no aromatics rebound on sandstone			
5.0								
6.0								

SSFL BORING LOG



7_158

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 158
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 5.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-4-11 1000	Date/Time Total Depth Reached: 9-21-11 1100	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		70265 (1020)	
Geologist: C. Knight	Checked By / Date: [Signature] 1-12-12			

Radiological Background: 13MR/2459/54	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					Surface? Soil and gravel			+0.5' 2985
0.5			0.0	62	Fill: Silty Sand with gravel; light yellowish brown (2.5Y 6/3), dry, medium dense, no color, 10% fine subangular gravel, 25% silt, 5% coarse sand, 15% medium sand, 45% fine sand, mottled	AF/SM		3460
1.0			0.0	70		AF/SM		5115
2.0			0.0	75	Fill: Silty Sand: yellowish brown (10YR 5/4), dry, medium dense, no color, 20% fine sand, 5% subangular sandstone fine gravel, 10% medium sand, 66% fine sand, very mottled, pockets of SP, trace rootlets	AF/SM		5490
3.0			0.0	67				5881
4.0			0.0	65				5665
5.0			0.0	70				5667
5.0			0.0	68				5601
5.0			0.0	63	Fill: Same as above: Silty Sand	AF/SM		5866
5.0			0.0	62				5893
5.0			0.0	64	Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), dry, dense, no color, 5% medium sand, 95% fine sand, fine grained sandstone			5794
5.0			0.0	61				5732
6.0					Refusal on Sandstone at 5.0' bgs No CW encountered			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 160
Drilling Company: HGL	Driller: J. Harris / I. Stone	Ground Elevation: NA		Total Depth Drilled: 1' 1"
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 11/01/11	Date/Time Total Depth Reached: 11/01/11	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70267) (NO sample)			
Geologist: Timothy Morse	Checked By / Date: [Signature] 1-12-12			

Radiological Background: 13 / 3579 / 76	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. to 0.5' (CPM)
			0.0	72	Surface: wood chips		
0.5			0.0	68	Sandy silt w/ gravel; Dark Yellowish Brown (10YR 4/4), 30% fine grained sand, 5% med. grained sand, 50% silt, 15% subangular sandstone gravel, dry, low plasticity, soft	ML	NM
1.0			0.0	70	1' 1"		
					Refusal on sandstone bedrock at 1' 1" bgs. NO GW encountered NO sample collected due to shallow refusal	Bedrock	
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 161	
Drilling Company: HGL		Driller: J. Harris/I. Stone		Ground Elevation: NA		Total Depth Drilled: 6'6" bgs.	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 11/2/11 1311		Date/Time Total Depth Reached: 11/2/11 1350	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70268) (1500)			
Geologist: Timothy Morse				Checked By / Date: 1-12-12			
Radiological Background: 12 / 3350 / 81		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft. bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. to 0.5' (CPM)
			0.0	79	Surface: Soil + veg.		
0.5			0.0	71	Silty Sand; Dark Yellowish Brown (10YR 4/4) 30% silt, 65% fine grained sand, 5% med-coarse grained sand, dry, no odor, loose, low plasticity, trace subangular gravel	AF/SM	3729
1.0			0.0	76	1'0" -----		4670
			0.0	73	Silty Sand; Dark Yellowish Brown (10YR 4/4) 35% silt, 65% fine grained sand, trace sandstone concretions and rounded sandstone gravel, dry, loose, no odor, low plasticity	SM	5116
2.0			0.0	80			5465
			0.0	82			5821
3.0			0.0	77			6206
			0.0	84	3'6" -----		6094
4.0			0.0	69	Silty Sand; Dark Yellowish Brown (10YR 4/6) 25% silt, 70% fine grained sand, 5% med. grained sand, trace sandstone concretions, trace rootlets, 1 piece of possible artificial fill (concrete debris), medium dense	SM	6256
			0.0	87	4'6" dry, no odor (concrete debris), medium dense		6221
5.0			0.0	88	SP Sand w/silt: Dark Yellowish Brown (10YR 4/6), 80% fine grain sand SP, 5% med to coarse grained sand, 15% silt, trace sandstone concretions, slightly moist, no odor, medium dense	SM	6596
			0.0	89			6777
6.0			0.0	92	5'3" same as below...	SP	6527
							6462

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04:03	Subarea: 7	Group: 1	Location ID: 161			
Radiological Background: 12 / 3350 / 81		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	9a	Sand with silt: Dark Yellowish Brown (10YR 4/6) 90% SP fine grained sand, 10% silt, trace sandstone concretions, medium dense to dense, dry 6'6" Refusal on sandstone bedrock at 6'6" bgs. NO GW encountered	SP	6	6462
			0.0	7a			7	5955
7.0								
8.0								
9.0								
10.0								
11.0								
12.0								
13.0								



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 165
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1202	Date/Time Total Depth Reached 9-16-11/1211
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#70272) (1210)		
Geologist C. Carmichael	Checked by/Date <i>[Signature]</i> 1-12-12		

Radiological Background 24	Radiological Equipment Used up R meter	PID Used Mini Rae 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.024	<p>1" of weathered asphalt on top ✓ <i>pale brown</i></p> <p>Silty sand with rock fragments, (10YR, 6/3), 60% fine to medium grained sand, 20% silt, 20% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.</p> <p>No GW reached</p>	SM		

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 165
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2.5 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/25/11 1456	Date/Time Total Depth Reached: 10/25/11 1509	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		70273-1515	
Geologist: Ian Stone		Checked By / Date: <i>[Signature]</i> 1-12-12		

Radiological Background: 19 / 4755 / 107	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 0.5 = 4473 (CPM)
0.0			0.0	102	Silty Sand, Dark Yellowish brown (10YR 4/4) 70% fine sand, 30% silt, trace sandstone gravel, dry, low-med dense, no odor or staining	SM	4788
0.5			0.0	90			5010
1.0			0.0	105			5290
1.5			0.0	79			5246
2.0			0.0	102			5390
2.5			0.0	138			5197
3.0					TD = 2.5ft bgs no gw encountered, no anomalies Refused on sandstone		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 166
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 27"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10-11-11/0958	Date/Time Total Depth Reached: 10-11-11/ 1018	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: 8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#70274) (1025)		Checked By / Date: [Signature] 1-12-12	
Geologist: Chelsea Carmichael				

Radiological Background: 78, 3504	Radiological Equipment Used: Micro R (Downhole) Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs	Borehole Gamma Readings (CPM)
0.5			0.0	127	Silty sand, (10YR, 4/4), 75% fine to medium grained sand, 15% silt, 10% sandstone rock fragments, semi-moist, medium dense, no plasticity, hardness or odor, trace asphalt.	SM		0.5 - 3516
			0.0	82				4876
1.0			0.0	91				1 - 5436
			0.0	96				5324
2.0			0.0	75				2 - 5352
3.0					Refusal at 27" - bedrock No GW reached.		3	
4.0							4	
5.0							5	
6.0							6	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 168
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 20"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10-11-11/1319	Date/Time Total Depth Reached: 10-11-11/1345	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: 8 oz jar		One 1/2 Gallon Bag (Approx 8 lbs.) (#.70276) (1350)	
Geologist: Chelsea Carmichael		Checked By / Date: [Signature] 1-12-12		

Radiological Background: 101, 3607	Radiological Equipment Used: Micro R (Downhole) Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	80	Silty sand, (10YR, 4/4), brown, 80%. Fine to medium grained sand, 15% silt, 5%. Sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.	SM		3819
			0.0	89			5164	4068
1.0			0.0	83			5587	
			0.0	78			5615	
2.0					Refusal at 20" - bedrock		2	
					No GW reached			
3.0							3	
4.0							4	
5.0							5	
6.0							6	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 169
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 4.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/10/11 0910	Date/Time Total Depth Reached: 10/10/11 0950	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: 1 6oz Jar One 1/2 Gallon Bag (Approx 8 lbs.)		70277 (0920)	
Geologist: C. Knight	Checked By / Date: [Signature] 1-12-12			

Radiological Background: 10MR/2442/47	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description <i>AF: Artificial Fill</i> (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	47	Surface: soil and			3329
0.5			0.0	49	Fill: Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 25% silt, 10% medium sand, 65% fine sand, trace angular fine gravel (sandstone), trace rootlets, mottled	AF/SM		3430
1.0			0.0	53				5277
2.0			0.0	52	1'6" angular fine siltstone gravel			5669
			0.0	56	Same as above: Fill: Silty Sand	AF/SM	2	5895
			0.0	57	2'5" Sandstone cobbles: Pale yellow (2.5Y 7/3), dense, no odor, dry, fine grained sandstone	AF/SM		6023
3.0			0.0	59	2'9" Silt: Olive brown (2.5Y 4/3), dry, medium stiff, no odor, 100% silt, cohesive, low plasticity, low toughness	ML	3	5919
4.0			0.0	60	3'2" Sandstone Bedrock: Pale yellow (2.5Y 7/4), dry, very dense, no odor, mechanically weathered to SP, fine grained sandstone	Bedrock		6055
			0.0	69			4	5540
5.0					Refusal on sandstone at 4' bgs			
6.0					No GW encountered		5	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 170		
Drilling Company: <i>Beart</i> <i>Beart</i> Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 10 ft bgs.		
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/24/11 1023		Date/Time Total Depth Reached: 9/26/11 1028 <i>10:06</i>		
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) + 8oz. jar 70278(1030)				
Geologist: <i>L. Robbins Goldman</i>				Checked By / Date: <i>L. Robbins Goldman</i> 1/12/12				
Radiological Background: <i>SMR 3350 cpm / 55</i>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)	
			0.0	49	Surface: soil + grass		+0.5' = 3502	
			0.0	50	AF = artificial fill Silty sand: yellowish brown (10YR 5/6), dry, dense, 75% fine sand, 10% med sand, 5% subangular gravel, 10% silt, trace asphalt chunks (<5mm), non-cohesive, low toughness, low dry strength, rapid dilatancy, rootlets (trace), slightly mottled.	AF/SM	3869	
			0.0	48		1	5149	
			0.0	60			5452	
			0.4	56		2	5685	
			0.1	61			5818	
			0.0	70	2'8" sandstone cobble: pale yellow (2.5Y, 7/3), dry		3	5719
			0.0	67	3'0" silty sand (same as 0' - 2'8" depth), no asphalt or rootlets present.	SM		5568
			0.0	64	3'7" silt: dark yellowish brown (10YR 4/4), moist, stiff, 90% silt, 10% fine sand, cohesive, med. dry strength, tough, slightly mottled, trace iron oxide staining, trace CaCO ₃ nodules (~1mm).	ML	4	5398
			0.0	52				
			0.0	57	Silty sand: yellowish brown (10YR 5/8), semi-moist to moist, 75% fine sand, 10% sandstone to gravel (~10mm to 50mm), 10% silt, 5% med. sand, dense, rapid dilatancy, non cohesive, low dry strength	SC	5	6014
			0.0	29		SM		5925
			0.3	48			6	5880

Project Name:		Project Number:	Subarea:	Group:	Location ID:						
SSFL Area IV Radiological Study		EP038.01.22.04.03	7	1	170						
Radiological Background:		Radiological Equipment Used:		PID Used:							
15/3356/55		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm							
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)			
6.0			0.0	48	Silty sand (same as above)	SR SM	6	5888			
			0.3	48			6	5890			
			0.0	48				5921			
7.0			0.0	33				7	6098		
			0.0	24					6044		
8.0			0.0	47			8' 2" siltstone beds: olive yellow - (2.5YR 4/6), med. dense		8	5951	
			0.0	56			Silty sand (same as above)	SR SM		6094	
9.0			0.0	73						9	5896
			0.0	83							5972
10.0			0.0	70						10	6024
11.0					final depth = 10' bgs no GW encountered no anomalies		11				
12.0							12				
13.0							13				

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 171
Drilling Company: HGL		Driller: J. HARRIS/I. STONE	Ground Elevation: NA		Total Depth Drilled: 10'0"
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 11/3/11 1240	Date/Time Total Depth Reached: 11/3/11 1415	
Type of Sampling Device: 2 3/4" hand auger		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs) (# 70279) (1430)		Checked By / Date: Dulbon-Robin Feldman 1/12/12	
Geologist: Timothy Morse		Radiological Background: 14 / 3422 / 72		Radiological Equipment Used: Micro R / Downhole / Pancake Meters	
		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' 3577 (CPM)
			0.0	79	Surface: Soil + Veg.		4524
0.5			0.0	85	Silty Sand: Olive Brown (2.5Y 4/4), 25% silt, 65% fine grained sand, 5% medium to coarse grained sand, 5% subangular artificial fill and sandstone gravel, trace sandstone concretions, dry, no odor, medium dense, low to no plasticity	AF / SM	5406
1.0			0.0	80			5597
			0.0	76	↳ 1' to 2' bgs. same as above except 5 to 10% subangular fill/sandstone gravel		5546
2.0			0.0	74	↳ 2'0" concrete debris located at ~ 2'6" bgs. same as above, except slightly moist		5476
			0.0	70	↳ 2'6" -----		5542
3.0			0.0	81	Silty Sand: Dark Yellowish Brown (10YR 4/4) 30% silt, 60% fine grained sand, 5% medium to coarse grained sand, 5% clay nodules and sandstone concretions, trace artificial fill debris (asphalt and concrete), slightly moist, no odor, medium dense to dense low plasticity, slightly cohesive	AF / SM	5553
			0.0	77			5559
4.0			0.0	83	↳ 3'6" -----		5506
			0.0	84	Silty Sand: Dark Yellowish Brown (10YR 4/4) 25% silt, 70% fine grained sand, 5% med. to coarse grained sand, trace sand stone gravel, artificial debris gravel, trace clay nodules slightly moist, no odor, low to no plasticity, medium dense	AF / SM	5689
5.0			0.0	93			5802
			0.0	100	↳ 5'0" -----		5917
6.0			0.0	76	Same as above except 5% subangular sandstone gravel and/or fill gravel		5971

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04:03		7	1	171	
Radiological Background:		Radiological Equipment Used:		PID Used:			
14 / 3422 / 72		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)							
6.0			0.0	76	Same as above...		5871
			0.0	89		AF/SM	6082
7.0			0.0	86	7'0" -----		5714
			0.0	115	Silty Sand: Dark Yellowish Brown (10YR 4/6) 20% silt, 75% fine grained sand, 5% med. grained sand, trace clay nodules and sandstone concretions, trace asphalt piece and debris material, slightly moist, medium dense to dense, nonplastic, no odor		5800
8.0			0.0	108		AF/SM	5784
			0.0	96			5849
9.0			0.0	102			5640
			0.0	90 HS	Same as above...		5709
10.0			0.0	115	10'0"		5685
					Bore complete at 10' 0" bgs. no refusal no groundwater encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 172
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9/27/11 0925	Date/Time Total Depth Reached: 9/27/11 0930	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) + (2) 8oz. jar		Dwp: 70312 (NT) 70280 (0930)	
Geologist: L. Robbins Goldman		Checked By / Date: J Robbins Goldman 1/12/12		

Radiological Background: 15/3496/48	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 8.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	85	Surface = soil + grass			3451
			0.0	96	AF = artificial fill			
0.5			0.0	73	silty sand (fill): yellowish brown (10YR 5/4), dry to semi-moist, dense, no odor, 80% fine sand, 10% silt, 5% med sand, 5% granitic angular + subangular gravel, non cohesive, med. tough, low dry strength, rapid dilatancy, trace rootlets, trace CaCO ₃ nodules, gravel sizes vary from 1cm to 5cm diameter, trace charcoal fragments ~ 2mm, small chunks of high grade concrete	AF		3943
1.0			0.0	75		SM		5227
2.0			0.0	58				5595
			0.0	45				5606
			0.0	79				5646
			0.0	55				5549
3.0			0.0	58				5509
			0.0	53				5555
4.0			0.0	68				5510
			0.0	81				5400
5.0			0.0	71			5305	
								5415
6.0								5489

unit continued on next page

Project Name:		Project Number:	Subarea:	Group:	Location ID:			
SSFL Area IV Radiological Study		EP038.01.22.04.03	7	1	172			
Radiological Background:		Radiological Equipment Used:		PID Used:				
1513496/48		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft. bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	71	silty sand (continued from above)	AF / SM	6	5489
			0.0	82			5629	
7.0			0.0	71	soil is moist		7	5471
			0.0	90				5539
8.0			0.0	78			8	5654
			0.0	95				5536
9.0			0.0	82			9	5586
			0.0	75	angular siltstone fragments, mottled, ~5mm, olive brown (2.5Y, 4/4)	AF / SM		5776
10.0			0.0	63			10	5678
11.0					total depth = 10' bgs no GW encountered no anomalies		11	
12.0							12	
13.0							13	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 173
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 2.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/10/11 1035	Date/Time Total Depth Reached: 10/10/11 115	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70282(1050)			
Geologist: C. Knight	Checked By / Date: J. Robbins Goldman 1/13/12			

Radiological Background: 10AR13568/58	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 00 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	51	Surface: Soil and grass			+0.5' 3443
0.5			0.0	54	S. lty Sand: Pale yellow (2.5Y 7/4), moist, medium dense, no odor, 15% silt, 85% fine sand, some roots	SM		3825
1.0			0.0	53	Weathered Sandstone Bedrock or Cobble or Boulder: Yellow (2.5Y 7/6), dry, very dense, no odor, mechanically weathered to SP, fine grained sandstone		1	5614
2.0			0.0	53			2	5864
3.0					Refusal on Bedrock Sandstone at 2.0' bgs		3	5863
4.0							4	
5.0							5	
6.0							6	

Bedrock / Cobble / Boulder

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 175
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-21-11/0856	Date/Time Total Depth Reached: 9-21-11/0906	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: Field DUP: # 70365		One 1/2 Gallon Bag (Approx 8 lbs.) (# 70284) (0905)	
Geologist: Chelsea Carmichael	Checked By./ Date: <i>John Rabinovitch</i> 1/13/12			
Radiological Background: 20	Radiological Equipment Used: Micro B / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm		

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	19	Silt with sand, (10 YR, 4/4), brown, 85% silt, 15% fine to medium grained sand, dry, medium stiff, trace sandstone and gravel fill rock, very low plasticity and hardness, no odor, 1 iron nail found.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name:		Project Number:		Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03		7	1	175		
Radiological Background:		Radiological Equipment Used:		PID Used:				
12 / 3165 / 70		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)	
6.0			0.0	67	Clayey sand w/silt: Dark Brown (10YR 3/3) 30% clay, 46% fine grained sand, 5% coarse to med. grained sand, 20% silt, dry, no odor, cohesive, firm, pockets of clay, low plasticity, medium dense to dense 7'-8' - trace rootlets trace calcium carbonate deposits	SC	6	5138
			0.0	74			7	5135
7.0			0.0	78			8	5241
			0.0	80			9	5089
8.0			0.0	93	8'0"	CL	8	5089
			0.0	87	Sandy clay with silt: Brown (10YR 4/2) 35% fine grained sand, 40% clay, 25% silt, dry, no odor, cohesive, firm, stiff,		9	5128
9.0			0.0	72			10	5184
			0.0	63			11	4951
10.0			0.0	56	10'0"	12	5045	
					10' bgs. Total sample depth reached NO GW encountered	13		
11.0								
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a	Location ID: 176	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-15-11/1027		Date/Time Total Depth Reached: 9-15-11/1033	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 70286) (1032)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Robert Feldman</i> 1/13/12			
Radiological Background: 21		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	20	Gravelly sand with silt, (104R, 6/3), ^{6 pale brown} 50% fine to medium grained sand, 40% sandstone rock fragments and asphalt fragments, 10% silt, dry, medium dense, no plasticity, hardness or odor.	SW	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group:	Location ID: 177	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 4.0 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9/25/11 0805		Date/Time Total Depth Reached: 9/29/11 0900	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 70288 (0830)			
Geologist: C-Knight				Checked By / Date: John Robb's Feldman 1/13/12			
Radiological Background: 15mR/2893/144		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			0.0	54	Surface: Asphalt		453040
0.5			0.0	57	Asphalt 3" thick		3510
1.0			0.0	64	Fill: Silty Sand: Pale yellow (2.5Y 7/4), dry, medium dense, no odor, 5% coarse sand, 5% subangular fine gravel (fill rock), 20% medium sand, 15% silt, 60% fine sand, mottled	Af / SM	4151
2.0			0.2	75			5232
2.0			0.1	70			5508
3.0			0.1	80	2'1" Fill: Sandy Silt: Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 30% fine sand, 70% silt, cohesive, low plasticity, low toughness	Af / ML	5579
3.0			0.2	76	2'7" Fill: Silty Sand: Light yellowish brown (10YR 6/4), dry, medium dense, no odor, 20% silt, 5% coarse sand, 10% medium sand, 65% fine sand, mottled	Af / SM	5002
4.0			0.1	59	3'6" Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), dry, very dense, no odor, mechanically weathered to SP, fine grained sandstone		5445
4.0			0.0	79			5158
5.0					Refusal on sandstone @ 4.0' bgs		4916
6.0					No GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: n/a	Location ID: 178	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-13-11/0945		Date/Time Total Depth Reached: 9-13-11/0950	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: (1) 8oz. jar One 1/2 Gallon Bag (Approx 8 lbs.) (#70289) (0950)			
Geologist: Chelsea Carmichael				Checked By./ Date: <i>Suleman Robinson / Feldman 1/13/12</i>			
Radiological Background: 19		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	21	<i>dark yellowish</i> Silt with sand, (10YR, 4/4), brown, 85% silt, 15% fine to medium grained sand, dry, stiff, very low hardness, very low plasticity, no odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 178
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 6'9" ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-15-11 0725	Date/Time Total Depth Reached: 9-15-11 0810	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) + 8oz Jar 70290 (0740)			
Geologist: C. Knight	Checked By / Date: Julian Robbins / Goldman 1/13/12			

Radiological Background: 104R/3555/48	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
					Surface: Soil and grass		10.5' 3671
0.5			0.0	62	Silty Sand: light yellowish brown (104R 6/4), dry, medium dense, no odor, 30% silt, 5% medium sand, 65% fine sand, trace rootlets	SM	4058
			0.0	66			5010
1.0			0.0	75			4868
			0.0	85			4866
2.0			0.0	61			4861
			0.0	50	2'3" Poorly graded sand with silt: Brownish yellow (104R 6/6), dry, medium dense, no odor, 10% silt, 5% medium sand, 85% fine sand, trace iron oxide staining	SP	4740
			0.0	49			4834
3.0			0.0	54			4802
			0.0	55			4805
4.0			0.0	64			5050
			0.0	67			5001
			0.0	65	5'6" weathered Bedrock sandstone: Pale yellow (2-54 7/4), moist, dense, no odor, fine grained sandstone, some iron oxide staining	Bd	4950
6.0			0.0	62			4863

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 178	
Radiological Background: 18, R / 3555 / 48		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.10	62	Same as above: Bedrock Sandstone	Bedrock	4863
			0.10	73	6" - siltstone bed ~ 2" thick		574
			0.10	69	6' 9" —————		NM
7.0					Refusal on 6' 9" on Sandstone No GW encountered		
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							



BORING LOG

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Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 179
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1502	Date/Time Total Depth Reached 9-16-11/1509
Type of Sampling Device trowel/shovel	Samples Collected (1) 1/2 gall bag (#70291) (1508)		
Geologist C. Carmichael	Checked by/Date Juduan Robbins Feldman 1/13/12		

Radiological Background 18	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.017	Silty sand with rock fragments, (10YR, 5/3) light brown, 55% fine to coarse grained sand, 30% silt, 15% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 7	Group: 1	Location ID: 181	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-23-11/1032		Date/Time Total Depth Reached: 9-23-11/1041	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#70294) (1040)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>William Kellum Golden 1/13/12</i>			
Radiological Background: 19		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	SCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	20	Sandy silt with gravel, (10 YR, 5/4) yellowish brown 50% silt, 35% fine to medium grained sand, 15% gravel fill rock, dry, medium stiff, no plasticity, hardness or odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 181
Drilling Company: HGL	Driller: J. Harris	Ground Elevation: NA		Total Depth Drilled: 1'7" bgs (1615)
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10/13/11 1500	Date/Time Total Depth Reached: 10/13/11 1'7" bgs. (1615) TM	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx. 8 lbs.) (# 70295, 70296, 1615)		Checked By / Date: J. Johnson 1/13/12	
Geologist: T. Morse				

Radiological Background: 3750 / 94	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	96	Surface: Igneous cobbles on surface 3-4"		10.5 3901
0.5			0.0	89	Sandy silt: Olive Brown (2.5 Y 4/4) 60% silt, 40% fine grain (sp. sand), slightly moist, medium dense to loose, no odor, low plasticity, non-cohesive	AF ML	3938
1.0			0.0	86	Sand w/ silt: Light olive Brown (2.5 Y 5/6) 85% fine grained sp sand, 15% silt, to dry, no odor, medium dense to dense, non-cohesive,	SM	5415
2.0			0.0	82	1'7" Mechanically weathered sp, dry, dense, no odor Refusal on sandstone bedrock 1'7" bgs. No GW encountered	Bedrock	5511
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 7	Group: 1	Location ID: 183
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-15-11 1355	Date/Time Total Depth Reached: 9-15-11 1455	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		70298	(1410)
Geologist: C. Knight	Checked By / Date: J.R. Goldman 9/13/12			

Radiological Background: 14MR/2828/50	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	64	Surface Soil & Gravel			705 3284 (CPM)
0.5			0.0	66	Fill: ^{cl. silt, sand} light yellowish (10YR 6/4), dry, medium stiff, no odor, 35% fine sand, 5% medium sand, 60% silt, low plasticity, low toughness, cohesive, trace rattlets	AF/ML		3852
1.0			0.0	63			1	5476
			0.0	74	12" Fill: silty sand: very pale brown (10YR 7/4), dry, medium dense, no odor, 5% coarse sand, 30% silt, 5% ^{cl.} medium sand, 60% fine sand, mottled	AF/SM		5440
2.0			0.0	56	2'0" siltstone gravel		2	5465
			0.0	48				5706
3.0			0.0	53			3	5759
			0.0	50				5336
4.0			0.0	61			4	5817
			0.0	79	Same as above	AF/SM		6202
5.0			0.0	72	4"8" thick charcoal section with ~20% silt. All black	AF	5	6195
			0.0	66	5"1" Fill: silt: very dark grayish brown (10YR 3/2), moist, medium stiff, no odor, 6% fine sand, 95% silt, cohesive, low plasticity, low toughness	AF/ML		6443
6.0			0.0	85			6	6456



BORING LOG

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Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 7, group 1	Location ID 184
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 9-16-11/1448	Date/Time Total Depth Reached 9-16-11/1456
Type of Sampling Device trowel/shovel	Samples Collected (1) 1/2 gall bag (#70299) (1455)		
Geologist C. Carmichael	Checked by/Date Sub. Dan Robbins/Goldman 1/13/12		

Radiological Background 18	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.0 17	Silty sand with rock fragments, (10YR, 5/4) SM light yellowish brown, 60% fine to coarse grained sand, 25% silt, 15% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor, 1 piece of iron metal found.			
No GW reached.								

