



Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: Subarea 6 group 1	Location ID: 2
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 1010 ft. bgs
Drilling Equipment: Geo probe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 8-3-11 1330	Date/Time Total Depth Reached: 8-3-11 1420
Type of Sampling Device: 1 3/4" Macrocoring	Samples Collected: (1) 1/2 gallon bags + 4 ^{CK} Jar 60002 (1340)		
Geologist: C. Knight	Checked by/Date: Chelsea Carnichael / 8-16-11		

Radiological Background: 41 / 2766 / 104R
 Radiological Equipment Used: Pancake / downhole / Micro R 1
 PID Used: Mini Rae 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: gravel and grass		1052776
			0.0	56	Fill: Artificial Fill		3534
0.5			0.0	52	Fill: Clays silt; light yellowish brown (2.54 6/4) dry, medium stiff, no odor, 20% clay, 5% fine sand, 75% silt, low plasticity, low toughness, cohesive, mottled	AF / ML	4055
1.0			0.0	73			4189
			0.0	65	19"		4102
2.0			0.0	58	Fill: Silty Clay: Pale brown (104R 6/3), moist, medium stiff, no odor, 20% silt, 5% fine sand, 75% clay, medium stiff plasticity, medium toughness, cohesive, mottled, trace pea size gravel	AF / CL	3999
			0.0	64			3921
3.0			0.0	58			4068
			0.0	43			4155
4.0			0.0	60	3'8"	AF / SM	4491
			0.0	61	4'5"		5118
5.0			0.0	53	Fill: Silty Clay with sand: Brown (104R 5/3), moist, stiff, no odor, 5% fine sand, 20% silt, 75% clay, medium plasticity, medium toughness, cohesive	AF / CL	4969
			0.0	53			4805
6.0			0.0	65			5461

Radiological Background 41/2766/10, MR				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.D3	Location 2		
Depth	Interval	Recovery	PTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micaceous, bedding, plasticity, density, cohesiveness, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
6.0		0.0	65		Same as above: Silty Clay with Sand	AF		5461
		0.0	55			Cl		5609
7.0		0.0	77		6'9" Fill: Silty Sand; dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 5% coarse sand, 5% medium gravel, 10% medium sand, 20% silt, 60% fine sand	AF		5606
		0.0	54			SM		5683
8.0		0.0	58		7'4" concrete debris ~ 1/2" diameter			
		0.0	70		7'11" concrete debris ~ 1/4" diameter			5574
		0.0	70					5422
9.0		0.0	65		8'8" granitic gravel ~ 1/2" diameter			
		0.0	67					5674
		0.0	67					5683
10.0		0.0	85		10'0" angular volcanic gravel (fill rock)	AF		
						SM		5709
Total Depth: 10.0' bgs								
No GW encountered								

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 3
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.3 (9'4") Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-3-11 0855	Date/Time Total Depth Reached 8-3-11 0850
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz jar 60003 (0800)		
Geologist C. Knight	Checked by Date Chelsea Carmichael / 8-16-11		

Radiological Background
43 / 2444 / 12

Radiological Equipment Used
Pancake / downhole / Micro R 1

PID Used
Mini Rae 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
					surface: soil and grass		10.5	2924
0.5			0.0	53	Fill: Artificial Fill			
			0.0	90	Fill: Clayey silt: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 5% medium sand, 25% clay, 70% silt, low plasticity, low toughness, cohesive, mottled, rootlets near surface	AF / ML	3203	3933
1.0			0.0	40				3962
			0.0	65				3961
2.0			0.0	55				4063
			0.0	53	2'4" -			4041
3.0			0.0	66	Fill: Silty clay: light yellowish brown (10YR 6/4), moist, stiff, no odor, 5% fine sand, 30% silt, 65% clay, cohesive, medium plasticity, medium toughness, trace coarse sand, mottled	AF / CL	4078	4144
			0.0	85				4144
4.0			0.0	90	3'10" -			4407
			0.0	68	Fill: Silty sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 5% coarse sand, 10% medium sand, 15% silt, 75% fine sand, mottled	AF / SM	5137	
5.0			0.0	76	4'10" -			5159
			0.0	80	Fill: Silty clay: light yellowish brown (10YR 6/4), moist, stiff, no odor, 30% silt, 70% clay, medium plasticity, medium toughness, cohesive, mottled	AF / CL	4719	
6.0			0.0	65				4483

Radiological Background 43/2944/12mR				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 3	
Depth	Interval	Recovery	FTD	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)
6.0		0.0	64	61"	contact 61"		4483
		0.0	75		Fill: Silty Sand with gravel: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 20% silt, 10% subangular medium gravel and concrete debris, 5% medium sand, 65% fine sand, mottled	AF SM	5028
7.0		0.0	83				5478
		0.0	70	2' 6" concrete debris			5400
8.0		0.0	73				5476
		0.0	56	8' 7"	Fill: Poorly graded Sand: Brown (7.5YR 5/4) moist, medium dense, no odor, 5% silt, 10% medium sand, 85% fine sand, mottled	AR SP	5811
9.0		0.0	65		Weathered Sandstone Bedrock: Dark yellowish brown (10YR 4/4) moist, hard, no odor, mechanically weathered to SP, fine grained sandstone, 5% silt, 95% fine sand.		5693
		0.0	68	5' 3"			NM
10.0							
11.0					Refusal 9' 4" hgs on sandstone		
12.0					No GW encountered		
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 4
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-3-11 1100	Date/Time Total Depth Reached 8-3-11 1150
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4 1/2 Jar 60005 (1110)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 8-16-11		

Radiological Background
39 / 14088 / 154R

Radiological Equipment Used
Pancake / downhole / MARL

PID Used
Mini Rae 2000 (Bkgs: 0.0 ppm)

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)
			0.0	52	Surface: soil		10.5 3749
0.5			0.0	55	Silty sand: light yellowish brown (10YR 6/4), dry, medium dense, no odor, 20% silt, 5% coarse sand, 15% medium sand, 60% fine sand	SM	3802
1.0			0.0	63	Weathered sandstone bedrock: olive yellow (2.5Y 4/6), dry, very dense, no odor, 10% medium sand, 90% finesand, mechanically weathered to SP, fine grained sandstone, Iron oxide staining	SC	4382
			0.0	91			4800
2.0			0.0	83			5277
			0.0	94			5480
3.0					Refusal on sandstone at 2.5 bgs No GW encountered		5407
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 4f				
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 7-15-11/1107	Date/Time Total Depth Reached 7-15-11/1116				
Type of Sampling Device trowel/shovel		Samples Collected 1 1/2 gall bag (#60004) (M15)						
Geologist C. Carmichael		Checked by/Date Chelsea Carmichael 8-16-11						
Radiological Background 5		Radiological Equipment Used up R. meter		PID Used Mini Rae 2000 (Bkgd: 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	15	Silty sand with gravel, (10 YR, 5/4), light brown, 60% fine to medium grained sand, 25% silt, 15% gravel fill, sandstone fragments, concrete fragments, dry, dense, trace rootlets, no plasticity, hardness or odor. No GW reached.	SM		



BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 5
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 7-15-11/1045	Date/Time Total Depth Reached 7-15-11/1055
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60006) (T054)		
Geologist C. Carmichael	Checked by/Date Judith Robbin Melman 12/12/11		

Radiological Background 15	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 <small>(CPM)</small>
0.5'			0.0	15	Silty sand, (10YR, 4/4), brown, 75% fine to medium grained subangular sand, 20% silt, 5% sandstone rock fragments, dry, medium dense, common rootlets, no plasticity, hardness or odor.	SM		
No GW reached								

Radiological Background 45/2474/10AR					Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 6
Depth	Interval	Recovery	PTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
							Inches
6.0		0.0	80		Fill Same as above + Silty Sand. Fill	AF	5787
		0.0	71		0'9" Sub angular medium sandstone gravel	SM	5785
7.0		0.0	60		7'3" sub angular fine sandstone gravel		5720
		0.0	67				5782
8.0		0.0	40		7'9" Fill: Well graded gravel with silt; Yellowish brown (10YR 5/6), moist, medium dense, no odor, 10% silt, 20% coarse sand, 30% medium sand, 40% fine sand, sub angular grains	AS SW	5813
		0.0	81				5756
9.0		0.0	87		Sandy silt; Dark gray (7.5YR 4/1), very moist, medium stiff, slight organic odor, 25% fine sand, 70% silt, 5% roots and rootlets (up to 1/4" diameter), low plasticity; low toughness, cohesive, slow dilatancy		5623
		0.0	90				5701
10.0		0.0	96				5841
<p>Total Depth: 10.0' bgs</p> <p>No GW encountered</p>							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6. group 1	Location ID 28 ^{ca} 8
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5 ^{ca} 0.25'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 7-27-11/0758	Date/Time Total Depth Reached 7-27-11/0805
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60010) (0805)		
Geologist C. Carmichael	Checked by/Date Judean Robbins Galdman 12/12/11		

Radiological Background 15	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	Borehole Gamma Readings <small>Inches (CPM)</small>
0.25				16	Sand with silt and gravel, (10YR, 4/4), brown, 75% fine to coarse grained sand, 15% gravel, asphalt, sandstone rock fragments, 10% silt, dry, medium dense, no plasticity, hardness, or odor. Bedrock hit at 0.25'	SW	
0.5					2-3" of asphalt on top		
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, 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 7-27-11/0818	Date/Time Total Depth Reached 7-27-11/0830
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60012) (0830)		
Geologist C. Carmichael	Checked by/Date Julie Robinson-Hedman 12/12/11		
Radiological Background 16	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)	

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	Inches	Borehole Gamma Readings (CPM)
0.5'				0.015	<p>Silty sand, (10 YR, 4/4), brown, 70% fine to medium grained sand, 20% silt, 10% sandstone, asphalt 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: EP9038.01.22.04.03	Subarea ID & Group: Subarea 6, group 1	Location ID: 10
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 7.5 ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 8-5-11 0750	Date/Time Total Depth Reached: 8-5-11 0815
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: (1) 1/2 gallon bags 60014 (0800)		
Geologist: C. L. Knight	Checked by/Date: Chelsea Carmichael / 8-16-11		

Radiological Background: 62 / 2381 / 10.1R	Radiological Equipment Used: Pancake / downhole / Micro R 1	PID Used: Mini Rae 2000 (Bkgd: 40.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: asphalt		
			0.0	63	3" Asphalt	AF	3204
0.5			0.0	67	Fill: Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 15% silt, 5% sub rounded gravel (fill rock), 10% coarse sand, 15% medium, 55% fine sand	AF / SM	4438
1.0			0.0	60			5515
			0.0	62	Silty Sand: Strong brown (7.5 YR 5/6), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand	SM	5531
2.0			0.0	71			5649
			0.0	80			5889
3.0			0.0	62			5750
			0.0	75			5946
4.0			0.0	68			5915
			0.0	73	Same as above: Silty Sand	SM	5951
5.0			0.0	71			5867
			0.0	80	Poorly graded Sand: Brownish yellow (10YR 6/6), moist, dense, no odor, 5% coarse sand, 20% medium sand, 75% fine sand, trace Fe staining	SP	5867
6.0			0.0	76			5941

Radiological Background 62/2384/10μR				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 10	
Depth	Interval	Recovery	RTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.6	76	Same as above: 6" H ₂ O Sand Pearly graded sand 2% c/c	CK SM	5941
			0.0	69	6'6"	SP	6001
7.0			0.0	73	Weathered Sandstone bedrock: Yellow (10YR 7/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone, 1/4" thick diagonal stringer of fine sand light brownish gray (10YR 6/2).	B S CL	5926
			0.0	74		7'6"	
8.0					Refusal at 7.5' bgs on Sandstone No GW encountered		
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 12
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 7-26-11/1500	Date/Time Total Depth Reached 7-26-11/1507
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (# 60016) (1507)		
Geologist C. Carmichael	Checked by/Date J. Deane Robbins, J. Goldman 12/12/11		

Radiological Background 17	Radiological Equipment Used w/ Raeter	PID Used Mini Rac 2000 (Bkgd: 0.0ppm)
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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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.016		Silty sand with gravel, (10YR, 6/4), light brown, 65% fine to coarse grained, 15% silt, 20% gravel fill and sandstone fragments, dry, medium dense, no plasticity, hardness or odor. No GW reached.	SM		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 12
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1' 10" ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-5-11 0850	Date/Time Total Depth Reached 8-5-11 0905
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 60017 (SAMPLE 6)		
Geologist C. L. Knight	Checked by/Date Chelsea Carmichael / 8-16-11		

Radiological Background 53 / 3172 / 10 pR	Radiological Equipment Used Pancake / downhole / MicroR	PID Used Mini Rae 2000 (Bkgd: 30.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches +65 C1C (CPM)
			0.0	52	Surface: asphalt v-ditch 2" Asphalt		
0.5			0.0	57	Fill: Silty sand with trace! light brownish gray (104% (6/2), dry, medium dense, no odor, 10% medium sub rounded gravel (close rfd), 20% silt, 10% coarse sand, 20% medium sand, 40% fine sand	MS / SM	No downhole Gamma collected
1.0			0.0	80	Sandstone bedrock: Light olive brown (2-5Y 5/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	B / G / K	
2.0			0.0	77	1' 10" Dark gray mudstone beds		
3.0					Refusal Sandstone 1' 10"		
4.0					NO GW encountered		
5.0					NO Lab sample collected		
6.0							



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	Location ID 13
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 7-26-11/1441	Date/Time Total Depth Reached 7-26-11/1446
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60018) (1445)		
Geologist C. Carmichael	Checked by/Date LuAnn Robinson-Heldman 12/12/11		

Radiological Background 17	Radiological Equipment Used up Reiter	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'					Silty sand with gravel, (10 YR, 5/4); light brown, 60% fine to coarse grained sand, 20% silt, 20% fill gravel, asphalt pieces, dry, medium dense, no plasticity, hardness or odor. No GW reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 14
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-4-11 0710	Date/Time Total Depth Reached 8-4-11 0805
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 402 ^{CL} Jar 60020 (0720)		
Geologist C. Knight	Checked by/Date Chelsea Cornichan / 8-16-11		

Radiological Background 45 / 2438 / 10.0R	Radiological Equipment Used Pancake / downhole / MinR 1	PID Used Mini Rae 2000 (Bkgd: 40.0 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 Inches (CPM)
			0.0	67	Surface: gravel & gravel		2982
0.5			0.0	60	Fill: Sandy silt with clay: light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 20% fine sand, 10% clay, 70% silt, cohesive, low plasticity, low toughness, mottled.	AF / M	3501
1.0			0.0	65			4187
			0.0	65			4316
2.0			0.0	70			4447
			0.0	70			4714
			0.0	65	2'8" _____		4529
3.0			0.0	53	Fill: Silty Clay: yellowish brown (10YR 5/4), moist, medium stiff, no odor, 35% silt, 5% fine sand, 60% clay, cohesive, medium plasticity, low toughness.	AF / CL	4425
			0.0	54			4713
			0.0	57	2'9" _____ Fill: Silty Sand: Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 5% fine gravel (fill rock), 10% coarse sand, 15% medium sand, 25% silt, 45% fine sand, mottled.	AF / SM	5325
4.0			0.0	52			5525
5.0			0.0	65			5506
			0.0	49			5464
6.0			0.0	60			5397

Radiological Background 45/2438/10					Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 14	
Depth	Interval	Recovery	PTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
6.0		0.0	60		Same as above: Fill: Silty Sand, mottled 6'9" trace fine (fill rock) gravel	AF SM	5397	
		0.0	50				5570	
7.0		0.0	53				5729	
		0.0	46				5842	
8.0		0.0	70				5859	
		0.0	70		8'5" concrete debris 3/4" diameter		5855	
9.0		0.0	72				5731	
		0.0	55				5820	
10.0		0.0	50		Same as above: Fill: Silty Sand	AF SM	5632	
11.0					ck Ref. Total Depth: 10.0' bgs No GW encountered			
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group	Location ID 15
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-3-11 1435	Date/Time Total Depth Reached 8-3-11 1526
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4 ^{CL} for 60021 (1445)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 8-16-11		

Radiological Background 37 / 2648 / 10uR	Radiological Equipment Used Pancake / downhole / Micro/R	PID Used Mini Rae 2000 (Bkgd: 40.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <i>AF: Artificial Fill</i> (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches +0.5' 2882 (CPM)
			0.0	53	Surface: gravel and grass		
0.5			0.0	51	Fill: ^{CL} Fill Silty sand with clay: light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 5% coarse sand, 5% medium sand, 15% fine sand, 15% clay, 60% silt, low plasticity, low toughness, cohesive	AF / ML	3465 4150
1.0			0.0	56			4793
			0.0	56			4596
2.0			0.0	71			4440
			0.0	73	Same as above: Silty sand with clay	AF / ML	4481
3.0			0.0	64			4748
			0.0	75	3' 2" Fill: Silty sand: yellowish brown (10YR 5/4), moist, medium dense, no odor, 5% coarse sand, 10% medium sand, 20% silt, 65% fine sand	AF / SM	5010
4.0			0.0	85	Fill: Gravelly Clay: ^{w/ silt} light yellowish brown (10YR 6/4), moist, stiff, no odor, 15% angular concrete debris	AF / CL	5306
			0.0	87	4' 5" (medium gravel), 15% silt, 5% fine sand, 65% clay, medium toughness, medium plasticity, cohesive		5501
5.0			0.0	76	Fill: Silty sand: dark yellowish brown (10YR 4/6), moist, medium dense no odor, 25% silt, 5% subangular medium gravel (fill rock), 5% medium sand, 65% fine sand	AF / SM	5775
			0.0	55			5732
6.0			0.0	65			5838

Radiological Background 37/2648/10UR				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 15
Depth feet	Interval	Recovery FTD	Radiological FTD	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micaceous, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
						Inches (CFM)
6.0		0.0	65	Same as above: Fill: Silty Sand	AF SM	5838
		0.0	73			5774
7.0		0.0	75			5918
		0.0	80			5794
8.0		0.0	73	7" ^{with silt} Poorly graded Sand: Strong brown (7.5YR 5/8), very moist, dense, no odor, 10% silt, 90% fine sand, Iron oxide staining	SP	5905
		0.0	77			5984
9.0		0.0	80			6046
		0.0	85			5764
10.0		0.0	90			5582
<p>Total Depth: 10.0' bgs NO GW encountered</p>						
11.0						
12.0						
13.0						

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group	Location ID 16
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-3-11 0855	Date/Time Total Depth Reached 8-3-11 1000
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 402 jar 60528 (WT) Field WIP 60022 (0910)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 8-16-11		

Radiological Background SE 13099 / 12uR	Radiological Equipment Used Pancake / downhole / Macro R 1	PID Used Mini Rae 2000 (Bkgd: 4.00 ppm)
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Depth	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 Inches (CPM)
			0.0	50	Surface: Soil and gravel		+0.5 2934
0.5			0.0	67	Fill: ^{clayey} Sandy silt w/ sand: Very pale brown (10YR 7/4), dry, medium stiff, no odor, 25% clay, 5% fine sand, 70% ^{fine} silt, low plasticity, low toughness, cohesive, mottled	AF / ML	3326 3817 3758
1.0			0.0	50			
			0.0	57			3868
2.0			0.0	54	11" Fill: Silty Clay: light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 15% silt, 5% fine sand, 80% clay	AF / CL	3830 3994
3.0			0.0	56			4516
			0.0	60	34" Fill: Silty Sand: Brownish yellow (10YR 6/6), moist, medium dense, no odor, 5% angular fine gravel (fill rock), 5% coarse sand, 20% silt, 10% medium sand, 60% fine sand, mottled	AF / SM	4979 4715
4.0			0.0	63			
			0.0	67	41" Fill: Clayey silt with sand: Brown (10YR 5/3), moist, medium stiff, no odor, 30% clay, 5% fine sand, 65% silt, low plasticity, low toughness, cohesive, trace coarse sand, mottled	AF / ML	4639 5429
5.0			0.0	78			
			0.0	64	50" Fill: Silty Sand: Brown (7.5YR 5/4), moist, medium dense, no odor, 35% silt, 5% granitic fine to medium gravel or concrete debris, 5% coarse sand, 5% medium sand, 50% fine sand, mottled	AF / SM	5502 5411
6.0			0.0	53			

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6. 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 7-27-11/0907	Date/Time Total Depth Reached 7-27-11/0916
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60023) (0915)		
Geologist C. Carmichael	Checked by/Date Julian Robbins, M.D. 12/12/11		
Radiological Background 19	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0ppm)	

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 <small>(CPM)</small>
0.5'			0.014		Sand with gravel, (10YR, 5/4), light brown, 80% fine to coarse grained sand, 15% gravel, asphalt and sandstone fragments, 5% silt, dry, dense, no plasticity, hardness or odor. No GW reached.	SW	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID #18
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-4-11 0610	Date/Time Total Depth Reached 8-4-11 1010
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected C/L (1) 1/2 gallon bags + Jar 60025 (0930)		
Geologist C. Knight	Checked by/Date Chelsea Carnicchia / 8-16-11		

Radiological Background 55 / 2330 / 4AR	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rsc 2000 (Bkgd: 400 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: gravel and grass		2845
0.5			0.0	51			3274
			0.0	68	Fill: Sandy Silt with gravel: light gray (10YR 7/2), dry, medium stiff, no odor, 10% subangular fine gravel, 35% fine sand, 5% medium sand, 50% silt	AF/ML	4754
1.0			0.0	61			5710
			0.0	53			6019
2.0			0.0	65	1' 10" Fill: Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 30% silt, 5% coarse sand, 5% medium sand, 60% fine sand, mottled, trace angular sandstone medium gravel	AF/SM	5910
			0.10	71			5882
3.0			0.10	67			5886
			0.0	60			5953
4.0			0.0	68			5744
			0.0	53	4' 2" Silty Sand: Brownish yellow (10YR 6/6), moist, medium dense, no odor, 30% silt, 20% fine sand, slow dilatancy, trace Iron Oxide staining	SM	5763
5.0			0.0	50			5795
			0.0	75			5955
6.0			0.0	61			5975

Radiological Background					Project Name	Project Number	Location		
55/2330/9MR					SSPL Area IV Radiological Study	EP9034.01.22.04.03	#18		
Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings		
							Inches	(CPM)	
6.0		0.0	61		Same as above: Silty Sand	SM		5975	
		0.0	66						5803
7.0		0.0	67						5924
		0.0	60						5862
8.0		0.0	80						5896
		0.0	85						5805
9.0		0.0	90						5876
		0.0	103						5812
10.0		0.0	102			Same as above: Silty Sand	SM		5881
						Total Depth 10.0' bgs			
					No GW encountered				

Radiological Background 49/2339/10AR					Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 19
Depth	Interval	Recovery	FTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
							Inches
6.0		0.0	56		Same as above; Silty Sand with gravel	Af / SM	5776
		0.0	65				5896
7.0		0.0	83				5804
		0.0	82				5758
8.0		0.0	84				5820
		0.0	88		Fill: Silty Sand: Dark brownish-yellowish brown (10YR 4/6), moist, medium dense, no odor, 30% silt, ^{CL} 65% fine sand, 5% fine angular granitic gravel	Af / SM	5829
9.0		0.0	73				5973
		0.0	54				5873
10.0		0.0	61		Same as above: Silty Sand		6016
<p>Total Depth: 10.0' bgs No GW encountered</p>							



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 20
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 7-15-11/1252	Date/Time Total Depth Reached 7-15-11/1300
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60027) (1300)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbittne Goldman 12/12/11		

Radiological Background 15	Radiological Equipment Used up Rater	PID Used Mini Rat 2000 (Bkgd: 0.8 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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.0	14	Silty sand, (10 YR, 4/3), brown, 65% fine to medium grained sand, 35% silt, dry, loose, pieces of wire found, some rootlets, no plasticity, hardness or odor.	SM		
No GW reached.								

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 21
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 11" ^{CK} ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-5-11 1045	Date/Time Total Depth Reached 8-5-11 1120
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 60029 (SAMPLES) ^{NO}		
Geologist C. L. Knight	Checked by/Date Chelsea Carmichael 8-17-11		

Radiological Background 35 / 2444 / 104R	Radiological Equipment Used Pancake / downhole / Micro B	PID Used Mini Rae 2000 (Bkgd: 20.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			67		Surface: Asphalt		
0.0			53		3" asphalt		
0.5					Sandstone Bedrock; light olive brown (2.5T 5/6), moist, very dense, no odor, mechanically weathered to SP, fine grained sandstone		NO downhole gamma collected
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Refusal on sandstone at 11" bgs
No GW encountered
No Lab sample collected

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 22
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 15.5" Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-5-11 1023	Date/Time Total Depth Reached 8-5-11 1038
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 600.30 (NO SAMPLES)		
Geologist C. Knight	Checked by/Date Chelsea Carnichael / 8-17-11		

Radiological Background SO / 2494 / 11mPa	Radiological Equipment Used Pancake / downhole / MicroB 1	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	Borehole Gamma Readings (CPM)
			0.0	67	Surface: Asphalt		
				67	3" Asphalt	AF	
0.5			6.0	76	Sandstone Bedrock: Yellow (10YR 7/6), moist, very dense, no odor, mechanically weathered to SP, fine grained sandstone	BGS COL	No downhole gamma collected
1.0			0.0	73			
2.0					Refusal on sandstone at 15.5" bgs NO GW encountered NO Lab sample collected		
3.0							
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 23
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 11.5' ft. bgs CK
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-5-11 0955	Date/Time Total Depth Reached 8-5-11 1015
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 60031 (SAMPLE) NO		
Geologist C. L. Knight	Checked by/Date Chelsea Carmichael / 8-17-11		

Radiological Background 51 / 2731 / 10212	Radiological Equipment Used Pancake / downhole / MicroR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	75	Surface: Asphalt		
			0.0	73	3" Asphalt	AF	
0.5			0.0	73	Sandstone Bedrock: Pale yellow (D. 5.4 7/4), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone.	B B3 COCK	No downhole gamma collected
1.0			0.0	82			
2.0					Refused on sandstone @ 11.5" bgs		
3.0					NO G.W. encountered		
4.0					NO Lab sample collected		
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 24
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-4-11 1400	Date/Time Total Depth Reached 8-4-11 1500
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 60032 (1410)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael/8-17-11		

Radiological Background 42 / 2564 / 10µR	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					surface: gravel and grass		2898
0.5			62		Fill: Silty Sand with gravel. Brownish yellow (10YR 6/6), dry, medium dense, no odor, 10% subangular fine to coarse sandstone gravel, 3% coarse sand, 20% silt, 15% medium sand, 50% fine sand, mottled	Af	3649
			69			Af/SM	5457
1.0			73				5683
			67				5935
2.0			55				5889
			50				5863
3.0			49		Same as above: Fill: Silty Sand w/ gravel: moist	Af/SM	6009
			42				5876
4.0			75		41" Fill: Silt with sand. Dark grayish brown (10YR 4/2), moist, medium stiff, no odor, 10% fine sand, 5% medium sandstone gravel, 85% silt, cohesive, low plasticity, low toughness, trace roots	Af/ML	5915
			68				5792
5.0			75				5900
			61		Sandy Silt: Brown (7.5YR 4/4), moist, medium stiff, no odor, 40% fine sand, 60% silt, low plasticity, low toughness, cohesive	ML	5812
6.0			71				5840

Radiological Background 42/2564/10, MR					Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 24		
Depth	Interval	Recovery	FTD	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)	
6.0		0.0	71		Same as above; Sandy silt	ML		5840	
		0.0	77						5847
7.0		0.0	72						5901
		0.0	75						5666
8.0		0.0	65						5168
		0.0	52		5'2" Partly graded sand with silt; strong brown (7.5YR 5/6), moist, medium dense, no color, 10% silt, 5% coarse sand, 10% medium sand, 75% fine sand.	ML		5797	
9.0		0.0	53						5961
		0.0	58					SP	5739
10.0		0.0	68					5860	
					Total Depth 10.0' bgs				
					No. GW encountered				

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 25
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-4-11 0815	Date/Time Total Depth Reached 8-4-11 0905
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags + 4 ^{CK} Jar 60033 (0825)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael (8-17-11)		

Radiological Background 54 / 2389 / 10 MAR	Radiological Equipment Used Pancake / downhole / MicroR	PID Used Mini Rae 2000 (Bkgd: 400 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: Gravel and gravel		
0.5			0.0	43	Description: Af: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Fill: Sandy Silt: Very pale brown (10YR 7/4), dry, medium stiff, no odor, 35% fine sand, 65% silt, low plasticity, low toughness, non-cohesive, slow dilatancy, trace asphalt	AF	3021
			0.0	61		ML	4205
1.0			0.0	55			5046
			0.0	54			5493
2.0			0.0	52			5663
			0.0	73	27" Silty Sand: Brown (7.5YR 4/4), moist, medium dense, no odor, 30% silt, 5% medium sand, 65% fine sand, rapid dilatancy	SM	5785
3.0			0.6	56			6033
			0.0	59			6015
4.0			0.0	52			5976
			0.0	66			5748
5.0			0.0	63	Same as above		5984
			0.0	54			5998
6.0			0.0	61		SM	6042

Radiological Background				Project Name	Project Number	Location	
54/2389/10MR				SSFL Area IV Radiological Study	EP9034.01.22.04.03	25	
Depth	Interval	Recovery	PTD	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)
6.0		0.0	61		Same as above: Silty Sand	SM	6042
		0.0	66				6013
7.0		0.0	68		6'10" ——— dashed ———		5874
		0.0	70		Silty sand; strong brown (7.5YR 5/6), moist, medium dense, no odor, 15% silt, 5% medium sand, 80% fine sand, rapid dilatancy	SM	5886
8.0		0.0	58				5731
		0.0	52				5760
9.0		0.0	63				5822
		0.0	54				6070
10.0		0.0	57		Same as above: Silty Sand	SM	6104
Total Depth: 10.0' bgs							
No GW encountered							



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 2k
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 7-15-11/1011	Date/Time Total Depth Reached 7-15-11/1016
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60034) (1015)		
Geologist C. Carmichael	Checked by/Date LuDeauRobline Bellman 12/12/11		

Radiological Background 12	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.0	12	Silt, (10YR, 6/3), beige, 95% silt, 5% fine grained sand, dry, heavily compact/cemented, trace rootlets, very low plasticity and hardness, no odor. No GW reached	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 26
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-2-11 1416	Date/Time Total Depth Reached 8-2-11 1510
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar (60035 (1420))		
Geologist C. Knight	Checked by/Date Chelsea Carmichael/8-18-11		

Radiological Background VI / 2245 / 10	Radiological Equipment Used Panace / downhole / Mirror 1	PID Used Mini Rae 2000 (Bkgd: ~ 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 Inches (CPM)
					Surface: soil, grass, gravel		2866
0.5			0.0	53	Fill: Artificial Fill		2960
			0.0	62	Fill: Clays silt with sand: Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 20% clay, 15% finesand, 65% silt, cohesive, low plasticity, low toughness, mottled	AF / ML	3880
1.0			0.0	49			4145
			0.0	78			4470
2.0			0.0	57	1'5" Fill: Silty Clay: light yellowish brown (10YR 6/4), clay, medium stiff, no odor, 20% silt, 5% finesand, 75% clay, medium plasticity, cohesive, medium toughness	AF / CL	4099
			0.0	50			4430
3.0			0.0	55	Fill: Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 5% fine to coarse gravel or asphalt/concrete debris, 20% silt, 5% coarse sand, 5% medium sand, 65% finesand, mottled, trace concrete/asphalt debris	AF / SM	5300
			0.0	70			5585
4.0			0.20	65	3'5" pea size asphalt debris		5607
			0.0	51	4'2" concrete debris - 3/4" diameter		5666
5.0			1.0	67			5720
			0.0	61	Same as above: Fill: Silty Sand	AF / SM	5856
6.0			0.0	53			5726

Radiological Background 44/2245/10					Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 26
Depth	Interval	Recovery	PTD	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	AF	5726
		0.0	65		6' 5" concrete debris - 1/2" diameter	SM	5580
7.0		0.0	50				5783
		0.0	52				5883
8.0		0.0	53				5692
		0.0	56				5717
9.0		0.0	64		9' 2" Granitic gravel - 3/4" diameter		5609
		0.0	67		Same as above: Fill: silty sand	AF SM	5701
					10' bgs. trace concrete debris, trace asphalt debris		5682
10.0		0.0	62				
					Total depth: 10.0' bgs		
					No GW encountered		
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 6, group 1	Location ID 27
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 7-15-11/1030	Date/Time Total Depth Reached 7-15-11/1035
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag, (# 60538) (1034)		
Geologist C. Carmichael	Checked by/Date Duane Robinson Yaldeman 12/12/11		

Radiological Background 13	Radiological Equipment Used up R meter	PID Used Mini Rac 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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.0 13	Silt, (10YR, 6/3), beige, 90% silt, 10% fine grained sand, dry, compact/cemented, trace rootlets, very low plasticity, hardness, no odor. No GW reached	ML		

Radiological Background 42/2726/11mR		Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 27				
Depth	Interval	Recovery	FTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
6.0		0.0	67		Same as above	AF		5350
		0.0	65		Fill: Silty Sand	SM		5529
					6" Concrete debris w/ 1/2" diameter			
7.0		0.0	51					5741
		0.0	50		7" Concrete debris w/ 1/2" diameter			5701
8.0		0.0	51		Trace			5723
		0.0	47		Angular medium gravel (Fill rock)			5684
					8" Some concrete debris w/ 1/2" diameter			
9.0		0.0	49					5599
		0.0	55			AF		5774
					Same as above: Fill: Silty Sand	SM		
10.0		0.0	44		9" 10" Weathered Sand/siltstone Bedrock: Strong brown (7.5 YR 4/6)			5836
					moist, dense, no color, fine grained sandstone w/ some siltstone			
					Total Depth 10' bgs			
					No CW encountered			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6. group 1	Location ID 28
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 7-27-11/0728	Date/Time Total Depth Reached 7-27-11/0740
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (# 60037) (0740) Field DUP: 60526		
Geologist C. Carmichael	Checked by/Date: Julian Robbins-Meldman 12/12/11		

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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.021	<p>Silty sand with rock fragments, (2.5v, 5/4), light brown, 70% fine to medium grained sand, 15% silt, 15% sandstone/siltstone rock fragments, dry, medium dense, no plasticity, hardness or odor.</p> <p>No GW reached.</p>	SM	

Project Name: SSEL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 28
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1'3" <i>ft. bys cil</i>
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-5-11 0925	Date/Time Total Depth Reached 8-5-11 0935
Type of Sampling Device 1 3/4" Macrocore	Samples Collected C(1) 1/2 gallon bags 60038 (NO SAMPLE)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 10-31-11		

Radiological Background 61 / 336 61 / 336 / 11HR	Radiological Equipment Used Pancake / downhole / Minir 1	PID Used Mini Rae 2000 (Bkgd: 300 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	Borehole Gamma Readings (CPM)
			0.0	61	Surface: Asphalt	AF	
			0.0	75	3" Asphalt		
0.5			0.0	75	Sandstone bed rock; Yellowish brown (10YR 5/4), clay dense, no odor, mechanically weathered to SP, fine grained sandstone	B S S S	NO downhole logging collected
1.0			0.0	80			
2.0					Refusal on Sandstone 1'3" bys		
3.0					No GW encountered		
4.0					No Lab sampled collected		
5.0							
6.0							



6_029



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 29
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 7-15-11/1314	Date/Time Total Depth Reached 7-15-11/1322
Type of Sampling Device trowel/shovel	Samples Collected 1/2 gall bag (# 60039) (1322)		
Geologist C. Carmichael		Checked by/Date Duane Robbins Madman 12/12/11	

Radiological Background 15	Radiological Equipment Used M 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'			0.015		Sandy silt, (10YR, 3/3), dark brown, 55% silt, 40% fine to medium grained sand, 5% sandstone cobbles, dry, some rootlets, soft, no plasticity, hardness or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 1	Location ID: 29	
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: 9-9-11/0804		Date/Time Total Depth Reached: 9-9-11/0816	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#60040) (n/a)			
Geologist: Chelsea Carmichael				Checked By / Date: Julian Robbins, Giddeman 12/12/11			
Radiological Background: 22, 73, 3866			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	65	Sandy silt, (10 YR, 3/3), dark brown, 75% silt, 20% fine to medium grained sand, 5% sandstone rock fragments, dry, soft, very low hardness, no plasticity or odor	ML	
1.0			0.0	74			
2.0					Refusal at bedrock - 9"		
					No GW reached		
					<u>No sample collected</u>		
3.0							
4.0							
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 6, group 1	Location ID 30			
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 7-13-11/1109	Date/Time Total Depth Reached 7-13-11/1116			
Type of Sampling Device trowel/shovel			Samples Collected 1-1/2 gall bag (#60041) (1115)				
Geologist C. Carmichael			Checked by/Date Julius D. ... 12/12/11				
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 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	15	Sandy silt, (10YR, 4/3), greyish-brown, 70% silt, 30% fine to medium grained sand, trace rootlets, dry, medium stiff, no plasticity, very low hardness, no odor. No GW reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 30
Drilling Company: Bert Longyear LLC HGL	Driller: I. Stone Don Hansen LLC	Ground Elevation: NA	Total Depth Drilled: 9'5" <i>ck bgs.</i>	
Drilling Equipment: Geoprobe 6600 <i>ck Auger</i>	Borehole Diameter: 1.75 inches <i>3.25"</i>	Date/Time Drilling Started: 8-23-11 0730	Date/Time Total Depth Reached: 8-23-11 0950	
Type of Sampling Device: 1.75 inch Macrocore <i>Hand auger</i>	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60042 (0750)	
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael / 10-31-11			

Radiological Background: 15AR/3970/69	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" 4044 (CPM)
			0.0	114	Surface: soil			
0.5			0.0	85	Fill: Silty Sand: Light yellowish brown (10YR 6/4), dry, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand, trace rootlets	AF/SM		4635
1.0			0.0	63	1'0" Poorly graded Sand with silt: yellowish brown (10YR 5/6), dry, medium dense, no odor, 5% coarse sand, 10% sandstone, 80% fine sand, 10% silt, mottled	AF/SP	1	5464
2.0			0.0	52	medium sand, 5% subrounded fine gravel (quartzite), <i>ck 80%</i> fine sand, 10% silt, mottled			5442
3.0			0.0	93	Poorly graded Sand with silt: Brown (10YR 4/3), moist, medium dense, no odor, 10% silt, 90% fine sand, mottled heavily, trace rootlets, trace fine sandstone gravel	ck AF/SP	2	5711
4.0			0.0	85				6073
5.0			0.0	65			3	5774
6.0			0.0	79				5540
			0.0	75			4	5380
			0.0	59				5140
			0.0	73			5	4580
			0.0	93	Same as above: Poorly graded Sand: Dark yellowish brown (10YR 4/6), very moist, dense, no odor, 5% coarse, 80% fine sand, 85% medium sand	SP		4564
			0.0	85			6	4684

Project Name: SSFL Area IV Radiological Study	Project Number EP9938.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 31
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-8-11 1350	Date/Time Total Depth Reached 8-8-11 1510
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 400cc 60043 (1400)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael/10-31-11		

Radiological Background 43 / 2652 / 11 uR	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 3.00 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: Soil and grass		10.5 3060
0.5			0.0	55	Artificial Fill		3036
			0.0	59	Fill: Silty Sand; Pale yellow (2.5Y 7/3) to Brown (10YR 5/3), dry, medium dense, no odor, 5% fine subangular gravel (fill rock), 35% silt, 10% coarse sand, 20% medium sand, 30% fine sand, very mottled, trace rootlets.	AS SM	3406
1.0			0.0	52			4265
			0.0	51			4846
2.0			0.0	53			5379
			0.0	50			5479
3.0			0.0	51			5495
			0.0	52			5601
4.0			0.0	52	3' 10" trace black ash	AS SM	5701
			0.0	60	Same as above; Silty Sand		5752
5.0			0.0	59	NO Recovery		5719
			0.0	59	Silty Sand; Very dark grayish brown (10YR 3/2), moist, medium sh. ff, no odor, 40% silt, 60% fine sand, trace rootlets	AS SM	5647
6.0			0.0	71			5641

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 32
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-8-11 1025	Date/Time Total Depth Reached 8-8-11 110
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 1400 Jars 60074 (1030)		
Geologist C. Knight	Checked by Date William Robbins, 10/1/11		

Radiological Background 48 12716 BAR	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 4.00 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 Inches (CPM)
			0.0	50	Surface gravel		3580
0.5		NR	0.0	54	medium to large gravel on surface		4943
1.0			0.0	56	No Recovery		5591
			0.0	60	Fill: Silty Sand: Dark yellowish brown (10YR 7/4)	AF	5705
2.0			0.0	55	dry, medium dense, no odor, 35% silt, 10% medium sand, 55% fine sand, mottled, trace rootlets	SM	5716
			0.0	61			5826
3.0			0.0	65	3'0"		5786
			0.0	62	Sandy silt: Brown (10YR 7/3), dry, medium stiff, no odor, 30% fine sand, 5% medium sand, 65% silt, cohesive, low plasticity, low toughness	AF / ML	5941
4.0			0.0	60	4'0"		5986
			0.0	58	Fill: Silty Sand: Dark yellowish brown (10YR 7/4), moist, medium dense, no odor 35% silt, 10% medium sand, 55% fine sand, mottled	AF / SM	6098
5.0			0.0	59	4'6" CIS	AF	6115
			0.0	50	Fill: well-graded sand with gravelly sand & light gray (10YR 7/2), dry, dense, no odor, 10% medium sand, 25% fine to medium subrounded gravel (volcanic gravel), 15% coarse sand, 50% fine sand	SW	6129
6.0			0.0	54	Same as above: 4' AF/SM: Fill: silty sand	AF / SM	6272

Radiological Background 48/2716/8MR					Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 32
Depth	Interval	Recovery	PTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micaceous, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0				59	Same as above; Fill: Silty Sand	AF	6272
			6.0	65		GM	6207
7.0			7.0	70			6560
			6.0	63	Weathered sandstone Bedrock: Strong brown (7.5YR 5/8), moist, dense; no odor, 5% silt, 95% fine sand, fine grained sandstone, trace pebbles		6356
8.0					Refusal at 7.5' by s on sandstone 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: 6	Group: 1	Location ID: 33	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 3.5'	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 1.75 inches - 2 3/4"		Date/Time Drilling Started: 8-11-11/1354		Date/Time Total Depth Reached: 8-11-11/1421	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: 4-oz jar (#60045) (1425) One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: Chelsea Carmichael				Checked By / Date: Paul Alan Robbins Hedman 8/11/11			
Radiological Background: 59, 3418		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	59			0.5 - 3500
0.5			0.0	77	Silt Sandy silt, (10YR, 3/4), dark brown, 70% silt, 30% fine to medium grained sand, dry, soft, common rootlets, trace sandstone fragments and gravel fill rock, very low plasticity no hardness or odor.	ML	4947
1.0			0.0	46		5430	
			0.0	82		5622	
2.0			0.0	104		5609	
			0.0	78	Same as above, except lighter brown (10YR, 4/4) and sandier: 60% silt, 40% fine grained sand.		5730
3.0			0.0	75		5725	
			0.0	109		5822	
4.0					Refusal hit at 3.5'-bedrock No GW reached.		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 34
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 7-13-11/1249	Date/Time Total Depth Reached 7-13-11/1255
Type of Sampling Device trowel/shovel	Samples Collected 1-4oz jar (#60046) (1255) 1-1/2 gall bag (#60046) (1255)		
Geologist C. Carmichael	Checked by/Date Judan Robbins Goldman 12/12/11		

Radiological Background 14	Radiological Equipment Used up Rater	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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.014	Silty sand, (10 YR, 4/3), greyish-brown, 75% very fine to fine grained sand, 25% silt, dry, loose, no plasticity, hardness or odor, some rootlets. No GW reached	SM	

Radiological Background 68, 3663cpm				Project Name SSFE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 34	
Depth	Interval	Recovery	FTD	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)
7'			0.0	61	Clayey sand, (10 YR, 4/3), brown with black speckles of carbon and mottled with red and dark grey, 60% fine to medium grained sand, 40% clay, moist, medium dense, no plasticity, hardness or odor.	SC	6483
			0.0	83	----- Gradational Contact ----- Sandy clay (2.5Y, 3/1), greenish-grey, 60% clay, 40% fine to medium grained sand, moist-wet, medium stiff, low plasticity, hardness, slight petroleum odor.	CL	6144
8'			0.0	87			5369
			0.0	75			4867
9'			0.0	65	← GW encountered at 8'3" ----- Gradational Contact ----- Sand with clay, (6.5Y1, 3/10Y), blue-green-grey, 85% fine to medium grained sand, 15% clay, wet, dense, no plasticity, hardness or odor.	SC	5068
			0.0	55			5335
			0.0	77			4858
Refusal at 9.5'							
GW encountered at 8'3" to refusal at 9'6"							



BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 35
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 7-13-11/1001	Date/Time Total Depth Reached 7-13-11/1009
Type of Sampling Device trowel/shovel	Samples Collected 4-se jar 1-1/2 gall bag (#60048) (1008)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins-Galdman		

Radiological Background 13	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole
							Gamma Readings (CPM)
0.5'			0.0	13	Silty sand, (10 YR, 4/4), brown, 50% fine to medium grained sand, 40% silt, 10% gravel fill and sandstone fragments, dry, medium dense, no plasticity, hardness or odor.	SM	
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 6, group 1	Location ID 36
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 7-13-11/1047	Date/Time Total Depth Reached 7-13-11/1054
Type of Sampling Device trowel/shovel	Samples Collected (1) 40g jar 1-1/2 gall bag (#60050) (1053)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Aldman 12/7/11		

Radiological Background 13	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	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	12	Silty, gravelly sand, (10YR, 3/3), dark brown, 50% fine to medium grained sand, 30% gravel fill rock, 20% silt, dry, loose, no plasticity, hardness or odor. No GW reached.	SM	

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EPO38.01.22.04.03		G	1	36	
Radiological Background:		Radiological Equipment Used:			PID Used:		
14R/3580/87		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	107	Same as above; color change to greenish gray (Gley 1 10Y 6/1)	SP	6 5733
			0.0	98			7 5592
7.0			0.0	82	7'6" - trace bark and roots partially decayed (in soil) Sandy Silt: Greenish Gray (Gley 1 10Y 6/1), very moist, medium stiff, no odor, 30% fine sand, 70% silt, cohesive, low plasticity, low toughness	2nd ML	7 5330
			0.0	80			8 5524
8.0			0.0	120	8'4" Poorly graded sand with silt 8'8" Seepage and GW encountered	SP	8 5560
			0.0	72			9 5494
9.0			0.0	100	<ul style="list-style-type: none"> - Seepage and shallow perched GW (110) encountered at 8'8" bgs - Downhole Gamma readings collected to 8.5' bgs due to perched GW - Total depth 9.0' bgs - 2nd GW perched level at 7.5' bgs (1140) 	in situ	9 NM
10.0							10
11.0							11
12.0							12
13.0							13



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group i	Location ID 37
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 7-14-11/1350	Date/Time Total Depth Reached 7-14-11/1359
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60052) (1358)		
Geologist C. Carmichael	Checked by/Date Julian Robinson Moldovan 12/7/11		

Radiological Background 16	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'				0.015	Sandy silt, (10YR, 3/3), dark brown, 60% silt, 40% fine to medium grained sand, dry, soft, some rootlets, no plasticity, hardness, or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 37
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 10'	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10-9-11 / 0730	Date/Time Total Depth Reached: 10-9-11 / 0914	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: 18-oz jar Field DUP: 60518 (bag + jar)		One 1/2 Gallon Bag (Approx 8 lbs.) (#60053) (#835) 0805	
Geologist: Chelsea Carmichael		Checked By: [Signature] Date: 12/7/11		
Radiological Background: 3504, 85	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)
0.0			0.0	113	Sandy silt, (10 YR, 4/4), brown, 70% silt, 30% fine to medium grained sand, dry, soft, common rootlets, very low hardness, no plasticity, no odor.	ML		4020
0.5			0.0	57			5144	
1.0			0.0	55	Same as above, except 7.5 YR, 4/4, reddish-brown.		5401	
			0.0	75			5512	
2.0			0.0	71	Gradational Contact Sand with clay, (10 YR, 4/6), orangeish-brown, 85% fine sand, 15% clay, semi-moist, medium dense, no plasticity, hardness or odor, trace weathered sandstone fragments.	SC	5587	
			0.0	72			5654	
3.0			0.0	68			5473	
			0.0	65	(rootlets/roots encountered) ~ 3.5' bgs		5398	
4.0			0.0	54			5366	
			0.0	64			5220	
5.0			0.0	77	← some iron-oxide tinting appears		5180	
			0.0	55			5235	
6.0			0.0	61			5349	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 38			
Drilling Company: HGL		Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 1.5'			
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 8-12-11 / 0733	Date/Time Total Depth Reached: 8-12-11 / 0750				
Type of Sampling Device: 2 3/4" hand auger			Samples Collected: 4-oz jar One 1/2 Gallon Bag (Approx. 8 lbs.) (#60054) (no sample)					
Geologist: Chelsea Carmichael			Checked By / Date: <i>Sullivan Kellins Feldman</i> 12/8/11					
Radiological Background: 60, 3039 cpm		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	87				
0.5			0.0	78	Silty sand with rock fragments, (10YR, 4/4) brown, 60% fine to medium grained sand, 25% silt, 15% sandstone rock fragments, trace rootlets, no plasticity, hardness or odor, dry, loose.	SM		n/a
1.0			0.0	80				
			0.0	104				
2.0					Refusal at 18"-bedrock			
					No GW reached			
					<u>No sample collected</u>			
3.0								
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study	Project Number FP903R.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 39
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-8-11 1120	Date/Time Total Depth Reached 8-8-11 1230
Type of Sampling Device 1 3/4" Macrocore	Samples Collected C) 1 1/2 gallon bags + 402 Jar 60055 (130)		
Geologist C. Knight	Checked by Date Chelsea Carmichael / 11-1-11		

Radiological Background 62 / 2464 / 104R	Radiological Equipment Used Panneake / downhole / MicroR 1	PID Used Mini Rae 2000 (Bkgd: 30.0 ppm)
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Depth	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 Inches (CPM)
			0.0	56	surface: gravel - well graded sand with gravel		145 2892
0.5			0.0	54	Fill: light olive brown (2.5Y 5/3), dry, dense, no odor, 10% coarse sand, 40% fine sand, 10% medium subrounded gravel, 40% medium sand.	AF / SW	3110
1.0			6.0	57	Fill: Silty Sand with gravel: Dark yellowish brown (10YR 4/6), moist medium st dense, no odor, 10% subrounded granitic gravel, 25% silt, 10% medium sand, 55% fine sand, mottled	AF / SM	4313
			0.0	58			4686
2.0			0.0	62			5358
			0.0	61			5657
			0.0	69			5740
3.0			0.0	66			5712
			0.0	65	Same as above: Silty Sand with gravel	AF / SM	5879
4.0			0.0	63	Fill: Silty Sand: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 35% fine sand, 5% medium sand, 60% silt.	AF / ML	5805
			0.0	62			5920
5.0			0.0	66	No recovery		6034
			0.0	50	Fill: Silty Sand: Brownish Yellow (10YR 6/6), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand, mottled	AF / SM	6090
6.0			0.0	48			5912

Radiological Background 62/2464/10MR					Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 39
Depth	Interval	Recovery	RPD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micaceous, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
							Inches (CPM)
6.0		0.0	46		Same as above! Fill: silty sand	AF SM	5912
		0.0	52				5795
7.0		0.0	46				5769
		0.0	43	7'6"			5823
8.0		0.0	47				Poorly graded sand with silt: Brown (10YR 5/3), moist, medium dense, no odor, 10% silt, 90% fine sand, some iron oxide staining
		0.0	49		5899		
9.0		0.0	48		5866		
		0.0	46		5744		
10.0		0.0	52		5507		
11.0					Total Depth: 10.0' bgs NO GW encountered		
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 40
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 7-13-11/0944	Date/Time Total Depth Reached 7-13-11/0953
Type of Sampling Device trowel/shovel	Samples Collected (1) - 4oz jar 1-1/2 gall bag (#6005b) (0952)		
Geologist C. Carmichael	Checked by/Date John Robins Goldman 12/6/11		

Radiological Background 14	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				0.014	Sandy silt, (10YR, 4/3), brown, 60% silt, 35%. fine to medium grained sand, 5%. rock fragments (sandstone and concrete, gravel fill), dry, soft, no plasticity, hardness or odor. No GW reached	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 1	Location ID: 40	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 5' 8" <i>ext bgs.</i>	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8-23-11 1323		Date/Time Total Depth Reached: 8-23-11 1430	
Type of Sampling Device: 1.75 inch Macrocore		Geologist: C. Knight		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		6057 (1330)	
Radiological Background: 14pR 13826 / 75		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	110	Surface: Soil and grass			10.5' 3056
0.5			0.0	63	Fill: Silty Sand; Brown (10YR 5/3), dry, medium dense to loose, no odor, 5% subangular fine gravel, 30% silt, 10% coarse sand, 15% medium sand, 40% fine sand, trace glass and fill rock	AF / SM		4012
1.0			0.0	85	Silty Sand; Yellowish brown (10YR 5/6), moist, medium dense, no odor, 20% silt, 80% fine sand, some pores, abundant roots and rootlets	SM	1	5732
2.0			0.0	69			2	5874
			0.0	96				5718
3.0			0.0	81			3	5617
			0.0	82				5562
4.0			0.0	84	Same as above		4	5559
			0.0	74	Poorly graded sand with silt; Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 10% silt, 5% angular gravel of sandstone, 85% fine sand	SP		5609
5.0			0.0	65			5	5647
			0.0	103	Same as above; sandstone refusal	SP		5812
6.0					NO GW encountered, Refusal on sandstone at 5' 8" bgs		6	6104

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID #42
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-9-11 0947	Date/Time Total Depth Reached 8-9-11 0955
Type of Sampling Device 1 3/4" Macrotore	Samples Collected (1) 1/2 gallon bags		LRG 60059 (0955)
Geologist L. Robbins Goldman		Checked by Date Chelsea Carmichael / 11-16-11	

Radiological Background 46 / 2463 / 9	Radiological Equipment Used Pancake / downhole / Mizar R 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, numerology, bedding, plasticity, density, consistency, etc., as applicable)		Inches (CPM)
					AF = artificial fill		
					Surface: grass + soil		10.5' = 3053 (CPM)
0.5			0.0	55	Sandy silt: 65% silt, 35% fine grained sand, brown (10yr 4/3), dry, loose, no odor, low plasticity, cohesive, low toughness, med. strength, slow dilatancy, rootlets, small concrete debris.	AF / ML	3297
			0.0	56			4169
1.0			0.0	53	1.0' Silty sand: pale yellow (2.5Y 7/4), dry, loose, no odor, 90% sand (fine grained), 10% silt, cohesive, low plasticity, rapid dilatancy, low toughness	SM	4618
			0.0	58			5061
2.0			0.0	62	1.4' Silty sand sandy silt, very dark grayish brown (2.5Y 3/2), moist, dense, no odor, 85% silt, 15% sand (med. grained), cohesive, low plasticity, cohesive, med. toughness, med. strength, slow dilatancy	ML	5243
			0.0	59			5493
3.0			0.0	61			5524
			0.0	59	3'3" Sandstone: dark yellowish brown (10yr 4/6), fine to med. grained sandstone mechanically weathered to SP.	Bedrock	5603
4.0					3'6" refusal @ 3'6" on sandstone no GW encountered no anomalies		



6_043



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 43
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trawl / shovel	Borehole Diameter NA	Date/Time Drilling Started 7-15-11 / 0727	Date/Time Total Depth Reached 7-15-11 / 0735
Type of Sampling Device trawl / shovel	Samples Collected 1-1/2 gall bag (#60060) (0735)		
Geologist C. Carmichael		Checked by/Date Julian Robbins Feldman 12/22/11	

Radiological Background 13	Radiological Equipment Used AP 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 13	Sandy silt, (10YR, 3/4), dark brown, 55% silt, 40% fine to medium grained sand, 5% sandstone rock and concrete fragments, dry, medium stiff, no plasticity, hardness, or odor. No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID #43
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4" ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-9-11 0753 0753	Date/Time Total Depth Reached 8-9-11 0745 0755
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 60061 (no sample)		
Geologist L. Robbins Goldman	Checked by/Date Chelsea Carmichael / 11-16-11		

Radiological Background 0.0 / 35 / 11	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 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					Surface: grass & soil		
1.0					no sample collected refusal @ 4" bgs	ML AF	no downhole data collected
2.0					4" - sandy silt artificial fill: light yellowish brown (10yr 6/4), 65% silt, 35% fine to med graded sand w/ some gravel stones ~ 1 in. diameter, refusal on bedrock (sandstone, light yellowish brown, weathered to SP), no odor.	ML UGS	
3.0							
4.0							
5.0							
6.0					no GW encountered		



BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, 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 7-15-11/0758	Date/Time Total Depth Reached 7-15-11/0805
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60062) (0805)		
Geologist C. Carmichael		Checked by/Date Julie Ann Robinson / 12/24/11	

Radiological Background 13	Radiological Equipment Used M/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'				0.013	Sandy silt, (10YR, 4/4), brown, 55% silt, 40% fine to medium grained sand, 5% concrete and sandstone rock fragments, dry, soft, no plasticity, hardness or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID #44
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3'10" ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-9-11 0800	Date/Time Total Depth Reached 8-9-11 - 0810
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		600636 (0810)
Geologist L. Robbins Goldman		Checked by/Date L. Robbins Goldman 11/29/11	

Radiological Background 54/2694/11	Radiological Equipment Used Pancake/downhole/Micro R 1	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	Borehole
							Gamma Readings Inches (CPM)
0.5			0.056		Sandy silt: dark yellowish brown (10yr 4/4), semi-moist, dense, no odor, cohesive, 85% silt, 15% fine to med. sand, low plasticity, no toughness, slow dilatancy, pin hole pores	ML	3239
			0.055				4175
1.0			0.052				4913
			0.053				5376
2.0			0.058				5727
			0.059		216" - color change - pale yellow (2.5y 7/4) - same as above.	ML	5945
3.0			0.055				5816
			0.057				NM=no measurement
4.0					3'10" refusal on sandstone (10yr 7/4) very pale brown, fine grained, mechanically weathered to SP	B e d r o c k	
5.0					hole only widened to 3'10" thus a gap in gamma downhole data. no GW encountered no anomalies		
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6.group i	Location ID 45
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 7-13-11/1302	Date/Time Total Depth Reached 7-13-11/1308
Type of Sampling Device trowel/shovel	Samples Collected Field DUP: 60519 (collected: 10-7-11) * 1-1/2 gall bag (#60064) (1306)		
Geologist C. Carmichael	Checked by/Date Susan Robbins Feldman 12/24/11		

Radiological Background 14	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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				14	Sandy silt with clay, (10YR, 3/2), dark brown, 55% silt, 30% fine to medium grained sand, 15% clay, moist, low plasticity and hardness, no odor. No GW reached	ML	
<p>* Original Surface Soil Sample (60064) was collected on 7/13/11 and was sent to GEL on 10/13/11 but analyses were canceled because we needed to collect a duplicate from Loc. 45. A duplicate (60519) was collected on 10/7/11 but mistakenly no parent sample was collected. Sample 60519 was not submitted for analyses, the soil was placed back in the vicinity of loc. 45. On 10/17/11 a parent sample (60542) and a duplicate (60520) were collected from loc. 45 and sent to GEL on 10/31/11</p>							

Radiological Background					Project Name	Project Number	Location	
87,3914 cpm					SSFE Area IV Radiological Study	EP9038.01.22.04.03	45	
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 (CPM)
								Inches
7'			4.0	78	Clayey sand (2.5%, 4/1), olive-grey, fine to medium grained sand, 30% clay, wet, no hardness, low plasticity, trace petroleum/oil odor, medium dense.	SC	5437	
			3.5	63			5296	
					Refusal at 7' - bedrock			
					GW level approached, but not hit.			



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 46
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 7-13-11/1019	Date/Time Total Depth Reached 7-13-11/1027
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60066) (1026)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins Feldman 12/22/11		

Radiological Background 14	Radiological Equipment Used w/ 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	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'				0013	Sandy silt, (10YR, 4/3), brown, 70% silt, 30% fine grained sand, some rootlets, dry, soft, no plasticity, very low hardness, no odor. No GW reached	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 4b
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 17"
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-23-11/1108	Date/Time Total Depth Reached 8-23-11/1125
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1-1/2 gall bag (#60067) (n/a)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Lehman 12/22/11		

Radiological Background 97, 3839 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rac 2000 (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	Borehole Gamma Readings <small>Inches (CPM)</small>
0'			00	78			
1'			00	81	Sandy silt with sandstone fragments, (10 YR, 4/4), 55% silt, 30% fine to medium grained sand, 15% sandstone rock fragments, dry, soft, trace rootlets, no plasticity, hardness, no odor.	ML	
2'			00	80			
3'			00	75	Refusal hit at 17" - sandstone		
4'					No BW reached.		
5'							
6'							



6_047



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6.group 1	Location ID 47
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 7-13-11/1344	Date/Time Total Depth Reached 7-13-11/1353
Type of Sampling Device trowel/shovel	Samples Collected 4-oz jar 1-1/2 gall bag (#60068) (1352)		
Geologist C. Carmichael	Checked by/Date Julian Robbins/Goldman 12/22/11		

Radiological Background 14	Radiological Equipment Used w/ 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 14	Silty sand, (10 YR, 4/4), brown, 60% fine to medium grained sand, 35% silt, 5% sandstone fragments, dry, loose, trace rootlets, no plasticity, hardness or odor. No GW reached.	SM	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 48
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 7-14-11/1541	Date/Time Total Depth Reached 7-14-11/1549
Type of Sampling Device trowel/shovel		Samples Collected 4-oz jar 1-1/2 gall bag (#60070) (1548)	
Geologist C. Carmichael		Checked by/Date Julian Robbins Goldman 12/22/11	

Radiological Background 17	Radiological Equipment Used M/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'				0.016	<p>Sandy silt, (10YR, 4/4), brown, 70% silt, 30% fine to medium grained sand, some rootlets, no plasticity, hardness or odor.</p> <p>Pieces of glass found on surface.</p> <p>No GW reached - Bedrock at 6"</p>	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 48
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10"
Drilling Equipment hand auger trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 8-24-11/1332	Date/Time Total Depth Reached 8-24-11/1345
Type of Sampling Device trowel/shovel 2 3/4" hand auger	Samples Collected 1-1/2 gall bag (#60071) (n/a)		
Geologist C. Carmichael	Checked by/Date Sullivan Robbins/Goldman 12/22/11		

Radiological Background 92,3638 cpm	Radiological Equipment Used Mini Rae Pancake meter Downhole meter	PID Used Mini Rae 2000 (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	Borehole Gamma Readings <small>Inches (CPM)</small>
			0.0	68	Sandy silt, (10YR, 4/4), brown, 65% silt, 35% fine grained sand, soft dry, trace rootlets, no plasticity, hardness or odor.	ML	
1'					Refusal hit at 10" - bedrock No GW reached		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6.group 2	Location ID 49				
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 7-14-11/1417	Date/Time Total Depth Reached 7-14-11/1425				
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (#60072), (1425)						
Geologist C. Carmichael		Checked by/Date Julian Phipps Goldman 12/22/11						
Radiological Background 17		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
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'				00 16	Sandy silt, (10YR, 4/4), brown, 70% silt, 30%. Fine grained sand, dry, compact/stiff, very low plasticity, hardness, no odor.	ML		
No GW reached.								

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group, VEG: Subarea 6 group 2	Location ID: 49
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 3.5 ft. bgs
Drilling Equipment: Geo probe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 8-9-11 1407	Date/Time Total Depth Reached: 8-9-11 1413
Type of Sampling Device: 1 3/4" Macrocoring	Samples Collected: (1) 1/2 gallon bags		60073 (1413)
Geologist: L. Robbins Goldman		Checked by/Date: Chelsea Carmichael/11-1-11	

Radiological Background: 55/19625/11	Radiological Equipment Used: Pancake/downhole/Micro R 1	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	Borehole Gamma Readings Inches
					Surface: soil + grass		40.5 = 3241 (CPM)
0.5			0.0	44	Silty sand: very dark brown (10yr 7/2), dry, low density, no odor, 99% fine grained sand, 10% silt, low plasticity, low cohesiveness, low toughness, med. dilatancy, rootlets	SM	4977
1.0			0.0	45			5652
1.0			0.0	42	10" sandy silt: very dark grayish brown (10yr 3/2) semi-moist, dense; no odor 65% silt, 35% fine sand, med. plasticity, low cohesiveness, med. toughness, slow dilatancy, pin hole pores, mica flecks, trace rootlets.	ML	5580
2.0			0.0	40			5652
2.0			0.0	43			5710
3.0			0.0	48	2'3" sandy silt, same as unit above, color change dark yellowish brown (10yr 3/6)	ML	5726
3.0			0.0	47			5636
4.0			0.0	44	3'4" sandstone bedrock: dark yellowish brown (10yr 4/6), fine to coarse grained bedrock mechanically weathered to S.P., mottled color, some (trace) iron-oxide nodules.	Bedrock	5808
5.0					refusal @ 3'6" bgs no GW encountered no anomalies		
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 50
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 7-14-11/0822	Date/Time Total Depth Reached 7-14-11/0830
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60074) (0830)		
Geologist C. Carmichael	Checked by/Date Julie Robbins Goldman 12/22/11		

Radiological Background 20	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.0	22	Silty sand, (10YR, 4/4), brown, 80% fine to medium grained subangular sand, 15% silt, 5% sandstone rock fragments, trace fill rock, dry, medium dense, no plasticity, hardness or odor, common rootlets. No BW reached.	SM		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 51				
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 7-14-11/0759	Date/Time Total Depth Reached 7-14-11/0808				
Type of Sampling Device trowel/shovel			Samples Collected 1-1/2 gall bag (# 60076) (0807)					
Geologist C. Carmichael			Checked by/Date Julie Ann Robbins Goldman 12/22/11					
Radiological Background 17		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
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	Inches	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	18	Silty sand, (10 YR, 4/4), brown, 80% fine to medium grained angular sand, 15% silt, 5% sandstone fragments, trace gravel fill, dry, loose, common rootlets, no plasticity, hardness or odor. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 1	Location ID: 51	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 4.5'	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 9-12-11/0747		Date/Time Total Depth Reached: 9-12-11/0814	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx. 8 lbs.) (#60077) (0815)			
Geologist: Chelsea Carmichael				Checked By / Date: Dudlan Rollins Feldman 12/22/11			
Radiological Background: 18, 88, 3685		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			0.0	82	Sandy silt, (10 YR, 4/4), brown, 60% silt, 40% fine to medium grained sand, dry, soft, trace rootlets in top 2-3", no plasticity, hardness or odor.	ML	0.5 - 3778
0.5			0.0	59		5477	
1.0			0.0	83			1 - 5785
			0.0	84	Gradational Contact Silty sand, (10 YR, 5/4), light brown, 65% fine to medium grained sand, 35% silt, dry, medium dense, no plasticity, hardness, or odor.	SM	2 - 6002
2.0			0.0	47	Gradational Contact Sandy silt, (10 YR, 5/6), reddish-brown, 55% silt, 35% fine to medium grained sand, 10% sandstone rock fragments, medium stiff, dry, no plasticity, hardness or odor.	ML	2 - 6171
			0.0	92			3 - 6268
3.0			0.0	85			3 - 6324
			0.0	78			4 - 6241
4.0			0.0	88			4 - 6081
			0.0	78			5 - 5955
5.0					Refusal hit on bedrock - 4.5'		
					No GW reached		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 6, 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 7-14-11/1014		Date/Time Total Depth Reached 7-14-11/1022	
Type of Sampling Device trowel/shovel				Samples Collected 1-1/2 gall bag (#60078) (1022)			
Geologist C. Carmichael				Checked by/Date Ludlow Robinson Aldman 12/22/11			
Radiological Background 18		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 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 (CPM)
0.5			0.0	18	Silty sand, (10 YR, 4/4), brown, 75% fine to medium grained sand, 20% silt, 5% sandstone rock fragments, dry, loose, some rootlets, no plasticity, hardness or odor. No GW reached.	sm	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 6, group i		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 7-14-11/0858-0950		Date/Time Total Depth Reached 7-14-11/0959	
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (#60080) (0958) (0858)		Checked by/Date Dr. Dean Robbins Goldman 12/22/11			
Geologist C. Carmichael		Radiological Background 16		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)	
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 <small>(CPM)</small>
0.5'			2.0	19	Silty sand, C10YR, 4/4, brown, 70% fine to medium grained subangular sand, 20% silt, 10% sandstone rock fragments and gravel fill rock, dry, loose, some rootlets, no plasticity, hardness or odor. No GW reached.	SM	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 54				
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment trawl/shovel		Borehole Diameter NA	Date/Time Drilling Started 7-14-11/0914	Date/Time Total Depth Reached 7-14-11/0923				
Type of Sampling Device trawl/shovel		Samples Collected 1-1/2 gall bag (#60082) (0922)						
Geologist C. Carmichael		Checked by/Date Julian Robbins Goldman 12/22/11						
Radiological Background 18		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
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	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	18	Silty sand, (10 YR, 4/4), brown, 75% fine to medium grained sand, 20% silt, 5% sandstone rock fragments, dry, some rootlets, loose, no plasticity, hardness or odor.	Sm		
					No GW reached.			



6_055



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 55
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 7-14-11/0851	Date/Time Total Depth Reached 7-14-11/0858
Type of Sampling Device trowel/shovel	Samples Collected 1/2 gall bag (#60084) (0858)		
Geologist C. Carmichael	Checked by/Date John Deane Robinson Goldman 12/22/11		
Radiological Background 18	Radiological Equipment Used w/ R meter	PID Used Mini Raz 2000 (Bkgd: 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	
							Inches	(CPM)
0.5'				0019	Silty sand, (10YR, 4/4), brown, 70% fine to medium grained subangular sand, 25% silt, 5% sandstone rock fragments, dry, common rootlets, loose, no plasticity, hardness or odor.	SM		
					No GW reached.			



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 56
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 7-14-11/1520	Date/Time Total Depth Reached 7-14-11/1528
Type of Sampling Device trowel/shovel	Samples Collected Field DUP: 60522 (CNT) 1-1/2 gall bag (# 60086) (1528)		
Geologist C. Carmichael	Checked by/Date Julian Robbins & Goldman 12/27/11		

Radiological Background 16	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.017	Silty sand, (10 YR, 4/4), brown, 55% fine to medium grained sand, 40% silt, 5% sandstone rock fragments, dry, loose, common rootlets, no plasticity, hardness or odor. No GW reached.	SM	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 56
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 22"
Drilling Equipment hand auger travel/stave	Borehole Diameter NA	Date/Time Drilling Started 8-24-11/1414	Date/Time Total Depth Reached 8-24-11/1430
Type of Sampling Device 2 3/4" hand auger travel/stave	Samples Collected 1-1/2 gall bag (#60087) (1435)		
Geologist C. Carmichael	Checked by/Date Lillian Robbins Goldman 12/22/11		

Radiological Background 83, 3776 cpm	Radiological Equipment Used Travel/stave Pancake meter Downhole meter	PID Used Mini Rae 2000 (0.0 ppm)
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Depth	Interval	Recovery	D.P.I.D.	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)
			0.1	83			0.5	3464
			0.0	72	Sandy silt, (10 YR, 4/4), brown, 60% silt, 35% fine to medium grained sand, 5% sandstone rock fragments, dry, soft, trace rootlets, no plasticity, hardness or odor. 1'	ML		
1'			0.0	83	Same as above, except increasing rock fragments.			5022
			0.0	72				5339
								5337
2'					Refusal hit at 22" - bedrock No GW reached			



6_057



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 57
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 7-14-11/1602	Date/Time Total Depth Reached 7-14-11/1607
Type of Sampling Device trowel/shovel	Samples Collected ^{4 or jarred} 1-1/2 gall bag (#60088) (1605)		
Geologist C. Carmichael	Checked by/Date John Robbins, Waldman 12/22/11		

Radiological Background 16	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 (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'			0.015		Silty sand, (10YR, 5/4), light brown, 70% fine to medium grained sand, 30% silt, dry, trace gravel fill, loose, no plasticity, hardness or odor. No GW reached.	sm		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID #57
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 41 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-9-11 1041	Date/Time Total Depth Reached 8-9-11 1045
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 60089(1045)		
Geologist L. Robbins Goldman	Checked by Date Culsea Carmichael / 11-16-11		

Radiological Background 51 / 2555 / 11	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 40.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches
					AF = artificial fill (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		+0.5 = 3091 (CPM)
					Surface = soil + grass		
0.5			0.0	59	silty sand: (10 yr 3/3) dark brown, 85% fine to med-grained sand, 15% silt, low plasticity, low density, dry, no odor, rootlets, concrete debris in upper 6" of unit	AF	3087
			0.0	61		SM	3438
1.0			0.0	66	1'0" silty sand (unit same as above) note: color change; dark yellowish brown (10 yr 4/6) no concrete debris	SM	4042
			4.0	65			4971
2.0			0.0	64	1'9" silty sand: yellowish brown (10 yr 5/6), dry, low density, no odor, 95% sand, 5% silt, low to med plasticity, low cohesiveness, low toughness, rapid dilatancy	SM	5357
			0.0	60			5384
3.0			0.0	62			5478
			3.2	59	3'2" silty sand: dark yellowish brown (10 yr 3/6) moist low density, no odor, 95% sand, 5% silt, no plasticity + cohesiveness, low toughness, rapid dilatancy, mottled color change combination of silty sands described above.	SM	6029
4.0			0.0	61	3'6" Bedrock: sandstone w/ interbedded siltstone pale yellow (2.5 yr 8/3), fine grained sandstone, mechanically weathered to S.P.	Bedrock	6072
5.0					4.0" refusal on bedrock @ 4.0' bgs no GW encountered no anomalies		
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 58
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 7-14-11/1459	Date/Time Total Depth Reached 7-14-11/1508
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60090) (1507)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins/Holdman 12/22/11		

Radiological Background 15	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				00 18	<p>Silty sand with gravel, (10YR, 5/4), light brown, 60% fine to medium grained sand, 25% silt, 15% gravel fill and sandstone rock fragments, dry, medium dense, trace rootlets, no plasticity, hardness, no odor.</p> <p>No GW reached.</p>	SM		

Project Name: SSFL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 58
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-9-11 1130	Date/Time Total Depth Reached 8-9-11 1138
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		60091 (61138)
Geologist L. Robbins Goldman		Checked by/Date Chelsea Carrinchaff/11-16-11	

Radiological Background 64/2797/11	Radiological Equipment Used Pancake/downhole/Micro R 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF = artificial fill <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>		10.5 = 3326
					Surface: Soil + grass		
0.5			0.0	55	Well graded sand: dark yellowish brown (10yr 4/6) dry; no odor, 95% sand, 5% silt; non-cohesive, low plasticity, loose, low density, rapid dilatancy, rootlets, scarce concrete debris, sand is fine to coarse grained.	AF	3505
			0.0	58		SW	4481
1.0			0.0	62		SW	5118
			0.0	61		SW	5480
2.0			0.0	57	2.0' bedrock-sandstone: fine grained, pale yellow (2.5yr 7/4), mechanically weathered to S.P.	B E D R O C K	5574
3.0					Refusal @ 2.0' bgs on sandstone no GW encountered no anomalies		
4.0							
5.0							
6.0							



BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 59
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 7-13-11/1320	Date/Time Total Depth Reached 7-13-11/1329
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60092) (1328)		
Geologist C. Carmichael	Checked by/Date Julie Robbins-Holman 12/22/11		

Radiological Background 13	Radiological Equipment Used w/ 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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.0	14	Silty sand, (10YR, 5/4), light brown, 80% fine to medium grained sand, 15% silt, 5% asphalt, concrete, glass, iron wire fragments, dry, loose, no plasticity, hardness, or odor. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 60
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 7-14-11/1036	Date/Time Total Depth Reached 7-14-11/1045
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (#60094) (1045)	
Geologist C. Carmichael		Checked by/Date Juliana Robinson-Heldman 12/22/11	

Radiological Background 16	Radiological Equipment Used RP 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	Borehole Gamma Readings
							Inches (CPM)
0.5'			0.0	16	Silty sand, (10 YR 4/3), greyish-brown, 70% fine to medium grained sand, 25% silt, 5% sandstone rock fragments and gravel fill rock, dry, loose, no plasticity, hardness or odor. No GW reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 61
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 7-14-11/1101	Date/Time Total Depth Reached 7-14-11/1106
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60096) (1105)		
Geologist C. Carmichael	Checked by/Date John P. Robinson/Malden 12/22/11		

Radiological Background 22	Radiological Equipment Used M 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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'			0.0	22	Silty sand, (10YR 4/4), brown, 70%. fine to medium grained sand, 30%. silt, common rootlets, no plasticity, hardness or odor, dry.	SM	
No GW reached							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 61
Drilling Company: HGL	Driller: B. Harris	Ground Elevation: NA	Total Depth Drilled: 18"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10-3-11/0923	Date/Time Total Depth Reached: 10-3-11/0953	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#60097) (n/2)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Julien Robinson</i> 12/22/11			

Radiological Background: 99, 4692	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	74	Silty sand with rock fragments, C10YR, 4/4), brown, 50% fine to medium grained sand, 35% silt, 15% sandstone rock fragments, dry, medium dense, some rootlets, no plasticity, hardness or odor.	SM	1	
1.0		0.0	64				2	
2.0		0.0	94				3	
3.0		0.0	77				4	
4.0					Refusal at 18" - bedrock No GW reached <u>No sample collected</u>		5	
5.0				6				
6.0								



BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 62
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 7-14-11/1138	Date/Time Total Depth Reached 7-14-11/1143
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60098) (1142)		
Geologist C. Carmichael	Checked by/Date John Robert Holdman 12/21/11		

Radiological Background 17	Radiological Equipment Used up Reiter	PID Used Mini Rac 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	Borehole Gamma Readings <small>(CPM)</small>
0.5				0.0 17	Sandy silt, (10YR, 4/3), greyish-brown, ML 55% silt, 40% fine to medium grained sand, 5% sandstone fine gravel, dry, medium stiff, no plasticity, hardness, or odor. No GW reached.		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 1	Location ID: 62		
Drilling Company: HGL		Driller: B. Harris		Ground Elevation: NA		Total Depth Drilled: 8'		
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10-3-11/1057		Date/Time Total Depth Reached: 10-3-11/1219		
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#60099) (1150)				
Geologist: Chelsea Carmichael				Checked By / Date: Julia Kettner-Heldman 12/21/11				
Radiological Background: 3599, 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, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	96	Sandy silt, (10YR, 3/4), dark reddish-brown, 70% silt, 30% fine to medium grained sand, soft, some rootlets, dry, no plasticity, hardness or odor, trace weathered bedrock pieces.	ML		0.5 - 3652
1.0			0.0	109				4943
1.0			0.0	96	Same as above, except medium stiff, semi-compact	ML	1	5367
2.0			0.0	85				5724
2.0			0.0	87			2	5701
3.0			0.0	88				5747
3.0			0.0	89			3	5598
4.0			0.0	98				5689
4.0			0.0	95	Same as above, except trace weathered sandstone fragments with heavy iron-oxide tinting.	ML	4	5784
5.0			0.0	76				5618
5.0			0.0	97			5	5806
6.0			0.0	86				5886
6.0			0.0	88			6	5978

Project Name:		Project Number:		Subarea: 6	Group: 1	Location ID: 62	
SSFL Area IV Radiological Study		EP038.01.22.04.03					
Radiological Background:			Radiological Equipment Used:			PID Used:	
3999, 99			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	88	Sand with silt, (10 YR, 4/4), orangeish brown, 85% fine to medium grained sand, 10% silt, 5% weathered sandstone fragments, semi-moist, medium dense, no plasticity, hardness or odor.	SM	6109
7.0			0.0	90		6161	
			0.0	100		6520	
8.0			0.0	87		6108	
9.0					Refusal at 8' - bedrock No GW reached		
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 63
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 7-14-11/1113	Date/Time Total Depth Reached 7-14-11/1121
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60100) (1120)		
Geologist C. Carmichael	Checked by/Date Julian Robbins / 12/21/11		

Radiological Background 18	Radiological Equipment Used M 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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.017	Silty sand, (10YR, 4/3), greyish-brown, 65% fine to medium grained sand, 30% silt, 5% sandstone rock fragments / concrete / asphalt / tar fragments, dry, medium dense, some rootlets, no plasticity, hardness or odor.	SM	
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 63
Drilling Company: HGL	Driller: B. 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: 10-3-11/1028	Date/Time Total Depth Reached: 10-3-11/1046	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 60101) (w/a)			
Geologist: Chelsea Carmichael	Checked By / Date: Justin Deane, Debbie Feldman 12/1/11			

Radiological Background: 3648, 86	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			0.0	86	Silty sand with gravel, (10YR, 4/4), brown, 50% fine to coarse grained sand, 30% silt, 20% sandstone and concrete rock fragments, trace rootlets, dry, loose, no plasticity, hardness or odor.	SM	0.0	
0.5			0.0	49				0.5
1.0					Refusal at 9" - bedrock No GW reached <u>No sample collected</u>		1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0							5.0	
6.0							6.0	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 64
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 7-14-11/1327	Date/Time Total Depth Reached 7-14-11/1334
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60102) (1332)		
Geologist C. Carmichael	Checked by/Date Lubland Robbins Holdman 12/21/11		

Radiological Background 19	Radiological Equipment Used M 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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.018	Sandy silt, (10YR, 4/3), brown, 60% silt, 35% fine to medium grained sand, 5% gravel fill rock and sandstone rock fragments, dry, soft, no plasticity, hardness or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 64
Drilling Company: HGL	Driller: D. Harris	Ground Elevation: NA	Total Depth Drilled: 10'	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10-3-11/1423	Date/Time Total Depth Reached: 10-3-11/1559	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#60103) (K25)			
Geologist: Chelsea Carmichael		Checked By / Date: <i>Chris Harris Helman</i> 12/21/11		

Radiological Background: 3886 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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	112	Silty sand, (10YR, 4/4), brown, 50% fine to medium grained sand, 45% silt, 5% sandstone rock fragments, dry, medium dense, trace rootlets, no plasticity, hardness or odor.	SM	0.5	3853
0.5			0.0	101			1	4774
1.0			0.0	140			1	
			0.0	99				
2.0			0.0	74	Gradational Contact Sandy silt, (10YR, 3/3), dark brown, 70% silt, 30% fine sand, dry, medium stiff, no plasticity, hardness or odor, trace sandstone rock fragments.	ML	2	5530
			0.0	77				5522
3.0			0.0	100			3	5463
			0.0	86				5497
4.0			0.0	65	Gradational Contact Sand with clay, (10YR, 4/4), brown, 85% fine to very fine sand, 15% clay, dry, medium dense, no plasticity, hardness or odor, asphalt fragments found.	SC	4	5602
			0.0	78				5614
5.0			0.0	85	Same as above, except fine to medium grained sand and semi-moist.		5	5385
			0.0	44				5456
6.0			0.0	91			6	5341

Project Name:		Project Number:		Subarea: 6	Group:	Location ID: 64	
SSFL Area IV Radiological Study		EP038.01.22.04.03					
Radiological Background:		Radiological Equipment Used:			PID Used:		
3886, 105		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	89	Same as above, except 10YR, 5/6, light orangeish brown.	SC	5344
7.0			0.0	75 83	Same as above, except 10YR, 4/6, reddish brown	SC	5573
			0.0	89			5479
8.0			0.0	82	----- Gradational Contact ----- Clayey Sand, (10YR, 5/4, 4/4), brown mottled with reddish-brown (iron-oxide), 70% fine to medium grained sand, 30% clay, semi-moist, very low hardness, uno plasticity or oder.	SC	5704
			0.0	75			5421
9.0			0.0	65			5358
			0.0	64			5431
10.0							5478
11.0					10' goal depth reached.		
					No GW reached.		
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 1	Location ID: 65		
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 33"		
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 8-12-11/0820		Date/Time Total Depth Reached: 8-12-11/0852		
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: 1-4-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#60104) (0900)				
Geologist: Chelsea Carmichael				Checked By / Date: <i>John Robbins / 12/19/11</i>				
Radiological Background: 57, 3257 cpm		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	62				0.5 - 3334
0.5			0.0	85	Silty sand, (10YR, 4/4), brown, 60% fine to medium grained sand, 30% silt, 10% sandstone rock fragments, dry, loose, no plasticity, hardness or odor, trace carbon (charcoal) pieces.	SM	4894	0 - 3900
1.0			0.0	72	1' Gradational Contact		5551	
			0.0	80	Silty sand with rock fragments, (10YR, 4/4), brown, 65% fine to coarse grained sand, 20% silt, 15% sandstone rock fragments, dry, loose, no plasticity, hardness or odor.	SM	5599	
2.0			0.0	100	2'		5532	
			0.0	78	Silty sand (same as 0'-1'), except dark brown (10YR, 3/3)	SM	5426	
3.0					Refusal hit at 33" - bedrock		3	
					No GW reached		4	
4.0							5	
5.0							6	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 66
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 7-13-11/1439	Date/Time Total Depth Reached 7-13-11/1448
Type of Sampling Device trowel/shovel	Samples Collected 1 4oz jar 1 1/2 gall bag (#60105) (1447)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Goldman 12/19/11		
Radiological Background 13	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)	

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	14	Silty sand, (10YR, 4/4), brown, 65% fine to medium grained sand, 30% silt, 5% sandstone fragments, dry, medium dense, no plasticity, hardness, or odor.	SM		
No GW reached.								

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 66
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 39" (3'3")
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-24-11/0943	Date/Time Total Depth Reached 8-24-11/1033
Type of Sampling Device 2 3/4" hand auger	Samples Collected 8-oz jar 1-1/2 gall bag (#60106) (1035)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins Goldman 12/14/11		

Radiological Background: 104,3540 cpm
 Radiological Equipment Used: Downhole scanner, Pancake meter
 PID Used: Mini Rac 2000 (0.0 ppm)

Depth	Interval	Recovery	RPD	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)
1'			0.074		Silty sand, (10 YR, 4/6), reddish-brown, 70% fine to medium grained sand, 25% silt, 5% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.	SM	0.5-3594
			0.080				4845
			0.080	1.5'			5243
2'			0.085		Gradational Contact Silty sand, (10 YR, 4/4), brown, 55% fine to medium grained sand, 40% silt, 5% sandstone, semi-moist, no plasticity, hardness, or odor, trace gravel fill.	SM	5461
			0.079				5590
			0.063				5614
3'							5549
4'					Refusal at 3'3"-bedrock		
5'					No GW reached		
6'							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group i	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 7-13-11/1412	Date/Time Total Depth Reached 7-13-11/1420
Type of Sampling Device trowel/shovel	Samples Collected 4-oz jar 1-1/2 gall bag (#60107) (1418)		
Geologist C. Carmichael	Checked by/Date Juliana Robbins-Holman 12/19/11		

Radiological Background 14	Radiological Equipment Used w/ 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 13	Sandy silt, (10 YR, 4/4), brown, 70% silt, 30% fine grained sand, dry, some rootlets, medium stiff, no plasticity, hardness or odor. No GW reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: Subarea 6 group 1	Location ID: 68
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 20 Ft. bgs
Drilling Equipment: Geo probe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7/27/11 1420	Date/Time Total Depth Reached: 7/27/11 1520
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: (1) 1/2 gallon bags + 4oz jar 60109 (1430)		
Geologist: C. Knight	Checked by/Date: Julian Robbins/Meldman 11/29/11		

Radiological Background
46 / 2658 / 10

Radiological Equipment Used
Pancake / downhole / Micro Rf

PID Used
Mini Rae 2000 (Bkgd: 40.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	62	Surface: Soil and grass		105 2964
0.5			0.0	56	Fill: Silt with sand and gravel: Light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 5% medium sand, 20% fine sand, 5% fine gravel and concrete debris, 5% silt, cohesive, low plasticity	AF / ML	3163 4288
1.0			0.0	52			4444
			0.0	54			4721
2.0			0.0	57			4576
			0.0	61	2'2" Fill: Silty Sand: Brown (10YR 5/3), moist, medium dense, no odor, 5% angular fine gravel (fill rock), 30% silt, 5% coarse sand, 5% medium sand, 5% clay, 50% fine sand	AF / SM	4714
3.0			0.0	57			4670
			0.0	62			4730
4.0			0.0	69			4938
			0.0	70			4925
5.0			0.0	77	4'7" Fill: Clay with silt and sand: Brown (10YR 5/3), moist, medium stiff, no odor, 10% silt, 10% fine sand, 5% gravel (fill rock), 5% clay	AF / CL	4780
			0.0	65			4715
6.0			0.0	77			4592

Radiological Background 46/2658/10				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 68
Depth	Interval	Recovery FTD	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)
6.0		0.0	77	Same as above: Clay with silt and sand	AR	4592
		0.0	57	6" some asphalt debris	CL	4676
7.0		0.0	52	Fill: Sandy silt with clay: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 10% clay, 15% fine sand, 5% medium sand, 5% fine gravel, 65% silt, non cohesive, low plasticity, low toughness, trace concrete	AF/ML	4787
		0.0	50			4789
8.0		0.0	62	2" thick concrete debris		4520
		0.0	57	Fill: Gravelly clay with silt: Yellowish brown (10YR 5/6), medium stiff to stiff, no odor, 15% fine to medium gravel and concrete debris, 5% fine sand, 10% silt, 70% clay, cohesive, medium plasticity, medium toughness, mottled	AF/CL	4638
9.0		0.0	62	8.7" concrete debris		4596
		0.0	60			4557
10.0		0.0	48			4440
		0.0	61			4490
11.0		0.0	81			4572
		0.0	84			4598
12.0		0.0	85	Same as above: Gravelly clay with silt	AF/CL	4320
		0.0	75	12.3" Fill: Sandy clay with gravel: Brown (10YR 4/3), moist, stiff, no odor, 10% medium subangular gravel and concrete, 5% coarse sand, 10% medium sand, 15% fine sand, 60% clay, cohesive, medium plasticity	AF/CL	4250
13.0		0.0	67			4505

Radiological Background 46/2658/10				Project Name SSPE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 68	
Depth	Interval	Recovery	FTD	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	(CFM)
13.0	6.0 CIL	00	67		Same as above: Fill: Silty Sandy Clay with gravel	AF	4605
		00	74			CL	4425
14.0	7.0 CIL	00	64				4634
		00	40				4404
15.0	8.0 CIL	00	45				4456
		00	45				4412
16.0	9.0 CIL	00	50				4528
		00	51			AF CL	4483
17.0	10.0 CIL	00	62				4617
		00	77				4594
18.0	11.0 CIL	00	74				4645
		00	61				NM
19.0	12.0 CIL	00	73				NM
		00	80	14" 10"		concrete with Mag netite	NM
20.0	13.0 CIL	00	82			Same as above: Fill: Sandy Clay with gravel	NM
						Total Depth / Refusal on concrete at 20' bgs	NM: not Measured
						No. GW encountered	

- Able to widen boring to 18' bgs and downhole to 18' bgs
- 20' recovery in sampling

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: Subarea 6 group 1	Location ID: 69
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10 Ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7/27/11 0735	Date/Time Total Depth Reached: 7/27/11 0840
Type of Sampling Device: 1 3/4" Macrotore	Samples Collected: (1) 1/2 gallon bags + 4oz jar 60110 & (0740)		
Geologist: C. Knight	Checked by/Date: Chelsea Caruina / 11-2-11		

Radiological Background: 57 / 2546 /	Radiological Equipment Used: Pancake / downhole	PID Used: Mini Rae 2000 (Bkgs: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiologist	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)
			0.0	72	Surface:		10.5 2742
0.5			0.0	83	Fill: Sandy silt with gravel: Pale brown (10YR 6/3), dry, medium stiff, no odor, 15% sub angular fine to medium gravel (fill rock), 5% coarse sand, 10% medium sand, 20% fine sand, 50% silt, cohesive, low plasticity, low toughness	AF / ML	2958 4082 4407
1.0			0.0	65			4726
			0.0	62			4722
2.0			0.0	71			4693
			0.0	59			4647
3.0			0.0	55	217" Fill Sandy silt with clay: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 5% medium sand, 5% subangular gravel (fill rock), 20% clay, 20% fine sand, 50% silt, cohesive, low plasticity, medium toughness	AF / ML	4608
			0.0	52			4771
4.0			0.0	54			4837
			0.0	57			4914
5.0			0.0	62	176" Fill Clay with silt and sand: Grayish brown (10YR 5/2), moist, stiff, no odor, 10% silt, 10% fine sand, 5% subangular gravel (fill rock), 75% clay, cohesive, medium plasticity, medium toughness	AS / CL	4561
			0.0	45			4888
6.0			0.0	37			

Radiological Background 57/2546				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 69	
Depth	Interval	Recovery	PTD	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 <small>(CPM)</small>
6.0		0.0	37		Same as above: Fill: Clay with silt and sand	AF	4888
		0.0	48			CL	4896
7.0		0.0	51		6'10" Fill: Sandy silt with clay and gravel: Yellowish Brown (10YR 5/4), moist, medium stiff, no odor, 5% medium sand, 20% fine sand, 10% clay, 10% subangular to angular medium gravel (fill rock) or concrete debris; 55% silt, low plasticity, non cohesive, low toughness	AF	4912
		0.0	46		5'2" concrete debris ~3" thick	ML	4842
8.0		0.0	67				4623
		0.0	52		nail 8'8"		4658
9.0		0.0	52		8'10" Fill: Clay with gravel: Yellowish brown (10YR 5/4), moist, stiff, no odor, 5% fine sand, 10% angular quartzite and concrete medium gravel, 5% silt, 80% clay, cohesive, medium plasticity, medium toughness	AF	4392
		0.0	60			CL	4708
10.0		0.0	75		10'0" medium angular quartzite gravel		4285
<p>Total Depth 10.0' bgs No GW encountered</p>							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 70
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 20.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/28/11 0825	Date/Time Total Depth Reached 7/28/11 10:50
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60" 11 (0830)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 11-2-11		

Radiological Background 42 / 2834 / 10	Radiological Equipment Used Pancake / downhole / Macro R 1	PID Used Mini Rae 2000 (Bkgd: 40.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <i>AF: Artificial Fill</i> <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 Inches +0.5' 2988 (CPM)
			0.0	53	Surface: Soil & gravel		3666
0.5			0.0	63	Fill: Sandy Silt: Very pale brown (10YR 7/4), dry, medium stiff, no odor, 5% subrounded medium gravel (fill rock), 20% fine sand, 5% medium sand, 70% silt, cohesive, low plasticity, low toughness	AF / ML	4412
1.0			0.0	55			4524
			0.0	65			4521
2.0			0.0	45	1' 9" → Fill: Silty Sand: Brown (10YR 5/3), moist, medium dense, no odor, 5% angular gravel (fill rock), 30% silt, 65% fine sand, mottled	AF / SM	4658
			0.0	78			4740
3.0			0.0	62	3' 6" → Fill: Silty Clay Sandy Silt with clay: Brown (10YR 5/3), moist, medium stiff, no odor, 5% medium sand, 20% fine sand, 10% clay, 65% silt, cohesive, low plasticity, low toughness ↳ some roots	AF / ML	4642
			0.0	43			4910
4.0			0.0	59			4924
			0.0	56			4770
5.0			0.0	58	8' 10" → See next page	AF / CL	4700
			0.0	44			4817
6.0			0.0	50			4746

Radiological Background 42/2834 / 10				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 70		
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)
6.0		0.0	50		Fill: Silty Clay: Dark grayish brown (10YR 4/2), moist, stiff, no odor, 25% silt, 52% fine sand, 70% clay, medium plasticity, medium toughness	AR	4746	
		0.0	53			CL	4739	
7.0		0.0	70		67" Fill: Sandy silt with gravel: Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 15% angular medium to large gravel and concrete debris, 52% medium sand, 20% fine sand, 60% silt, cohesive, low plasticity, mottled	AR	4468	
		0.0	45			ML	4543	
8.0		0.0	49		8'3" Abundant concrete with magnesiumite		475.2	
		0.0	57			OK	4665 4635	
9.0		0.0	62			OK	4665 4697	
		0.0	60				4665	
10.0		0.0	57		10'0" same medium subrounded gravel (fill rock)		4394	
		0.0	59				4507	
11.0		0.0	80				4513	
		0.0	75				4599	
12.0		0.0	66				4544	
		0.0	53		Fill: Same as above: Sandy silt with gravel	AR	4500	
13.0		0.0	65			ML	4595	

Radiological Background 42/2834 /10				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 70	
Depth	Interval	Recovery	PTD	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)
13.0	65				Same as above: Fill: Sandy silt with gravel	AF/ML	4595
	63						4582
14.0	65				13'10" Fill: Poorly graded sand; Olive yellow (2.5Y 6/6), moist, dense, no odor, fine grained sand (100%),	AF/SP	4419
	50				14'3" trace medium sand	AF/CL	4671
15.0	59				Fill: Silty clay with sand: Olive brown (2.5Y 4/3), moist, stiff, no odor, 5% coarse sand, 5% medium sand, 10% fine sand, 35% silt, 45% clay, cohesive,		4577
	53						4476
16.0	64						4443
	74				16'3" Fill: Sandy silt with gravel: light olive brown (2.5Y 5/3), moist, stiff, no odor, 5% medium sand, 10% subrounded to subangular fine to medium gravel (fill rock), 20% fine sand, 65% silt, trace clay;	AF/ML	4816
17.0	66						4818
	75						4496
18.0	55				18'6" to 18'8" Concrete debris		4399
	55						4314
19.0	75				19'1" trace asphalt		41607
					19'3" Magnetite and concrete debris, very moist soil	AF/ML	
	61				Weathered Sandstone Bedrock: Olive gray (5Y 5/2), moist, hard, no odor, 5% fine (pea size) gravel,		4554
20.0	72				19'10" 10% coarse sand, 85% fine sand, fine grained sandstone	Bedrock	4679

Refusal on Sandstone at 20' bgs

No GW encountered

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 71
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 15.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-14-11 1123	Date/Time Total Depth Reached 7-14-11 1310 ^{ck} 1450
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 6012 (60970) (1130) CIL (1) 1/2 gallon bags + 4oz jar CIL		
Geologist C. Knight	Checked by/Date Julie Robinson-Maldman 11/29/11		

Radiological Background 42 / 2100	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	65	Surface: Soil and gravel		2440
0.5			0.0	65	Fill: Silty Sand with gravel; light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 5% medium sand, 35% fine sand, 10% angular fine to coarse gravel and concrete debris, 60% silt, mottled, trace asphalt	AF / ML	3146
1.0			0.0	68			3495
			0.0	60			3619
2.0			0.0	45			3676
			0.0	65			3604
3.0			0.0	56	3' 2" Fill: Silty clay with ^{cl} sand; Yellowish brown (10YR 5/6) moist, medium stiff, no odor, 5% fine gravel and asphalt debris, 5% fine sand, 30% silt, 60% clay, cohesive, low plasticity, medium toughness	AF / CL	3531
			0.0	70			3565
4.0			0.0	65			3441
			0.0	65			3447
5.0			0.0	62	Fill: Silty Sand with gravel; Very pale brown (10YR 7/4) to yellowish brown (10YR 5/4), moist, dense, no odor, 35% silt, 15% angular gravel and asphalt/concrete debris, 15% medium sand, 35% fine sand, mottled	AF / SM	3579
			0.0	52			3516
6.0			0.0	48			3664

Radiological Background 42/2100			Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 71			
Depth	Interval	Recovery	FTD	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)
6.0			0.0	48	6'0" bgs asphalt debris ~2" thick	AF		3664
			0.0	68		SM		3554
7.0			0.0	73	Fill; Same as above; Silty Sand with gravel			3653
			0.0	48				3600
8.0			0.0	51	8' granitic gravel			3282
				55	8'2" concrete debris			3217
9.0			70		Fill; Silty Sand with gravel; dark yellowish brown (10YR 4/4), moist, dense, no odor, 15% silt, 10% angular gravel, 5% coarse sand, 40% medium sand, 60% fine sand, mottled	AF		3326
			66			SM		3515
10.0			65					NM
			65					
11.0			60		11'-2" thick concrete debris	AF		
			63		Fill; Silty Sand with gravel; Dark yellowish brown (10YR 4/4), moist, dense, no odor, 15% angular gravel and concrete debris, 15% silt, 10% medium sand, 5% coarse sand, 55% fine sand, mottled, trace asphalt	SM		
12.0			70					
			55					
13.0			46					
			63					
			49					

Radiological Background 42/2100					Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 71	
Depth	Interval	Recovery	FTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol Inches	Borehole Gamma Readings (CPM)
14.0	CK 8.0		0.0	49	Same as above: Fill; silty sand with gravel		AF SM	
			0.0	56				
15.0	CK 7.0		0.0	53	15' 0" black concrete debris			
					Refusal on concrete at 15.0' bgs			
					No GW encountered			
					- Unable to widen boring for use as downhole gamma logging past 9.5' bgs. Refusal with widener at 9.5' bgs			
16.0	CK 8.0							
17.0	CK 9.0							
18.0	CK 10.0							
19.0	CK 11.0							
20.0	CK 12.0							
21.0	CK 13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6, group 1	Location ID 72
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-13-11 0735	Date/Time Total Depth Reached 7-13-11 0850
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 60113 (0745) (1) 1/2 gallon bags + 4 oz jars		
Geologist C. Knight	Checked by/Date Julian Robbins Goldman 11/29/11		

Radiological Background 44 / 2488	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	46	Surface: soil and gravel		+0.5' 2743
0.5			0.0	47	Fill: Sandy Silt: Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 5% fine angular gravel (fill rock), 5% coarse sand, 5% medium sand, 20% fine sand, 65% silt, cohesive, low plasticity, low toughness, trace asphalt, mottled	AF/ML	3406
			0.0	48			4578
1.0			0.0	48			4955
			0.0	50			5090
2.0			0.0	49			4928
			0.0	56	2' 4"	AF/SM	4834
3.0			0.0	56	Fill: Silty Sand: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 15% silt, 5% coarse sand, 10% medium sand, 70% fine sand, trace pinkule pores, mottled, coarse sand is volcanic		5075
			0.0	62			4961
4.0			0.0	66			4835
			0.0	76	4' 3" Poorly graded Sand with Silt: Brown (7.5YR 4/4), moist, medium dense, no odor, 10% silt, 5% medium sand, 85% fine sand, some Iron oxide staining	SP	4906
5.0			0.0	79			4942
			0.0	55			4988
6.0			0.0	60			4975

Radiological Background 44 / 2488					Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 72	
Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches (CPM)	
6.0		0.0	60		Same as above: Poorly graded Sand with silt	SP	4975	
		0.0	61			"	5011	
7.0		0.0	59			"	5090	
		0.0	62			"	5115	
8.0		0.0	60			"	5044	
		0.0	58			"	4908	
9.0		0.0	61			"	4999	
		0.0	57			"	5157	
10.0		0.0	66			Same as above	SP	5178
						Total Depth: 10.0' bgs		
					No G.W. encountered			

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 6 group 1	Location ID: 73
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 5' 3" Ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7-21-11 0920	Date/Time Total Depth Reached: 7-21-11 1010
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: (1) 1/2 gallon bags + 4oz Jar 60114 (0930)		
Geologist: C. Knight	Checked by/Date: Chelsea Carmichael / 11-2-11		

Radiological Background: 66 / 2035 / 13	Radiological Equipment Used: Pancake / downhole / Micro R	PID Used: Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	62	Surface: grass and soil		+0.5' 3119 (CPM)
0.5		0.0	77		Fill: Sandy silt with Gravel: light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 5% medium sand, 15% fine sand, 10% fine to medium subangular gravel (fill rock), 5% clay, 65% silt, low plasticity, low toughness	AF / ML	3305 4750
1.0		0.0	63		1' 2"		4937
		0.0	73		Fill: Silty sand with gravel / dark yellowish brown (10YR 4/4), moist, dense, no odor, 25% silt, 15% fine to coarse subangular gravel and concrete debris, 10% coarse sand, 10% medium sand, 40% fine sand, mottled, trace duct tape debris	AF / SM	4671 4442
2.0		0.0	84				4160
		0.0	49				4023
3.0		0.0	54				4068
		0.0	72				
4.0		0.0	53		4' 1" some magnetite debris		NM
		0.0	74				NM
5.0		0.0	54		5' Red brick debris trace		
					5' 3" Abundant concrete debris		NM
					5' 3"		
6.0					<ul style="list-style-type: none"> • Only able to widen boring to 3' 6" for downhole bore logging • No CW encountered = Total Depth 5' 3" 		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 Group 1	Location ID 74
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/14/11 0745 0725	Date/Time Total Depth Reached 7/14/11 0855
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 60115 (0730) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 11-2-11		

Radiological Background 46 / 2533	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	55	surface: gravel and soil		3570
0.5			0.0	65	Fill: Silty Sand with gravel: light yellowish brown (2.5Y 7/4), dry, medium stiff, no odor, 5% medium sand, 20% fine sand, 75% silt, cohesive, low plasticity, mottled, trace rootlets	AF / ML	4478
1.0			0.0	55			4747
			0.0	62	1" 6"		4826
2.0			0.0	49	Fill: Silty Sand with gravel: light yellowish brown (2.5Y 6/3), moist, medium dense, no odor, 15% angular granitic gravel, 25% silt, 5% medium sand, 5% coarse sand, 50% fine sand, trace rootlets, mottled, trace concrete debris.	AF / SM	4677
			0.0	52			4552
3.0			0.0	50			4467
			0.0	57			4493
4.0			0.0	69	Same as above: Fill: Silty Sand with gravel	AF / SM	4585
			0.0	67	1/8" trace asphalt		4547
5.0			0.0	80	No Recovery		4409
			0.0	80	Same as above: Fill: Silty Sand with gravel	AF / SM	4234
6.0			0.0	70			4004

Radiological Background 46/2533				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 74	
Depth	Interval	Recovery	PTD	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)
6.0		0.0	70		Same as above: Silty Sand with gravel	Af	41004
		0.0	65			Sp	3909
7.0		0.0	75		7'6" ^{CK} large coarse angular concrete debris w/ 1/4" dia.		3835
		0.0	60		7'6"		3800
8.0		0.0	90		Fill: Sandy silt with gravel: yellowish brown (10YR 5/4) moist, medium stiff, no odor, 35% fine sand, 15% angular fine to coarse gravel (fill rock), 50% silt, trace concrete debris	Af / ML	3573
		0.0	80			Af	3418
9.0		0.0	65		Fill: Silty Sand with gravel: yellowish brown (10YR 5/4) moist, medium dense, no odor, 15% silt, 5% coarse sand, 10% medium sand, 15% angular fine to coarse gravel (fill rock), 55% fine sand	Sm	3442
		0.0	50				3618
10.0		0.0	55	10'			3822
Total Depth: 10.0' bgs							
No GW Encountered							

Radiological Background				Project Name	Project Number	Location	
57	2555	11		SSPL Area IV Radiological Study	EP9034.01.22.04.03	75	
Depth	Interval	Recovery	PTD	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
						Inches	(CPM)
6.0		0.0	63		Same as above (CL)	CL	4532
		0.0	74			CL	4608
7.0		0.0	49			CL	4511
		0.0	54			CL	4660
		0.0	47			CL	4785
8.0		0.0	73		7 1/8" asphalt and concrete debris		
		0.0	61		Same as above (CL)	CL	4719
9.0		0.0	71		8'10" asphalt debris - same as above		
		0.0	71		9'2" - 9'4" concrete		
		0.0	83		Same as above (CL)	CL	4451
10.0						CL	4595
					TD = 10' bgs (all artificial fill)		
					NO groundwater encountered		
							4607
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 76
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/27/11 1025	Date/Time Total Depth Reached 7/27/11 1100
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags + 4oz Jar - 60117 (1030)		
Geologist C. Knight	Checked by/Date Chelsea Carnichael / 11-2-11		

Radiological Background 54 / 3013 / 12	Radiological Equipment Used Pancake / downhole / Micro RI	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches
					Surface: soil analysis		+0.5' 3031 (CPM)
0.5			0.0	64	Silty Sand! Very pale brown (10YR 7/3) dry, dense, no odor, 35% silt, 5% medium sand, 60% fine sand, rootlets near surface	SM	3030
1.0			0.0	50			3550
			0.0	55			4661
2.0			0.0	62	Weathered Sandstone/siltstone Bedrock - Pale yellow (5Y 7/4), dry, very dense, no odor, inter bedded sandstone and siltstone layers, mechanically weathered to SP, fine grained sandstone with interbedded siltstone	SP	5354
			0.0	65			5032
3.0			0.0	51			5402
			0.0	52	mudstone bedding, moist, hard, no odor		5189

Total Depth: 3.0' bgs
No. GW encountered

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 6 / 1	Location ID: 77
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10 ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7/26/11 / 0848	Date/Time Total Depth Reached: 7/26/11 / 0857
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected sample ID: 60118 time: 0935 (1) 1/2 gallon bags / (1) 4 oz jar		
Geologist: Stephanie Lapeyre Montrose	Checked by/Date: Chelsea Carmichael / 11-16-11		

Radiological Background: 66 / 267 / 11	Radiological Equipment Used: Pancake / downhole / MICOR	PID Used: Mini Rae 2000 (Bkgd: 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 Inches + 0.5 = 2846 (CPM)
			0.0	45	surface: top soil and vegetation		
0.5			0.0	54	0-11" SP SAND yellowish brown (10YR 5/4) 10% clay, 10% silt, 80% fine-coarse grained sand, dense, low plasticity, rootlets, trace gravel - subangular (sandstone), very soft, dry	SP	3104 4383
1.0			0.0	59	11"-2' SM silty sand yellowish brown (10YR 5/4) 25% silt, 65% fine-coarse grained sand	SM	4725
			0.0	51	10% clay, trace gravel - subangular (sandstone), trace concrete debris low plasticity, dense, very soft, dry, no odor		4669
2.0			0.0	57	2'-5' CL sandy CLAY with silt dark yellowish brown (10YR 4/4)	CL	4493
			0.0	59	35% clay, 25% silt, 40% fine-med. grained sand		4580
3.0			0.0	60	medium plasticity, firm, dry trace concrete debris and asphalt debris		4513
			0.0	51	throughout, no odor		4688
4.0			0.0	52	Same as above		4821
			0.0	67			4886
5.0			0.0	66	CL sandy clay with silt yellowish brown (10YR 5/4) Same as above - no concrete debris	CL	4946
			0.0	50			4739
6.0					5'10"-6'3" SM silty sand yellowish brown 10% clay, 40% silt, 50% fine-coarse grained sand (10YR 5/4) trace gravel - subangular (quartz), trace asphalt debris low plasticity, very soft, dense, dry, no odor	SM	

Radiological Background				Project Name	Project Number	Location	
66	2671	11		SSPL Area IV Radiological Study	EP9034.01.22.04.03	77	
Depth	Interval	Recovery	PTD	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	Inches	
6.0		0.0	74		Same as above	SM	4853
		0.0	84		6'4"-6'5" concrete		
		0.0	61		6'5"-10' sandy clay with silt yellowish brown (10% 5/4) 35% clay, 25% silt, 5% gravel-subangular (volcanic) 35% fine-medium grained sand, medium plasticity, firm, dry, no odor	CL	5000
7.0		0.0	64		7/2" asphalt pieces		4801
		0.0	64			CL	4648
8.0		0.0	85		Same as above		4736
		0.0	66				4806
9.0		0.0	58		8'10"-8'11" asphalt pieces		
		0.0	52		Same as above	CL	4903
		0.0	52		9'8" 1" magnetite piece		4507
10.0		0.0	68		10' concrete pieces, trace gravel-subangular (granitic)		4324
					TD = 10' bgs (all artificial fill) no GW encountered		
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 78
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-25-11 1400	Date/Time Total Depth Reached 7-25-11 1425
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60119 (SAMPLE) ^{NO}		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-2-11		

Radiological Background 49 / 2853 / 1111R	Radiological Equipment Used Pancake / downhole 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	42	Surface: Soil & grad		2906
0.5			0.0	70	Fill: Silty sand with gravel; light yellowish brown (2.54 G/4), dry, medium dense, no odor, 35% silt, 10% angular medium to coarse gravel (fill rock), 5% coarse sand, 1% medium sand, 3% fine sand, trace asphalt, 1/2" - 2" thick asphalt debris	AF / SM	4157
1.0			0.0	70	Sandstone block, fine grained sandstone pale brown (104R - 6/3), dry dense, no odor		4986
1.5			0.0	NM	Refusal on Sandstone at 1.5' bgs		NM
2.0					No GW encountered		
3.0					Only able to widen boring to 1.0		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 6 Group A	Location ID: 79
Drilling Company: Boat Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 2.5 Ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7/25/11 1430	Date/Time Total Depth Reached: 7/25/11 1500
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: C1) 1/2 gallon bags + Moisture 60120 (1440)		
Geologist: C. Knight	Checked by/Date: Chelsea Carmichael / 11-3-11		

Radiological Background: 81 / 3084 / 12	Radiological Equipment Used: Pancake / downhole / Micro R	PID Used: Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: Soil and grass		10.5' 2812
0.5			0.0	47	Fill: Well graded Sand! Yellowish brown (10YR 5/4), dry, medium dense, no odor, 15% coarse sand, 5% silt, 5% angular fine gravel (fill rock), 35% medium sand, 40% fine sand	AF / SW	2843
			0.0	42			3571
1.0			0.0	45			4102
			0.0	63	110" - trace asphalt debris w 1/8" diameter		4754
2.0			0.0	20	2' 0"		NM
			0.0	62	Weathered sandstone bedrock: very pale brown (10YR 7/4), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone, 5% fine gravel, 95% fine sand	Substr	NM
3.0					Refusal Sandstone at 2.5' bgs		
4.0					No GW encountered		
5.0					Only able to widen boring to 1.5' for downhole logging		
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group 6 / 1	Location ID 80
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.5' 4.6 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/26/11 / 1015	Date/Time Total Depth Reached 7/26/11 / 1022
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags / (1) 4oz. jar		
Geologist Stephanie Lapeyre Montrose		Checked by/Date Melissa Carmichael / 11-16-11	

Radiological Background 50 / 2616 / 11	Radiological Equipment Used Pancake / downhole / MICOR	PID Used Mini Rae 2000 (Bkgd: " 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches +0.5 = 2606 (CPM)
			2.0	78	Surface = top soil and vegetation		
0.5			0.0	82	0-1'4" SC clayey sand yellowish brown (10 YR 5/4) 10% silt, 25% clay, 65% fine-medium grained sand rootlets, dense, low plasticity, soft, dry, no odor	SC	2961 4231
1.0			0.0	68	trace gravel - subangular (sandstone and volcanic)		4785
			0.0	67	1'4" - 1'8" SC clayey sand w/silt brownish yellow 25% clay, 15% silt, 60% fine-coarse (10 YR 6/6) grains sand, dense, low plasticity, soft, dry, no odor	SC	5056
2.0			0.0	105	1'8" - 3'8" SM sand with silt, low plasticity, dense, dry, no odor 20% silt, 10% clay, 70% fine-coarse (10 YR 5/6) 2'-2'2" sandstone - GLEV (7/1) light greenish gray, no odor 2'2" - 2'4" trace of pea gravel (volcanic - subangular)	SM	5356
			0.0	89	2'4" piece of asphalt		5319
3.0			0.0	87	SM sand with silt Same as above	SM	5434
			0.0	74	3'4" trace granitic gravel - subangular		5313
4.0			0.0	67	3'8" - 3'9" sandstone with biotite flakes		
			0.0	67	3'9" - 4'6" SW SANDS yellowish brown (10 YR 5/6) 10% silt, 90% fine-coarse grained sand	SW	4594
			0.0	39	loose, non plastic, dry, no odor		
5.0					TD = 4'6" bgs (refusal) No GW encountered		4.5 = 4440
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 81
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10-0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-21-11 1450	Date/Time Total Depth Reached 7-21-11 1600
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60122 (1500)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 11-3-11		

Radiological Background SB / 2871 / 12	Radiological Equipment Used Pancake / downhole / Micro R11	PID Used Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	72	Fill: Artificial fill		3831
0.5			0.0	75	Fill: Silty Sand; Yellowish brown (10YR 5/4), moist, medium dense, no odor, 30% silt, 5% subangular fine to medium gravel, 5% coarse sand, 10% medium sand, 50% fine sand, mottled	AF / SM	4596
1.0			0.0	71			5054
			0.0	61			5681
2.0			0.0	49			1'10" Fill: Poorly graded sand & greenish gray (10Y 6/1), moist, dense, no odor, 20% medium sand, 80% fine sand
			0.0	61	Fill: Silty Sand with gravel; Yellowish brown (10YR 5/6), moist, medium dense, no odor, 20% silt, 5% coarse sand, 15% medium sand, 10% angular to subangular fine to coarse gravel, 50% fine sand	AF / SM	5605
3.0			0.0	66			5504
			0.0	77			5636
4.0			0.0	72			5683
			0.0	83			5746
5.0			0.0	86			6595
			0.0	67	Same as above	AF / SM	5606
6.0			0.0	56			5325

Radiological Background 58/2871/12				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 81	
Depth	Interval	Recovery	FTD	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	(CFM)
6.0		0.0	56		Same as above; Silty Sand with gravel	AF	5325
		0.0	63			SM	5387
7.0		0.0	69				5278
		0.0	74				5468
8.0		0.0	65			7" 11" weathered Sandstone; Not bedded, likely a cobble or boulder; Very pale brown (10YR 7/4), dry, hard, no odor, mechanically weathered to SP, fine grained sandstone	AF
		0.0	67		Poorly graded sand w. fine silt Fill: light yellowish brown (2.5Y 6/4), moist, medium dense, no odor, 10% silt, 5% sandstone gravel, 85% fine sand, trace fill rock, mottled.	SP	5561
9.0		0.0	85				5607
		0.0	83				5631
10.0		0.0	79				5769
<p>Total Depth: 10.0' bgs No GW encountered</p>							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 / 1	Location ID 82
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/22/11 / 0905	Date/Time Total Depth Reached 7/22/11 / 0922
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags / (1) 4 oz. jar		Sample ID: 60123 Time: 0920
Geologist Stephanie Lapeyre Montrose	Checked by/Date Chelsea Carmichael / 11-16-11		

Radiological Background 52/2392/10	Radiological Equipment Used Pancake / downhole / Micro IR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiologist	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 + 0.5 = 2886 (CPM)
			0.0	47	surface - top soil + vegetation		
0.5			0.0	44	SM silty sand with clay 20% clay, 25% silt, 50% fine-medium grained sand low-med plasticity, soft, dry, no odor rootlets, 5% pea gravel (subangular)	SM	3483 4481
1.0			0.0	38	7" trace pea gravel, same as above		4562
			0.0	34	same as above - trace pea gravel		4904
2.0			0.0	51	2'1" - 2'4" asphalt		5068
			0.0	60	2'4" - 3'1" SM sand with silt 15% silt, 85% fine-medium grained sand trace clay, trace sandstone subangular gravel non plastic, loose, dry, no odor	SM	5415
3.0			0.0	49			5486
			0.0	36			5484
4.0			0.0	37	3'1" - 4' SC clayey sand 30% clay, 70% fine-coarse grained sand medium plasticity, firm, dry, no odor.	SC	5416
			0.0	31	SC sand with clay 15% clay, 10% silt, 75% fine-medium grained sand trace sandstone subangular gravel, low plasticity, soft, dry, no odor	SC	5463
5.0			0.0	48			5415
			0.0	42	5' - 6'3" SP sand 10% silt, 85% fine-medium grained sand trace 5% clay, trace sandstone subangular gravel non plastic, dense, dry, no odor	SP	5481

Radiological Background			Project Name	Project Number	Location		
SZ/2392/10			SSPL Area IV Radiological Study	EP9034.01.22.04.03	82		
Depth	Interval	Recovery	PTD	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)
6.0		0.0	65				5480
		0.0	58		6'3" - 6'7" SW sand less very pale brown 7/3 10% silt, 90% fine- ^{coarse} medium grained sand, trace coarse grained sand, loose, dry, no odor	Sw	5456
7.0		0.0	54		6'7" - 9'11" SW SAND coarse yellowish brown 10% silt, 90% fine- ^{medium} grained (10% 5/14) trace clay, trace sandstone subangular gravel, non plastic, dense, dry, no odor trace asphalt debris (trace coarse grained)	Sw Sp	5610
		0.0	42	Ⓢ	trace coarse	Ⓢ	5404
8.0		0.0	50				5540
		0.0	54				5659
9.0		0.0	60		Same as above		5590
		0.0	75				5605
10.0		0.0	65		9'11" - 10' sandstone light grey (2.54 7/2) fine-coarse grained sand		5509
					TD=10' bgs (all artificial fill) No Gw encountered		
11.0							
12.0							
13.0							

Radiological Background 61/2615				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 83	
Depth	Interval	Recovery	PTD	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 (CPM)
6.0		0.0	47		6'1" Same as above: Silty sand with gravel	AP	3935
		0.0	49		85% concrete debris, 15% fine sand	SM	4130
7.0		0.0	52		Fill: Silty sand with gravel; Dark yellowish brown (10YR 4/4), moist, medium dense, no odor		4577
		0.0	57		15% silt, 10% fine to coarse gravel and concrete debris, 70% fine sand, 5% medium sand	AP	4423
8.0		0.0	56		7'7" concrete debris ~ 1" thick	SM	4177
		0.0	55		8'5" electrical wire ~ 1/8" diameter		4370
9.0		0.0	57		8'10" pocket of poorly graded fine sand (100%), gray (2.5Y 5/1), moist, med dense, no odor ~ 1 1/2" thick		4249
		0.0	62		Asphalt + gravel 9'9" to 10' bgs with trace sand at terminus of boring		3939
10.0		0.0	65				4076 470 (CK)
<p>Total Depth: 10.0' bgs No GW encountered</p>							

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 6 group 1	Location ID: 84
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10.0 ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7-19-11 0910	Date/Time Total Depth Reached: 7-19-11 1005
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: (1) 1/2 gallon bags + 4oz Jar 60125 (0920) 60515 (Net)		
Geologist: C. Knight	Checked by/Date: Shelley R. Feldman 11/29/11		

Radiological Background: 47 / 3247 / 114	Radiological Equipment Used: Pancake / downhole / Mini Rn	PID Used: Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	46	Surface soil		3247
0.5			0.0	63	Fill: Clayey silt with sand - Very Pale brown (10YR 7/3), dry, medium stiff, no odor, 20% clay, 15% fine sand, 5% fine gravel (fill rock), 60% silt, low plasticity, mottled	AF/ML	3575 4642
1.0			0.0	58			5131
			0.0	63			5057
2.0			0.0	59	1'10" Fill: Silty Sand with gravel - light yellowish brown (2.5Y 6/4), dry, medium dense, no odor, 35% silt, 20% fine to coarse gravel and concrete debris, 45% fine sand, mottled	AF/SM	4982
			0.0	57			4755
3.0			0.0	65	3'2" Abundant concrete debris		4475
			0.0	64	3'5" Same as above: Fill: Silty Sand with gravel - light olive brown (2.5Y 5/3), trace electrical wire	AF/SM	4185
4.0			0.0	57			4412
			0.0	55			4109
5.0			0.0	59			4091
			0.0	47			4183
6.0			0.0	51	6'0" trace black concrete	AF/SM	4571

Radiological Background				Project Name	Project Number	Location	
47/11/2				SSPL Area IV Radiological Study	EP9034.01.22.04.03	84	
Depth	Interval	Recovery	PTD	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)
6.0		0.0	51		Same as above! Silty Sand with lg gravel	AS	4571
		0.0	48			SM	4346
7.0		0.0	49		7.5" trace black fine concrete		3687
		0.0	56				3500
8.0		0.0	57		8'8" Fill; Poorly graded sand: light olive brown (2.5Y 5/4), moist, medium dense, no odor, 10% coarse sand, 5% medium sand, 85% fine sand, mottled		4153
		0.0	61				4268
9.0		0.0	68			AS	4486
		0.0	77			SP	4604
10.0		0.0	72				4432
11.0					Total depth 10.0' bgs No GW encountered Refusal conditions met from 3.5 to 6' bgs on sampling efforts on debris		
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 85
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-19-11 1050	Date/Time Total Depth Reached 7-19-11 1125
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60126(100)		
Geologist C. Knight	Checked by/Date Subarea Rollin J. Johnson 11/29/11		

Radiological Background SS 13271/15	Radiological Equipment Used Pancake / downhole / Micro R	PID Used Mini Rae 2000 (Bkgd: 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 Inches
					surface: soil and grass		+0.5' 3271 (CPM)
0.5			0.0	44	Fill: Sandy silt: light yellowish brown (2.5: 6/4), dry, medium stiff, no odor, 5% medium sand, 25% fine sand, 5% fine gravel, 65% silt, cohesive, low plasticity	AF	3401
			0.0	46		ML	4159
1.0			0.0	51	1'0" Fill: Silty Sand: yellowish brown (10YR 5/6), moist, medium dense, no odor, 20% silt, 5% medium sand, 75% fine sand, mottled, trace fine gravel	AF	4413
			0.0	55		SM	4974
2.0			0.0	60			5369
			0.0	62			5432
3.0			0.0	66			5430
			0.0	60			5498
4.0			0.0	55			5453
			0.0	58			5333
5.0			0.0	55	Same as above: ^{ck} Fill: Silty Sand	AF	5465
			0.0	51		SM	5591
6.0			0.0	65			5093

Radiological Background				Project Name	Project Number	Location	
55		15		SSPL Area IV Radiological Study	EP9034.01.22.04.03	85	
Depth	Interval	Recovery	PTD	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
						inches	(CPM)
6.0		0.0		65	Same as above: Fill silty sand	AF	5693
		0.0		64		SM	5664
7.0		0.0		56			5643
		0.0		72			5576
		0.0		70			5735
8.0		0.0			<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Weathered Sandstone bedrock: light olive brown (2-54 5/4), moist, dense, no odor, mechanically weathered to SP, finegrained sandstone </div>	Bedrock	
					Refusal on sandstone at 8.0' bgs.		
					No GW encountered		
9.0							
10.0							
11.0							
12.0							
13.0							



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 3	Location ID 86
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/20/11 1426	Date/Time Total Depth Reached 7/20/11 1505
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags + 402 Bag		60127 (1430)
Geologist C. Knight	Checked by/Date Julie Robinson Goldman 11/29/11		

Radiological Background 49 / 3040 / 16	Radiological Equipment Used Pancake / downhole / MicroIR	PID Used Mini Rae 2000 (Bkgs: 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	Borehole Gamma Readings <small>Inches</small>
					Surface: soil and gravel		3040 (CPM)
0.5			0.0	65	Fill: Sandy silt ^{w/ clay} Brown (10YR 5/3), dry, medium stiff, no odor, 5% fine subrounded gravel, 5% medium sand, 25% fine sand, 10% clay, 55% silt, cohesive, low plasticity, low toughness, mottled, trace asphalt	AF	3692
			0.0	61		AF	4466
1.0			0.0	57		AF	4825
			0.0	55		AF	4613
2.0			6.0	57		AF	4830
			0.0	53	2'6" Fill: Silty Sand: Yellowish brown (10YR 5/4), moist, no odor, 25% silt, 5% medium sand, 5% fine gravel, 65% fine sand, mottled	AF	5029
3.0			0.0	52	3'6" trace rubber debris	AF	5084
			0.0	47		AF	5036
4.0			0.0	48	4'5" 7" thick asphalt debris without any soil	AF	5098
			0.0	49		AF	5149
5.0			0.0	45		5' Fill: Silty Sand: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 5% medium subrounded gravel, 20% silt, 5% medium sand, 70% fine sand, trace concrete	AF
			0.0	44		AF	5174
6.0			0.0	46		AF	5155

Radiological Background				Project Name	Project Number	Location	
49/ 115				SSPL Area IV Radiological Study	EP9034.01.22.04.03	86	
Depth	Interval	Recovery	PTD	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)
6.0		0.0		46	Same as above : Fill : Silty Sand	AF SM	5155
		0.0		47			5089
7.0		0.0		48			5058
		0.0		45			5299
8.0		0.0		50			5380
		0.0		52	8" angular gravel (fill rock)	AF SM	5557
9.0		0.0		56			5434
		0.0		57	Same as above : Fill : Silty Sand	AF SM	CK 5534 5554
10.0		0.0		52			5516
Total depth: 10.0' bgs.							
No GW encountered							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 87
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-21-11 0755	Date/Time Total Depth Reached 7-21-11 0950
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60128 (0800)		
Geologist C. Knight	Checked by/Date Julie Ann Roberts-Mellman 11/29/11		

Radiological Background 51 / 2505 / 13	Radiological Equipment Used Pancake / downhole / Micro R1	PID Used Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	57	Surface: Soil and grass		795 3110
0.5			0.0	70	Fill: Silt with sand and gravel: Light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 10% fine gravel, 5% medium sand, 5% fine sand, 5% clay, 75% silt, low plasticity, low toughness, non cohesive	AF / ML	3929 4880
1.0			0.0	74			5217
			0.0	75	Fill: Sandy clay with silt: Brown (10YR 5/3), dry, medium stiff, no odor, 5% coarse sand, 5% fine gravel, 10% medium sand, 15% fine sand, 10% silt, 55% clay, low toughness, medium plasticity, cohesive, trace asphalt	AF / CL	4461
2.0			0.0	72			4175
			0.0	61	2'2" Concrete debris: 100% concrete	AF	3770
			0.0	73	2'8" Fill: Silty sand with gravel: Yellowish brown (10YR 5/4), moist, dense, no odor, 20% silt, 10% fine to medium angular gravel or concrete debris, 10% medium sand, 60% fine sand	AF / SM	4037
3.0			0.0	93			4256
			0.0	87	3'7" trace black: concrete		4296
4.0			0.0	78	4'6" some black concrete		4158
5.0			0.1	73	No Recovery		3619
			0.0	66	Same as above: Silty sand with gravel	AF / SM	3405
6.0			0.0	68			3349

Radiological Background 51/2505/13				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 87		
Depth	Interval	Recovery	RTD	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)
6.0		0.0		68	Same as above: Fill; Silty Sand with gravel	AF SM	3349	
		0.0		55			2779	
7.0		0.0		51			2237	
		0.0		46	7'4" to 7'6" Black concrete debris ~ 2" thick section	AF	1352	
		0.0		44	7'6" Concrete (Dark gray 10YR 4/1), quartz, dense no odor		1363	
8.0		0.0		35	4'0" Pieces of concrete debris became noticeably magnetic with iron dust being polarized (Possible Magnetite)	AF SM	1741	
		0.0		58	Fill: Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 5% angular medium concrete debris, 35% silt, 5% medium sand, 60% fine sand		3018	
		0.0		63		AF SM	3439	
10.0	NR	0.0		68	NO Recovery.		3749	
<p>Total Depth: 10.0' bgs No GW encountered</p>								

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 88
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 15.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-14-11 0925	Date/Time Total Depth Reached 7-14-11 1050
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 60129 (0930) (1) 1/2 gallon bags + 402 Jar		
Geologist C. Knight	Checked by/Date Steve Roberts, Yedman 11/29/11		

Radiological Background 53 / 2554	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)	
					Surface: soil and grass		2646	
0.5			0.0	60	Description AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Fill: Silty Sand with gravel: yellowish brown (10YR 5/6), moist, medium dense, no odor, 10% gravel angular fine to coarse, 5% coarse sand, 15% silt, 30% medium sand, 40% fine sand, mottled	AF	3675	
1.0			0.0	75		SM	4279	
			0.0	75			4203	
2.0			0.0	80			4118	
			0.0	75			3994	
3.0			0.0	73			4036	
			0.0	75			3704	
4.0			0.0	88		3" concrete debris ~ 1" diameter	AF/SM	3839
			0.0	69		Same as above: Fill: Silty Sand with gravel		3961
5.0			0.0	60		No. Recovery		4107
			0.0	50	Fill: Silty Sand with gravel: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 20% silt, 10% angular fine to medium gravel (fill rock), 10% medium sand, 60% fine sand, mottled	AF/SM	4316	
6.0			0.0	60			4357	

Radiological Background 53/2554			Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 88			
Depth	Interval	Recovery	FTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
6.0		0.0	60		Same as above: Silty Sand with gravel	AF	4357	
		0.0	70			SM	4282	
7.0		0.0	65				4103	
		0.0	49		7'7" Concrete Debris w 1/2" diameter		4018	
8.0		0.0	50		Same as above: Silty Sand with gravel		4163	
		0.0	70		Fill: Well graded Sand: Light olive brown (10YR 5/3), moist, loose, no odor, 15% coarse sand, 30% medium sand, 55% fine sand, subrounded grains	AF	4388	
9.0		0.0	75			8'10" Sand, 30% medium sand, 55% fine sand, subrounded grains	AF	4676
		0.0	88			SW	4688	
		NR			No Recovery			
10.0		0.0	85		Fill: Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 15% silt, 10% medium sand, 5% fine gravel, 70% fine sand	AF	4387	
		0.0	78				SM	4496
		0.0	89				4775	
		0.0	85				4768	
11.0		0.0	80			AF	4444	
		0.0	69		12'6"	SM	3987	
13.0		0.0	60		Fill: Well graded Sand: Light olive brown (10YR 5/3), moist, loose, no odor, 15% fine sand, 30% coarse sand, 55% medium sand, trace fine gravel, sub-rounded grains of sand	AF	3895	
						SW		

Radiological Background 53/2554				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 88	
Depth	Interval	Recovery	FTD	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)	Inches	
14.0	CK		0.0	45	Same as above: well graded sand	AF SW	3838
			0.0	47	14'6" weathered sandstone bedrock: Brown (10YR 5/4), very moist, dense, no odor, 5% coarse sand, 5% silt, 90% fine sand, mechanically weathered to SP, Iron oxide staining		3921
15.0	CK		0.0	85	15'0" Sandstone Bedrock: Very pale brown (10YR 7/4), moist, very dense, no odor, fine grained sandstone		3754
16.0	CK						
17.0	CK						
18.0	CK						
19.0	CK						
20.0	CK						
21.0	CK						

Refusal on sandstone at 15.0' bgs
No GW encountered

Radiological Background 65/2685/10			Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 89			
Depth	Interval	Recovery	PTD	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)
6.0		0.0	47		Same as above: Fill: silty clay with sand	AF		4729
		0.0	35		6'10" concrete debris 2" diameter	CL		4678
7.0		0.0	41		6'10"			
		0.0	33		Fill: Sandy silt with gravel and clay: Yellowish brown (10YR 5/4), moist, stiff, no odor, 5% coarse sand, 52% medium sand, 20% fine sand, 10% subangular medium gravel (fill rock), 10% clay, 50% silt, non cohesive, mottled, low plasticity, some concrete debris	AF ML		4675 4650
8.0		0.0	45					4671
		0.0	50					4662
9.0		0.0	60					4679
		0.0	64					4633
10.0		0.0	76					4684
<p>Total Depth 10' bgs No GW encountered</p>								

Project Name: SSEL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 90
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/28/11 1105	Date/Time Total Depth Reached 7/28/11 1122
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60131 & (1110)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael/11-3-11		
Radiological Background 47 / 2237 / 10	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: Soil		+0.5' 3123
0.5			80		Fill: Silty Sand; Light olive brown (2.54 5/6), dry, medium dense, no odor, 15% silt, 5% sub angular fine gravel (fill rock), 80% fine sand, mottled, trace fine granitic gravel	AF / SM	3201 4234 5175
1.0			69				5313
2.0			60		Weathered Sandstone Bedrock: Brownish yellow (10YR 6/6), moist, dense, no odor, 10% medium sand, 90% fine sand, Iron oxide staining (trace)	SP	5425 5486
3.0			64				5548
4.0			65				5587
4.0			60				5562
5.0					Refusal on sandstone at 4' bgs		
6.0					No GW encountered		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 / 1	Location ID 91
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/26/11 / 1115	Date/Time Total Depth Reached 7/26/11 / 1122
Type of Sampling Device 1 3/4" Macrocore	Samples Collected Sample ID / time: no sample collected (1) 1/2 gallon bags / (1) 4 oz. jar		
Geologist Stephanie Lapeyre Montrose	Checked by/Date Chelsea Carmichael / 11-3-11		

Radiological Background 55 / 2850 / 10	Radiological Equipment Used Pancake / downhole / Micro R	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	Borehole Gamma Readings Inches + 0.5 = 3102 (CPM)
0.0			61		Surface top soil		
0.5	0-1.3'		74		sc clayey sand with silt light olive brown 20% silt, 25% clay, 55% fine (2.54 5/4) low-medium plasticity, soft, dry, no odor rootlets, trace gravel - subrounded subangular volcanic sandstone	SC	3295 4466 5752
1.0			55				
2.0	1.3"-1'6"		88		SM silty sand light olive gray 30% silt, 70% fine-coarse grained sand loose, non-plastic, dry, no odor	SM	
2.0					TD = 1.5' bgs (refusal)		
3.0					No GW encountered		
4.0					No sample collected - shallow refusal		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 / 1	Location ID 92
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/26/11 / 1405	Date/Time Total Depth Reached 7/26/11 / 1414
Type of Sampling Device 1 3/4" Macrocore	Samples Collected - Sample ID 60133 (time: no sample collected) (+) 1/2 gallon bags / (1) 406. Jan (2) collected		
Geologist Stephanie Lapeyre Montrose	Checked by/Date Chelsea Carmichael / 11-16-11		

Radiological Background 53 / 2685 / 10	Radiological Equipment Used Pancake / downhole / MICOR	PID Used Mini Rae 2000 (Bkgd: "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 Inches +0.5 = 2990 (CPM)
			0.0	45	Surface top soil		
0.5			0.10	59	0-7" SC clayey sand with silt 25% clay, 20% silt, 55% fine-medium grained sand (2.54 b/3) trace sandstone gravel - subangular, dense, low plasticity, soft, dry, no odor	SC	3078
					7"-11" SM silty SAND, trace subangular sandstone gravel 20% silt, 10% clay, 70% fine-medium grained sand, light yellowish brown (10R 5/6) trace coarse grained sand, dense, low plasticity, soft, dry, no odor	SM	3802
1.0			0.0	60	11"-1' SP sand 10% silt, 90% fine-medium grained sand, trace coarse grained 6/0/3 light yellowish brown trace sandstone gravel - subangular, non plastic, loose, dry, no odor	SP	5064
					TD = 1' bgs (refusal)		
					No GW encountered		
					Shallow refusal - no sample collected		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 / 1	Location ID 93
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10" inches ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/26/11 / 1441	Date/Time Total Depth Reached 7/26/11 / 1445
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 6 (1) 1/2 gallon bags / (1) 4 oz jar @ 2 sample		sample ID 60134 / time 110
Geologist Stephanie Lapeyre Montrose	Checked by/Date Chelsea Carmichael / 11-16-11		

Radiological Background 58 / 2651 / 11	Radiological Equipment Used Pancake / downhole / MICOR	PID Used Mini Rae 2000 (Bkgd: "0.0 ppm)
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Depth	Interval	Recovery	PID	Radiologist	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)
			0.0	64	Surface = top soil			
0.5			0.0	71	0-6" SM silty sand yellowish brown (10YR 5/6) 20% silt, 10% clay, 70% fine-medium grained sand, dense, non-low plasticity, very soft, dry, no odor	SM		
1.0			0.0	109	6"-10" SP sand light yellowish brown 10% silt, 90% fine-coarse grained sand (2.5Y 6/3) loose, non plastic trace sandstone gravel subangular @ loose, dry, no odor	SP		
					TD = 10" bgs (refusal)			
					No gw encountered			
					No sample collected			
					Unable to Downhole gamma scan			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 94
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-21-11 1155	Date/Time Total Depth Reached 7-21-11 1230
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60135 (1200)		
Geologist C. Knight	Checked by/Date Chelsea Carrivickal / 11-3-11		

Radiological Background 44 / 2470 / 12	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgrd: 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)
			0.0	40	AF: Artificial Fill		+0.5' 3072 (CPM)
0.5			6.0	58	Fill: Silty Sand with gravel; Yellowish brown (10YR 5/4), dry, medium dense, no odor, 10% subangular medium gravel (fill rock), 40% silt, 5% medium sand, 5% coarse sand, 40% fine sand	AF	3135
1.0			6.0	61		SM	3594
			6.0	61			4414
			0.0	69	1'8" weathered sandstone bedrock; light olive brown (2.5Y 5/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	Bedrock	4625
2.0			0.0	71			5127
3.0					Refusal on sandstone at 2' bgs		
4.0					No GW encountered		
5.0							
6.0							



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 95
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-21-11 1110	Date/Time Total Depth Reached 7-21-11 1140
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60136 (1115)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-3-11		

Radiological Background 66 12545/13	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	52	Surface soil and gravel		+0.5' 2888
0.5		0.0	63	63	Fill: Silty Sand with gravel (yellowish brown (10YR 5/4), dry, medium dense, no odor, 5% subrounded gravel and concrete debris, 20% silt, 5% coarse sand, 10% medium sand, 60% fine sand, mottled, trace asphalt.	AF/SM	3781 4498
1.0		0.0	76	76			4910
		0.0	75	75			5212
2.0		0.0	64	64			5102
		0.0	64	64	2'4" weathered sandstone bedrock: light olive brown (2.5Y 5/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	NM
3.0		0.0	63	63	Refusal on sandstone at 3.0' bgs No GW encountered	SP	NM
4.0					• 3' recovery, only able to widen to 2' bgs for downhole logging • No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 Group 1	Location ID 96
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-15-11 0930	Date/Time Total Depth Reached 7-15-11 1010
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 60137 (0940) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date Chelsea Carnichael / 11-3-11		

Radiological Background 55 / 2445	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	71	Surface: Soil and grass		+0.5' 2159
0.5			0.0	62	Fill: Silty Sand with gravel: light yellowish brown (10YR 6/4), dry, medium dense, no odor, 35% silt, 15% angular volcanic (granite, basalt) fine to coarse gravel, 5% medium sand, 45% fine sand, trace rutile, trace asphalt	AF, SM	2198 2972
1.0			0.0	56			3264
			0.0	55	Sandstone bedrock: Pale yellow (2.5Y 7/4), dry, very dense, no odor, fine grained sandstone 100% fine sand		3520
2.0			0.0	71	Refusal on Sandstone at 2.0' bgs No GW encountered	Bedrock	3760
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 97
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/20/11 1335	Date/Time Total Depth Reached 7/20/11 1410
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60138(1345)		
Geologist C. Knight	Checked by/Date Judean Robbins Medina 11/29/11		

Radiological Background 45 / 3284 / 14	Radiological Equipment Used Pancake / downhole / Micro R	PID Used Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	46	AF: Artificial Fill		+05' 3284
0.5			0.0	50	Fill: S. lty Sand; Yellowish brown (10YR 5/4), slightly moist, medium dense, no odor, 20% silt, 5% angular medium gravel and concrete, 5% coarse sand, 15% medium sand, 55% fine sand, trace asphalt, mottled	AF	3294
1.0			0.0	47		SM	3899
			0.0	50			4371
2.0			0.0	52	1'10" Tar/Asphalt patch without aggregate or sand		4428
			0.0	62			4708
3.0			0.0	60			5325
			0.0	63	3'1" Fill: Poorly graded sand with silt; Dark, ellavish brown (10YR 4/6), moist, dense, no odor, 5% angular gravel (medium), 10% silt, 85% fine sand, trace asphalt	AF/SP	5744
4.0			0.0	76			5712
			0.0	75			5534
5.0			0.0	75			5865
			0.0	47			6244
			0.0	45	5'7" weathered sandstone bedrock: Pale olive (5Y 6/3), moist, dense, no odor, mechanically weathered to SP fine grained sandstone		6336
6.0			0.0	45			5934

Refusal on sandstone at 6.0' bgs
No GW encountered

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, 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 7-12-11/0836	Date/Time Total Depth Reached 7-12-11/0843			
Type of Sampling Device trowel/shovel		Samples Collected 4-oz jar 1-1/2 gall bag (#60139) (0842)					
Geologist C. Carmichael		Checked by/Date Julian Robbins Goodman 12/19/11					
Radiological Background 15		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	14	Silty sand, (10YR, 5/4), light brown, 60% fine to coarse grained sand, 30% silt, 5% fine gravel (sandstone, concrete), 5% sandstone cobbles, dry, medium dense, no plasticity, hardness or odor. No GW reached.	SM	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 98
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-25-11 0920	Date/Time Total Depth Reached 7-25-11 1000
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60140 (0930)		
Geologist C. Knight	Checked by/Date Chelsea Carimichael / 11-3-11		

Radiological Background 45 / 3412 / B	Radiological Equipment Used Pancake / downhole / Micro R	PID Used Mini Rae 2000 (Bkgd: 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 Inches (CPM)
					Surface: soil and gravel		405 3244
0.5			0.0	56	Fill: Silty sand with gravel: light olive brown (2.5Y 5/3), dry, medium dense, no odor, 10% fine to coarse subangular gravel (fill rock) and concrete debris, 5% clay, 35% silt, 5% coarse sand, 15% medium sand, 30% fine sand, mottled trace asphalt	AF	3486
1.0			0.0	51		SM	4046
			0.0	60			4456
			0.0	41	18" weathered sandstone bedrock: olive yellow (2.5Y 6/6) moist, dense, no odor, fine grained sandstone, mechanically weathered to SP		4839
2.0			0.0	45			5092
			0.0	47			5656
3.0			0.0	58			5620
4.0					Refusal on sandstone at 3' bgs No GW encountered		
5.0							
6.0							

Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 99
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-25-11 1045	Date/Time Total Depth Reached 7-25-11 1055
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 6014) (NO SAMPLE)		
Geologist C. Knight	Checked by/Date Julian Roberts Alderman 11/29/11		

Radiological Background SB 12973 / R	Radiological Equipment Used Pancake / downhole / Micro R	PID Used Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	04	Surface: soil and grass		10.5 2974 (CPM)
0.5			0.0	01	Fill: silty sand; light olive brown (2.5Y 5/4) dry, medium dense, no odor, 30% silt, 5% fine to medium gravel (fill rock), 5% coarse sand, 10% medium sand, 50% fine sand, mottled	AK / SM	3281 3978
1.0			0.0	02	Weathered Sandstone Bedrock: ^{pink} Olive Yellow (2.5Y 6/6) dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	Plankt	5007 4951
2.0					Refusal on sandstone at 1.5' bgs No GW encountered - No sample collected due to shallow refusal		
3.0							
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 100
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-25-11 0840	Date/Time Total Depth Reached 7-25-11 0910
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60142 (NO SAMPLE)		
Geologist C. Knight	Checked by/Date Julian Robbins Feldman 11/29/11		

Radiological Background 42 12938 / 11AR	Radiological Equipment Used Pancake / downhole / Micro R	PID Used Mini Rae 2000 (Bkgd: 20 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 Inches (CPM)
				Surface:	AF: Artificial Fill		10.5' 2968
0.5			0.0	48	Fill: Silty sand with gravel: light olive brown (2.5Y 5/4), dry, medium dense, no odor, 10% fine sand, 10% fine to medium gravel (fill rock), 30% silt, 10% coarse sand, 20% medium sand, 30% fine sand, trace asphalt	AF SM	2986 3028
1.0			0.2	73	12% Weathered sandstone bedrock: Brownish yellow (10YR 6/6) dry, dense, no odor, mechanically weathered to SP fine grained sandstone		3654
			0.2	45	Refusal on sandstone 1.5' bgs No sample collected due to refusal No GW encountered		4663

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 101
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-25-11 10:05	Date/Time Total Depth Reached 7-25-11 10:25
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60143 (No sample)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-3-11		

Radiological Background 74 / 2726 / 11/11/11	Radiological Equipment Used Pancake / downhole / Micro RI	PID Used Mini Rae 2000 (Bkgrd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description AF: Artificial (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings +0.5 3059 (CPM)
			0.0	87	Surface: soil and grass		
0.5			0.0	81	Fill: Silty Sand with gravel + Pale yellow (2.54 7/3), dy, medium dense, no odor, 35% silt, 10% coarse sand, 10% subangular medium gravel (fill rock), 15% medium sand, 30% fine sand, trace pin holes pores	AR / SM	3126 3939
1.0			0.0	93	1' bgs - fine grained sandstone		4757
2.0					Refusal on sandstone at 1' bgs No GW encountered - No sample collected due to shallow refusal		
3.0							
4.0							
5.0							
6.0							



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 102
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 7-11-11/1059	Date/Time Total Depth Reached 7-11-11/1114
Type of Sampling Device trowel/shovel	Samples Collected 4-oz jar 1 1/2 gall bag (#60144) (1105)		
Geologist C. Carmichael	Checked by/Date J. Robbins Waldman 8/16/11		

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 (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	18	<p>~5-6" of asphalt on top. Sand with silt and gravel, (10 YR, 3/3), 75% fine to medium grained sand, 15% asphalt and sandstone gravel, 10% silt, dry, dense, no plasticity or hardness, no odor.</p> <p>No GW reached.</p>	SP		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 102
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 6"
Drilling Equipment trawl/shovel	Borehole Diameter NA	Date/Time Drilling Started 8-25-11/1429	Date/Time Total Depth Reached 8-25-11/1431
Type of Sampling Device trawl/shovel	Samples Collected 1/2 gall bag, 8-oz jar (#60145) (n/a)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Goldman 12/19/11		

Radiological Background 18,90,3809	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	73	Silty sand with gravel, (10YR 4/2), greyish-brown, 65% fine to coarse grained sand, 20% silt, 15% sandstone and asphalt fragments, dry, medium dense, no plasticity, hardness or odor	SM	
1'					Refusal hit at 6" - bedrock No GW reached No sample collected.		

Radiological Background			Project Name	Project Number	Location		
28 / 2885 / 12			SSPL Area IV Radiological Study	EP9034.01.22.04.03	103		
Depth	Interval	Recovery	PTD	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
						inches	(CPM)
6.0		0.0	68		Same as above	SM	5853
		0.0	55			"	5647
7.0		0.0	52		6'9" - 7' concrete		
		0.0	48		7' - 8'11" SM silty sand 30% silt, 70% fine-medium grained sand brownish yellow (10YR 6/6)	SM	5816
8.0		0.0	53		non plastic, loose, dry, no odor		5644
		0.0	62				5664
9.0		0.0	60		8'11" - 9'2" sandstone fine-medium grained yellowish brown (10YR 5/4) 10% clay, weathered sandstone SP		5525
		0.0	49		9'2" - 9'10" SP sand 55% fine-medium grained sand 5% sandstone gravel-subangular, 10% silt brownish yellow (10YR 6/6)	SP	5585
10.0		0.0	74		9'10" - 10' NO Recovery non plastic, loose, dry, no odor		5461
					TD = 10' bgs (all artificial fill)		5533
					NO GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 104
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-21-11 1400	Date/Time Total Depth Reached 7-21-11 1445
Type of Sampling Device 1 3/4" Macrocore	Samples Collected C1) 1/2 gallon bags + 402 Jar 60147 (H10) CK @ 1410		
Geologist C. Knight	Checked by/Date Chelsea Carmichael/11-3-11		

Radiological Background 46 / 2636 / 11	Radiological Equipment Used Pancake / downhole / Micro R1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.0			0.0	56	Description AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable) Fill: Silty Sand with gravel: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 20% silt, 10% subangular medium gravel (fill rock), 5% coarse sand, 25% medium sand 40% fine sand, mottled, trace concrete and asphalt, rootlets near surface 2'0" large 1 1/2" diameter concrete debris Weathered Sandstone Bedrock: light olive brown (2.5Y 5/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone Refusal on sandstone @ 3.5' bgs No GW encountered	AF / SM	70.5
0.5		0.0	57	3499			
		0.0	67	4477			
		0.0	64				
1.0		0.0	66	5244			
		0.0	66	5286			
2.0		0.0	63	5265			
		0.0	53	5333			
3.0		0.0	74	5553			
		0.0	73	5539			

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 6 group 1	Location ID: 105
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: CIL 3, 2, 3, 5 ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7-21-11 1015	Date/Time Total Depth Reached: 7-21-11 1100
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: 60148 (1020)		
Geologist: C. Knight	Checked by/Date: Judeca Robbins & Feldman 11/29/11		

Radiological Background: G1 / 2341 / 13	Radiological Equipment Used: Pancake / downhole / Micro RLI	PID Used: Mini Rae 2000 (Bkgd: "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 Inches (CPM)
			00	60	Surface: Soil and grass		+0.5 2750
0.5			00	49	Fill: Sandy silt with gravel; light olive brown (2.5Y 5/4), dry, medium stiff, no odor, 10% fine angular gravel, 5% medium sand, 13% fine sand, 5% clay, 65% silt, cohesive, low plasticity.	AF / ML	2919 4150
1.0			00	46	13" Concrete debris: 100% concrete	AF	4673
2.0			00	56	Fill: Silty sand with gravel; light olive brown (2.5Y 5/4), moist, medium dense, no odor, 10% ^{sub} angular medium gravel, 20% silt, 5% medium sand, 65% fine sand	AF / SM	4973
			00	87			5018
3.0			00	86	Weathered sandstone bedrock: light olive brown (2.5Y 5/4) (2.5Y 5/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone		5249
			00	65			5096
			00	52	Refusal on sandstone at 3.5 bgs		5631
4.0					No CW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 6 Group 1	Location ID: 106
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 1.5' ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7-20-11 1310	Date/Time Total Depth Reached: 7-20-11 1340
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: (1) 1/2 gallon bags + 4oz Jar		60149 (1313) ^{OK} NO SAMPLE
Geologist: C. Knight	Checked by/Date: Judean Robbins Hallman 11/29/11		

Radiological Background: 45 / NA / 15	Radiological Equipment Used: Pancake / downhole / Micro IR	PID Used: Mini Rae 2000 (Bkgrd: 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 <small>Inches (CPM)</small>
0.5			00	55	Fill: silty sand with gravel: Yellowish brown (10YR 5/4), dry, dense, no odor, 35% silt, 10% subangular medium gravel (fill rock), 5% coarse sand, 10% medium sand, 50% fine sand, trace concrete, trace asphalt.	AF/SM	40.5' ±
			00	59			
1.0			00	56			
			00	61			
2.0					Fill Refusal on sandstone ^{OK} at 1.5' bgs No GW encountered No sample collected		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 107
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-25-11 1115	Date/Time Total Depth Reached 7-25-11 1150
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 601.50 (1120)		
Geologist C. Knight	Checked by/Date M. Jean Robbins Salzman 11/29/11		

Radiological Background 60 / 3154 / 12	Radiological Equipment Used Pancake / downhole / MicroRi	PID Used Mini Rae 2000 (Bkgsd: 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 Inches (CPM)
			9.0	62	Surface: soil and grass		+0.5' 2904
0.5			0.0	50	Fill: Silty Sand: light yellowish brown (10YR 6/4) dry, medium dense, no odor, 5% fine to medium subangular gravel (fill rock), 35% silt, 5% coarse sand, 10% medium sand, 45% fine sand, trace asphalt, trace concrete debris	AF / SM	3208 4184 5114
1.0			0.0	61			
			0.0	74	15" weathered Sandstone Bedrock: yellowish brown (10YR 5/6), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	BS	5760
2.0			0.0	67			5877
			0.0	86			5769
3.0							
4.0							
5.0							
6.0							

Refusal on sandstone at 2.5' bgs
NO GW encountered

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group i	Location ID 108
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 7-12-11/0915	Date/Time Total Depth Reached 7-12-11/0923
Type of Sampling Device trowel/shovel	Samples Collected ^{4 oz jar} 1-1/2 gall bag (# 60151) (0922)		
Geologist C. Carmichael	Checked by/Date Julian Robbins, Moldovan 12/19/11		

Radiological Background 14	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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.014	Sandy silt with gravel, (10 YR, 5/3), light brown, 50% silt, 35% fine to medium grained sand, 15% gravel fill and sandstone/siltstone and cement fragments, dry, medium stiff, some rootlets, no plasticity, hardness or odor. No GW reached	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 108
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-25-11 12:05	Date/Time Total Depth Reached 7-25-11 12:45
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60152 (1210)		
Geologist C. Knight	Checked by/Date Ladawn Pollock-Baldman 11/29/11		

Radiological Background 761 3001	Radiological Equipment Used Pancake / downhole 1	PID Used Mini Rae 2000 (Bkgd: 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 Inches +0.5' 3001 (CPM)
					Surface Soil and gravel		
0.5		0.0	94		Sandy silt: light to brown (2.5Y 5/6), dry, medium stiff, no odor, 5% angular fine gravel, 20% fine sand, 5% medium sand, 70% silt, cohesive, low plasticity	ML	3330
		0.0	87				4234
1.0		0.0	80		Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand, some Iron oxide staining	SM	4732
		0.0	75				5108
2.0		0.0	75		Weathered Sandstone Bedrock: Brownish yellow (10YR 5/4), moist, no odor, dense, mechanically weathered to SP, fine grained sandstone, Iron oxide staining, 5% silt, 95% fine sand	SP	5367
		0.0	61				5467
3.0					Refusal on sandstone at 2.5' bgs		
4.0					Mo GW encountered		
5.0							
6.0							

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 109
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 7-12-11/0931	Date/Time Total Depth Reached 7-12-11/0951
Type of Sampling Device trowel/shovel	Samples Collected 4 oz jar 1-1/2 gall bag (# 60153) (0950)		
Geologist C. Carmichael	Checked by/Date Julian Robbins/Geldman 12/19/11		

Radiological Background 15	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 (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	14	4" of asphalt on top. Silty sand, (10YR, 5/4), light brown, 55% fine to medium grained sand, 35% silt, 10% asphalt, sandstone pieces and gravel, dry, dense, no plasticity, hardness or odor. (Fill)	SM		
					No GW reached.			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group i	Location ID 110
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 7-12-11/1004	Date/Time Total Depth Reached 7-12-11/1017
Type of Sampling Device trowel/shovel	Samples Collected 4-oz jar (#60155) (1015) 1-1/2 gall bag		
Geologist C. Carmichael	Checked by/Date Julie Robbins Selman 12/19/11		

Radiological Background 5	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	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	14	<p>Gravelly sand with silt, (10 YR, 4/4), brown, 60% fine to medium grained sand, 30% gravel fill, sandstone and asphalt fragments, 10% silt, dry, dense, no plasticity, hardness or odor.</p> <p>Sandstone bedrock encountered at 6" bgs</p> <p>No GW reached.</p>	SW	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 1	Location ID: 110	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 3"	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 8-26-11/ 1119		Date/Time Total Depth Reached: 8-26-11/ 1122	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#60156) (n/a)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>John Robbins Goldman 12/19/11</i>			
Radiological Background: 17, 84, 3653		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	97	3" of asphalt Silty sand with gravel (10% R, 4/4), brown, 55% fine to medium grained sand, 30% silt, 15% sandstone fragments and asphalt fragments, dry, medium dense, no plasticity, hardness or odor.	SM	
0.5					<p>Refusal at 3" - bedrock</p> <p>No GW reached.</p> <p>No samples collected.</p>		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group i	Location ID 111
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 7-12-11/1044	Date/Time Total Depth Reached 7-12-11/1107
Type of Sampling Device trowel/shovel	Samples Collected 4-oz jar (1) 1-1/2 gall bag (#60157) (1105)		
Geologist C. Carmichael	Checked by/Date: Julian Robbins Holman		

Radiological Background 15	Radiological Equipment Used w/ Rater	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	15	Sitty sand, (10 YR, 4/4), brown, 70% fine sand, 25% silt, 5% sandstone and asphalt fragments, trace fill rock, 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: 6	Group: 1	Location ID: 111
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 5"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 8-26-11/ 1135	Date/Time Total Depth Reached: 8-26-11/ 1140	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx. 8 lbs.) # 60158 (w/a)		Checked By / Date: Julian Palmer / 12/19/11	
Geologist: Chelsea Carmichael				

Radiological Background: 18, 77, 3556	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			0.0	70	3" asphalt			
0.5			0.0	84	Silty sand, (10YR 4/4), brown, 75% fine to coarse grained sand, 25% silt, dry, medium dense - dense, no plasticity, hardness or odor.	SM		
1.0					<p>Refusal at 5" - bedrock</p> <p>No GW reached</p> <p><u>No sample collected</u></p>			
2.0								
3.0								
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study	Project Number EP2038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 112
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4" ^{CK} / _{ft. bgs}
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-13-11 0947	Date/Time Total Depth Reached 7-13-11 0958
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (0) 1/2 gallon bags 60159 (NO SAMPLE)		
Geologist C. Knight	Checked by/Date J. Dan Robbins Feldman 11/29/11		

Radiological Background 40 / 2609	Radiological Equipment Used Pancake / downhole	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	Borehole Gamma Readings <small>Inches</small>
0.0			40		Surface: soil + vegetation		No downhole (CPM)
0.5					Sandstone bedrock: pale yellow (2.5Y 7/3), dry, very dense, no odor, 15% coarse sand, 10% medium sand, 75% fine sand, sparse vegetation on surface	bedrock	collected
1.0							
2.0					Refusal on Sandstone 4" bgs		
3.0					No GW encountered		
4.0					No Lab sample collected		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 113
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 7-11-11/1156	Date/Time Total Depth Reached 7-11-11/1206
Type of Sampling Device trowel/shovel	Samples Collected ^{4oz jar} (# 60160) (1205) 1-1/2 gall bag		
Geologist C. Carmichael	Checked by/Date L. Dean Robbins, J. Edman 12/16/11		

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	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.018		<p>~1' of asphalt on top</p> <p>Silty sand, (10 YR, 3/4), dark reddish-brown, 75% fine to medium grained sand, 20% silt, 5% asphalt fragments, dry, dense, dry, no plasticity or 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: 6	Group: 1	Location ID: 113	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 8'	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 8-26-11/1319		Date/Time Total Depth Reached: 8-26-11/1410	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: 1-8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#60161) (1415)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Lucy Van Robbin & Hedman 12/16/11</i>			

Radiological Background: 17, 85, 3556	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	97	7" asphalt			0.5 - 3734
0.5			0.0	83	Silty sand, (10 YR, 5/4), light brown, 50% fine to medium grained sand, 40% silt, 10% asphalt and sandstone fragments, dry, soft, no plasticity, hardness or odor.	SM	4780	0 - 4290
1.0			0.0	62			5282	
			0.0	110	1.5' Gradational Contact Silty sand, (10 YR, 5/6), orangeish-brown	SM	5462	
2.0			0.0	75	65% fine sand, 35% silt, dry, medium dense, no plasticity, hardness, or odor.		5542	
			0.0	115	2.5' Gradational Contact Sand with clay and silt, (10 YR, 6/3), light brown, 75% fine sand, 15% clay, 10% silt, dry, medium dense, no plasticity, hardness or odor, trace CaCO ₃ nodules.	SC	5773	
3.0			0.0	82			5881	
			0.0	105			6051	
4.0			0.0	101			6027	
			0.0	90			5973	
5.0			0.0	105			5874	
			0.0	70			5966	
6.0			0.0	102			5667	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 114
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-5-11 1405	Date/Time Total Depth Reached 8-5-11 1500
Type of Sampling Device 1 3/4" Macrotore	Samples Collected (1) 1/2 gallon bags + 4 bags 60162 (1410)		
Geologist C. L. Knight	Checked by/Date Duane Robbins, Malvern 11/29/11		

Radiological Background 48 / 2789 / WPR	Radiological Equipment Used Poncake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 40.0 ppm)
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Depth	Interval	Recovery	PID	Radiologist	Description of Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, macrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches 2454 (CPM)
			53		Surface: Asphalt		
0.5			75		Fill: Well graded sand with gravel; light brownish gray (2.5Y 6/2), dry, medium dense, no odor, 20% sub rounded medium gravel, 15% coarse sand, 25% medium sand, 40% fine sand	AF AF SW	2994 4831
1.0			66				
			69		Fill: Silty sand; yellowish brown (10YR 5/4), moist, medium dense, no odor, 5% fine gravel, 15% coarse sand, 25% medium sand, 20% silt, 35% fine sand, mottled	AF SM	5184 5357
2.0			75				5490
			65				5424
3.0			43				5437
			75				5216
4.0			77				4582
			94				4352
5.0			82				4969
			63		Fill: Sandy silt; dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 20% fine sand, 80% silt, cohesive, low plasticity, low cohesive,	AF ML	5709
6.0			77				5655

Radiological Background 46/2789					Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 114
Depth	Interval	Recovery	TD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0		0.0	77		Same as above: Sandy silt	AK / FF SA CK ML	5655
		0.0	86				5607
7.0		0.0	75		7' 1" Silty Sand & Yellowish brown (10YR 5/4) moist, medium dense, no odor, 30% silt, 52 medium sand, 65% fine sand	SM	5581
		0.0	58				5482
8.0		0.0	49				5516
		0.0	76				5600
9.0		0.0	75		Same as above: Silty Sand	SM	5416
		0.0	58				5354
10.0		0.0	64				5003
Total Depth: 10.0' bgs No GW encountered							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 115
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10" <i>ft. bgs</i>
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/27/11 1110	Date/Time Total Depth Reached 7/27/11 1130
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60163 (NO SAMPLE)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-3-11		

Radiological Background 45 / 3191 / 11	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 40.0 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	Borehole Gamma Readings Inches (CPM)
0.0			60		Surface: Soil		
0.5			55		Silty Sand; light yellowish brown (10YR 6/4), dry, dense, no odor, 35% silt, 65% fine sand	SM	
1.0			51		Sandstone bedrock: Pale yellow (2.5Y 7/3), dry, very dense, no odor, 5% coarse sand, 10% medium sand, 85% fine sand	GM	
2.0					Refusal met at 7", 7" and 10" bgs NO GW encountered		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 116
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-13-11 0900	Date/Time Total Depth Reached 7-13-11 0935
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 60164 (0905) (5) 1/2 gallon bags + 4oz Jar		
Geologist C. L. Knight	Checked by/Date Julie Ann Robbins Alderman 11/29/11		

Radiological Background 54 / 2770	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches
			0.0	56	Surface: grass and soil		2661 (CPM)
0.5			0.0	54	Fill: Silty Sand with gravel: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 35% silt, 10% fine to medium gravel (fill rock), 5% coarse sand, 15% medium sand, 35% fine sand	AF/SM	3193
1.0			0.0	54		4576	
			0.0	63		5087	
			0.0	65		5196	
2.0			0.0	65	2' asphalt debris		5097
			0.0	58	3' angular concrete debris 1/2" diameter	AF/SM	5165
3.0			0.0	61	Weathered Sandstone bedrock: Yellowish brown (10YR 5/8), moist, dense, no odor, 100% fine sand, mechanically weathered to SP, fine grained sandstone		5119
			0.0	54		5015	
4.0					Refusal on sandstone at 3-5' bgs		
					No GW encountered		

Project Name: SSEL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 117
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2' 10" Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/27/11 1135	Date/Time Total Depth Reached 7/27/11 1215
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz jar - 60165 (1140)		
Geologist C. Knight	Checked by/Date Subarea Robbins & Goldman (1/29/11)		

Radiological Background 60 72572/11	Radiological Equipment Used Pancake / downhole / MicroR 1	PID Used Mini Rae 2000 (Bkgd: 30.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Artificial Fill Surface: soil and gravel		2733
0.5			0.6	55	Fill: Silty sand; light yellowish brown (2.5Y 6/4), dry, medium dense, trace sandstone gravel, 5% coarse sand, 5% medium sand, 30% silt, 60% fine sand	SM	2899
			0.0	47			3660
1.0			0.8	51			4943
			0.40	45			5356
2.0			0.0	48	Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/3), dry, dense, no odor, mechanically weathered to SP, 5% coarse sand, 5% medium sand, 90% fine sand, fine grained sandstone	Sdscs	5437
			0.0	68			5208
3.0			0.0	43			MM
4.0					Refusal at 2' 10"		
					No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 6 Group 1	Location ID: 118
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 11.5 ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7-13-11 1113	Date/Time Total Depth Reached: 7-13-11 1400
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: 60166 (1330) (1) 1/2 gallon bags + 4oz Jar		
Geologist: C. Knight	Checked by/Date: Chelsea Carmichael / 11-18-11		

Radiological Background: 43 / 2666 2636	Radiological Equipment Used: Pancake / downhole	PID Used: Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	59	Surface: grass and soil		2757
0.5			0.0	52	Fill: Silty Sand: Light yellowish brown (10YR 5/4), dry, medium dense, no odor, 25% silt, 5% clay, 5% fine to medium gravel, 10% medium sand, 55% fine sand, mottled, trace rootlets	AF / SM	3987
1.0			0.0	51			4131
			0.0	55			4184
2.0			0.0	49	2'6" fine concrete gravel debris		4091
			0.0	54	2'6"		4174
3.0			0.0	52	Fill: Silty Clay: Brown (10YR 5/3), moist, medium stiff, no odor, 5% finesand, 35% silt, 60% clay, trace fine to coarse gravel (fill rock), low plasticity, low toughness, cohesive	AF / CL	4309
			0.0	58			4301
4.0			0.0	53			4415
			0.0	62	4'5" concrete debris - 1 1/4" diameter		4292
5.0			0.0	60			4269
			0.0	50	Fill: Sandy Silt with clay: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 20% clay, 5% medium sand, 25% finesand, 50% silt, cohesive, low plasticity, low toughness, trace fines gravel, mottled	AF / ML	4530
			0.0	55			4576

Radiological Background 43/2636			Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 118			
Depth	Interval	Recovery	PTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
						Inches	(CPM)	
6.0		0.0	55		Same as above: Sandy silt with clay	AF	4576	
		0.0	57			ML	4940	
7.0		0.0	58	6'11"	Fill: Silty Sand: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 5% angular fine to medium gravel (granitic or metamorphic), 10% medium sand, 15% silt, 70% fine sand, mottled	AF	5172	
		0.0	57			SM	5256	
8.0		0.0	56					5197
		0.0	53					5199
9.0		0.0	54					5129
		0.0	52				4911	
10.0		0.0	55		Fill: Well graded Sand: Pale Brown (10YR 6/3), moist, loose, no odor, 20% coarse sand, 40% medium sand, 40% fine sand.	AF	4963	
		0.0	58			SW	4677	
11.0		0.0	68	11.3"	Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone (100%)		4463	
		0.0	67				4533	
20					Refusal on sandstone at 11.8' hgs.			
					No GW encountered			



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 119
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-13-11 1002	Date/Time Total Depth Reached 7-13-11 1030
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 60165 (1010) (1) 1/2 gallon bags + 102 Jar		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 47 / 2463	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 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 Inches (CPM)
			0.0	39	Surface Soil		2521
0.5			0.0	33	Fill: Silty Sand with gravel: Light yellowish brown (10 YR 6/4), dry, medium dense, no odor, 20% silt, 10% coarse sand, 15% medium sand, 40% angular gravel and concrete debris, 45% fine sand	AF / SM	2787
1.0		0.0	45	3855			
		0.0	53	4604			
2.0			0.0	61	Weathered Siltstone and Mudstone: Pale yellow (2.5Y 7/4), dry, very dense, no odor, mudstone at terminus of boring	Rock	4647
		0.0	57	4797			
3.0					Refusal at 2.5' bgs on Siltstone/mudstone No GW encountered		5027
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6, group 1	Location ID 120
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9" Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-13-11 1055	Date/Time Total Depth Reached 7-13-11 1110
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 60168 (NO SAMPLE) (0) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 11-4-11		

Radiological Background 50 / 2830	Radiological Equipment Used Pancake / downhole	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	Borehole Gamma Readings (CPM)
			0.0	60	Surface: Soil top soil ~ 3"		
0.5			0.0	62	Sandstone bedrock: Pale yellow (2.5Y 7/3), dry, very dense, no odor, 100% fine grained sandstone	bedrock	None Collected
1.0					<p>Refusal on sandstone at 9" bgs</p> <p>No GW encountered</p> <p>No Lab Sample collected</p>		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 1	Location ID 121
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/29/11 1322	Date/Time Total Depth Reached 7/29/11 1400
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 60169 - 1330 (1) 1/2 gallon bags; (1) 4oz jar		
Geologist I. Stone	Checked by/Date Chelsea Carmichael/11-4-11		

Radiological Background 36 / 2242 / 10	Radiological Equipment Used Pancake / downhole / yRi	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches
			0.0	51	Silty sand, yellowish brown (5/4 10YR)		2201
0.5				49	70% fine sand, 30% silt, trace gravel, (fill) trace concrete, dry, loose, no odor or staining	SM	3413
1.0				52	Sand w/ silt, dark yellowish brown (4/6 10YR)		4924
				55	90% fine sand, 10% silt, dry, low-med dense, no odor or staining	SP	5392
2.0				53	SAND/SANDSTONE, brownish yellow (6/6 10YR)		5664
				65	100% fine sand, med-high dense, dry, no odor or staining		5468
3.0					TD = 2.5 FT bgs, refusal on sandstone bedrock no gw encountered no anomalies		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 1	Location ID 122
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/29/11 1415	Date/Time Total Depth Reached 7/29/11 1421
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected none collected () 1/2 gallon bags		
Geologist I. Stone	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 40 / 1985 / 9	Radiological Equipment Used Pancake / downhole /uRi	PID Used Mini Rae 2000 (Bkgd: 40.0 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	Borehole Gamma Readings (CPM)
0.5			48	53	Silty SAND, Yellowish Brown (S/4 1042) 70% fine sand, 30% silt, trace gravel, dry, loose, no odor or staining	SM	NA
1.0					TD = 6" bgs no gas encountered Refused on sandstone bedrock		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 1	Location ID 123
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/29/11 0850	Date/Time Total Depth Reached 7/29/11 0945
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 60171 - 0915 (1) 1/2 gallon bags ; (1) 4oz jar		
Geologist I. Stone	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 55 / 2640 / 10	Radiological Equipment Used Pancake / downhole / WR 1	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	Borehole Gamma Readings Inches +0.5' = 2875 (CPM)
0.5			0.2	42	Silty Sand, Yellowish brown (5/6 (04R)) 75% fine sand, 20% silt, trace gravel, trace spherulite, trace roots, low dense, dry, no odor or staining	SM	3057
				43			3937
1.0				41			4481
				45			4661
2.0				42			(Fill)
				47	Sandy Silt, Dark yellowish brown (4/4 (04R)) 55% silt, 40% fine (S) 40% sand (80% fine, 20% med), 55% silt, 5% clay, trace rock fragment/gravel, dry, low strength, low tough, low plasticity, no odor or staining.	ML	5093
3.0			48	5047			
			53	5336			
4.0			57	5189			
			55	4740			
5.0			63	4492			
				49	4333		
6.0				58	(Fill)		4488

Concrete

Radiological Background				Project Name	Project Number	Location	
55 / 2640 / 10				SSPL Area IV Radiological Study	EP9034.01.22.04.03	6, 1, 123	
Depth	Interval	Recovery	FD	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
							(CPM)
6.0			0.2	58	Silty sand, Dark yellowish brown (3/4 (OYR))		4488
				62	concrete (light gray) 65% fine sand, 35% silt, trace gravel, trace asphalt, dry, low-med dense, no odor or staining	SM	4383
7.0				60			4364
				58			4282
8.0				60	concrete (black/dark gray)		4077
				57			NM
9.0				55			NM
				65	concrete (Fill)		NM
10.0					TD: 9.5 ft bgs Refusal on construction debris no gw encountered no anomalies last 1.5' (IS)		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID #/Group 6/1	Location ID 124
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 14 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/22/11 / 1026	Date/Time Total Depth Reached 7/22/11 / 1047
Type of Sampling Device 1 3/4" Macrocore	Samples Collected Sample ID: 60172 time: 1140 (1) 1/2 gallon bags / (1) 4 oz jar		Checked by/Date Chelsea Carnichay / 11-16-11
Geologist Stephanie Lapeyre Montrose			

Radiological Background S2 / 2540 / 13	Radiological Equipment Used Pancake / downhole / Micro R	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	Borehole Gamma Readings Inches (CPM)
			0.0	51	surface = top soil + vegetation (weeds)		2729
0.5			0.0	67	SM silty sand light yellowish brown (104R 6/4)	SM	3482
1.0			0.0	63	10% clay, 30% silt, 60% fine-coarse grained sand, loose, low plasticity, very soft, dry, no odor		4077
			0.0	79			3956
2.0			0.0	77	1'10" - 5' SB sand	SM	4267
			0.0	56	10% clay, 10% silt, 80% fine-yellowish brown (104R 5/4) coarse grained sand, loose, low plasticity, very soft, dry, no odor, concrete debris throughout		4278
3.0			0.0	51	asphalt debris throughout, trace sandstone subangular gravel		4476
			0.0	48			4352
4.0			0.0	35	same as above		4170
			0.0	27	4'6" - 4'10" magnetite		2935
5.0			0.0	40	4'10" - 5'7" SB sand	SM	3503
			0.0	45	same as 1'10" - 5' description		4074
6.0					5'7" - 5'11" magnetite 5'11" - 8'9" SM silty sand w/clay yellowish brown (104R) 15% clay, 20% silt, 65% fine-coarse (5/4) grained sand, loose, low plasticity, soft, dry concrete debris throughout	SM	

Radiological Background					Project Name	Project Number	Location	
52	2540	13			SSFL Area IV Radiological Study	EP9034.01.22.04.03	124	
Depth	Interval	Recovery	PTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
6.0		0.0	48		SM silty sand yellowish brown (10YR 5/4)	SM	4309	
		0.0	52		15% clay, 20% silt, 65% fine-coarse grained sand, loose, low plasticity, soft, dry, concrete debris throughout		4105	
7.0		0.0	56		7'1" magnetite pieces		4156	
		0.0	46					
		0.0	40		Same as above		3914	
8.0		0.0	63		8' magnetite pieces	SM	3898	
		0.0	72		8'4" magnetite piece		3870	
		0.0	72		8'6" - 8'9" concrete			
9.0		0.0	70		8'9" - 10' SM silty sand with clay brown (10YR 4/3)	SM	3636	
		0.0	72		15% clay, 20% silt, 65% fine-coarse grained sand asphalt debris, trace volcanic gravel - subangular low plasticity, firm, dry, no odor		3870	
10.0		0.0	70		10' - 13'10" SC clayey sand	SC	3620	
		0.0	32		20% clay, 10% silt brown (7.5 YR 4/4)		3678	
		0.0	33		70% fine-coarse grained sand, low-medium plasticity, firm, dry, no odor concrete debris throughout, trace volcanic gravel subangular throughout.		3875	
11.0		0.0	33		10'8" - piece of magnetite		4016	
		0.0	53		11'8" - 11'9" piece of magnetite			
12.0		0.0	64		12' - same as above + asphalt debris		3831	
		0.0	63		12'2" - 12'9" concrete		3921	
13.0		0.0	63		Same as above (SC)	SC	3898	

Radiological Background					Project Name	Project Number	Location
52	2540	13			SSFL Area IV Radiological Study	BP9034.01.22.04.03	124
Depth	Interval	Recovery	PTD	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)		
13'	5'0"		0.0	63	same as above		3898
	5'6"		0.0	67	13'2" - 13'6" - concrete & building material debris	SC ₄	4382
	6'0"				13'6" - 13'10" same as above (SC)		
	6'6"				13'10" - 14' concrete		
14'	7'0"		0.0	60	TD = 14' bgs. (artificial fill) No GW encountered Able to widen bore hole to 13'6" bgs for down hole gamma logging		
	7'6"						
	8'0"						
	8'6"						
	9'0"						
	9'6"						
	10'0"						
	10'6"						
	11'0"						
	11'6"						
	12'0"						
	12'6"						
	13'0"						
	13'6"						
	14'0"						

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 125
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 21' 4" ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/28/11 / 1350	Date/Time Total Depth Reached 7/28/11 / 1430
Type of Sampling Device 1 3/4" Macrocore	Samples Collected Sample ID: 60173 / Time 1450 (1) 1/2 gallon bags + 4oz Jar		
Geologist Stephanie Lapere Montrose	Checked by/Date Chelsea Carmichael / 11-16-11		

Radiological Background SI / 2601 / 510	Radiological Equipment Used Pancake / downhole / MICRO R	PID Used Mini Rae 2000 (Bkgd: 40.0 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 Inches (CPM)
					Surface = top soil and vegetation		+0.5 = 3074
0.5			0.0	60	SC clayey sand with silt light olive brown (2.5 Y 5/3)	SC	3212
			0.0	58	30% clay, 20% silt, 50% fine-medium grained sand, rootlets, dense, medium plasticity, firm, dry, no odor		4316
1.0			0.0	65			4509
			0.0	63	1'6" - 1'9" concrete		4528
2.0			0.0	66	1'9" - 2'4" SW SAND concrete debris, asphalt debris, 10% clay, 10% silt, 80% fine-medium grained sand loose, low plasticity, very soft, dry, no odor	SW	4528
			0.0	70	2'4" - 2'10" CL sandy clay with silt 40% clay, 25% silt, 35% fine-medium grained sand yellowish brown (10YR 5/4)	CL	4357
3.0			0.0	82	2'10" - 3'1" SW sand (same as 1'9" - 2'4")	SW	4374
					3'1" - 3'2" concrete		
			0.0	68	3'2" - 4' CL sandy clay with silt 40% clay, 25% silt, 35% fine-medium grained sand, trace gravel - subangular, yellowish brown (10YR 5/4)	CL	4258
4.0			0.0	72	4'4" concrete pieces medium plasticity, hard, dry, no odor		4487
					4'1" - 5' CL		
			0.0	50	same as above		4424
5.0			0.0	61	5' - 8'9" CL sandy clay with silt, mottled		4625
			0.0	65	same as above		4713

Radiological Background					Project Name	Project Number	Location	
SI	266	10			SSFL Area IV Radiological Study	EP9038.01.22.04.03	125	
Depth	Interval	Recovery	FTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micromology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
						Inches	(CPM)	
6.0		00	85		LL sandy clay with silt dark yellowish brown (10YR 4/4) mottled		4653	
		00	88				4720	
7.0		00	66			Same as above	CL	4509
		00	78					4365
8.0		00	72				4364	
		00	62		8'9"-9'2" SP sand with silt yellowish brown (10YR 5/4) 15% silt, 80% fine-coarse grained sand, 5% sandstone pieces, loose, dry, no odor, non plastic.		4315	
9.0		00	60			9'2"-9'3" magnetite	SP	4380
		00	65		9'3"-10' CL sandy clay with silt dark yellowish brown (10YR 4/4) 40% clay, 25% silt, 35% fine-med. grained sand, med. plasticity, hard, dry, no odor mottled, concrete + asphalt debris throughout.		4552	
10.0		00	56			10'-12' CL sandy clay with silt yellowish brown (10YR 5/4) 40% clay, 25% silt, 35% fine-med. grained sand, med. plasticity, hard, dry, no odor magnetite pieces throughout	CL	4633
		00	54				4586	
11.0		00	66		11'1"-11'2" magnetite piece		4399	
		00	62		Same as above		4357	
12.0		00	65		12'-12'8" SW sand with silt yellowish brown (10YR 5/4) 18% silt, 85% fine-coarse grained sand, 5% gravel subangular, non plastic, loose, dry, no odor, concrete + asphalt + magnetite pieces throughout.		4136	
		00	75			12'8"-12'10" CL sandy clay with silt (same as 10')	SW	4207
					12'10" asphalt piece	CL		
13.0		00	60		12'10"-15' SC clayey sand w/silt yellowish brown (10YR 5/4) 25% clay, 15% silt, 60% fine-coarse grained sand dense, low plasticity, firm, trace gravel-subangular, concrete and asphalt debris throughout	SC	4193	

Radiological Background				Project Name	Project Number	Location	
SI	266	10		SSFL Area IV Radiological Study	EP9038.01.22.04.03	125	
Depth	Interval	Recovery	FTD	Radiologist	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
						inches	(CFM)
13	690	0.0	60		Same as above	SC	4193
		0.0	50		14'4" - 14'6" asphalt SC clayey sand	"	4297
14	720	0.0	56		Same as above		4441
		0.0	64			SC	4387
15	800	0.0	65		15' - 16'5" CL sandy CLAY w/silt dark yellowish brown ^{yellowish brown} (104R #1/4) ^{5/3}	CL	3827
		0.0	55		40% clay, 15% silt, 45% fine-med. grained sand, hard, med. plasticity no odor, trace asphalt & concrete debris		3553
16	920	0.0	60				3709
		0.0	63		16'5" - 16'6" concrete 16'6" - 16'7" asphalt CL - same as above		4004
17	1000	0.0	55		16'10" - 17'1" asphalt 17'1" - 17'3" concrete		4205
		0.0	63		17'3" - 17'9" SP Sand brown (104R 5/3) 10% silt, 90% fine-medium grained sand, trace coarse grained sand, dense, non-plastic, no odor	SP	3876
18	1100	0.0	60		17'9" - 18' concrete		3787
		0.0	66		18' - 20' No Recovery		3674
19-20		0.0	75		NO Recovery		3697
		0.0	73		14'4" - 14'6" asphalt ^{SP} NO Recovery		3703
20	1300	0.0	80		20'0" - 20'2" concrete 20'2" - 21' (see next page) ^{SP}	SP	4149

saturated

21
②

Radiological Background					Project Name	Project Number	Location
SI / 2661 / 10					SSPL Area IV Radiological Study	EP9034.01.22.04.03	125
Depth	Interval	Recovery	PTD	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)
20			0.0	80	20'-20'2" concrete		4149
			0.0	86	20'2"-21' SP sand brown (10R 5/3) 10% silt, 90% fine-ped. graded sand, trace coarse graded sand, dense, non plastic, no odor saturated saturated	SP	--- NM
21			0.0	88	21'-21'4" @ SP sand yellowish brown (10R 5/4) 10% silt 80% fine-coarse graded sand (weathered bedrock) 1/2" pieces of sandstone - 10% moist, loose, non plastic	SP SW @	--- NM
22							
23					TD = 21'4" bgs (refusal) on sandstone Gw encountered 20'-21' bgs artificial fill		
24							
25							
26							
27							



BORING LOG

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 6, group 1		Location ID 126	
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 7-15-11/1430		Date/Time Total Depth Reached 7-15-11/1439	
Type of Sampling Device trowel/shovel				Samples Collected 1-1/2 gall bag, 1-4oz jar (#60174) (1438)			
Geologist C. Carmichael				Checked by/Date Julian Robbins Feldman 12/16/11			
Radiological Background 3		Radiological Equipment Used up R meter			PID Used Mini Rae 2000 (Bg rd: 0.0ppm)		
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 (CPM)
0.5'			0.013		<p>Silty, gravelly sand, (10YR, 5/4), light brown, 50% fine to medium grained sand, 35% gravel fill rock, 15% silt, dry, medium dense, no plasticity, hardness, or odor.</p> <p>No GW reached.</p>	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 1	Location ID 126
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/29/11 1039	Date/Time Total Depth Reached 7/29/11 1139
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 60175-1100 (1) 1/2 gallon bags ; (1) 4oz jar		
Geologist I. Stone	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 72 / 2832 / 10	Radiological Equipment Used Pancake / downhole / W/R 1	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	Borehole Gamma Readings Inches 0.5' = 3117 (CPM)
0.0 - 0.5		0.0	44	Silty Sand, light yellowish brown (6/4 10YR)		3316
0.5 - 1.0			48	60% fine sand, 40% silt, trace gravel, dry, loose, no odor or staining		4662
1.0 - 1.5			46	trace concrete fragments	SM	5115
1.5 - 2.0			50			5335
2.0 - 2.5			60	(Fill)		5579
2.5 - 3.0			60	Silty Sand, Dark yellowish brown (4/4 10YR)		5819
3.0 - 3.5			61	65% fine sand, 35% silt, dry, med dense, no odor or staining	SM	5681
3.5 - 4.0			57			5793
4.0 - 4.5			62			5688
4.5 - 5.0			64	Silty Sand, yellowish brown (5/6 10YR)		5565
5.0 - 5.5			68	75% sand (90% fine, 10% med coarse), 25% silt, dry, med dense, no odor or staining	SM	5669
5.5 - 6.0			69			5774
6.0 - 6.5			70			5836

Radiological Background 72 / 2832 / 10				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location E, 1, 126	
Depth	Interval	Recovery	PTD	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	Silty Sand, continued same as above		5836
				68		SM	5638
7.0				71	Sand w/ silt, pale brown (6/3 10YR)		5545
				67	90% sand (60% fine, 20% med coarse), 10% silt, dry; low dense, no odor or staining	SP	5552
8.0				65			5238
				64	Silty Sand, yellowish brown (5/6 10YR)		5321
				63	80% fine sand, 20% silt, dry med dense, no odor or staining	SM	5425
				69			NM
10.0				72	TD=10ft bgs, no refusal no gw encountered no anomalies		NM
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / group Subarea 6 group 1		Location ID 127	
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 7-18-11 / 0937		Date/Time Total Depth Reached 7-18-11 / 0955	
Type of Sampling Device trowel / shovel		Samples Collected (1) 1/2 gal bag / (1) 4oz jar		Sample ID: 60176		Time: 0943	
Geologist S. Lapeyre-Montrose		Checked by/Date Chelsea Carmichael / 11-16-11					
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth ft	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 (CPM)
0.25			0.0	12	surface - top soil + vegetation (weeds)		
0.5			0.0	13	SM silty sand brown (10YR 5/3) 30% silt, 15% clay, 55% fine-coarse grained sand (trace coarse grained sand), trace sandstone gravel - subangular, loose, low plasticity, soft, dry, no odor rootlets, twigs	SM	
					TA = 0.5' bgs		
					NO GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 - group 1	Location ID 127
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 3.0 ft. bgs
Drilling Equipment Hand Auger	Borehole Diameter 3.25	Date/Time Drilling Started 8-1-11 0920	Date/Time Total Depth Reached 8-1-11 1000
Type of Sampling Device Handauger	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60177 (60940)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 87 / 3700 / 13	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 40.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: soil		10.5 3448
0.5			0.0	87	Fill; Dark yellowish brown (104R 4/4), clay, sandy silt; medium stiff, no odor, 15% fine sand, 5% medium sand, 5% clay, 75% silt, cohesive, low plasticity, low toughness, trace asphalt	AF / ML	3672
			0.0	91			4767
1.0			0.0	100			5074
			0.0	67			5098
2.0			0.0	71			4994
			0.0	73		4920	
3.0			0.0	80	Same as above	AF / ML	4789
4.0					Refusal on sandstone at 3' bgs No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 6 group 1	Location ID 128			
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 7-18-11 / 0908	Date/Time Total Depth Reached 7-18-11 / 0925			
Type of Sampling Device trowel/shovel		Samples Collected Sample ID 60178 time 0916 (1) 1/2 gal bag, (1) 4oz. jar					
Geologist S. Lapeyre-Montrose		Checked by/Date Chelsea Carmichael 11-4-11					
Radiological Background 13		Radiological Equipment Used MP R meter		PID Used Mini Rae 2000 (Bgd: 0.0 ppm)			
Depth ft	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>
0.25			0.0	13	surface: top soil and vegetation (weeds)		
0.5			0.0	14	SM silty sand ^{0.2} brown (10YR 5/3), twigs, rootlets, loose, dry, low plasticity, soft, no odor 15% clay, trace sandstone gravel - subangular, 20% silt, 65% fine-medium grained sand	SM	
TD = 0.5' bgs NO GW encountered.							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 128
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8.5 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-2-11 1110	Date/Time Total Depth Reached 8-2-11 1315
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60179 (1120)		
Geologist C. Knight	Checked by/Date Julian Polina Sullivan 11/22/11		

Radiological Background 44 / 2487 / 10	Radiological Equipment Used Panecake / downhole / MicroR 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface Soil		10.5 2852
0.5			0.0	58 35 52 31	Fill: Sandy Silt: Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 20% fine sand, 5% medium sand, 5% fine gravel (fill rock), 70% silt, trace clay, pin hole pores, mottled, low plasticity, low toughness	AF ML	3060
1.0		0.0	44 44 33	4297			
		0.0	44 33	4946			
		0.0	40	5088			
2.0			0.0	45 52	1.5" Fill: Silty Sand: Dark brown (10YR 3/3), moist, medium dense, no odor, 20% silt, 5% medium sand, 5% fine gravel (granitic fill rock), 70% fine sand, mottled, trace concrete debris.	AF SM	4989
		0.0	44 45	5018			
3.0		0.0	52 55	4990			
		0.0	68	4779			
4.0			0.0	63 61	4.7" Fill: Silty Sand: Dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 35% silt, 5% fine granitic gravel, 5% medium sand, 55% fine sand.	AF SM	4598
		0.0	70 67	4700			
5.0		0.0	72 60	4793			
		0.0	75	5029			
6.0		0.0	76				5123

Radiological Background 44/2487/10 _u R				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 128	
Depth	Interval	Recovery	FTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
						inches	(CPM)
6.0		0.0	76		Same as above: Fill: 5' lg Sand	AS	5123
		0.0	52			SM	5169
7.0		0.0	58				5100
		0.0	57				5018
8.0		0.0	48				5099
		0.0	50		Weathered Sandstone Bedrock: light olive brown (2.5Y 5/3), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone		5226
9.0							
					Refusal on sandstone at 8.5' bgs		
					No GW encountered		
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / group Subarea 6 group 1		Location ID 129	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 0.5	
Drilling Equipment trussel / shovel		Borehole Diameter NA		Date/Time Drilling Started 7-18-11 / 1204		Date/Time Total Depth Reached 7-18-11 / 1215	
Type of Sampling Device trussel / shovel				Samples Collected sample ID 60180 time 1208 (I) 1/2 gal bag / (II) 4 oz. jar			
Geologist S. Lapeyre-Montrose				Checked by/Date Chelsea Carmichael / 11-16-11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth ft	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>Inches (CPM)</small>
0.25			0.0	13	Surface: top soil and vegetation (weeds)		
0.5			0.0	13	SM silty sand brown (10YR 5/3), rootlets, twigs 10% clay, 30% silt, 60% fine-medium grained sand trace sandstone gravel - subangular low plasticity, soft, loose, dry, no odor	SM	
					TD = 0.5' bgs		
					NO GW encountered		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 129
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6' 10" Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-2-11 1020	Date/Time Total Depth Reached 8-2-11 1110
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60181 & (1030)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael/11-4-11		

Radiological Background 45 / 3102 / 12	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 30.0 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 Inches (CPM)
			0.0	50	Surface soil		2950
0.5			0.0	52	Fill: Sandy silt; Brown (10YR 4/3) dry, medium stiff, no odor, 30% fine sand, 70% silt, low plasticity, low toughness, cohesive, mottled, pinhole pores	AF / ML	3151
			0.0	49			4179
1.0			0.0	33			4823
			0.0	33	weathered sandstone rock at 2' 0" bgs		4871
2.0			0.0	45	Fill: Silty sand; Brown (7.5 5/4) moist, medium dense, no odor, 30% silt, 5% medium sand, 65% fine sand, mottled	AF / SM	4909
			0.0	41			4767
3.0			0.0	52			4909
			0.0	67			4818
4.0			0.0	63	Same as above; 15% silt, 85% fine sand, mottled	AF / SM	4990
			0.0	70			5135
5.0			0.0	72			5082
			0.0	57		AF / SM	5178
6.0			0.0	37	Same as above		5277

Radiological Background 45/3102/12				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 129	
Depth	Interval	Recovery	FTD	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, microology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings
						Inches	(CPM)
6.0			0.0	37	Same as above: Fill: Silty Sand	AF	5277
			0.0	55	6'6" weathered sandstone bedrock; light yellowish brown (at 2.5' 6/4) moist, dense, noncohesive, 10% medium sand, 90% fine sand, mechanically weathered to SP	SM	5118
7.0			0.0	52	6'10" Refusal on sandstone at 6'10" bgs No GW encountered	SP	5740
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP9038.01.22.04.03	Subarea ID / group: Subarea 6 group 1	Location ID: 130			
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: 7-18-11 / 1145	Date/Time Total Depth Reached: 7-18-11 / 1155			
Type of Sampling Device: trowel/shovel		Samples Collected: Sample ID 60182 time 1148 ① 1/2 gal bag / ① 4 oz jar					
Geologist: S. Lapeyre-Montrose		Checked by/Date: Chelsea Carmichael / 11-16-11					
Radiological Background: 14		Radiological Equipment Used: up R meter		PID Used: Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth, ft	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)
0.25			0.0	14	Surface: top soil and vegetation (weeds)		
0.5			0.0	15	SM silty sand SM brown (10R 5/3) 25% silt, 10% clay, 65% fine-coarse grained sand, rootlets, twigs, loose, low plasticity, soft, dry, no color asphalt debris	SM	
<p>TD = 0.5' bgs</p> <p>No GW encountered</p>							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 130
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 5.5'
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 9-6-11 / 1338		Date/Time Total Depth Reached: 9-6-11 / 1505
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: 1-8-oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (# 60183) (1505)			Checked By / Date: Julie Ann Robbins Leadman 7/16/11
Geologist: Chelsea Carmichael				

Radiological Background: 17, 57, 3552	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			76		Sandy silt, (10YR, 4/4), brown, 50% silt, 40% fine to medium grained sand, 10% gravel fill rock and asphalt fragments, dry, medium stiff, no plasticity, hardness or odor.	ML		0.5 - 3474
0.5			53			5211 4861		
1.0			86				1 - 5169	5211
								5169
2.0			42		Gradational Contact Silty sand, (10YR, 4/4), brown, 55% fine to medium grained sand, 40% silt, 5% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.	SM	2 - 5064	
								4948
3.0			87				3 - 5105	
								5019
4.0			100		Gradational Contact Sandy silt, (10YR, 3/4), dark brown, 70% silt, 30% fine sand, medium stiff, dry, no plasticity, hardness or odor.	ML	4 - 5216	
								5288
5.0			73				5 - 5517	
								5474
6.0			45		Refusal hit at 5.5' No GW reached.		6	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 6 group 1	Location ID 131
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 7-18-11 / 1049	Date/Time Total Depth Reached 7-18-11 / 1103
Type of Sampling Device trowel / shovel	Samples Collected sample ID 60184 (1) 1/2 gal bag / (1) 4 oz. jar		Time 1052
Geologist S. Lapeyre-Montrose	Checked by/Date Chelsea Carmichael / 11-10-11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth - ft	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 (CPM)
					Surface: top soil + vegetation (weeds)		
0.25			0.0	13	SM silty sand brown (10YR 5/3), rootlets, twigs 30% silt 10% clay, 60% fine-coarse grained sand asphalt debris, trace sandstone gravel - subangular	SM	
0.5			0.0	13	low plasticity, soft, loose, dry, no odor		
					TD = 0.5' bgs		
					NO GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 - group 1	Location ID 13)
Drilling Company: HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs
Drilling Equipment Hand Auger	Borehole Diameter 3.25	Date/Time Drilling Started 8-1-11 1050	Date/Time Total Depth Reached 8-1-11 1115
Type of Sampling Device Handauger	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60185 (NO SAMPLE)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael/11-4-11		

Radiological Background 82/3497/13	Radiological Equipment Used Pancake/downhole/Micro R1	PID Used Mini Rae 2000 (Bkgd: 400 ppm)
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Depth	Interval	Recovery	PID	Radiologist	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>+0.5' NM (CPM)</small>
			90		Surface soil and grass		
0.5			82		<p>AF: Artificial Fill</p> <p>Fill: Sandy silt with gravel; Partly yellowish brown (10YR 7/4), dry, medium stiff, no odor 15% fine sand, 10% subangular fine to medium gravel (fill rock), 5% medium sand, 5% coarse sand, 65% silt, cohesive, low plasticity.</p>	AF/ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Refusal at 0.5' bgs on debris

No sample collected for lab
No GW encountered

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 6 group 1	Location ID 132			
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 7-18-11 / 1115	Date/Time Total Depth Reached 7-18-11 / 1135			
Type of Sampling Device trowel / shovel		Samples Collected sample ID 60186 time 1125 (1) 1/2 gal bag / (1) 4oz. jar					
Geologist S. Lapeyre-Mantrose		Checked by/Date Chelsea Carmichael 11-16-11					
Radiological Background 14		Radiological Equipment Used MP R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth - ft	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>
0.25			0.0	14	Surface: top soil and (weeds) vegetation SM silty SAND brown (10YR 5/3) rootlets, twigs, 10% clay, 30% silt, 60% fine-coarse grained sand, trace sandstone gravel- subangular, loose, low plasticity, soft, dry, no odor	SM	
0.5			0.0	14			
TD = 0.5' bgs NO GW encountered							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 "group"	Location ID 132
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 1'9" ft. bgs
Drilling Equipment Hand Auger	Borehole Diameter 3.25"	Date/Time Drilling Started 8-1-11 1440	Date/Time Total Depth Reached 8-1-11 1510
Type of Sampling Device Handauger	Samples Collected (1) 1/2 gallon bags + 4oz Jar (60187) (SAMPLE) ^{NO}		
Geologist C. Knight	Checked by/Date Chelsea Carnichael/11-4-11		

Radiological Background 75 / 3491 / 13	Radiological Equipment Used Pancake / downhole / Micro R 1	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	Borehole Gamma Readings <small>+0.5 (CPM)</small>
			68		surface soil and grass		
0.5			76		Fill: Sandy silt; Yellowish brown (10YR 5/4) dry medium stiff, no odor, 20% fine sand, 5% medium sand, 5% coarse sand, 5% fine to medium subangular gravel, 65% silt, cohesive, low plasticity, low toughness	Af ML	
1.0		72					
		75					
2.0					Refusal at 1'9" No GW encountered No Sample collected for lab		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / group Subarea 6 group 1		Location ID 133	
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 7-18-11 / 0753		Date/Time Total Depth Reached 7-18-11 / 0805	
Type of Sampling Device trowel / shovel				Samples Collected Sample 10: 60188 time: 0757 (1) 1/2 gal bag / (1) 4oz jar			
Geologist S. Lapeyre-Mantrose				Checked by/Date Chelsea Carmichael 11-16-11			
Radiological Background 13		Radiological Equipment Used RP Meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth ft	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>
0.25			0.0	13	Surface; top soil and vegetation (weeds)		
0.5			0.0	13	SM silty sand w/ clay brown (10YR 5/3) 15% clay, 30% silt, 55% fine-medium grained sand, trace gravel - subangular sandstone, low plasticity, soft, loose, no odor, rootlets, dry	SM	
					TD = 0.5' bgs NO GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 - group 1	Location ID 133
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 1' 5" ft. bgs
Drilling Equipment Hand Auger	Borehole Diameter 3.25	Date/Time Drilling Started 8-1-11 0745	Date/Time Total Depth Reached 8-1-11 0815
Type of Sampling Device Handauger	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60189 (NO SAMPLE) (0800) CK		
Geologist C. Knight	Checked by/Date J. Robbins, Mulvan 11/29/11		

Radiological Background 71 / 3428 / 13	Radiological Equipment Used Pancake / downhole / Micro R1	PID Used Mini Rae 2000 (Bkgd: 40.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill surface: soil and grass		10.5'
0.5			78		Fill: Sandy silt; Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 10% fine sand, 5% medium sand, 5% clay, 5% silt, 5% branched medium gravel, 75% silt, cohesive, low plasticity, low toughness	AF / ML	
			63				
1.0			58				
			38				
2.0					Refusal at 1' 5", 1' 5" and 4" bgs		
					No GW encountered		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 6 group 1	Location ID 134
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 7-18-11 / 0820	Date/Time Total Depth Reached 7-18-11 / 0845
Type of Sampling Device trowel / shovel	Samples Collected Sample ID: 60190 time: 0833 / Field Dup: 60513 (no time) (2) 1/2 gal bags / (2) 4 oz. jar		
Geologist S. Lapeyre-Montrose	Checked by/Date Chelsea Carmichael / 11-16-11		

Radiological Background 13	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth - ft	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	
							Inches	(CPM)
0.25			0.0	13	Surface - top soil and vegetation (weeds)			
0.5			0.0	14	SM silty sand w/ clay brown (10% silt), rootlets, 25% silt, 15% clay, 5% sandstone gravel - subangular, 55% fine-medium grained sand, low plasticity, soft, loose, dry, no odor	SM		
					TD = 0.5' bgs No GW encountered			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 - group 1	Location ID 134
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 1'6" ft. bgs
Drilling Equipment Hand Auger	Borehole Diameter 3.25"	Date/Time Drilling Started 8-1-11 0825	Date/Time Total Depth Reached 8-1-11 0900
Type of Sampling Device Handauger	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60191 (NO SAMPLE)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 75 / 3962 / 13	Radiological Equipment Used Pancake / downhole / Micro R1	PID Used Mini Rae 2000 (Bkgd: 400 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Description <i>Artificial Fill</i> (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable) surface: soil and gravel		
0.5			00	86	Fill: Sandy silt; Light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 15% fine sand, 5% medium sand, 5% clay, 5% sub angular gravel (fill rock), 70% silt, cohesive, low plasticity, trace rootlets	AF/ML	
1.0			00	76			
		NR			NO Recovery		
2.0			00	76	Refusal at 1'6" bgs NO GW encountered		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 6 group 1		Location ID 135	
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth CK 5 ft. bgs	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 7-11-11 1150		Date/Time Total Depth Reached 7-11-11 1245	
Type of Sampling Device 1 3/4" Macrocoring		Samples Collected (1) 1/2 gallon bags + 4oz Jar		Date/Time Total Depth Reached 7-11-11 1245		Date/Time Total Depth Reached 7-11-11 1245	
Geologist C. Knight		Checked by/Date Chelsea Carmichael / 11-4-11					
Radiological Background 48 / 2118		Radiological Equipment Used Pancake / downhole		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: Soil and grass		4410
0.5			0.0	52	Fill: Silty Sand: Dark yellowish brown (10YR 4/6), medium dense, moist, no odor, 15% silt, 5% coarse sand, 5% medium sand, 75% fine sand, rapid dilatancy, trace medium quartz gravel, mottled, trace rootlets near surface	AF/SM	4706
1.0			0.0	49			4815
			0.0	59			4894
2.0			0.0	62			5050
			0.0	75	Silty Sand: Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 15% silt, 5% coarse sand, 5% medium sand, 75% fine sand, rapid dilatancy, Iron oxide staining	SM	4847
3.0			0.0	85			4989
			0.0	94			4862
4.0			0.0	88			4924
			0.0	53	Weathered Sandstone Bedrock: Olive yellow (2.5Y 6/6), moist, dense, no odor, fine grained sandstone, Iron oxide staining.	Bedrock	4922
5.0			0.0	56			4931
6.0					No GW encountered Refusal on sandstone at 5' bgs		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 Group 1	Location ID 136
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-12-11 0815	Date/Time Total Depth Reached 7-12-11 0910
Type of Sampling Device 1 3/4" Macrocure	Samples Collected 60193 (0820) (1) 1/2 gallon bags + 4 oz Jar		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 11-4-11		

Radiological Background 53 / 2595	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgs: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) surface: grass and soil		2568
0.5			0.0	57	Fill: Silty Sand: dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 20% silt, 5% angular fine gravel (fill rock), 75% fine sand, mottled, trace sandstone gravel	AR / SM	3211
			0.0	54			4542
1.0			0.0	55			4754
			0.0	54			4877
2.0			0.0	51	2' 0"	SM	4970
			0.0	45	Silty Sand: Brown (7.5 YR 4/4), moist, medium dense, no odor, 25% silt, 75% fine sand, rapid dilatancy		4863
3.0			0.0	41			4758
			0.0	46			4852
4.0			0.0	60		SP	4591
			0.0	63			4672
5.0			0.0	61	5' 0"		4667
			0.0	58	Poorly graded sand with silt: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 10% silt, 90% fine sand, trace Iron oxide staining		4511
6.0			0.0	59			4715

Radiological Background 53/2595					Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 136
Depth	Interval	Recovery	FPD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
						Inches	(CPM)
6.0		0.0	59		Same as above: Poorly graded sand with silt	SP	4715
		0.0	55				4843
7.0		0.0	53				4726
		0.0	50				4843
8.0		0.0	50				4963
		0.0	53				4880
9.0		0.0	59		8' 7" Weathered Sandstone Bedrock: light yellowish brown (10% R 6/4), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone, ^{some} Iron oxide staining	Bedrock	4887
		0.0	60				4903
10.0		0.0	58				4760
					Total Depth: 10.0' bgs No GW encountered		
11.0							
12.0							
13.0							



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6, group 1	Location ID 137
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-11-11 1400	Date/Time Total Depth Reached 7-11-11 1440
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar		60194 (1410)
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 52 / 2451	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 00 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 Inches (CPM)
					Surface: soil		10.5' 2580
0.5			0.0	53	Fill: Silty Sand: Yellowish brown (10YR 5/4) moist, medium dense, no odor, 15% silt, 5% fine asphalt gravel, 80% fine sand, mottled	AF/SM	3143
1.0			0.0	61			4215
1.0			0.0	66			4524
2.0			0.0	63	Weathered Sandstone Bedrock: Yellowish brown (10YR 5/4) olive yellow (2.5Y 6/6), moist, dense, no odor, 95% fine grained 5% medium grained sandstone	Bedrock	4569
2.0			0.0	60			4630
3.0			0.0	63			NM
3.0					Refusal on sandstone at 2.5' bgs No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 138
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-11-11 1450	Date/Time Total Depth Reached 7-11-11 1530
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 6095 (1500) (1) 1/2 gallon bags + 4oz Jar		Checked by/Date Duane Robbins / 11/28/11
Geologist C. Knight			

Radiological Background 39 / 2224	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Description: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) surface: soil and grass		+0.5' 2766 (CPM)
0.5			0.0	48	Fill: Silty Sand; Dark yellowish brown (10YR 4/6) moist, loose, no odor, 25% silt, 5% medium sand, 70% fine sand, trace asphalt near surface, trace rootlets, mottled slightly	AR / SM	4638
			0.0	53			4700
1.0			0.0	50			5060
			0.0	55			4947
2.0			0.0	50			5078
			0.0	54			5002
3.0			0.0	56			5025
			0.0	57			5088
4.0			0.0	65			4890
			0.0	63			4734
5.0			0.0	64	Same as above	AR / SM	4733
			0.0	53			4661
6.0			0.0	55			4563

Silty Sand; dark yellowish brown (10YR 4/6) moist, medium dense, no odor, 15% silt, 85% fine sand, ~~with~~ rapid dilatancy

Radiological Background 39/2224				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 138			
Depth	Interval	Recovery	FD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings		
							Inches	(CPM)	
6.0		0.0	53		Same as above!	SM		4563	
		0.0	55						4599
7.0		0.0	52		Poorly graded Sand with silt! Yellowish brown (10YR 5/4), med, medium dense, no odor, 10% silt 90% fine sand, rapid dilatancy	SP		4725	
		0.0	54						4810
8.0		0.0	56						4748
		0.0	57						4807
9.0		0.0	52						4749
		0.0	57						4872
10.0		0.0	56					4906	
					Total Depth: 10.0' bgs				
					No GW encountered				

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 Group	Location ID 139
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-12-11 0930	Date/Time Total Depth Reached 7-12-11 1020
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags + 4oz Jar	60196 (0940)	
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 39 / 2483	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					surface: asphalt		+0.5 2632
			0.0	57	3" thick asphalt		3469
0.5			0.0	66	Fill: Silty Sand: Brown (7.5YR 4/4), moist, medium dense, no odor, 20% silt, 80% fine sand, trace roots and rootlets (decayed roots), mottled	AF/SM	4536
1.0			0.0	67			4753
			0.0	62			4603
2.0			0.0	60	Silty Sand: Dark brown (7.5YR 3/4), moist, medium dense, no odor, 25% silt, 75% fine sand, trace rootlets	SM	4669
			0.0	57			4775
3.0			0.0	56			4673
			0.0	52			4625
4.0			0.0	53			4583
			0.0	50		SM	4358
5.0		NR	0.0	67	No Recovery		4423
			0.0	50	Poorly graded Sand with silt: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 10% silt, 90% fine sand, trace roots, trace Iron oxide staining	SP	4495
6.0			0.0	48			4564

Radiological Background 39 / 2483					Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 139 Subarea G, group!
Depth	Interval	Recovery	FTD	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)
6.0		0.0	48		Same as above: Poorly graded sand with S.H	SP	4564
		0.0	52				4650
7.0		0.0	53				4691
		0.0	51				4665
8.0		0.0	48				4581
		0.0	46		8' 7 1/2" Weathered Sandstone Bedrock: Yellowish brown (10YR 5/6), moist, dense, no odor, very weathered, mechanically weathered to SP, fine grained sandstone, some Iron oxide staining		4692
9.0		0.0	46			SP to c/s	4605
		0.0	54				4554
10.0		0.0	60				4617
					Total Depth: 10.0' bgs		
					No GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group: 6 / group 1	Location ID 142
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 7-18-11 1010	Date/Time Total Depth Reached 7-18-11 1100
Type of Sampling Device trowel/shovel	Samples Collected 4 2 gal bags + 4 UZ Jal 60199 (1045)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 11-4-11		

Radiological Background 1.0	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth ft.	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)
0.25			0.0	16	Silty Sand: light yellowish brown (10YR 6/4), dry, soft, loose, no odor, 35% silt, 10% clay, 5% medium sand, 50% fine sand	SM		
0.5					No GW encountered Total Depth: 0.5 bgs D.S. CIC			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 - group 1	Location ID 142
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 2.0 ft. bgs
Drilling Equipment Hand Auger	Borehole Diameter 3.25	Date/Time Drilling Started 8-1-11 1340	Date/Time Total Depth Reached 8-1-11 1425
Type of Sampling Device Handauger	C. Knight ^{etc}	Samples Collected (1) 1/2 gallon bags + 4oz. Jar 60200 (1400)	
Geologist C. Knight		Checked by/Date Chelsea Carnichael / 11-4-11	

Radiological Background 72 / 3595 / 13	Radiological Equipment Used Pancake / downhole / Micro R	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	Borehole Gamma Readings <small>Inches</small>
					Surface: soil		10.5' 2391 (CPM)
0.5			0.0	88	Fill: sandy silt with gravel; yellowish brown (10YR 5/4), dry, medium stiff, no odor, 15% fine sand, 5% medium sand, 5% clay, 10% fine to medium gravel (fill rock), 65% silt, cohesive, low plasticity, low toughness	AR	3644
			0.0	100		ML	4707
1.0			0.0	115		6310	
			0.0	105		5229	
2.0			0.0	110		5103	
3.0					Refusal at 2.0' bgs No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / Group 6 / group 1		Location ID 143	
Drilling Company HGL		Driller I. Stone		Ground Elevation NA		Total Drilled Depth 0.5 ft. bgs	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 7-18-11 1100		Date/Time Total Depth Reached 7-18-11 1225	
Type of Sampling Device trowel/shovel				Samples Collected 1/2 gal bag + 4oz Jar 60201 (1110)			
Geologist C. Knight				Checked by/Date Duane Robbins, Madmen 11/29/11			
Radiological Background 16 µR		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth ft.	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 Inches (CPM)
0.25			0.0	16	Silty Sand: light yellowish brown (10YR 6/4), dry, medium dense, no odor, 5% coarse sand, 5% medium sand, 50% fine sand, 10% clay, 30% silt, trace fine gravel.	SM	NA
0.5							
<p>No log encountered Total Depth: 0.5 bgs</p>							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 6 group 1	Location ID 143
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 28"
Drilling Equipment hand auger	Borehole Diameter NA	Date/Time Drilling Started 9-7-11/1326	Date/Time Total Depth Reached 9-7-11/1346
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1/2 gall bag, 8-oz jar (#60202) (1350)		
Geologist S. Lapeyre	C. Carmichael	Checked by/Date Julian Robbins Feldman 12/16/11	

Radiological Background 20, 82, 3562	Radiological Equipment Used Pancake meter, R meter, Downhole meter	PID Used Mini Rae 2000 (Bgd: 0.0 ppm)
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Depth ft	Interval	Recovery	Radiological PID	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)
			79			0.5	3380
			74	Sandy silt with rock fragments, (10 YR, 4/4), brown, 50% silt, 35% fine to medium grained sand, 15% sandstone rock fragments, asphalt fragments, dry, soft, no plasticity, hardness, or odor.	ML		
1'			77			4154	
			68			5059	
2'			95			5220	
				Refusal hit at 28" - bedrock		5405	
3'							
4'							
No GW reached.							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 1	Location ID 1417
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 7-18-11 0910	Date/Time Total Depth Reached 7-18-11 0925
Type of Sampling Device trowel/shovel	Samples Collected 1/2 gal bag + 4oz jar	60203 (0920)	
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 20mR	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd) 0.0 ppm
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Depth ft.	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)
0.25			0.0	20	Fill: Silty Sand: light yellowish brown (10YR 6/4) dry, medium dense, no odor, 20% silt, 5% angular medium gravel, 25% fine sand, trace siltlets	AF, SM	
0.5					No GW encountered TD: 0.5' bgs.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 144
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 4.5'
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 9-7-11/1038	Date/Time Total Depth Reached: 9-7-11/1101	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: 1-3 oz jar One 1/2 Gallon Bag (Approx 8 lbs.) (#60204) (1130)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Paul DeBolin, Goldman</i> 12/16/11			

Radiological Background: 18, 89, 3508	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			0.0	78	Sandy silt with rock fragments, (10YR, 4/3), brown, 50% silt, 35% fine to medium grained sand, 15% sandstone rock fragments, dry, soft, no plasticity, hardness or odor	ML		3494
0.5			0.0	88			5300	
1.0			0.0	127	Same as above, except semi-moist with trace gravel		5583	
			0.0	101			5616	
2.0			0.0	69			5585	
			0.0	109			5721	
3.0			0.0	91	Gradational Contact Same as Silty sand, (10YR, 4/4), orangeish brown, 60% fine to medium grained sand, 30% silt, 10% sandstone rock fragments, semi-moist, medium dense, no plasticity, hardness or odor.	SM	5514	
			0.0	93			5720	
4.0			0.0	95			5772	
			0.0	87	bedrock		5645	
5.0					Refusal at bedrock - 4.5'			
6.0					No GW reached.			



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 1	Location ID 145				
Drilling Company HGL		Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs				
Drilling Equipment trowel/shovel		Borehole Diameter NA	Date/Time Drilling Started 7-18-11 0930	Date/Time Total Depth Reached 7-18-11 0940				
Type of Sampling Device trowel/shovel		Samples Collected 1/2 gal bag + 4oz Jar 60205 (2933)						
Geologist C. Knight		Checked by/Date Chelsea Carmichael / 11-4-11						
Radiological Background 18		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
Depth ft.	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)
0.25			0.0	18	Sandy Silt: light yellowish brown (10YR 6/4), dry, med. stiff, no odor, 57% medium sand, 35% fine sand, 68% silt, cohesive, low plasticity	ML		
0.5					No GW encountered FD: 0.5 bgs			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 145
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.5 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-2-11 0740	Date/Time Total Depth Reached 8-2-11 0940
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60206 & 0750		
Geologist C. Knight	Checked by/Date Juliana Robbins-Malden		

Radiological Background 74 / 3257 / 13	Radiological Equipment Used Pancake / downhole / μ R 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			2.0	56	Surface Soil		4220
0.5		0.0	0.0	46	Fill: Silty Sand: Brown (10YR 5/3), dry, medium dense, no odor, 25% silt, 10% coarse sand, 15% medium sand, 50% fine sand, mottled, trace rootlets near surface.	AF/SM	5533
1.0		0.0	0.0	41		5646	
		0.0	0.0	39		5900	
2.0		0.0	0.0	47		5772	
		0.0	0.0	53	24" Fill: Sandy Silt: Dark brown (7.5YR 3/4), moist, medium stiff, no odor, 20% fine sand, 90% silt, non cohesive, low plasticity, low toughness	AF/ML	5880
3.0		0.0	0.0	43			5890
		0.0	0.0	36	36" CL		6171
4.0		0.0	0.0	34	Fill: Sand with silt: Dark brown light yellowish brown (10YR 6/4), moist, dense, no odor, 10% silt, 90% fine sand, mottled with silt packets	AF/SP	5941
		0.0	0.0	44	44" weathered Sandstone Bedrock: Brownish yellow (10YR 6/6), moist, hard, no odor, mechanically weathered to SW, 20% coarse sand, 40% medium sand, 40% fine sand		6033
5.0					Refusal on Sandstone at 4.5' bgs		
6.0					No GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 1	Location ID 146				
Drilling Company HGL		Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs				
Drilling Equipment trowel / shovel		Borehole Diameter NA	Date/Time Drilling Started 7-18-11 0950	Date/Time Total Depth Reached 7-18-11 1035				
Type of Sampling Device trowel / shovel		Samples Collected 1/2 gal bag + 4oz jar 60207(1000)						
Geologist C. Knight		Checked by/Date Chelsea Carmichael / 11-4-11						
Radiological Background 18 mR		Radiological Equipment Used up R meter		PID Used Mini Rax 2000 (Bkgd: 0.0 ppm)				
Depth ft.	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)
0.25					Sandy silt: light yellowish brown (10YR 6/4), dry soft, no odor, 5% coarse sand, 5% medium sand, 30% fine sand, 10% clay, 50% silt, trace rootlets near surface, cohesive, low plasticity	SM		
0.5								
Total Depth 0.5 bgs No GW encountered								



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 6 group 1	Location ID 147
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 7-18-11 / 1011	Date/Time Total Depth Reached 7-18-11 / 1040
Type of Sampling Device trowel/shovel	Samples Collected sample ID: 60209 time: 1020 (1) 1/2 gal bag / (1) 4 oz. jar		
Geologist S. Lapeyre-Montrose	Checked by/Date Chelsea Carrivick / 11-16-11		

Radiological Background 14	Radiological Equipment Used AP R meter	PID Used Mini Rae 2000 (Bkgd 0.0 ppm)
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Depth ft	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	
							Inches	(CPM)
0.25			0.0	13	Surface: top soil & vegetation (weeds) SM silty SAND rootlets, twigs brown (100% S/S) 30% silt, 10% clay, 60% fine-coarse grained sand, trace sandstone	SM		
0.5			0.0	13	granular piece of concrete debris, asphalt debris, loose, low plasticity, soft, dry, no odor - 4" bedrock - sandstone			
<p>TD = 0.5' bgs No GW encountered</p>								

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 "group"	Location ID 147
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 1'9" ft. bgs
Drilling Equipment Hand Auger	Borehole Diameter 3.25	Date/Time Drilling Started 8-1-11 1117	Date/Time Total Depth Reached 8-1-11 1150
Type of Sampling Device Handauger	Samples Collected (1) 1/2 gallon bags + 4oz. Jar 60210 (NO SAMPLE)		
Geologist C. Knight	Checked by/Date Chelsea Carrivick/11-4-11		

Radiological Background 67 / 3358 / 13	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)		Inches 10.5' (CPM)
			0.0	72	Surface: soil and drainage		
0.5			0.1	87	Fill: Sandy silt with gravel; yellowish brown (10YR 5/4), dry, medium stiff, no odor, 15% fine sand, 5% medium sand, 5% clay, 10% fine to medium gravel (granitic gravel), 65% silt, cohesive, low plasticity	AF ML	
1.0		0.1	85				
		0.1	83				
2.0					Refusal at 1'9" bgs on sandstone No GW encountered		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 1	Location ID 148
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 7-18-11 11:30	Date/Time Total Depth Reached 7-18-11 11:50
Type of Sampling Device trowel/shovel	Samples Collected 1/2 gal bag + 4oz Jar		60211 CL 60215 (1140)
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 18 mR	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth ft.	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)
0.25			0.0	18	Surface: soil on slope		
0.5					Silty Sand (Light yellowish brown (10YR 6/4), dry, medium dense, no odor, 30% silt, 57% medium sand, 65% fine sand)	SM	
<p>No GW encountered Total Depth 0.5'</p>							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 148
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 18"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 9-7-11/0818	Date/Time Total Depth Reached: 9-7-11/0830	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#60212) (w/a)			
Geologist: Chelsea Carmichael		Checked By / Date: <i>Andrew Robbins Bedman 12/14/11</i>		

Radiological Background: 20, 94, 3903	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			126		Sandy silt with rock fragments, (10YR 3/3) dark brown, 55% silt, 30% fine to medium grained sand, 15% sandstone rock fragments, dry, soft, no plasticity, hardness or odor.	ML	0	
0.5			56			1		
1.0			68			2		
2.0			82			3		
3.0					Refusal at bedrock - 18" No GW reached No sample collected		4	
4.0						5		
5.0						6		
6.0								



Project Name: SSFL Area JV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 149				
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 7-11-11/0914	Date/Time Total Depth Reached 7-11-11/0922				
Type of Sampling Device trowel/shovel		Samples Collected 4-oz jar 1 1/2 gall bag (#60213) (0920)						
Geologist C. Carmichael		Checked by/Date Judian Robbins Feldman 8/29/11						
Radiological Background 24		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0ppm)				
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				0.023	Silty sand, (10YR, 3/3), dark brown, 70% fine to coarse grained sand, 25% silt, 5% gravel sandstone pieces, dry, loose, no plasticity, hardness or odor.	SM		
No GW reached								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 1	Location ID: 149	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 8"	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 8-25-11/1313		Date/Time Total Depth Reached: 8-25-11/1316	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#60214) (n/a)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>Julian Robbins/Goldman 12/14/11</i>			
Radiological Background: 115, 24r, 5410		Radiological Equipment Used: <u>Micro R Downhole 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	Borehole Gamma Readings (CPM)
0.5			0.0	128	Silty sand with rock fragments, (10YR, 4/3), greyish-brown, 70% fine to medium grained sand, 15% silt, 15% sandstone rock fragments, dry, loose, no plasticity, hardness or odor.	SM	
			0.0	72			
1.0					Refusal at 8" - bedrock No GW reached. <u>No sample collected</u>		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group	Location ID 150
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 7-18-11 1155	Date/Time Total Depth Reached 7-18-11 1210
Type of Sampling Device trowel / shovel	Samples Collected 1/2 gal bag + 4 oz Jar 60215 (1200)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-4-11		

Radiological Background 17 mR	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth ft.	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)
0.25			00	30	surface soil on slope Fill: silty sand: light yellowish brown (10YR 6/4), dry, loose, no odor, 5% medium sand, 25% silt, 10% clay, 60% fine sand, trace metal debris (hexagonal bolt)	AF SM		
0.5					No GW encountered Total Depth 0.5' bgs			

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 2	Location ID 151
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 7-19-11/0934	Date/Time Total Depth Reached 7-19-11/0941
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60217) (0940)		
Geologist C. Carmichael	Checked by/Date Julie Robbins Haldeman 12/14/11		

Radiological Background 14	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 <small>(CPM)</small>
0.5'				14	Sandy silt, (10 YR, 4/4), brown, 60% silt, 40% fine to medium grained sand, trace sandstone rock fragments, dry, soft, no plasticity, hardness or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 2	Location ID 151
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-10-11 0840	Date/Time Total Depth Reached 8-10-11 0930
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 7/2 gallon bags	60529 60218	(NT) (0850)
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-7-11		

Radiological Background SI 1218 / 10uR	Radiological Equipment Used Pancake / downhole	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole
							Gamma Readings Inches (CPM)
					Surface: Soil and grass		+0.5' 3206
0.5			0.0	65	Sandy Silt; Brown (7.5YR 4/4), dry, medium stiff, no odor, 25% fine sand, 75% silt, cohesive, low stiff plasticity, low toughness	ML	3539
			0.0	63		5139	
1.0			0.0	64		5460	
			0.0	59		5636	
			0.0	70		5675	
2.0			0.0	67	Same as above: Sandy Silt	ML	5735
			0.0	65		5675	
3.0			0.0	65		5584	
			0.0	75		5453	
4.0			0.0	75	Silty Sand! Strong brown (7.5YR 4/6), moist, medium dense, no odor, 30% silt, 10% medium sand, 60% fine sand	SM	5552
			0.0	64		5624	
5.0			0.0	74		5480	
			0.0	70		5553	
6.0			0.0	73			

Radiological Background 51/2718/10μR					Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 151		
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	(CFM)	
6.0		0.0	73		Same as above: Silty Sand	SM	5553		
		0.0	80			"	574 C/L	5609	
7.0		0.0	77				553 C/L	5728	
		0.0	87				554 C/L	574 C/L	
		0.0	85		7'10" Poorly graded Sand with S: H: Light yellowish brown (10YR 6/4), moist, medium dense, no odor, 10% silt, 90% fine sand, trace Iron oxide staining, rapid dilatancy, trace medium sand	SP	553 C/L	5711	
		0.0	75				553 C/L	574 C/L	
9.0		0.0	67				5599		
		0.0	65		--- dashed --- Poorly graded Sand: Light yellowish brown (2.5Y 6/3), moist, medium dense, no odor, 100% fine sand, trace medium sand		5499		
10.0		0.0	64			SP	5765		
Total Depth: 10.0'									
No GW encountered									

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 6 group 2	Location ID 152
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 7-18-11 / 1509	Date/Time Total Depth Reached 7-18-11 / 1520
Type of Sampling Device trowel / shovel	Samples Collected sample 10 60219 time 1518 (1) 1/2 gal bag		
Geologist S. Lapeyre-Montrose	Checked by/Date Chelsea Carmichael / 11-16-11		

Radiological Background 15	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bgd: 0.0 ppm)
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Depth ft	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>
0.25					surface: top soil and vegetation (weeds)		
0.5			0.0	13	SM silty sand ^{dark yellowish brown (10YR 4/4)} rootlets, twigs 25% silt, 70% fine-coarse grained sand, 5% clay low plasticity, very soft, loose, dry, no odor piece of pipe fitting, piece of asphalt trace sandstone gravel-subangular	SM	
					TD = 0.5' bgs NO GW encountered		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 2	Location ID 153
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 7-19-11/1024	Date/Time Total Depth Reached 7-19-11/1029
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60221) (1028)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins Goldman 12/14/11		

Radiological Background 14	Radiological Equipment Used MP 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.015	<p>Silt with sand, (10 YR, 4/4), brown, 70% silt, 25% fine sand, 5% gravel fill rock, dry, medium stiff, no plasticity, hardness or odor.</p> <p>Oxidized bolt found.</p> <p>No GW reached.</p>	ML	



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 2	Location ID 154
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 7-19-11/1002	Date/Time Total Depth Reached 7-19-11/1009
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall. bag (#60223) (1007)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Mallman 12/14/11		

Radiological Background 14	Radiological Equipment Used RP R meter	PID Used Mini Rac 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 <small>(CPM)</small>
0.5'			0.0	14	Silt with sand, (10YR, 4/4), brown, 80% silt, 20% fine grained sand, dry, medium stiff, trace gravel fill, no plasticity, very low hardness, no odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 2	Location ID: 154
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 3'10" ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8-17-11 0736	Date/Time Total Depth Reached: 8-17-11 0815	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.)		60224 (0740)	
Geologist: C. Knight	Checked By / Date: Andrew Robbins & Waldman 11/29/11			

Radiological Background: 11R/2938/31	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. (CPM)
			0.0	68	Surface: Soil and grass		+0.5' 3480
0.5			0.0	69	Fill: Silty Sand: Dark yellowish brown (10YR 4/4), clay, medium dense to loose, 25% silt, 5% fine subangular gravel, 5% coarse sand, 10% medium sand, 55% fine sand, trace asphalt	Af/SM	3955
1.0			0.0	72			5110
			0.0	61	1'6"		5446
2.0			0.0	60	Silty Sand: Dark Brown (7.5YR 3/4), moist, medium dense, no odor, 30% silt, 70% fine sand, rapid dilatancy	SM	5347
			0.0	54			5570
3.0			0.0	81	2'11"		5596
			0.0	66	Weathered Sandstone Bedrock: Brownish yellow (10YR 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone, iron oxide staining	Bedrock	5837
4.0			0.0	65			3'10"
5.0					Refusal on Sandstone at 3'10" No GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 6 group 2	Location ID 155
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 7-18-11 / 1418	Date/Time Total Depth Reached 7-18-11 / 1426
Type of Sampling Device trowel / shovel	Samples Collected Sample 10:60225 time 1425 (1) 1/2 gal bag		
Geologist S. Lapeyre-Montrose	Checked by/Date Chelsea Carminick 11-16-11		

Radiological Background 15	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bgd: 0.0 ppm)
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Depth ft	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)
0.25			0.0	14	Surface: top soil and vegetation (weeds)			
0.5			0.0	15	SM silty sand brown (10YR 4/3) 25% silt, 10% clay, 65% fine-grained sand, loose, low plasticity, very soft, rootlets, twigs, dry, no odor	SM		
<p>TD = 0.5' bgs no GW encountered</p>								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 2	Location ID: 155
Drilling Company: Bort 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: 8-11-11 0940	Date/Time Total Depth Reached: 8-11-11 1040	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60226 (0950)	
Geologist: C. Knight	Checked By / Date: Julian Robbins Goldman 11/29/11			

Radiological Background: D.R. / 3285 / 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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' 3417 (CPM)
0.0			0.0	62	Sandy silt; Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 20% fine sand, 80% silt, cohesive, low plasticity, low toughness, trace rootlets	ML	3504
0.5			0.0	75			4332
1.0			0.0	60			5116
			0.0	74			5542
2.0			0.0	60			5685
			0.0	64	5702		
3.0			0.0	50	3'3" Silty Sand; Yellowish brown (10YR 5/6), moist, medium dense, no odor, 35% silt, 65% fine sand, trace fine subrounded gravel	SM	5672
			0.0	65			5746
4.0			0.0	74	Poorly graded sand with silt; Yellow (10YR 7/6), moist, dense, no odor, 10% silt, 5% medium sand, 85% fine sand	SP	5806
			0.0	77			5686
			0.0	71	NO Recovery		5670
5.0			0.0	64	Same as above; Poorly graded sand with silt	SP	5667
			0.0	77	contact		5543

Radiological Background 12MR/3285/50				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 155	
Depth	Interval	Recovery	FTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Boothole Gamma Readings (CPM)
6.0		0.0		77	Weathered Sandstone Bedrock: Brownish yellow (10YR 6/6), dry, is dense, no color, 10% medium sand, 90% fine sand, fine grained sandstone, mechanically weathered to SP	USCS Symbol SP	5943
		0.0		75			5908
7.0		0.0		86			5870
8.0					Refusal on Sandstone at 7.0' bgs		
					No GW encountered		
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6. group 3	Location ID 156
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 7-20-11/0823	Date/Time Total Depth Reached 7-20-11/0830
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60227) (0830)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Friedman 12/14/11		

Radiological Background 14	Radiological Equipment Used w/ Rneter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.015	Silt with sand, (10 YR, 4/4), brown, with pink speckles, 85% silt, 15% fine sand, dry, compact/dense, trace gravel fill, very low hardness, no plasticity, no odor.	ML		
No GW reached								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 3	Location ID: 156	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 4 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8/15/11 0815		Date/Time Total Depth Reached: 8/15/11 0850	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60228 (0820)			
Geologist: C. Knight				Checked By / Date: Sullivan Robbins Holman 11/29/11			
Radiological Background: 2uR/2974 / 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	Feet bgs.	Borehole Gamma Readings 10.5' 3523 (CPM)
			0.0	50	Surface: soil and grass			3657
0.5			0.0	54	Sandy silt: yellowish brown (10YR 5/4), dry, medium dense, no odor, 15% fine sand, 85% silt, cohesive, low plasticity, low toughness, trace rootlets	ML		4755
1.0			0.0	75				5827
			0.0	69				60425
2.0			0.0	84	2'2" weathered siltstone: yellow (10YR 7/6), dry, hard, no odor, inter bedded siltstone layers, trace roots, ^{cl} friable	Bedrock		6775
			0.0	76				6585
3.0			0.0	63	2'9" weathered sandstone Bedrock: yellowish brown (10YR 5/4), dense, dry, no odor, mechanically weathered to SP, 15% medium sand, 85% fine sand, fine grained sandstone	Bedrock		6099
			0.0	59				5647
4.0			0.0	65				5935
5.0					Refusal on sandstone at 4' bgs			
6.0					No GW encountered			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6.group 3	Location ID 157
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 7-20-11/0910	Date/Time Total Depth Reached 7-20-11/0919
Type of Sampling Device trowel / shovel	Samples Collected 1-1/2 gall bag (#60229) (0918)		
Geologist C. Carmichael	Checked by/Date LuDea Robinson / Solomon 12/14/11		

Radiological Background 13	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 (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 14	Silty sand, (10 YR, 5/4), light brown, 70% fine to medium grained sand, 20% silt, 10% gravel fill rock, dry, medium dense, no plasticity, hardness or odor.	SM		
					No GW reached.			



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	Location ID 158
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 7-19-11/1437	Date/Time Total Depth Reached 7-19-11/1442
Type of Sampling Device trowel/shovel	Samples Collected 1/2 gall bag (#60231) (1440)		
Geologist C. Carmichael	Checked by/Date Julie Robbins Moldman 12/14/11		

Radiological Background 13	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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0013	Sand with gravel, (10 YR, 6/2), brownish SW grey, 75% fine to coarse grained sand, 25% gravel fill rock, 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: 6	Group: 3	Location ID: 158	
Drilling Company: Bort 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: 8/15/11 1046		Date/Time Total Depth Reached: 8/15/11 1120	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: C. Knight				Checked By / Date: John Rollins / 11/29/11			
Radiological Background: DNR 3010 / 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	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	58	surface: Soil and gravel			3476
0.5			0.0	72	Fill: Silty Sand with gravel (light yellowish brown (2.5Y 6/4), dry, dense, no odor, 15% fine subangular gravel (fill rock), 20% silt, 5% coarse sand, 10% medium sand, 50% fine sand, road base material	AF / SM		4738
1.0			0.0	84	11"		1	5826
			0.0	61	Silty with Sand: Dark yellowish brown (10YR 4/4), dry, soft to medium stiff, no odor, 5% coarse sand, 10% fine sand, 90% silt, cohesive, low plasticity, low toughness	ML		6136
2.0			0.0	55			2	6245
			0.0	68				6351
3.0			0.0	82	2' 11" dashed		3	6381
			0.0	88	Clayey silt with Sand: strong brown (7.5YR 4/6), dry, stiff, no odor, 5% coarse sand, 5% medium sand, 5% fine sand, 20% clay, 65% silt, low plasticity, low toughness, cohesive	ML		6300
4.0			0.0	79			4	6175
			0.0	68	Sandstone bedrock: light yellowish brown (2.5Y 6/4), dry, dense to very dense, no odor, fine grained sandstone			6179
5.0			0.0	63	4' 11"		5	6031
6.0					Refusal on Sandstone at 5' bgs No CW encountered		6	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / group 6 / group 3		Location ID 159	
Drilling Company HGL		Driller I. Stone		Ground Elevation NA		Total Drilled Depth 0.5 ft. bgs	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 7-20-11 0935		Date/Time Total Depth Reached 7-20-11 0950	
Type of Sampling Device trowel/shovel				Samples Collected 1- 1/2 gal bag		60233 (0950)	
Geologist C. Knight				Checked by/Date Chelsea Carnichap / 11-7-11			
Radiological Background 16AR		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Blkgd: 0.1 ppm)			
Depth ft.	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.25			0.1	16	<p>AF: Artificial Fill</p> <p>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</p> <p>Surface: grass and soil</p> <p>Fill: Silty Sand: Brown (10YR 5/3), dry, medium dense, no odor, 5% sub rounded to sub angular gravel, 20% silt, 10% coarse grained sand, 15% medium grained sand, 50% fine grained sand, trace concret debris, trace fill rock</p> <p>Total Depth: 0.5'</p> <p>No GW encountered</p>	AF/SM	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 3	Location ID: 159
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: 8/16/11 0925	Date/Time Total Depth Reached: 8/16/11 1040	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60234 (0940)	
Geologist: C. Knight	Checked By / Date: Dale Robert Goldman 11/29/11			

Radiological Background: 10AR 13115 / 44	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.4 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface: soil and grass		
			74		No Recovery		3345
0.5			58		Fill: Silty sand with gravel: Olive yellow (2.5Y 6/6), dry, medium dense to loose, no odor, 15% fine sub angular gravel, 20% silt, 60% fine sand, 5% medium sand	AP/SM	4212
1.0			55			1	5304
			62				5749
2.0			88			2	5777
			74				5671
3.0			68			3	5877
			66				6123
4.0			73		3'7" Sandy silt: Dark yellowish brown (10YR 4/4) 15% fine sand, 5% clay, 80% silt, cohesive, low plasticity, low toughness.	ML	6145
			64		----- dashed -----		6158
5.0			54		4'5" Sandy silt with clay: Brown (7.5YR 4/4), moist, medium stiff, no odor, 10% clay, 5% medium sand, 16% fine sand, 70% silt, cohesive, low plasticity, low toughness.	ML	6227
			82				6110
6.0			110				6007

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 3	Location ID: 159 - Subarea 6		
Radiological Background: 16MR/3115744		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.4 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			0.1	110	Same as above: Sandy silt with clay		6007
			0.1	115	6'6" clayey sand with silt; yellowish brown (10YR 5/4), moist, medium dense ^{cl} cl medium dense, no odor, 20% clay, 10% silt, 5% coarse sand, 10% medium sand, 55% fine sand, cohesive, no plasticity	SC	5934
7.0			0.1	118			6098
			0.1	77	7'5" weathered siltstone Bedrock: olive yellow (2.5Y 6/6), moist, hard, no odor, interbedded siltstone and clay stone layers from 2mm to 8mm thick	Bedrock	6002
8.0			0.1	85			6309
					Refusal on siltstone at 8' bgs No GW encountered		
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 3	Location ID 160
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 7-20-11 0810	Date/Time Total Depth Reached 7-20-11 0825
Type of Sampling Device trowel / shovel	Samples Collected 1/2 gal bag 60235 (0815)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-7-11		

Radiological Background 6	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.7 cpm)
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Depth ft.	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)
0.25			0.7	16	Surface: soil and gravel Fill: Silty sand with gravel; Light yellowish brown (10YR 6/4), dry, no odor, 40% silt, 5% coarse sand, 5% medium sand, 10% angular to subangular fine to coarse gravel (fill rock), 40% fine sand, trace concrete and nails, trace asphalt Total Depth: 0.5' bgs No GW encountered	AF / SM	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 3	Location ID: 160	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 5'2" ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8/16/11 0835		Date/Time Total Depth Reached: 8/16/11 0920	
Type of Sampling Device: 1.75 inch Macrocore		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60236 (0840)			
Geologist: C. Knight		Checked By / Date: Subarea Records Manager 11/28/11					
Radiological Background: DAB/3221/43		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 <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Feet bgs.	Borehole Gamma Readings <small>(CPM)</small>	
					Surface: grass and soil			+0.5' 3351	
0.5			7.0	76	Fill: Silty Sand with gravel: light olive brown (2.54 5/6) dry, medium dense to loose, no odor, 25% silt, 5% medium sand, 60% fine sand, 10% fine sand larger gravel	AF SM		3511	
			2.8	60					4391
1.0			1.5	51					5191
			1.3	65					5632
2.0			1.0	83	2'2" Sand: Sandy silt with clay: Park yellowish brown (10YR 4/4) dry, medium st. A, no odor, 10% clay, 15% fine sand, 75% silt, cohesive, low plasticity, low toughness	ML		5528	
			0.9	90					5668
3.0			0.8	81					6006
			0.8	75					6063
4.0			0.8	68					6329
			0.8	70					6197
5.0			0.8	87	4'11" Sandstone Bedrock: light olive brown (2.54 5/6) dry, dense, fine grained sandstone with siltstone at terminus of boring	Bedrock		6035	
			5'2"						
6.0					Refusal on Sandstone at 5'2" No GW encountered Surrounding Sage plants affected by the PID reading				



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	Location ID 161
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 7-20-11/0846	Date/Time Total Depth Reached 7-20-11/0851
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (# 60237) (0850)		
Geologist C. Carmichael	Checked by/Date Julian Perkins Melman 12/13/11		

Radiological Background 13	Radiological Equipment Used w/ 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> and gravel @	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.013	Silt with sand, (10 YR, 5/4), light brown, 70% silt, 15% fine sand, 15% gravel fill rock, dry, medium stiff, no plasticity, hardness or odor.	ML		
					No GW reached.			



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	Location ID 162
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 7-20-11/0938	Date/Time Total Depth Reached 7-20-11/0947
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60239) (0945)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins Madman 12/14/11		

Radiological Background 13	Radiological Equipment Used M R meter 1	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.0	13	Silty sand, (10 YR, 5/4), light brown, 70% fine to medium grained sand, 20% silt, 10% sandstone rock fragments and gravel fill rock, trace rootlets, dry, dense, no plasticity, hardness or odor.	SM		
					No GW reached Bedrock at 5" bgs			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 3	Location ID: 162
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 7" OK # bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/15/11 0755	Date/Time Total Depth Reached: 8/15/11 0805	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.)		60240 (NO SAMPLE)	
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael / 11-7-11			

Radiological Background: 10AR/2621/45	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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			70		surface: soil and grass			
0.5			80		Fill: well graded sand with gravel; light, greenish gray (6 lex 7/10) ery, dense, no color, 10% medium sand, 25% coarse sand, 15% gravel, 50% fines weathered sandstone bedrock (yellow to 10YR 7/6), etc, hard, nodules mechanically weathered to SP, fine sand	Af SW Bd		not measured
1.0							1	
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

Refusal at 7" bgs on sandstone
No GW encountered

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	Location ID 163
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 7-20-11/1000	Date/Time Total Depth Reached 7-20-11/1007
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60241) (1006)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Feldman 10/13/11		

Radiological Background 15	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (Bkgd: 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	
							Inches	(CPM)
0.5'				0.013	<p>Sand with rock fragments, (10 YR, 6/4) 80% fine to medium grained sand, 15% sandstone rock fragments, 5% silt, dry, dense, no plasticity, hardness or odor.</p> <p>No GW reached. Weathered bedrock - 2" bgs</p>	SP		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / Group 6 / group 3		Location ID 164	
Drilling Company HGL		Driller I. Stone		Ground Elevation NA		Total Drilled Depth 0.5' ft. bgs	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 7-20-11 0855		Date/Time Total Depth Reached 7-20-11 0920	
Type of Sampling Device trowel/shovel				Samples Collected 1-1/2 gal bag 60243 (0900)			
Geologist C. Knight				Checked by/Date Chelsea Carmichael / 11-7-11			
Radiological Background 16		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.1 ppm)			
Depth ft.	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 (CPM)
0.25			0.1	16	Surface: plants and soil		
0.5					Silty Sand: Very pale brown (10YR 7/4), clay, medium dense, no odor, 25% silt, 5% sub angular medium to coarse gravel (sandstone), 5% coarse sand, 10% medium sand, 55% fine sand	SM	
					Total Depth: 0.5' bgs		
					No GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 3	Location ID: 164
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: <u>92'</u> ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/16/11 1140	Date/Time Total Depth Reached: 8/16/11 1240	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) <u>60244</u> (<u>1150</u>)			
Geologist: <u>C. Knight</u>	Checked By / Date: <u>Chelsea Carmichael 11-7-11</u>			

Radiological Background: <u>13MR / 2928 / 57</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 (GPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		<u>90.5'</u> <u>3371</u>
					Surf face: Soil and grass		
0.5			0.0	84	Fill: Silty sand with gravel; Pale yellow (2.5Y 7/4), dry, medium dense, no odor, 10% fine subangular gravel, 20% silt, 5% medium sand, 65% fine sand, trace roots and rootlets, mottled	AF SM	3776
			0.0	90			4834
1.0			0.0	95			6363
			0.0	76			5567
2.0			0.0	58			5714
			0.0	52	3'11" Sandy silt with clay: Brown (10YR 4/3), moist, medium stiff, no odor, 5% coarse sand, 10% clay, 5% medium sand, 10% fine sand, 70% silt, cohesive, low plasticity, low toughness, trace white speckles	ML	5582
3.0			0.1	85			5860
			0.1	69			5711
4.0			0.2	87			5611
			0.2	73			5688
5.0			0.2	77	5'0" Weathered Sandstone Bedrock: Brownish yellow (10YR 6/6), dry, dense, no odor, mechanically weathered to SP, fine gray red sandstone.	ML BEDROCK	5642
			0.0	61	6043		
6.0			0.0	57	5'8" See next page		6326

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	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 7-20-11/1021	Date/Time Total Depth Reached 7-20-11/1030
Type of Sampling Device trowel/shovel	Samples Collected 1/2 gall bag (#60245) (1030)		
Geologist C. Carmichael	Checked by/Date John Rollins, J. L. Man 10/12/11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0ppm)
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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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.014		Silty sand, (10YR, 5/4), light brown, 70% fine to medium grained sand, 25% silt, 5% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor. No GW reached.	SM		

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 3	Location ID: 165	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 1'9" ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8/16/11 0725		Date/Time Total Depth Reached: 8/16/11 0740	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60246 (NO SAMPLE)			
Geologist: C. Knight				Checked By / Date: Chelsea Carmichael / 11-7-11			
Radiological Background: 12.4 / 3253 / 51		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			79		Surface: Soil and grass		
0.5			84		Fill: Silty Sand: Brownish yellow (10YR 6/6), dry, medium dense, no odor, 5% subangular gravel, 25% silt, 5% coarse sand, 10% medium sand, 55% fine sand, trace roots	AF SM	No down hole collected
1.0			74		Weathered Sandstone Bedrock: Olive yellow (2.5Y 6/6), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	Bedrock	
2.0			69		1'9"		
3.0					Refusal on sandstone at 1'4", 1'9" and 1'2"		
4.0					No GW encountered		
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 6, group 3	Location ID 166
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 7-19-11/1453	Date/Time Total Depth Reached 7-19-11/1501
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60247) (1500)		
Geologist C. Carmichael	Checked by/Date LuAnn Robbins Feldman 12/13/11		

Radiological Background 13	Radiological Equipment Used MR 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	14	Silty sand, (10 YR, 5/3), light brown, 65% fine to medium grained sand, 25% silt, 10% gravel fill rock and sandstone/siltstone fragments, dry, 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: 6	Group: 3	Location ID: 166
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: 8/15/11 130	Date/Time Total Depth Reached: 8/15/11 1200	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60248 (1135)	
Geologist: <i>C. Knight</i>	Checked By / Date: <i>Chelsea Carmichael 11-7-11</i>			

Radiological Background: <i>3mR / 30m / 71</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)
				Surface	and clay			+0.5 3196
			6.0	82	Fill: Silts Sand with gravel! Lightly yellowish brown (10YR 6/4), dry, medium dense, 10% fine sand, 10% clay, 25% silt, 55% fine sand, mottled	AF / SM		3415
0.5			0.0	92				4375
1.0			0.0	104	1'2"			5900
			0.0	102		ML		6390
2.0			0.0	100	2'11" silt with sand: Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 10% fine sand, 90% silt, low moisture plasticity, low toughness, cohesive	ML		CK 6390 6659
			0.0	95				CK 6655 6608
3.0			0.0	70	2'10" Clayey silt with sand: Brown (7.5YR 4/4), dry, stiff, no odor, 20% clay, 10% fine sand, 20% silt, low plasticity, low toughness, cohesive, trace rootlets, trace pin-hole pores	ML		CK 6608 6641
			0.0	80				CK 6644 6467
4.0			0.0	87	3'10" Sandstone Bedrock: Light olive brown (2.5Y 5/6), dense, dry, no odor, fine grained sandstone, mechanically weathered to SP	SP		6353
5.0								
6.0								

Refusal on Sandstone at ^{4'} bgs
NO GW encountered

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	Location ID 167
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 7-20-11/0752	Date/Time Total Depth Reached 7-20-11/0806
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60249) (0805) Field DUP: 60523 (NT)		
Geologist C. Carmichael	Checked by/Date LuDean Robbins, Goldman 12/13/11		

Radiological Background 14	Radiological Equipment Used M R meter	PID Used Mini Raz 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, minerology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.014		Silty sand with gravel, (10 YR, 5/4), light brown, 60% fine to medium grained sand, 20% silt, 20% gravel fill, dry, 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: 6	Group: 3	Location ID: 167	
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: 8/15/11 0900		Date/Time Total Depth Reached: 8/15/11 0935	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60250 (0910)			
Geologist: C. Knight				Checked By / Date: Chelsea Carmichael 11-7-11			
Radiological Background: 11.8/2746 / 50		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)		105 3412
0.0			0.0	75	Fill: Silty Sand with gravel; Brown (10YR 5/3) dry, loose, no odor, 15% sub angular gravel (base rock), 20% silt, 5% coarse sand, 10% medium sand, 50% fine sand	AF, SM	3444
0.5			0.0	72			4225
1.0			0.0	69	11" Sandy Silt: yellowish brown (10YR 5/4) dry, medium stiff, no odor, 10% fine sand, 5% medium sand, 5% coarse sand, 80% silt, cohesive, low plasticity, low toughness	ML	5462
2.0			0.0	63			6178
			0.0	44			6290
			0.0	55	24" - - - dashed - - - Clayey silt with sand: Dark yellowish brown (10YR 4/4), ^{cl} medium stiff, no odor, 20% clay, 15% fine sand, 65% silt, cohesive, low plasticity, low toughness	ML	6534
3.0			0.0	51			6432
			0.0	67			6125
4.0			0.0	55	37" Weathered Sandstone Bedrock: yellow (10YR 7/6), ^{dry} moist, dense, no odor, mechanically weathered to SP, fine grained ^{cl} sandstone, 5% medium sand, 95% fine sand	Bedrock	6172
5.0					Refusal at 4' bgs on sandstone No GW encountered		
6.0							



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	Location ID 168
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 7-19-11/1259	Date/Time Total Depth Reached 7-19-11/1306
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60251) (1305)		
Geologist C. Carmichael	Checked by/Date Julian Robbins/Alan 12/13/11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rac 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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.0 14	Silt with sand and gravel, (10 YR, 4/3), 70% silt, 15% fine to medium grained sand, 15% asphalt, concrete fragments, gravel fill, dry, stiff, trace rootlets, no plasticity, hardness or odor.	ML		
					No GW reached.			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 3	Location ID: 168
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 3' ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling: Started: 8/12/11 / 1140	Date/Time Total Depth Reached: 8/12/11 / 1152	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		sample ID: 60252 time: 1155	
Geologist: Stephanie Lapierre Morthose	Checked By / Date: Chelsea Carmichael / 11-16-11			
Radiological Background: 12 / 3189 / 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 (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 = 3362 (CPM)
0.0			0.0	66	0-9" sm silty sand brown (10UR 4/3) 20% silt, 10% clay, 70% fine-coarse grained sand, rootlets, trace gravel - subangular low plasticity, dense, no HC odor, dry	SM	3893
0.5			0.0	83			4921
1.0			0.0	72	9" quartzite gravel - subangular 10" - 2'11" SW @ Sand dark yellowish brown (10UR 3/4 4/3)	SP SW Ⓢ	5628
			0.0	78	10% clay, 10% silt, 80% fine-coarse grained sand (trace coarse grained sand) low plasticity, dense, no HC odor, dry		5627
2.0			0.0	75			5641
			0.0	59			5687
3.0			0.0	60	2'11" - 3' Sandstone pale yellow (2.5Y 7/3)		5597
<p>TD = 3' bgs (refusal) No GW encountered</p>							
4.0							
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 6.group 3	Location ID 169
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 7-19-11/1323	Date/Time Total Depth Reached 7-19-11/1330
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60253) (1330)		
Geologist C. Carmichael	Checked by/Date Ludwig Kohn / 12/13/11		

Radiological Background H	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	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'				0.013	Silty sand, (10 YR, 4/4), brown, 55% fine to medium grained sand, 40% silt, 5% asphalt, sandstone fragments, dry, medium dense, trace rootlets, no plasticity, hardness or odor. No GW reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 3	Location ID: 169
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: 8/12/11 / 1359	Date/Time Total Depth Reached: 8/12/11 / 1405	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		Sample ID: 60254 / Time: 1410	
Geologist: Stephanie Lapeyre Montrose		Checked By / Date: Chelsea Carnicchia / 11-16-11		

Radiological Background: 11/2751/61	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 (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings + 0.5 = 3245 (CPM)
0.0			0.0	58	0 - 1'5" SM sand with silt brown (104R 4/3)	SM	3376
0.5			0.0	77	10% clay, 15% silt 75% fine-coarse grained sand, trace gravel-subangular, roots low plasticity, soft, no HC odor, dry		4249
1.0			0.0	61			5222
1.5			0.0	57	1'5" - 2'5" SP sand yellowish brown (104R 5/4)	SP	5356
2.0			0.0	51	10% silt 10% clay, 80% fine-medium grained sand, dense, no HC odor, low plasticity, soft, dry wood chunk		5500
2.5			0.0	61	Same as above 2'5" - 2'6" SP sand yellowish brown (104R 5/4) 10% silt, 90% fine-medium grained sand non plastic, dense, no odor, dry	SP	5887
3.0					TD = 2'6" bgs (refusal)		
4.0					NO Gw encountered		
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	Location ID 170
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 7-19-11/1348	Date/Time Total Depth Reached 7-19-11/1353
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60255) (1352)		
Geologist C. Carmichael	Checked by/Date Subarea Rabbin Feldman 12/13/11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rac 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.014		Silty sand, (10 YR, 4/4), brown, 65% fine to medium grained sand, 30% silt, 5% sandstone and siltstone 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: 6	Group: <u>3</u>	Location ID: <u>170</u>	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: <u>4.5'</u> ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8/12/11 / 1058		Date/Time Total Depth Reached: 8/12/11 / 1105	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: <u>Sample ID: 60256 / time: 1110</u> One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: <u>Stephenie Lapeyre Montrose</u>				Checked By / Date: <u>Chelsea Carmichael / 11-16-11</u>			
Radiological Background: <u>12 / 3250 / 50</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 (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings +0.50 = 3325 (CPM)
0.0			67	67	SM sand with silt SM silt @ brown (10YR 5/3)	SM	3372
0.5			70	70	20% silt, 10% clay, 70% fine-coarse grained sand, trace gravel-subangular + subrounded, roots, low plasticity, soft, no HC odor, dry		3904
1.0			63	63	1'-2'5" SP/SC sand with clay brown (10YR 4/3) (15-20%)	SP/SC	5015
			45	45	15% clay, 10% silt, 75% fine-medium grained sand, trace coarse grained sand, trace gravel-subangular, roots, low plasticity, soft, no HC odor, dry		5391
2.0			47	47			5503
			53	53	2'5"-3'5" ML sandy silt with clay dark yellowish brown (10YR 4/4)	ML	5666
			69	69	40% silt, 20% clay, 40% fine-medium grained sand, low plasticity, soft-firm, no HC odor, dry		5656
			78	78	3'5"-4'5" SP sand dark yellowish brown (10YR 3/4)	SP	5559
			72	72	10% clay, 10% silt, 80% fine-coarse grained sand (trace coarse grained sand), dense, low plasticity, soft, no HC odor, dry		5576
			63	63	4'5"-4'6" sandstone brownish yellow (10YR 6/8)		5645
					TD = 4'6" bgs (Refusal) No GW encountered		
5.0							
6.0							



BORING LOG

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Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	Location ID 171				
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 7-19-11/1402	Date/Time Total Depth Reached 7-19-11/1410				
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (#60257) (1410)						
Geologist C. Carmichael		Checked by/Date Subramanian Rabbim Goldman 12/13/11						
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
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	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0 1.2 2.0	13	Silty sand, (10YR, 4/3), greyish-brown, 70% fine to medium grained sand, 20% silt, 10% gravel fit) rock, dry, 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: 6	Group: 3	Location ID: 171	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 6' ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8/12/11/0941		Date/Time Total Depth Reached: 8/12/11/0954	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: Stephanie Lapeyre Montrose				Checked By / Date: Chelsea Carmichael / 11-16-11			
Radiological Background: 10/2679/SI		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 ±0.5 = 3209 (CPM)
0.0			0.0	54	0-5" SM silty sand 20% silt, 10% clay, 70% fine grained sand low plasticity, soft, no HC odor, dry, rootlets	SM	3759
0.5			0.0	59	5"-2'3" ^{SP} sand with silt brown (10YR 4/3)	SP	5144
1.0			0.0	50	10% clay, 10% silt, 80% fine-medium grained sand, trace coarse grained sand, trace gravel sub angular, dense, low plasticity, soft, no HC odor, dry		5699
			0.0	49			5939
2.0			0.0	45			5927
			0.0	56	2'3"-4'1" ^{SP/SC} sand with clay dark brown (7.5YR 3/4)	SP/SC	5960
			0.0	54	15-20% clay, 10% silt, 70-75% fine-medium grained sand, very dense, low plasticity, firm soft, no HC odor, dry		5875
			0.0	57			5871
4.0			0.0	53	4'1"-5'8" ^{SP} sand yellowish brown (10YR 5/8)	SP	5964
			0.0	77	10% silt, 90% fine-coarse grained sand (trace coarse grained sand) dense, non plastic, dry, no HC odor		6094
5.0			0.0	72			6154
			0.0	53			6750
6.0			0.0	63	5'8"-6' (yellowish brown 10YR 5/8) sandstone interbedded with thin silty, light brownish gray (2.5Y 6/2)		6837

TD = 6' bgs (refusal)

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 3	Location ID 172
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 7-19-11/1104	Date/Time Total Depth Reached 7-19-11/1123
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60259) (1122)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Feldman 12/13/11		

Radiological Background 16	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'				0.015	Silty sand, (10YR, 3/4), dark reddish-brown, 60% fine to medium grained sand, 40% silt, semi-moist, medium dense, trace asphalt and sandstone fragments, no plasticity, hardness or odor. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 3	Location ID: 172
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 1'3" ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8-17-11 0825	Date/Time Total Depth Reached: 8-17-11 0845	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60260 ^{NO SAMPLE} (0832) ck			
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael / 11-7-11			

Radiological Background: DPR / 3098 / 41	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	52	Surface asphalt v. dirt 2.5' Asphalt	AF	
0.5			0.0	45	Silty Sand: strong brown (7.5YR 4/6), moist, medium dense, no color, 30% silt, 70% fine sand, mottled	AF / SM	not recorded
1.0			0.0	56	7" weathered sandstone Balak: yellow (2.5Y 7/6), moist, dense, no color, mechanically weathered to SP, fine grained sandstone	Balak	
					1'3" —————		
2.0					Refusal on sandstone at 1'3" (3 attempts)		
					No GW encountered		
					No sample collected for lab		
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 / group Subarea 6 group 4	Location ID 173
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 7-18-11 7-22-11/1542	Date/Time Total Depth Reached 7-18-11 7-22-11/1546
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60261) (1545)		
Geologist S. Lapeyre Montrose C. Carmichael	Checked by/Date Julie Robbins Gelman 12/13/11		
Radiological Background 16	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)	

Depth ft	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 (CPM)
0.25					Silty sand, (10YR, 3/4), dark brown, 60% fine sand, 40% silt, high organic content, loose loose, dry, no plasticity, hardness or odor.	SM	
0.5							
No GW reached.							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: <u>6</u>	Group: <u>4</u>	Location ID: 173
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 5'2"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10-10-11/ 0844	Date/Time Total Depth Reached: 10-10-11/ 0937	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 60262) (0940)			
Geologist: Chelsea Carmichael	Checked By/ Date: <u>LuAnn Robbins & Tedman 12/13/11</u>			

Radiological Background: 81, 3263	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	79	Sand with clay, (10 YR, 3/3), dark brown, fine 75% fine to medium grained sand,	SC		3247
0.5			0.0	125	15% clay, 10% gravel fill rock, concrete, sandstone fragments, moist, loose, no plasticity, hardness or odor,		4844	
1.0			0.0	88	piece of glass found. Gradational Contact		5206	
			0.0	72	Silty sand, (10 YR, 4/6), reddish brown, 85% fine to medium grained sand, 15% silt, semi-moist, medium dense, no plasticity, hardness or odor.	SM	5747	3861
2.0			0.0	106	2' Gradational Contact		6058	
			0.0	114	Sand with clay, (10 YR, 4/6), reddish-brown mottled with brown, 85% fine to medium grained sand, 15% clay, semi-moist, no plasticity, hardness or odor.	SC	5976	
3.0			0.0	105	3' Same as above, except light brown/ beige (10 YR, 6/6)	SC	6030	
			0.0	92			6046	
4.0			0.0	107	4' Gradational Contact		6135	
			0.0	79	Sand with clay, (10 YR, 7/6), beige, 80% fine to medium grained sand, 20% clay, semi-moist, very low hardness, no plasticity, no odor.	SC	6251	
5.0			0.0	97			5985	
6.0					Refusal at 5'2" - bedrock No GW reached			

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 2	Location ID 174
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 7-19-11/0817	Date/Time Total Depth Reached 7-19-11/0823
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60263) (0822)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Waldman 12/13/11		

Radiological Background 14	Radiological Equipment Used up Rneter	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.014		Silty sand, (10 YR, 4/4), brown, 55% fine grained sand, 40% silt, 5% sandstone rock fragments, dry, medium dense, trace rootlets, no plasticity, hardness or odor.	SM		
					No GW reached.			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 2	Location ID: 174
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: 8-11-11 1435	Date/Time Total Depth Reached: 8-11-11 1500	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60264 (1440)	
Geologist: C. Knight		Checked By / Date:		

Radiological Background: Micro R/3320/46	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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings +0.5' 3454 (CPM)
0.0			0.0	60	Sandy silt fill Partly yellowish brown (10YR 4/4), dry, medium stiff, no odor, 20% fine sand, 80% silt, low plasticity, low toughness, cohesive, trace concrete debris	AF	3583
0.5			0.0	64		ML	50-11
1.0			0.0	55	12" silty sand & yellowish brown (10YR 5/8), dry, medium dense, no odor, 5% coarse sand, 10% medium sand, 25% silt, 60% fine sand	SM	5720
2.0			0.0	55	11" weathered sandstone bedrock: strong brown (7.5YR 5/6), dry, dense, no odor, 5% medium sand, 5% coarse sand, 90% fine sand, fine grained sandstone	Bedrock	5599
3.0			0.0	67			5522
			0.0	80			5421
							5346
4.0					Refusal at 3.0' bgs on sandstone		
5.0					No GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / Group Subarea 6 group 2	Location ID 175
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 7-18-11 / 1557	Date/Time Total Depth Reached 7-18-11 / 1605
Type of Sampling Device trowel/shovel	Samples Collected sample ID 60265 TIM 602 @ 1600 (1) 1/2 gal bag		
Geologist S. Lapeyre-Montrose	Checked by/Date Chelsea Carmichael / 11-16-11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bgd: 0.0 ppm)
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Depth - ft	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	
							Inches	(CPM)
0.25			0.0	14	Surface: top soil and vegetation (wards)			
0.5			0.0	14	SM silty sand brown (10R 4/5) 25% silt, 70% fine-medium grained sand, 5% clay rootlets, twigs, low plasticity, very soft, loose, dry, no odor	SM		
					TD = 0.5' bgs NO GW encountered			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / Group Subarea 6 group 2	Location ID 176
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 7-18-11 / 1437	Date/Time Total Depth Reached 7-18-11 / 1445
Type of Sampling Device trowel / shovel	Samples Collected Sample ID 60267 time 1440 (1) 1/2 gal bag Field Dup: 60514 no time		
Geologist S. Lapeyre-Montrose	Checked by/Date Chelsea Carmichael 11-16-11		
Radiological Background 15	Radiological Equipment Used up R meter	PID Used Mini Rax 2000 (Bgd: 0.0 ppm)	

Depth - ft	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>
0.25			0.0	13	Surface: top soil and vegetation (weeds)		
0.5			0.0	15	SM silty sand brown (10 PR 4/3) 20% silt, 70% fine-coarse grained sand, lot of clay low plasticity, very soft, loose, dry, no odor rootlets, twigs	SM	
<p>TD = 0.5' bgs NO GW encountered</p>							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 6 group 2	Location ID 177
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 7-18-11 / 1452	Date/Time Total Depth Reached 7-18-11 / 1505
Type of Sampling Device trowel/shovel	Samples Collected sample ID 60269 time: 1457 (1) 1/2 gal bag		
Geologist S. Lapeyre-Montrose	Checked by/Date Chelsea Carnichael / 11-16-11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth ft	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)
0.25			0.0	14	surface = top soil and vegetation (weeds)		
0.5			0.0	15	5m silty sand (M) brown (10YR 5/3) 30% silt 65% fine coarse grained sand, 5% clay rootlets, twigs, low plasticity, very soft loose, dry, no odor, trace sandstone gravel - subangular 5" sandstone bedrock	SM	
<p>TD = 0.5' bgs NO GW encountered</p>							



Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 2	Location ID 178
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 7-19-11/0837	Date/Time Total Depth Reached 7-19-11/0843
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60271) (0842)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins Myrdman 12/13/11		

Radiological Background 4	Radiological Equipment Used w/ Rater	PID Used Mini Rae 2000 (Bkgd: 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'			0.014		<p>Silty sand, (10 YR, 4/4), brown, 55% fine to medium grained sand, 35% silt, 10% sandstone rock fragments, dry, trace rootlets, no plasticity, hardness or odor.</p> <p>4-5" long metal pipe, piece of metal</p> <p>No GW reached</p> <p>Sandstone bedrock at 5-6" bgs</p>	SM	

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 2	Location ID: 178
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 2 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/12/11 0742	Date/Time Total Depth Reached: 8/12/11 0754	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: 60272-0755 One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: I. Stone	Checked By / Date: Chelsea Carnichael / 11-8-11			
Radiological Background: 10 / 2656 / 40	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			0.0	43	Sandy Silt, Dark yellowish Brown (4/4 10YR)		3490
0.5			0.0	54	70% silt, 30% fine sand, dry, low strength, low toughness, med @ trace roots, trace gravel, no odor or staining	ML	4521
1.0			0.0	52	SAND/Weathered Sandstone, Yellowish Brown (5/6 10YR)		5062
1.5			0.0	55	95% fine sand, 5% silt, dry, med-high dense, no odor or staining	Spl / Bed rock	5401
2.0			0.0	48	TD 2ft bgs Refusal on sandstone no gw encountered no anomalies		5342
3.0							
4.0							
5.0							
6.0							



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 2	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 7-19-11/0859	Date/Time Total Depth Reached 7-19-11/0903
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60273) (0902)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins/Geldman 7/13/11		

Radiological Background 14	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.0	14	Sandy silt, (10 YR, 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. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 2	Location ID: 179	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: $\textcircled{2} 2' 5'' 3'$ ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8/12/11 / 0831		Date/Time Total Depth Reached: 8/12/11 / 0848	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		Sample ID: 60274 time: 0840	
Geologist: Stephanie Lapeyre Montrose				Checked By / Date: Chelsea Carmichael / 11-16-11			
Radiological Background: 11 / 3010 / 51		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 = 3319 (CPM)
			0.0	56	Surface: top soil and vegetation (weeds)		
0.5			0.0	57	0-3" SM silty sand roots, 15% clay, 20% silt, 65% fine brown (104R 5/3) coarse grained sand 3"-1'6" trace gravel - subangular, low plasticity, very soft, no HC odor, dry	SM	3460
1.0			0.0	63	SC sand with clay dark yellowish brown (104R 4/4) 15% clay, 10% silt, 75% fine - medium grained sand	SC	4450
2.0			0.0	87	1'6" - 2'8" brownish yellow (104R 6/6) SP SAND	SP	5798
3.0			0.0	68	10% clay, 5% silt, 85% fine - medium grained sand low plasticity, soft, no HC odor, dry		5638
			0.0	56	2'8" - 3' SP sand brownish yellow (104R 6/6) 5% silt, 95% fine - coarse grained sand (trace coarse grained sand) non plastic, dense, no HC odor, dry, pieces of sandstone	SP	5901
			0.0	48	TD = 3' bgs (refusal) NO GW encountered		5712
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 2	Location ID 180
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 7-18-11 1405	Date/Time Total Depth Reached 7-18-11 1420
Type of Sampling Device trowel / shovel	Samples Collected 1/2 gal bag + 4oz jar cil 60275 (1410)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 11-8-11		

Radiological Background 15mR	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth ft.	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	
							Inches	(CPM)
0.25			0.0	15mR	surface: soil and grass w/ clay Sandy Silt: light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 5% medium sand, 15% fine sand, 10% clay, 70% silt, low plasticity, cohesive.	ML		
0.5					NO GW encountered Total Depth: 0.5 bgs			

Project Name: SSEL Area IV Radiological Study		Project Number: EP9038.01.22.04.03		Subarea ID & Group: Subarea 6 group 2		Location ID: 180	
Drilling Company: Boart Longyear		Driller: D. Hansen		Ground Elevation: NA		Total Drilled Depth: 6.5 ft. bgs	
Drilling Equipment: Geo probe 6600		Borehole Diameter: 1 3/4"		Date/Time Drilling Started: 8-10-11 1415		Date/Time Total Depth Reached: 8-10-11 1455	
Type of Sampling Device: 1 3/4" Macrocoring		Samples Collected: (1) 7/2 gallon bags 60276 (1420)					
Geologist: C. Knight		Checked by/Date: Chelsea Carmichael / 11-8-11					
Radiological Background: 55 / 3287 / 2AR		Radiological Equipment Used: Pancake / downhole / MicroR		PID Used: Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiologist	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole
							Inches
					Surface: soil analysis		3359
0.5			0.0	52	Fill: Sandy Silt: Dark yellowish brown (10YR 4/4) dry, medium stiff, no odor, 20% fine sand, 5% coarse sand, 10% medium sand, 65% silt, cohesive, low plasticity, low toughness, trace fine gravel (fill rock), trace brick fragments	AF / ML	5002
			0.0	46			5605
1.0			0.0	73			5564
			0.0	65			5801
			0.0	70			5862
2.0			0.0	78	2'9" Silt: Silt: Strong brown (7.5 YR 5/6), moist, medium dense, no odor, 30% silt, 5% medium sand, 65% fine sand	SM	5620
			0.0	49			5713
			0.2	56			5605
4.0			0.0	62			5801
			0.0	83			5721
5.0			0.0	78	dashed Silt: Sand: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 15% silt, 5% medium sand, 80% fine sand, some iron oxide staining	SM	5721
			0.0	85			5815
6.0			0.0	72			5887

Radiological Background 55/3287/12, R				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 180	
Depth	Interval	Recovery	FTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
							(CPM)
6.0			0.0	72	Same as above: Silty sand	SM	5887
6.3			0.0	86	Weathered Sandstone bedrock: light yellowish brown (2-5% clay), moist, dense, no odor, 5% medium sand, 95% fine sand when mechanically weathered, fine grained sandstone.	SP SC	6061
7.0							
8.0					Refusal at 6.5' bgs No GW encountered		
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 2	Location ID 181			
Drilling Company HGL		Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0:5 ft. bgs			
Drilling Equipment trowel/shovel		Borehole Diameter NA	Date/Time Drilling Started 7-18-11 1425	Date/Time Total Depth Reached 7-18-11 1430			
Type of Sampling Device trowel/shovel		Samples Collected 60277 (1430) 1/2 gal bag + 100 ml cil					
Geologist C. Knight		Checked by/Date Chelsea Carmichael / 11-8-11					
Radiological Background 16mR		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bgct: 0.0 ppm)			
Depth ft.	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.25			0.0	15mR	Surface soil and gravel Fill: Sandy silt with gravel: Light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 10% medium to coarse subangular gravel (fill rock), 30% fine sand, 5% medium sand, 55% silt, low plasticity, cohesive, trace concrete	AF ML	
0.5					Total Depth 0:5 bgs No GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 2	Location ID: 181
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 6' 10" ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/11/11 0825	Date/Time Total Depth Reached: 8/11/11 0930	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60278 (0830)	
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael 11-8-11			

Radiological Background: 100 R / 2547 / 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	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)			10.5' 3092
					Surface: Soil and Grass			
0.5			0.0	55	Fill: Sandy silt! Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 25% fine sand, 5% medium sand, 5% subangular fine gravel (fill rock), 65% silt, low plasticity, low toughness, cohesive	AF/ML		3893
			0.0	83				4989
1.0			0.0	77				5569
			0.0	65				5656
2.0			0.0	66	1'6" - Silty Sand: Strong brown (7.5YR 4/6), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand	SM		5643
			0.0	65				5689
3.0			0.0	71				5792
			0.0	74				5622
4.0			0.0	75	4'3" - Weathered Sandstone Bedrock: Yellow (10YR 7/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	Weathered Bedrock		5667
			0.0	64				5768
5.0			0.0	90				5832
			0.0	63				5809
6.0			0.0	65				5910

Radiological Background ICAR/2577/44				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 181 Subarea 6	
Depth	Interval	Recovery	FTD	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	65	Same as above: Weathered Sandstone		5910
			0.0	66	6'4" weathered siltstone; light yellowish brown (2.5Y 6/4), moist, hard, no color, interbedded siltstone layers		6865
7.0			0.0	95	6'10" Refusal siltstone at 6'10" bgs		NM
8.0					- No GW encountered		
9.0					- Anomaly (3 Sigma) at 6.5' bgs. Sample interval 6-6.5' bgs		
10.0					- only able to widen borehole to 6.5' bgs for gamma logging downhole		
11.0							
12.0							
13.0							



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / Group 6 / group 2	Location ID 182			
Drilling Company HGL		Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs			
Drilling Equipment trowel/shovel		Borehole Diameter NA	Date/Time Drilling Started 7-18-11 1437	Date/Time Total Depth Reached 7-18-11 1455			
Type of Sampling Device trowel/shovel		Samples Collected at 1/2 gal bag ^{at} 60279 (1440)					
Geologist C. Knight		Checked by/Date					
Radiological Background 10mR		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth ft.	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>
0.25			0.0	16	Sandy silt; light yellowish brown (10 YR 5/6), dry, medium stiff, no odor, 5% coarse sand, 15% medium sand, 30% fine sand, 50% silt, trace gravel (fill rock)	ML	
0.5					No GW encountered Total depth 0.5 bgs		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 2	Location ID 182
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-10-11 1205	Date/Time Total Depth Reached 8-10-11 1300
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 72 gallon bags 60280 (1210)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 11-8-11		

Radiological Background 69/2403/10NR	Radiological Equipment Used Pancake / downhole / Macro R	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: Soil and gravel		3083
0.5			0.0	80	Fill; Sandy silt: Yellowish brown (10YR 5/6), dry, medium stiff, no odor, 30% fine sand, 5% fine subrounded gravel, 65% silt, low plasticity, low toughness, cohesive	AF	3113
			0.0	84		ML	4808
1.0			0.0	73			5357
			0.0	68			5604
2.0			0.0	66			5631
			0.0	65			5682
3.0			1.0	55	28' Silty Sand: Strong brown (7.5YR 4/6), moist, medium dense, no odor, 5% coarse sand, 10% medium sand, 25% silt, 60% fine sand	SM	5532
			0.0	58			5495
4.0			0.0	57			5556
			0.0	60			5652
5.0			0.0	66	Same as above - Silty Sand	SM	5652
			0.0	103			5650
6.0			0.0	85	NO Recovery		5774

Radiological Background 49/2903/10 _{HR}					Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 182
Depth	Interval	Recovery	FTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
							Inches (CPM)
6.0		0.0	85		<p>No Recovery</p> <p>Poorly graded sand with silt; Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 10% silt, 90% fine sand, some iron oxide staining.</p> <p>Same as above; Poorly graded sand with silt.</p> <p>Total Depth: 10.0' bgs No GW encountered</p>		5774
	HR	0.0	77				5772
7.0		0.0	75			SP	6006
		0.0	95				5852
8.0		0.0	85				5870
		0.0	68				5883
9.0		0.0	65				5724
		0.0	82				5998
10.0		0.0	91			SP	5881 588 c/c
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 2	Location ID 183			
Drilling Company HGL		Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs			
Drilling Equipment trowel/shovel		Borehole Diameter NA	Date/Time Drilling Started 7-18-11 1513	Date/Time Total Depth Reached 7-18-11 1525			
Type of Sampling Device trowel/shovel		Samples Collected 60281 (1520)					
Geologist C. Knight		Checked by/Date Chelsea Carvichoff / 11-8-11					
Radiological Background 17mR		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd 10.0 ppm)			
Depth ft.	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 (CPM)
0.25			17mR		Silty Sand; Yellowish brown (10YR 8/4), dry, medium dense, no odor, 15% silt, 5% fine to medium gravel, 80% fine sand. No GW encountered Total Depth: 0.5' bgs	AF SM	
0.5							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 2	Location ID 183
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10r0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-10-11 06:45:10:15	Date/Time Total Depth Reached 8-10-11 1100
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 7/2 gallon bags	602822 602802 ck ck (1020-0820)	
Geologist C. Knight	Checked by/Date Chelsea Carmichael 11-8-11		

Radiological Background 53 / 2498 / 1248				Radiological Equipment Used Pancake / downhole / MINOR		PID Used Mini Rae 2000 (Bkgd: 0r0 ppm)	
Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include Ethology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface: So. land, 1222		
0.5			0.0	45	Fill: Sandy silt: Brown (10YR 4/3), dry, medium stiff, no odor, 15% fine sand, 5% medium sand, 80% silt, low plasticity, cohesive, low toughness trace glass and asphalt, trace fine subangular gravel (fill rock)	AF	3503
			0.0	55		PL	4851
1.0			0.0	52		5280	
			0.0	48		5385	
			0.0	50		5405	
2.0			0.0	49	2'6" Silty Sand: Strong brown (7.5YR 4/6), moist, medium dense, no odor, 30% silt, 5% medium sand, 5% coarse sand, 60% fine sand	SM	5539
			0.0	48		5482	
3.0			0.0	65		5373	
			0.0	78		5285	
			0.0	81		5414	
5.0			0.0	80	No Recovery		5565
			0.0	42		SM	5403
			0.0	45		Silty Sand: Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 25% silt, 5% medium sand, 20% fine sand, trace roots, trace iron oxide staining	5716

Radiological Background 53/2998/124R				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 183	
Depth	Interval	Recovery	PTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micaceous, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
						inches	(CPM)
6.0		0.0	45		Same as above: Silty Sand	SM	5716
		0.0	53			"	5703
7.0		0.0	50				5687
		0.0	55				5674
8.0		0.0	60				5651
		0.0	64		8'5" Poorly graded sand with silt; Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 10% silt, 90% fine sand, iron oxide staining	SP	5607
9.0		0.0	58				5637
		0.0	60				5590
		0.0	60				5537
10.0		0.0	58				
					Total Depth: 10.0' bgs NO GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 6 group 2	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 7-18-11 / 1528	Date/Time Total Depth Reached 7-18-11 / 1542					
Type of Sampling Device trowel / shovel	Samples Collected (1) 1/2 gal bag		sample ID 60283	time 1536				
Geologist S. Lapeyre-Montrose	Checked by/Date Chelsea Carmichael / 11-16-11							
Radiological Background 15	Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)					
Depth ft	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.25			0.0	13	Surface: top soil and vegetation (weeds)			
0.5			0.0	13	SM silty sand brown (10YR 4/3) rootlets, twigs, 20% silt, 5% clay, 75% fine coarse grained sand (trace coarse grained), loose, low plasticity, soft, dry, no odor	SM		
					TD = 0.5' bgs NO GW encountered			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 2	Location ID: 184	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 2'4" ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8-11-11 1340		Date/Time Total Depth Reached: 8-11-11 1415	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60284 (9345)			
Geologist: C. Knight				Checked By / Date: Chelsea Carmichael 11-8-11			
Radiological Background: 11mR/2968/43		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, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			0.0	52	Surface soil analysis		3369
0.5			0.0	66	Sandy Silt: Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 15% fine sand, 85% silt, cohesive, low plasticity, low toughness, some rootlets	ML	4403
1.0			0.0	68			5193
1.5			0.0	72			5620
2.0			0.0	68	1" to SP, fine grained sandstone	Bedrock	6141
2.4					Sandstone Bedrock: Brownish yellow (10YR 6/6), dry, dense, no odor, mechanically weathered		
3.0					Refusal on sandstone at 2'4"		
4.0					No GW encountered		
5.0							
6.0							

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 2	Location ID 185
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 7-19-11/0911	Date/Time Total Depth Reached 7-19-11/0926
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60285) (0925)		
Geologist C. Carmichael	Checked by/Date Duane Robbins Goldman 12/12/11		

Radiological Background 14	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 (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	14	Silty sand, (10 VR, 4/4), brown, 70% fine to medium grained sand, 25% silt, 5% sandstone rock fragments and gravel fill rock, dry, dense, no plasticity, hardness or odor. No GW reached.	SM		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 2	Location ID 155
Drilling Company Boat Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-10-11 0740	Date/Time Total Depth Reached 8-10-11 0835
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 72 gallon bags 60286 (0750)		
Geologist C. Knight	Checked by/Date Chelsea Carnichael / 11-8-11		

Radiological Background 53 / 2840 / 16AR	Radiological Equipment Used Pancake / downhole / Meter 3	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	Borehole Gamma Readings	
							Inch	(CPM)
					AF: Artificial Fill surface: asphalt visible		+0.5	2887
0.5			0.0	50	Fill: Silty Sand: Yellowish brown (10YR 5/6), moist, no odor, 5% fine gravel, 15% silt, 5% coarse sand, 10% medium sand, 65% fine sand	AR		3391
			0.0	47		SM		5336
1.0			0.0	44	12" ————— Silty Sand: dark yellowish brown (10YR 3/4) moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand, rapid dilatancy	SM		5626
			0.0	53				5674
2.0			0.0	58	27" ————— dashed —————			5767
			0.0	62				5619
3.0			0.0	72	Silty Sand: Brown (7.5YR 4/3), moist, medium dense, no odor, 15% silt, 5% medium sand, 80% fine sand, rapid dilatancy	SM		5488
			0.0	70				5587
4.0			0.0	65	Poorly graded Sand with silt: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 10% silt, 90% fine sand, trace Iron oxide staining			5486
			0.0	75				5496
5.0			0.0	77				5438
			0.0	57		SP		5387
6.0			0.0	52				5614

Radiological Background 53/2846/10mR					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 185	
Depth	Interval	Recovery	PTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
6.0		0.0	52		Same as above; Poorly graded sand with silt	SP	5617	
		0.0	54			"	5690	
7.0		0.0	55			"	5640	
		0.6	60			"	5517	
8.0		0.0	60			"	5570	
		0.0	66			"	5509	
9.0		0.0	74			"	5350	
		0.0	77			"	5245	
10.0		0.0	80			SP	5430	
						Total Depth: 10.0' bgs No GW encountered		
11.0								
12.0								
13.0								

----- dashed -----

Poorly graded Sand: Light yellowish brown
(2.54 6/3), moist, medium dense, no odor,
fine sand (100%)

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 2	Location ID 186			
Drilling Company HGL		Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs			
Drilling Equipment trowel / shovel		Borehole Diameter NA	Date/Time Drilling Started 7-18-11 1503	Date/Time Total Depth Reached 7-18-11 1510			
Type of Sampling Device trowel / shovel			Samples Collected 1/2 gal bag 60287 (1505)				
Geologist C. Knight			Checked by/Date Chelsea Carnichael / 11-8-11				
Radiological Background 104R		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 90 ppm)			
Depth ft.	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 (CPM)
0.25			0.0	16	<p>Silty Sand: Yellowish brown (10YR 5/4), dry, medium dense, no color, 5% fine subangular gravel, 15% silt, 80% fine sand</p> <p>Total Depth 0.5' bgs</p> <p>No GW encountered</p>	AF / SM	
0.5							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 2	Location ID 186
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation MA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-10-11 1110	Date/Time Total Depth Reached 8-10-11 1155
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 7/2 gallon bags		60288 (1120)
Geologist C. Knight	Checked by/Date Chelsea Carmichael 11-8-11		

Radiological Background 49 / 2777 / 11AR				Radiological Equipment Used Pancake / downhole / Micro R		PID Used Mini Rae 2000 (Bkgs: 0.0 ppm)	
Depth	Interval	Recovery	PID	Radiologist	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: Soil and grass		+0.5 3316
					Fill: Artificial Fill		
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
0.5			0.0	75	Fill: Sandy silt: Brown (10YR 4/3), dry, medium stiff, no odor, 15% fine sand, 5% medium sand, 80% silt, low plasticity, cohesive, ^{ML} low toughness, trace fine gravel	AF / ML	3428
1.0			0.0	65			5277
			0.0	62			5605
			0.0	62			5516
2.0			0.0	55	2'0"		5596
			0.0	50	Silty Sand: Strong brown (7.5YR 4/6), moist, medium dense, no odor, 30% silt, 5% medium sand, 5% coarse sand, 60% fine ^{CL} fine sand	SM	5596
3.0			0.0	52			5513
			0.0	53			5571
4.0			0.0	52			5469
			0.0	50			5445
5.0			0.0	52	----- dashed -----		5567
			0.0	60	Silty Sand: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 25% silt 5% medium sand, 70% fine sand, Iron oxide staining	SM	5724
6.0			0.0	67			5508



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 2	Location ID 187
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 7-18-11 1634	Date/Time Total Depth Reached 7-18-11 1550
Type of Sampling Device trowel/shovel	Samples Collected 60289 (1540)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 11-8-11		

Radiological Background 16mR	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Blkgd: 0.0 ppm)
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Depth ft.	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	
							Inches	(CPM)
0.25			0.0	16mR	Description Af: Artificial Fill surface is sand soil Fill: silty sand; Brown (10YR 5/3), dry, medium dense, no odor, 70% fine sand, 25% silt, 5% glass shards No GW encountered Total Depth: 0.5' bgs	Af/SM		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 2	Location ID: 187	
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: 8-11-11 0718		Date/Time Total Depth Reached: 8-11-11 0815	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: C. Knight				Checked By / Date: Chelsea Carmichael / 11-9-11			
Radiological Background: 12mR / 3185 / 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	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		3347
0.5			0.0	65	Fill: Sandy silt: Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 25% fine sand, 5% fine subrounded gravel, 70% silt, cohesive, low plasticity, low toughness, trace rootlets	AF / ML	4273
			0.0	75			5355
1.0			0.0	59			5687
			0.0	80			5826
2.0			0.0	67			6022
			0.0	67			5826
3.0			0.0	61	2'9" Silty Sand: Strong brown (7.5YR 4/6), moist, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand	SM	5894
			0.0	60	3'5" Sand with silt: Brownish yellow (10YR 6/6), moist, dense, no odor, 10% silt, 10% medium sand, 80% fine sand	SP	6080
4.0			0.0	55			6101
			0.0	63			6256
5.0			0.0	60	4'8" Weathered Siltstone bedrock: Light yellowish brown (10YR 6/4), moist, hard, no odor, mechanically weathered to ML, some iron oxide staining	Weathered Bedrock	5633
			0.0	57	Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), moist, very dense, no odor, mechanically weathered to SP, 5% medium sand, 95% fine sand, fine grained sandstone		NM
6.0			0.0	77			

Radiological Background				Project Name	Project Number	Location	
12UR/2185/54				SSPL Area IV Radiological Study	EP9034.01.22.04.03	187	Sullivan, G
Depth	Interval	Recovery	PTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
							Inches (CPM)
6.0		0.0	77		Same as above: Weathered Sandstone		NM
		0.0	75				NM
7.0		0.0	80				NM
		0.0	72		7 1/4" Weathered Siltstone bedrock: light yellowish brown (2.5Y 6/3), moist, hard, no odor, inter bedded. siltstone layers, some iron oxide staining.		NM
8.0		0.0	65				NM
9.0					Refusal on Siltstone at 8.0' bgs		
					No GW encountered		
					Only able to widen boring to 5.5' bgs and collect downhole gamma readings to 5.5' bgs		
10.0							
11.0							
12.0							
13.0							

Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group 0 / group 3	Location ID 188			
Drilling Company HGL		Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5' ft. bgs			
Drilling Equipment trowel/shovel		Borehole Diameter NA	Date/Time Drilling Started 7-20-11 0745	Date/Time Total Depth Reached 7-20-11 0805			
Type of Sampling Device trowel/shovel		Samples Collected 1/2 gal bag 60291 (0750)					
Geologist C. Knight		Checked by/Date Chelsea Carmichael / 11-8-11					
Radiological Background 17 mR		Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Blkgd: 0.0 ppm)				
Depth ft.	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.25			0.0	17	<p>CK Fill Sandy silt with gravel; Light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 10% angular sandstone gravel (fine to medium in size), 5% coarse sand, 10% medium sand, 20% fine sand, 55% silt, non cohesive, low plasticity</p> <p>surface: soil and gravel</p>	AF/ML	
0.5					<p>0.5' bgs is Total Depth No GW encountered</p>		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 3	Location ID: 188
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: 8/16/11 0745	Date/Time Total Depth Reached: 8/16/11 0825	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60292 (0750)	
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael 11-8-11			

Radiological Background: 13MR / 2544 / 156	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. (GPM)
0.0			0.0	72	Fill: Silty sand with gravel. Yellowish brown (10YR 5/4), dry, loose, no odor, 25% silt, 20% subangular fine gravel (fill rock), 55% fine sand, mottled, trace rootlets	AF / SM	3505
0.5			0.0	80			4517
1.0			0.0	79			5468
1.5			0.0	58			5696
2.0			0.0	54	15" Sandy silt with clay: Olivebrown (2.5Y 4/4) moist, medium stiff, no odor, 10% clay, 15% fine sand, 75% silt, low plasticity, low toughness, cohesive, trace rootlets	ML	6159
2.5			0.0	62			6156
3.0			0.0	69			6409
3.5			0.0	71	3'4" weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), dry dense, no odor, mechanically weathered to SP, 57% coarse sand, 18% medium sand, 85% fine sand, siltstone beds in last 4" of boring	Bedrock	5885
4.0			0.0	84			CL NA NM
4.5					Refusal on Sandstone at 4' bgs No GW encountered		
5.0							
6.0							



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP2038.01.22.04.03	Subarea ID 6, group ²⁵ 10	Location ID 190
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 7-25-11/1547	Date/Time Total Depth Reached 7-25-11/1558
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60295) (1558)		
Geologist C. Carmichael	Checked by/Date <i>[Signature]</i> 12-9-11		

Radiological Background 16	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.0	16	Sandy silt, (10 YR, 3/3), dark brown, 60% silt, 35% fine to medium grained sand, 5% sandstone, trace gravel covered with carbon, dry, medium stiff, no plasticity, hardness or odor.	ML		
					No GW reached.			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 2	Location ID: 190
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 2.3 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8-30-11 0725	Date/Time Total Depth Reached: 8-30-11 0800	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60296 (0730)	
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael / 11-8-11			
Radiological Background: DnR/311 / 45	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' = 3356 (CPM)
			0.0	100	Surface: Soil and grass		
0.5			0.0	95	Sandy S. Lt. Brown (10YR 5/3), dry, medium silt, no odor, 3" - 25% fine sand, 75% silt, low plasticity, low toughness, cohesive, trace rootlets	ML	3400
1.0			0.0	91	Weathered Sandstone Bedrock: yellow (10YR 7/6), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone, trace roots	Bedrock	4593
			0.0	81			5287
2.0			0.0	100			5473
					24'		5528
3.0					Refusal on Sandstone at 23' or 24' bgs No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 2	Location ID: 191	
Drilling Company: HGL		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 21"	
Drilling Equipment: 2 3/4" hand auger		Borehole Diameter: 2 3/4 inches		Date/Time Drilling Started: 10-4-11 / 1429		Date/Time Total Depth Reached: 10-4-11 / 1533	
Type of Sampling Device: 2 3/4" hand auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#60297) (1530)			
Geologist: Chelsea Carmichael				Checked By./ Date: <i>[Signature]</i> 12-9-11			
Radiological Background: 72, 3105		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	76	Silty sand with gravel, (10 YR, 4/4), brown, 50% fine to coarse grained sand, 25% silt, 25% gravel fill rock, concrete, asphalt fragments, very dense, dry, no plasticity, hardness or odor.	SM	3226
1.0			0.0	63	Gradational Contact Sandy silt with gravel, (10 YR, 4/4), orangeish brown, 50% silt, 30% fine to medium grained sand, 20% gravel fill rock, semi-moist, dense, no plasticity, hardness or odor. 21"		4732
1.0			0.0	80		ML	5096
2.0			0.0	57			5126
2.0					Talc layer hit at 14" on 2 nd attempt (~1-2" thick)		
3.0					Refusal at 21"		
3.0					No GW reached		
4.0							
4.0							
5.0							
5.0							
6.0							
6.0							



6_192



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 192			
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 7-25-11/1519	Date/Time Total Depth Reached 7-25-11/1530			
Type of Sampling Device trowel/shovel		Samples Collected 1 1/2 gall bag (#60298) (1530)					
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 12-9-11					
Radiological Background 16		Radiological Equipment Used up Reber	PID Used Mini Rae 2000 (Bkgd: 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'				0.017	Silty sand, (10 YR, 4/4), brown, 70% fine to coarse grained sand, 20% silt, 10% 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: 6	Group: 5	Location ID: 192
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: 8-27-11 1200	Date/Time Total Depth Reached: 8-29-11 1435	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60299 (1210)			
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael 11-8-11			

Radiological Background: 2MA/3125/51	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	Feet bgs.	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)			10.5 3418
					Surface: Soil analysis			
0.5			0.0	64	Fill: Sandy silt: Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 5% medium sand, 20% fine sand, 75% silt, low plasticity, low toughness, cohesive, mottled	AF/ML		4969
			0.0	75				5467
1.0			0.0	70			1	5552
			0.0	68	1'3" Fill: Silty Sand: light yellowish brown (2.5Y 6/4), moist, no odor, 20% silt, 70% fine sand, 10% medium sand, mottled heavily	AF/SM		5659
2.0			0.0	70			2	5729
			0.0	70				5482
3.0			0.0	69			3	5548
			0.0	66				5806
4.0			0.0	61	4'2" trace fine subrounded gravel		4	5620
			0.0	67				5247
5.0			0.0	65	4'10" some silt packets	AF/SM	5	4640
			0.0	66	Same as above? Fill: Silty Sand			4068
6.0			0.0	60			6	5094

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6. group 5	Location ID 193				
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 7-25-11/1044	Date/Time Total Depth Reached 7-25-11/1056				
Type of Sampling Device trowel/shovel		Samples Collected 1 1/2 gall bag (#60300) (1055) Field DUP: 60525 (NT)						
Geologist C. Carmichael		Checked by/Date Chelsea Carmichael/11-8-11						
Radiological Background 17		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Bkgd: 0.0ppm)				
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	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	16	Silty sand, (10 YR, 4/4), brown, 70% fine to medium grained sand, 20% silt, 10% sandstone rock fragments and asphalt fragments, dry, dense, no plasticity, hardness or odor. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 194				
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 7-25-11/1322	Date/Time Total Depth Reached 7-25-11/1330				
Type of Sampling Device trowel/shovel		Samples Collected 1 1/2 gall bag (#60302) (1330)						
Geologist C. Carmichael		Checked by/Date 12-9-11						
Radiological Background 16		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Bkgd: 0.8 ppm)				
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	Inches	Borehole Gamma Readings (CPM)
0.5'				0.017	Sand with silt, (10YR, 5/4), light brown, 85% fine to coarse grained sand, 10% silt, 5% sandstone rock fragments, dry, dense, no plasticity, hardness or odor. No GW reached.	SW		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 5	Location ID: 194	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 1'4" # bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8-27-11 0900		Date/Time Total Depth Reached: 8-28-11 0915	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60303 (NO Sample)			
Geologist: C. Knight				Checked By / Date: <i>Chelsea Carmichael</i> / 11-8-11			
Radiological Background: 10mR / 3337 / 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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.6	60	Surface: soil and grass		
1.0			0.0	59	Sandy silt: Yellowish brown (10YR 5/6), dry, medium stiff, no odor, 5% coarse sand, 5% medium sand, 25% fine sand, 65% silt	ML	No down hole gamma logging recorded
1.5			0.0	63	11" weathered sandstone bedrock: Yellow (2.5Y 7/6), dry, dense, no odor, 5% coarse sand, 10% medium sand, 85% fine sand, mechanically weathered to SP, fine grained sandstone	PSM	
2.0					<p>Refusal on sandstone at 1'4"</p> <p>No GW encountered</p> <p>No sample collected for lab</p>		
3.0							
4.0							
5.0							
6.0							



Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 5	Location ID: #196	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 6.5 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 0734 8/25/11		Date/Time Total Depth Reached: 0750	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60305 (0750)			
Geologist: L. Robbins Goldman				Checked By / Date: Chelsea Carmichael / 11-9-11			
Radiological Background: 10 CFR 2843/58			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)
					Surface: soil + grass AF = artificial fill			3301
0.5			0.0	65	Silt w/ sand: ^{LL6} dark yellowish brown (10 yr 3/6), dry, stiff, dense, no odor, 85% silt, 15% sand, med. plasticity, cohesive, med. tough, trace rootlets, ≤ 1.5 " gravel	ML / AF		4854
1.0			0.0	53				5343
			0.0	67				5309
2.0			0.0	56				5150
			0.0	70				5607
3.0			0.0	87	2'8" Sandy silt: dark yellowish brn (10 yr 3/6), med. stiff, dense, no odor, ^{LL6} 75% silt, 25% sand. low plasticity, cohesive, med. toughness, no dilatancy, pinhole pores, trace CaCO ₃ nodules < 10mm.	ML		5959
			0.0	93				5974
4.0			0.0	80				5883
			0.0	75	4'6" Sandy silt described as above, note color change: yellowish brown (10 yr 5/6), calcium nodules less apparent	ML		5773
5.0			0.0	72				5692
			0.0	87				5576
6.0			0.0	70				5624

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: #196		
Radiological Background: 10WR/2843/50		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)
6.0			0.0	70	unit described above		5624
			0.0	57	6'24" silty sand fine grained sandstone mech. weathered to SP, brownish yellow (10 yr b/b)	SP / silty sand	5347
7.0					6'5" refusal on sandstone no GW encountered	CK	
8.0							
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: 6	Group: 5	Location ID: 197
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 7'4" <i>OK bgs.</i>	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/24/11 1026	Date/Time Total Depth Reached: 8/24/11 1120	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60306 (103g)			
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael / 11-9-11			

Radiological Background: 104R / 2722 / 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 East and grass			3261
			0.0	51	Fill: Silty clay with sand; Dark yellowish brown (104R 4/4), dry, medium stiff, no odor, 20% silt, 10% fine sand, 70% 5% medium sand, 65% clay, medium plasticity, medium toughness, cohesive, mottled, trace rootlets, trace asphalt	AF / CL		3288
0.5			0.0	60				4265
1.0			0.0	89				4916
			0.0	76				4975
2.0			0.0	67 87 CL				5258
			0.0	81				5209
3.0			0.0	67 78 CL	8" Silty Sand; Very Dark grayish brown (104R 3/2), moist, medium dense, no odor, 30% silt, 5% medium sand, 5% coarse sand, 60% fine sand	SM		5109
			0.0	70				5116
4.0			0.0	66 77 CL				5444
			0.0	71				5556
5.0			0.0	85 75 CL				5621
			0.0	75			Partly graded sand with silt; Yellowish brown (104R 5/4), moist, medium dense, no odor, 10% silt, 90% fine sand	SP
6.0			0.0	93		5437		



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 198
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 20.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/31/11 0740	Date/Time Total Depth Reached: 8/31/11 0850	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60307 (0750)	
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael 11-9-11			

Radiological Background: 10AR/2536/51	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	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	64	Surface: Soil and grass		10.5	3040
			0.0	69	Fill: Sandy silt with clay: Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 5% medium sand, 20% fine sand, 15% clay, 60% silt, trace fine subrounded gravel (~1/4" diameter), cohesive, low plasticity, low toughness	Af/ML	1	3154
			0.0	62				4670
			0.0	59				5110
			0.0	61				5179
			0.0	71				5186
			0.0	70	2'8" dashed			5305
			0.0	69	Fill: Clayey silt with gravel: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 25% clay, 10% fine subrounded gravel (pea gravel ~1/4" diameter) 65% silt, low toughness, low plasticity, cohesive	Af/ML	3	5580
			0.0	67	packet of fine subrounded gravel (~1/4" diameter) with fine and medium sand		4	5628
			0.0	68				5651
			0.0	67	5'0" dashed			5666
			0.0	48	Fill: Clayey silt with gravel: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 40% clay, 10% fine subrounded gravel (pea gravel ~1/4" diameter) 50% silt, cohesive, low plasticity, medium toughness		5	5493
			0.0	43				5632
			0.0					5637

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 5	Location ID: 199	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: CRDR 7.5 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8/31/11 1145		Date/Time Total Depth Reached: 8/31/11 1229 7:00	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60308 (1150)	
Geologist: C. Knight				Checked By / Date: Chelsea Carmichael / 11-9-11			
Radiological Background: 10mR / 2888 / 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	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		
			0.0	52	Fill: Sandy silt; Dark yellowish brown (10YR 3/4) clay, medium stiff, no odor, 5% angular fine sandstone gravel, 40% fine sand, 55% silt, cohesive, low toughness, low plasticity, slow dilatancy, some mottling	AF	3291
0.5			0.0	61		ML	4387
1.0			0.0	58			5397
			0.0	77			5444
2.0			0.0	81	2" trace charcoal ~ 3mm diameter		5656
			0.0	100			5546
3.0			0.0	102	3' 3"		5525
			0.0	94	Silty Sand: Brown (10YR 4/3) moist, medium dense, no odor, 30% silt, 70% fine sand	SM	5636
4.0			0.0	96			5734
			0.0	88			5821
5.0			0.0	91	5' 11" CL		5645
			0.0	88	Same as above: Silty Sand	SM	5590
6.0			0.0	92	5' 11" contact		5683

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 5	Location ID: 200	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 6.5 ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8/31/11 1405		Date/Time Total Depth Reached: 8/31/11 1450	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60309 (1410)			
Geologist: C. Knight				Checked By / Date: Chelsea Carmichael / 11-9-11			
Radiological Background: 16mR / 2822 / 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	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 grass		
0.5			0.0	48	Fill: Sandy silt; Brown (7.5YR 4/3), moist, dry at surface, medium stiff, no odor, 5% medium sand, 5% fine subrounded gravel, 25% fine sand, 65% silt, cohesive, low plasticity, low toughness, mottled	AF	3597
			0.0	57		ML	5176
1.0			0.0	56		1	5714
			0.0	61			5729
2.0			0.0	58		2	5832
			0.0	78		5937	
3.0			0.0	76	3'0" Abundant fine subrounded gravel (pea gravel w/ 1/4" diameter)		5816
			0.0	88	3'3" Silty Sand: Dark brown (10YR 3/3), moist, medium dense, no odor, 35% silt, 65% fine sand, rapid dilatancy	SM	6047
4.0			0.0	85		4	5973
			0.0	97			5976
5.0			0.0	94		5	6010
			0.0	71	Weathered Sandstone Bedrock: Brownish yellow (10YR 6/6), moist, dense, no odor, 5% medium sand, 95% fine sand, mechanically weathered to SP, fine grained sandstone	SP	5853
6.0			0.0	67		6	5781



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 201
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 6'10" ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/3/11 1005	Date/Time Total Depth Reached: 8/3/11 1050	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60310 (1010)	
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael		11-9-11	

Radiological Background: 16AR/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	Borehole Gamma Readings (CPM)
					Surface: Soil and grass		4.5' 2960
0.5	0-0		0.0	91	Description AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Fill: Silty Clay with Sand: Dark grayish brown (10YR 4/2), dry, medium stiff, no odor, 25% silt, 10% fine sand, 65% clay, cohesive, medium plasticity, medium toughness	AF/CL	3093
			0.0	87		4084	
1.0	0-0		0.0	100		4696	
			6.0	90		4981	
2.0	0-0		0.0	83		5002	
			0.0	79		4961	
3.0	0-0		0.0	86		4986	
			0.0	78		5157	
4.0	0-0		0.0	82		5556	
			0.0	85		5890	
5.0	0-0		0.0	86	6013		
			0.0	88	6372		
6.0	0-0		0.0	63	6755		

4'2" Silty Sand: Brown (7.5YR 4/3), moist, medium dense, no odor, 5% medium sand, 25% silt, 70% fine sand, trace pin hole pores

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 204
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 7-26-11/0958	Date/Time Total Depth Reached 7-26-11/1006
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gallon bag (#60313) (1005)		
Geologist C. Carmichael	Checked by/Date <i>[Signature]</i> 12-9-11		

Radiological Background 17	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.017	Silt with sand, (10YR, 4/3), pale brown, 75% silt, 25% fine sand, dry, soft, trace rootlets, trace glass and asphalt pieces, no plasticity, hardness or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 5	Location ID: 204	
Drilling Company: Bort 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: 9-6-11 1205		Date/Time Total Depth Reached: 9-6-11 1300	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60314 (1210)			
Geologist: C. Knight				Checked By / Date: Chelsea Carmichael / 11-9-11			
Radiological Background: U/R / 2844 / 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)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					surface: soil and grass		+95 3212
			0.0	50			3787
			0.0	53	Fill: Sandy silt: Yellowish Brown (10YR 5/4), dry, medium stiff, no odor, 35% fine sand, 65% silt, low plasticity, low toughness, cohesive, trace rootlets, mottled texture	Af / ML	5011
			0.0	63			5355
			0.0	65	1'3" Silt: Sandy Brownish yellow (10YR 6/6), dry, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand	SM	5539
			0.0	59			5375
			0.0	60			5293
			0.0	59	2'7" Poorly graded sand with silt: Olive yellow (2.5Y 6/6), moist, dense, no odor, 10% silt, 90% fine sand, some iron oxide staining	SP	5411
			0.0	65			5346
			0.0	70			5439
			0.0	82			5666
			0.0	70	Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), moist, very dense, no odor, mechanically weathered to SP, fine grained sandstone	Bedrock	5628
			0.0	75			NM
					Refusal on sandstone at 5.5' bgs NO GW encountered		




BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6.group 5	Location ID 205				
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 7-26-11/1201	Date/Time Total Depth Reached 7-26-11/1212				
Type of Sampling Device trowel/shovel		Samples Collected 1 1/2 gall bag (#60315) (1210)						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 12-9-11						
Radiological Background 16		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.016		Silt with sand, (10YR, 4/4), brown, 80% silt, 20% fine sand, dry, medium stiff, no plasticity, very low hardness, no odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 5	Location ID: 205	
Drilling Company: Bort 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: 9-7-11 1045		Date/Time Total Depth Reached: 9-7-11 1139	
Type of Sampling Device: 1.75 inch Macrocore		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		Checked By / Date: Chelsea Carnichael / 11-9-11		(NT) 60533 (Field Dup) OC 60316 109 (1100)	
Geologist: C. Knight		Radiological Background: 16mR / 3063 / 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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: soil and grass		10.5' 3458
0.5			0.0	55	Sandy silt: Dark yellowish brown (10YR 4/6), dry, medium stiff, no odor, 30% fine sand, 70% silt, cohesive, low plasticity, low toughness	ML	4553
			0.0	50			5603
1.0			0.0	74	1'0"		5826
			0.0	56	Silty Sand: Brownish yellow (10YR 6/6), moist, medium dense, no odor, 15% silt, 85% fine sand, some iron oxide staining	SM	5819
			0.0	75			5764
2.0			0.0	50			6052
			0.0	56			5966
3.0			0.0	45			5858
			0.0	60	Poorly graded sand with silt: Pale yellow (2.5Y 7/3), moist, medium dense, no odor, 10% silt, 90% fine sand, some iron oxide staining	SP	5723
			0.0	55			5540
4.0			0.0	58	5'0"		5444
			0.0	73	Weathered Sandstone Bedrock: Yellow (2.5Y 7/6), moist, very dense, no odor, 10% coarse sand, 20% medium sand, 70% fine sand, some iron oxide staining	Bedrock	NM
5.0			0.0	51	Refusal on Sandstone at 5.5' bgs, No GW encountered		
6.0			0.0				

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 206
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 7-26-11/0816	Date/Time Total Depth Reached 7-26-11/0825
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60317) (0825)		
Geologist C. Carmichael	Checked by/Date  12-9-11		

Radiological Background 15	Radiological Equipment Used w/ Rater	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.015	Silt with clay, (10YR, 4/3), pale brown, 75% silt, 20% clay, 5% fine sand, dry, some rootlets, medium stiff, compact, low plasticity, hardness, no odor.	ML	
No GW reached.							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 9C 5	Location ID: 206	
Drilling Company: HGL		Driller: I. Stone		Ground Elevation: NA		Total Depth Drilled: 5.0 ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: 10/4/11 1440		Date/Time Total Depth Reached: 10/4/11 1515	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60318 (1500)			
Geologist: C. Knight				Checked By / Date: Chelsea Carmichael 11-9-11			
Radiological Background: 160R/3159/66		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 fill in excavation		3205
0.5			0.0	86	Fill: silty clay with sand: Brown (10YR 5/3), clay, medium stiff, no odor, 20% silt, 5% medium sand, 10% fine sand, 65% clay, adhesive, medium plasticity, medium toughness, trace asphalt, mottled, trace pinhole pores, trace rustlets	AF/CL	3927
			0.0	71			4664
1.0			0.0	75			4917
			0.0	56			4842
2.0			0.0	76			4942
			0.0	104	Same as above; Fill: silty clay with sand: moist	AF/CL	4853
			0.0	59			4949
			0.0	72			5033
			0.0	42 CR			5253
4.0			0.0	96	43" weathered bedrock sandstone: Brownish yellow (10YR 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	B sandstone	5452
			0.0	60			5713
5.0			0.0	49			
Refusal on Sandstone at 5.0' bgs No GW encountered							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 5	Location ID: 207	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 6' 10" <i>chk 4 bgs.</i>	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9-9-11 0740		Date/Time Total Depth Reached: 9-9-11 0850	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60319 (0750)	
Geologist: C. Knight				Checked By / Date: <i>Chelsea Carmichael / 11-9-11</i>			
Radiological Background: 12MR / 2M44 / 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 <i>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	
							Feet bgs.	CPM
			0.0	40	Surface: Soil and grass		±0.5'	2932
0.5			0.0	59	<i>Fill:</i> Sandy silt with clay and gravel: Brown (10YR 5/3), dry, medium stiff, no odor, 10% subangular fine granitic gravel, 20% clay, 25% fine sand, 5% medium sand, 40% silt, cohesive, low plasticity, low toughness, trace asphalt, mottled	<i>AF / ML</i>		2994
1.0			0.0	49				4056
			0.0	57				4765
			0.0	50				4930
2.0			0.0	49				5154
			0.0	50	<i>2' 10"</i> Silty Sand: Dark yellowish brown (10YR 3/6), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand.	<i>SM</i>		5348
3.0			0.0	54				5646
			0.0	54				5782
			0.0	53				5769
4.0			0.0	60				5626
			0.0	54				5782 5762
5.0			0.0	52	<i>5' 5"</i> Weathered Sandstone Bedrock: Brownish yellow (10YR 6/6), moist, dense, no odor, mechanically weathered to SP, 5% medium sand, 95% fine sand, fine grained sandstone	<i>Bedrock</i>		5718
6.0			0.0	55				5723

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 207			
Radiological Background: 12m R / 2494 / 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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	55	Same as above: Weathered Sandstone Bedrock 6'10"	Sandstone	6	5223
			0.0	62			7	5250
7.0			0.0	63			7	NM
8.0					- Refusal on Sandstone at 6'10" - No GW encountered		8	
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: 6	Group: elx 5	Location ID: 208	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 7'4" c/r bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8/24/11 1130		Date/Time Total Depth Reached: 8/24/11 1215	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60320 L1140			
Geologist: C. Knight				Checked By / Date: Chelsea Armichael 11-9-11			
Radiological Background: 10mR / 2443 / 88		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 +0.5' 3217 (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface Soil and gravel		
0.5			0.0	74	Fill: Sandy Silt: Yellowish brown (10YR 5/4), dry, soft, no odor, 5% coarse sand, 5% medium sand, 15% fine sand, 5% sub angular concrete gravel, 70% silt, cohesive, low plasticity, low toughness	AF / ML	3525
			0.0	88			4703
1.0			0.0	79			5149
2.0			0.0	95	1'4" Fill: Silty Clay with sand: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% angular to sub angular fine gravel or concrete debris, 10% fine sand, 20% silt, 65% clay, medium toughness, medium plasticity, cohesive	AF / CL	5372
			0.0	82			5573
3.0			0.0	75	2'6" Silty Sand: Very dark grayish brown (10YR 3/2), moist, medium dense, no odor, 30% silt, 5% medium sand, 5% coarse sand, 60% fine sand	SM	5175
			0.0	82			5394
4.0			0.0	76			5560
			0.0	64			5683
			0.0	69			5525
5.0			0.0	71	5'0" Poorly graded Sand with silt: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 10% silt, 90% fine sand	SP	5395
			0.0	74			5327
6.0			0.0	85			5143



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 209
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: 9-9-11 1030	Date/Time Total Depth Reached: 9-9-11 1110	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60321 (1040)			
Geologist: C. Knight	Checked By / Date: Chelsea Carnichael 11-9-11			

Radiological Background: DAR/3055/36	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			105 3107 (CPM)
0.5			0.0	65	Sandy Silt: Brown (10YR 5/3), dry, medium stiff, no odor, 15% fine sand, 5% clay, 80% silt, low plasticity, low toughness, cohesive, trace rootlets, trace mottling, trace fine gravel (fill rock)	AS / ML		3184
			0.0	59				4460
1.0			0.0	26	8" Fill: Clayey Silt: Brown (10YR 4/3), dry, stiff, no odor, 35% clay, 5% fine sand, 60% silt, low plasticity, Medium toughness, cohesive	AS / ML	1	4754
			0.0	55				4885
2.0			0.0	75			2	4870
			0.0	77				4965
3.0			0.0	72			3	5073
			0.0	87				5130
4.0			0.0	74			4	5012
			0.0	59	4 1/2" Fill: Silty Clay: Very dark grayish brown (10YR 3/2), moist, stiff, no odor, 20% silt, 80% clay, medium toughness, medium plasticity, cohesive, high dry strength	AS / CL		4995
5.0			0.0	66			5	4930
			0.0	71				5055
6.0			0.0	80	5' 9" see next page	AS / SM	6	5299

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 209		
Radiological Background: 12MR/3055/36		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)
6.0			0.0	80	Fill: s: 1/2 Sand: dark brown (10YR 3/3), moist, medium ^{ck} dense, no ^{ck} silt, 20% silt, 5% medium sand, 5% angular fine sandstone gravel, 90% fine sand, some pockets of Greenish Gray (Gley) (6/10G4) fine sand with silt and -7'3" pocket of fine stained sand ~ 1/4" thick 7'10" pocket of fine stained sand ~ 1" thick	AF /SM	6 5299
			0.0	70			7 5889
7.0			4.6	71			8 5377
			7.7	68			
8.0			2.5	73	Refusal on clay at 8' bgs No GW encountered		
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: 6	Group: 5	Location ID: 210	
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: 9-9-11 1415		Date/Time Total Depth Reached: 9-9-11 1510	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60322 (1420)			
Geologist: C. Knight				Checked By / Date: Chelsea Carmichael 11-9-11			
Radiological Background: 14mR/2829/55		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 Feet bgs. 3005 (CPM)
					Surface: Soil and gravel		
			0.0	60			3227
0.5			0.0	57	Fill: Clayey Silt with Sand: Dark grayish brown (10YR 4/2), dry, medium stiff, no odor, 30% clay, 20% fine sand, 50% silt, low plasticity, low toughness, cohesive, mottled, trace fine gravel (fill rock)	AF/ML	3457
1.0			0.0	62			4630
			0.0	55			4842
2.0			0.0	63			5147
					2'3" ————— dashed —————		
			0.0	84	Fill: Sandy Silt: light olive brown (2.5Y 5/3), dry, medium stiff, no odor, 20% fine sand, 80% silt, cohesive, low plasticity, low toughness, mottled	AF/ML	5619
3.0			0.0	87			5733
			0.0	82	3'3" Fill: Poorly graded Sand: light yellowish brown (2.5Y 6/3), dry, medium dense to dense, no odor, 100% fine grained sand, possible former sandstone cobble weathered into SP	AF/SP	5699
4.0			0.0	81			5585
			0.0	65	Sandy Silt: Olive brown (2.5Y 4/3), dry, medium stiff, no odor, 20% fine sand, 80% silt, cohesive, low plasticity, low toughness	ML	5596
5.0			0.0	69			5647
			0.0	84	Silty Sand: Brown (7.5YR 4/4), moist, medium dense, no odor, 30% silt, 20% fine sand.	SM	5551
6.0			0.0	89			5464



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 211
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 7-21-11/1010	Date/Time Total Depth Reached 7-21-11/1021
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60323) (1020)		
Geologist C. Carmichael	Checked by/Date <i>[Signature]</i> 12-9-11		

Radiological Background 17	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.017	Sandy silt, (10 YR, 4/4), brown, 60% silt, 40% fine sand, trace sandstone rock fragments, dry, medium stiff, no plasticity, hardness, or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 212			
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 7-26-11/0916	Date/Time Total Depth Reached 7-26-11/0927			
Type of Sampling Device trowel/shovel		Samples Collected 1 1/2 gall bag (# 60325) (0925)					
Geologist C. Carmichael		Checked by/Date 12-9-11					
Radiological Background 17		Radiological Equipment Used RP Rater	PID Used Mini Rae 2000 (Bkgd: 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'					Sandy silt, (10YR, 3/4), dark reddish-brown, 65% silt, 30% fine to medium grained sand, 5% asphalt pieces and pea gravel, semi-moist, medium stiff, no plasticity, hardness or odor.	ML	
No GW reached.							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 212
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: 9-9-11 0940	Date/Time Total Depth Reached: 9-9-11 1015	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60326	(0950)
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael		11-9-11	

Radiological Background: 13 MAR 29 10 7 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	Feet bgs.	Borehole Gamma Readings +0.5' 3289 (CPM)
			0.0	50	Surface: Asphalt V-ditch	AF		3562
0.5			0.0	66	Fall: Sandy silt: Brown (10YR 5/3), dry, medium stiff, no odor, 20% fine sand, 80% silt, low plasticity, low ^{CS} toughness, cohesive, trace mottled	AS / ML		5618
1.0			0.0	68		ML	1	6016
2.0			0.0	84	Clayey silt: Dark yellowish brown (10YR 3/4) ^{moist} medium stiff, no odor, 30% clay, 5% fine sand, 65% silt, low plasticity, medium toughness, cohesive, trace pinhole pores	ML		6205
			0.0	65			2	6008
			0.0	73				6049
3.0			0.0	76			3	6117
			0.0	70				6226
4.0			0.0	58			4	6046
			0.0	62	4 1/2" Silty clay: Dark brown (10YR 3/3), moist stiff, no odor, 40% silt, 60% clay, medium plasticity, medium toughness, cohesive	CL		5937
5.0			0.0	54	Weathered Sandstone Bedrock: Yellow (2.5Y 7/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	Bedrock	5	5928
6.0					No GW encountered, refusal on sandstone at 5' bgs		6	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 213
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 7-26-11/0838	Date/Time Total Depth Reached 7-26-11/0845
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60327) (0845)		
Geologist C. Carmichael	Checked by/Date <i>[Signature]</i> 12-9-11		

Radiological Background 14	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.014	Silt with clay, (10YR, 4/4), brown, 80% silt, 15% clay, 5% sandstone rock fragments, gravel, asphalt pieces, dry, semi-cemented, medium stiff, low plasticity, hardness, no odor.	ML		
					No GW reached			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 213
Drilling Company: Bort 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: 8/3/11 0855	Date/Time Total Depth Reached: 8/3/11 0945	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60328 (0910)	
Geologist: C. Knight	Checked By / Date: Chelsea Charnick 11-1-11			

Radiological Background: 104R/2678/66	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	68	Surface: Soil and grass			2965
0.5			0.0	76	^{ck} Sandy w/ sand Silt: Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 15% fine sand, 85% silt, cohesive, low plasticity, low toughness, trace rootlets near surface	ML		3885
1.0			0.0	86			1	5598
			0.0	79				6053
2.0			0.0	78			2	6088
			0.0	75				6135
3.0			0.0	81	2'10" granite gravel		3	6188
			0.0	80				6160
4.0			0.0	76	3'5" Silty Sand: Brown (10YR 4/3), moist, medium dense, no odor, 30% silt, 70% fine sand, trace rootlets	SM	4	6158
			0.0	76				6207
5.0			0.0	76	4'11" Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4) moist, dense, no odor, mechanically weathered to SP, fine grained sandstone with interbedded siltstone layers	Weathered Bedrock	5	6063
			0.0	64	5'2" to 5'4" Siltstone bed			5968
6.0			0.0	63			6	6010

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6.group4	Location ID 214				
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 7-21-11/0905	Date/Time Total Depth Reached 7-21-11/0913				
Type of Sampling Device trowel/shovel		Samples Collected 1 1/2 gallon bag (#60539) (0912)						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 12-9-11						
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.6 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'				0.016	Sandy silt, (10 YR, 4/3), greyish-brown, 60% silt, 40% fine sand, dry, soft, trace foil, plastic, tile pieces, duct tape found, no plasticity, hardness, no odor.	ML		
					No GW reached.			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 214
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 1'10" <i>ext bgs.</i>	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/19/11 1200	Date/Time Total Depth Reached: 8/19/11 1200	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60329 (1130)	
Geologist: <i>Orknight</i>	Checked By / Date: <i>Chelsea Carmichael / 11-9-11</i>			

Radiological Background: <i>11MAY9046 / 62</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, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 105' 3414 (CPM)
			0.0	70	Surface: Soil exposed		
0.5			0.0	67	Sandy silt: light olive brown (2.5Y 5/4), dry, medium stiff, no odor, 20% fine sand, 5% medium sand, 75% silt, cohesive, low ^{EL} plasticity, low toughness, trace rootlets	ML	4212 5733
1.0			0.0	63	Weathered siltstone bedrock: light yellowish brown (2.5Y 6/4), dry, hard, no odor, mechanically weathered to ML in some beds, interbedded layers of siltstone and mudstone	BS Bk	6616
			0.0	71			6644
2.0			0.0	83	1'10" —————		6432
3.0					Refusal on siltstone at 1'10"		
4.0					No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 215
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 7-20-11/1326	Date/Time Total Depth Reached 7-20-11/1335
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60330) (1335)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-9-11		

Radiological Background 4	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 <small>(CPM)</small>
0.5				0.015	Silt, with sand, (10 YR, 4/3), pale brown, 80% silt, 15% fine sand, 5% clay, dry, medium stiff, trace rootlets, very low plasticity, hardness, no odor.	ML		
No GW reached.								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 6, group 4		Location ID 216	
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 7-21-11/0946		Date/Time Total Depth Reached 7-21-11/0954	
Type of Sampling Device trowel/shovel				Samples Collected 1 1/2 gall bag (#60332) (0952)			
Geologist C. Carmichael				Checked by/Date [Signature] 12-9-11			
Radiological Background 16		Radiological Equipment Used up R meter			PID Used Mini Rae 2000 (Bkgd: 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'			0.018		Silt with sand, (10 YR, 4/4), brown, 85% silt, 15% fine sand, dry, soft, trace rootlets; no plasticity, very low ϕ hardness, no odor. No GW reached.	ML	



6_217



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 217
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 7-26-11/0900	Date/Time Total Depth Reached 7-26-11/0909
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60541) (0908)		
Geologist C. Carmichael	Checked by/Date ch 12-12-11		

Radiological Background 14	Radiological Equipment Used RP 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.016	Silt with clay (10YR, 4/2), greyish-brown, 80% silt, 15% clay, 5% fine sand, dry, medium stiff, semi-cemented, low plasticity, hardness, no odor.	ML	
No GW reached							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 217
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: 9-9-11 1250	Date/Time Total Depth Reached: 9-9-11 1355	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60334 (1300)	
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael 11-10-11			

Radiological Background: 12MR/2837/59	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 +0.5' 3463 (CPM)
					Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: soil and grass			
0.0			0.0	66	Fill: Sandy silt: Brown (10YR 5/3), dry, medium stiff,	AS		4658
0.5			0.0	63	no odor, 20% fine sand, 80% silt, cohesive, low plasticity,	ML		4968
1.0			0.0	50	low toughness, trace fine gravel (fill rock)		1	4986
2.0			0.0	62	12" Clayey silt with sand; Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 30% clay, 10% fine sand,	ML		5078
			0.0	65	60% silt, cohesive, low plasticity, low toughness		2	5061
3.0			0.0	58	3.5" CL Clay with silt;	CL		5034
			0.0	59			3	4941
4.0			0.0	60	3.5" clay with silt: Very dark grayish brown (10YR 3/2),			5087
			0.0	55	moist, stiff, no odor, 10% silt, 5% angular sandstone	CL	4	5151
			0.0	64	gravel, 95% clay, medium plasticity, medium toughness,			5363
			0.0	59	cohesive		5	5600
5.0			0.0	73	5.2" Silty Sand; Brown (10YR 4/3), moist, medium	SM		5524
			0.0	81	dense, no odor, 25% silt, 75% fine sand, rapid		6	5543
6.0			0.0		dilatancy			

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04.03		6	5	217	
Radiological Background:			Radiological Equipment Used:			PID Used:	
DAR/2837/54			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	81	Same as above: Silty Sand	SM	5543
			0.0	80			5837
7.0			0.0	68	7 1/2"		5788
			0.0	88	Weathered Sandstone Bedrock: Yellowish brown (10YR 5/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	Bedrock	5707
			0.0	80	Some iron oxide staining		5639
8.0			0.0	74			5740
9.0					Refusal at 8.5' bgs on sandstone No GW encountered		
10.0							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6.group 4	Location ID 218
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 7-20-11/1233	Date/Time Total Depth Reached 7-20-11/1241
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60335) (1240)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-11-11		

Radiological Background 15	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.014		Silty sand, (10 YR 5/4), light brown, 80% fine to medium grained sand, 15% silt, 5% sandstone/siltstone rock fragments, dry, medium dense, no plasticity, hardness order. Weathered siltstone/sandstone bedrock. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 218
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 1' 8" ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/19/11 1425	Date/Time Total Depth Reached: 8/19/11 1440	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60336 (NO SAMPLE)			
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael / 11-10-11			

Radiological Background: 13mR / 3201/42	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	Borehole Gamma Readings (CPM)
0.0			0.0	63	Sandy silt: yellowish brown (10YR 5/4), clay, medium stiff, no odor, 30% fine sand, 5% medium sand,	ML	No downhole gamma recorded
0.5			0.0	75	65% silt, cohesive, low plasticity, low toughness, trace roots Silty sand: yellowish brown (10YR 5/6), clay, medium dense, no odor, 5% medium sand, 35% silt, 60% fine sand	SM	
1.0			0.0	100	12" weathered siltstone bedrock: pale yellow (2.5Y 7/4), clay, hard, no odor, inter bedded siltstone layers	Bedrock	
1.5			0.0	95	15" Refusal on siltstone at 1' 8"		
2.0					No GW encountered		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6.group4	Location ID 219
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 7-21-11/0923	Date/Time Total Depth Reached 7-21-11/0931
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60337) (0930)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-12-11		

Radiological Background 17	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	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'				0.017	Sandy silt, (10 YR. 4/4), brown, 60% silt, 35% fine sand, 5% sandstone rock fragments, dry, soft, no plasticity, hardness, or odor. No GW reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 219
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 3' 8" ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8-19-11 0750	Date/Time Total Depth Reached: 8-18-11 0755	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60338 (0800)	
Geologist: T. Morse	Checked By / Date: Chelsea Carmichael / 11-10-11			

Radiological Background: 10/29/5/53	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 (CPM)
0.0			0.0	85	surface soil & vegetation		10513308
0.5			0.0	7a	Silty Sand & Yellowish Brown (10YR 5/6), dry, loose / no odor, 35% silt, 5% medium grained sand, 60% fine grained sand, trace rootlets	SM	3357
1.0			0.0	67			4712
			0.0	66			5524
			0.0	66			5736
2.0			0.0	65	1' 9" - - - dashed - - - - - Silty Sand & Dark Yellowish Brown (10YR 4/6), moist, medium dense, no odor, 25% silt, 5% medium grained sand, 70% fine grained sand	SM	5644
			0.0	71			5731
3.0			0.0	78			5904
			0.0	81	3' 4" Weathered Sandstone bedrock & Olive Yellow (2.5Y 6/6), moist, hard, no odor, mechanically weathers to very fine grained sand	Bedrock	NM
4.0					- Refuse on Sandstone bedrock @ 3' 8" - NO GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 220
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 7-20-11/1305	Date/Time Total Depth Reached 7-20-11/1313
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60339) (1312)		
Geologist C. Carmichael	Checked by/Date [Signature] 11-12-11		

Radiological Background 13	Radiological Equipment Used up Rater	PID Used Mini Rax 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 <small>(CPM)</small>
0.5'				13	<p>4/4 Silty sand, (10YR, 5/4), brown, 70% fine to medium grained sand, 30% silt, 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: 6	Group: 4	Location ID: 220	
Drilling Company: Bort 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: 8/19/11 1025		Date/Time Total Depth Reached: 8/19/11 1100	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60340 (1030)			
Geologist: C. Knight				Checked By / Date: Chelsea Carmichael 11-10-11			
Radiological Background: 9.8/2350 /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	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	45	Surface: Asphalt		705' 2963
0.5			0.0	70	5" Fill: Silty Sand: Yellowish brown (10YR 5/4), dry, loose, no odor, 40% silt, 10% medium sand, 5% coarse sand, 45% fine sand	AF/SM	3103
1.0			0.0	77	8" Asphalt 3" thick	AF	3556
1.5			0.0	77	Fill: Silty with Sand: Brown (10YR 5/3), dry, medium stiff, no odor, 10% fine sand, 5% clay, 5% angular fine sandstone gravel, low plasticity, cohesive, low toughness, mottled, 80% silt	AF/ML	4996
2.0			0.0	70	14" weathered sandstone bedrock: Pale yellow (2.5Y 7/4), dry, very dense, no odor, mechanically weathered to SP, fine grained sandstone, upper 4" of bedrock is siltstone, some mudstone beds interbedded with sandstone	Bedrock	5859
2.0			0.0	84	Refusal on sandstone at 2.0' bgs		5821
3.0					No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 222
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 4'6" ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8-17-11/1334	Date/Time Total Depth Reached: 8-17-11 1335	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60342 (1340)		Checked By / Date: Chelsea Carmichael / 11-10-11	
Geologist: T. Morse				

Radiological Background: 912414/60	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 (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)
					surface: soil & grass		+0.5' 2972
			52	0.0	Fill: silty sand & yellowish brown (10YR 5/4) dry, loose, no odor, 5% gravel, 35% silt, 60% fine grained sand, trace rootlets	AF/SM	4162
0.5			69	0.0	0'6"		
					Silty sand; dark yellowish brown (10YR 3/4) dry, medium dense, no odor, 30% silt, 70% fine grained sand	SM	5321
1.0			66	0.0			5760
					1'7"		
			60	0.0			5795
					Silty sand; brown (10YR 5/3) dry, dense, no odor, 25% silt, 70% fine grained sand, 5% medium grained sand.	SM	
2.0			79	0.0			5880
			62	0.0			5897
			61	0.0			5957
3.0							
			52	0.0			5861
			68	0.0			5726
4.0							
					4'5" weathered sandstone bedrock; light olive brown (2.5Y 5/4) dense, dry, no odor, mechanically weathered	bedrock	
			70	0.0	4'6" to SP fine grained sand and trace medium grained sand		5713
					Refusal on sandstone at 4'6" bgs. No bn encounter		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 4	Location ID: 223	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 3'6" ft bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 8-17-11 1115		Date/Time Total Depth Reached: 8-17-11 1137	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60343 (1130)			
Geologist: T. Moge				Checked By / Date: Chelsea Carmichael / 11-10-11			
Radiological Background: 10/2193/54		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	Borehole Gamma Readings (CPM)
			0.0	42	AP - Artificial fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) surface & soil and grass		70.5 / 2838
0.5			0.0	51	Fill; Silty Sand with fine gravel & Dark Yellowish Brown (10YR 3/6) Loose, dry, no odor, 5% fine gravel, 30% silt, 5% coarse grained sand, 10% medium grained sand, 50% fine grained sand, slight mottling	AF / SM	2936 / 4591
1.0			0.0	42	Silty sand; yellowish brown (10YR 5/0) medium to ^{dense} stiff, moist, no odor, 35% silt, 65% fine grained sand, trace amounts of medium grained sand	SM	5514
			0.0	65	2' 8" Silty sand layers stiffens to ^{dense} stiff to very ^{dense} stiff, trace amounts of medium grained sand.		5836
2.0			0.0	78			5781
			0.0	75			5871
3.0			0.0	67	3' 3" weathered sandstone bedrock & pale yellow (2.5Y 7/4) dry, very ^{stiff} mechanically weathered to SP fine grained sand	Bedrock	5833
			0.0	66	3' 6" Sandstone Refusal at 3'6" NO GW encountered		5793
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 224
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: 8-17-11 0930	Date/Time Total Depth Reached: 8-17-11 1030	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60344 (0940)		Checked By / Date: Chelsea Carmichael 11-10-11	
Geologist: C. Knight				

Radiological Background: 10uR/2443/62	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 plants		2808
0.5			0.0	74	Fill: Silt sand: Dark yellowish brown (10YR 4/6), dry, ^{cl} loose, no odor, 30% silt, 5% medium, 65% fine sand, trace mottling, trace rootlets	AR	2984
			0.0	80		SM	3757
1.0			0.0	85	Poorly graded Sand: Pale yellow (2.5Y 8/4), dry, medium dense, no odor, 5% silt, 95% fine sand	SP	4868
			0.0	69			5751
2.0			0.0	73	Weathered Siltstone Bedrock: Light olive brown (2.5Y 5/6), moist, very stiff to stiff, interbedded siltstone layers with trace sandstone lenses, siltstone very friable, some iron oxide staining	Weathered Bedrock	6513
			0.0	61	3/4" to 3/5" weathered sandstone layer, 1" thick fine grained sand		6511
			0.0	61			6960
3.0			0.0	55			6620
			0.0	56			6466
4.0			0.0	59	4'0" claystone w/1.5"		6111
			0.0	60	Same as above: Weathered Siltstone Bedrock		NM
5.0					Refusal on siltstone at 4.5' bgs		
					No GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 4	Location ID: 226	
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: 8-17-11 1417		Date/Time Total Depth Reached: 8-17-11 1425	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60346 (1450)+(60531)DWP			
Geologist: T. Moore				Checked By / Date: Chelsea Carmichael / 11-10-11			
Radiological Background: 10 / 2610 / 51			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	71	surface soil & grass		40.5' 3331
0.5			0.0	72	Fill: silty sand with gravel yellowish brown (10YR 5/4), loose, dry, no odor, 15% gravel to fine gravel, 25% silt, 10% coarse grained sand, 10% medium grained sand, 40% fine grained sand	AF/SM	4745
1.0			0.0	68	silty sand: brown (10YR 5/3) dry, dense, no odor, 25% silt, 76% fine grained sand, trace medium grained sand		5650
			0.0	67	3'5" to 3'11" silty sand becomes more dense	SM	5858
2.0			0.0	57			5921
			0.0	69			6097
			0.0	80			5911
3.0			0.0	75			5721
			0.0	89	3'11"		5814
4.0			0.0	90	weathered sandstone bedrock: light yellowish brown (2.5Y 6/4), dry, dense, mechanically weathered to SP, fine grained sand	* Bedrock	5811
			0.0	53	5'0"		5425
5.0					Refusal on sandstone at 5'0" bgs. NO GW encountered		NM
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 227
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 7-22-11/1108	Date/Time Total Depth Reached 7-22-11/1112
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag, (# 60347) (1111)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-12-11		

Radiological Background 16	Radiological Equipment Used M 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	16	<p>Silty sand ^(C) Sandy silt</p> <p>Sandy silt, (10YR, 4/4), brown, 70% silt, 30% fine to medium grained sand, semi-cemented, dry, medium stiff, trace rootlets, no plasticity, hardness or odor.</p> <p>No GW reached.</p>	ML	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 227
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: 8/21/11 1420	Date/Time Total Depth Reached: 8/24/11 1505	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60348 (1430)	
Geologist: C. Knight	Checked By / Date: Chelsea Carnick / 11-10-11			

Radiological Background: 10 / 2879 / 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	Feet bgs.	Borehole Gamma Readings +0.5' 3147 (CPM)
0.0			0.0	52	surface: soil and grass			3209
0.5			0.0	74	Fill: Silty Sand: Yellowish brown (10YR 5/4), dry, loose loose, no odor, 35% silt, 5% medium sand, 60% fine sand, mottled, trace rootlets	AS / SM		5079
1.0			0.0	71			1	5593
2.0			0.0	60	14" Silty Sand: Brown (7.5YR 4/4), moist, medium dense, no odor, 5% medium sand, 30% silt, 65% fine sand	SM		5688
			0.0	64			2	5766
			0.0	57				5692
			0.0	63			3	5723
			0.0	73				5876
			0.0	76			4	5686
			0.0	74				5684
5.0			0.0	75	5'0" Poorly graded Sand with silt: light yellowish brown (2.5 6/4), moist, medium dense, no odor, 10% silt, 90% fine sand, some iron oxide staining	SP	5	5515
			0.0	61				5560
6.0			0.0	62			6	5713

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 228
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 7-21-11/1236	Date/Time Total Depth Reached 7-21-11/1251
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gallon bag (#60349) (1250)		
Geologist C. Carmichael	Checked by/Date <i>[Signature]</i> 12-12-11		

Radiological Background 17	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.0	16	Silty sand, (10YR, 4/3), pale brown, 60% fine sand, 40% silt, dry, medium dense, trace rootlets, no plasticity, hardness or odor. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 228
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: 8-18-11 / 1134	Date/Time Total Depth Reached: 8-18-11 / 1141	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60350 (1145)	
Geologist: T. Morse	Checked By / Date: Chelsea Carmichael / 11-10-11			

Radiological Background: 10/2787/63	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	Borehole Gamma Readings +0.5' 3875 (CPM)
					Surface soil and grass		
0.5			0.0	91 TM 45	Silty sand: Yellowish Brown (10YR 5/4), dry, loose to medium dense, no odor, 30% silt, 15% medium grained sand, 55% fine grained sand, trace rootlets.	SM	5128
			0.0	101 TM 60			5191
1.0			0.0	109 TM 74			5471
			0.0	99 TM 92			5231
2.0			0.0	104 TM 71	1'10" Silty sand: Dark Yellowish Brown (10YR 4/6), moist, dense to medium dense, no odor, 20% silt, 15% medium grained sand, 65% fine grained sand.	SM	5335
			0.0	112 TM 69			5355
3.0			0.0	97 TM 62			5449
			0.0	131 TM 55			5411
4.0			0.0	63 TM 56	3'11" dashed poorly graded sand with silt: Yellowish Brown (10YR 5/6), moist, dense, no odor, mottled, presence of iron oxide staining, 10% silt, 5% medium grained sand, 85% fine grained sand	SM	5628
			0.0	43			5369
5.0			0.0	47	4'10" 5'0" weathers to sp fine grained sand, trace iron oxide staining Weathered sandstone bedrock: Light yellowish brown (2.5Y 6/4), hard, dry, no odor, mechanically	Bedrock	5574
					Refusal on sandstone bedrock at 5'0" bgs. NO GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 4	Location ID: 229	
Drilling Company: HGL		Driller: I. Stone		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 10/6/11 0830		Date/Time Total Depth Reached: 10/6/11 0930	
Type of Sampling Device: Trowel/Shovel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60535LNT (0830) 60351 (0830)			
Geologist: C. Knight		Checked By / Date: Chelsea Carmichael / 11-10-11					
Radiological Background: 17AR/3804/61		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 (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	17	Silty Sand: Yellowish brown (10YR 5/4), moist, loose, no odor, 15% silt, 5% coarse sand, 15% medium sand, 65% fine sand, trace rootlets	SM	
0.5			0.0	17			
1.0					<p style="text-align: center;">T.D. = 0.5' bgs</p> <p style="text-align: center;">No GW encountered</p>		1
2.0							2
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: 6	Group: 4	Location ID: 229	
Drilling Company: HGL		Driller: <i>J. Stone</i>		Ground Elevation: NA		Total Depth Drilled: 3.0 ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: <i>10/6/11 0830</i>		Date/Time Total Depth Reached: <i>10/6/11 0930</i>	
Type of Sampling Device: Hand Auger		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60352(0840)			
Geologist: <i>C. Knight</i>		Checked By / Date: <i>Chelsea Carmichael / 11-10-11</i>					
Radiological Background: <i>17uR / 3804 / 61</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	Borehole Gamma Readings (CPM)
					<i>Surface: soil</i>		<i>+0.5' 3879</i>
			<i>0.0</i>	<i>75</i>	<i>Silty Sand: Yellowish brown (10YR 5/4), moist, loose, no odor, 15% silt, 5% coarse sand, 15% medium sand, 65% fine sand, trace rutlets</i>	<i>SM</i>	<i>4130</i>
<i>0.5</i>			<i>0.0</i>	<i>65</i>			<i>5130</i>
<i>1.0</i>			<i>0.0</i>	<i>78</i>	<i>Same as above</i>	<i>SM</i>	<i>5433</i>
			<i>0.0</i>	<i>68</i>			<i>5727</i>
<i>2.0</i>			<i>0.0</i>	<i>58</i>			<i>5729</i>
			<i>0.0</i>	<i>88</i>			<i>5836</i>
<i>3.0</i>			<i>0.0</i>	<i>84</i>	<i>Refusal No GW encountered</i>		<i>5919</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: 6	Group: 4	Location ID: 230	
Drilling Company: HGL		Driller: I. Stone		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 10/6/11 1010		Date/Time Total Depth Reached: 10/6/11 1140	
Type of Sampling Device: Trowel/Shovel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60353 (08 1030)			
Geologist: C. Knight		Checked By / Date:		Chelsea Carmichael / 11-10-11			
Radiological Background: 162R/3195/47		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)
0.5			0.0	16	Poorly Graded Sand with silt: Dark yellowish brown (10% R 3/4), moist, loose, no ader, 10% silt, 5% coarse sand, 10% medium sand, 75% fine sand, trace gravel (fine)	SP	
1.0			0.0	15			
2.0							
3.0							
4.0							
5.0							
6.0							

T.D: 0.5'
No GW encountered

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 230
Drilling Company: HGL	Driller: I. Stone	Ground Elevation: NA	Total Depth Drilled: 4' 10"	CR #bgs.
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 10/6/11 1010	Date/Time Total Depth Reached: 10/6/11 1140	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)	60354 (1030)		
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael 11-10-11			

Radiological Background: 162R/3195/47	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 (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: Soil		+6.5'	3399
			0.0	86	Partly graded sand with silt: Dark yellowish brown (10YR 3/4), moist, loose, no odor, 10% silt, 5% coarse sand, 10% medium sand, 75% fine sand, trace ^{fine} gravel	SP		3704
0.5			0.0	84				4668
1.0			0.0	81				5255
			0.0	73				5414
2.0			0.0	107				5472
			0.0	75	Same as above: Brown (10YR 4/3)	SP		5670
3.0			0.0	62				5566
			0.0	80				5638
4.0			0.0	55				5820
			0.0	102	Same as above: Partly graded sand with silt and gravel	SP		6075
5.0					4' 10" sandstone Bedrock			11.11
6.0					Refusal on sandstone at 4' 10" No LW encountered			



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 231
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 7-22-11/0748	Date/Time Total Depth Reached 7-22-11/0754
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag, (#60355) (0752)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-11-11		

Radiological Background 20	Radiological Equipment Used w/ Raeter	PID Used Mini Rae 2000	Bkgd: (0.0 ppm)	Field DUP: (60524)
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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	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	20	Silt with sand, (10 YR, 4/4), brown, 75% silt, 20% fine sand, 5% pea gravel and sandstone fragments, dry, soft, no plasticity, hardness or odor. No GW reached	ML	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 232
Drilling Company: HGL	Driller: I. Stone	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 10/6/11 1445	Date/Time Total Depth Reached: 10/6/11 1530	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60357 (1450)		Checked By / Date: Chelsea Carmichael / 11-10-11	
Geologist: C. Knight		PID Used: Mini Rae 2000 - Background: 0.0 ppm		

Radiological Background: 16 _M R / 3566 / 03	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	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)
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Depth (ft bgs)	Interval	Recovery	PID	Radiological M/R	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	16	Silty Sand: Brown (7.5 YR 8/4), dry, medium dense, no odor, 20% silt, 5% coarse sand, 10x medium sand, 65% fine sand, pin hole pores, trace rootlets	SM	0.0	
0.5			0.0	17				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	

TD: 0.5'
No GW encountered



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 233
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 7-22-11/0808	Date/Time Total Depth Reached 7-22-11/0816
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag, (#60359) (0815)		
Geologist C. Carmichael	Checked by/Date ch 12-12-11		

Radiological Background 18	Radiological Equipment Used M 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				18	Sandy silt, (10 YR, 4/4), brown, 65% silt, 30% fine to medium grained sand, 5% gravel fill rock, concrete and sandstone fragments, dry, soft, trace rootlets, no plasticity, hardness or odor.	ML	
No GW reached.							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 233
Drilling Company: HGL		Driller: I. Stone	Ground Elevation: NA		Total Depth Drilled: 2.0 ft bgs.
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 10/4/11 1152		Date/Time Total Depth Reached: 10/4/11 1230
Type of Sampling Device: Hand Auger		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60360 (1215)	
Geologist: C. Knight		Checked By / Date: Chelsea Carrindia / 11-10-11			
Radiological Background: 17uR/3640/67		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	85	Surface: drainage / soil		3619
0.5			0.0	89	Silty Sand: yellowish brown (10YR 5/4), dry, medium dense, no odor, 5% coarse sand, 10% medium sand, 10% angular fine grained sandstone, 75% fine sand	SM	4508
1.0			0.0	61	1" weathered sandstone: pale yellow (2.5Y 7/4), dry, very dense, no odor, fine grained ^{clay} sandstone, mechanically weathered to SP	BS	5310
2.0			0.0	83			5450
3.0					Refusal on sandstone at 2.0' 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: 6	Group: 4	Location ID: 234	
Drilling Company: HGL		Driller: I. Stone		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 10/6/11 1210		Date/Time Total Depth Reached: 10/6/11 1255	
Type of Sampling Device: Trowel/Shovel		Samples Collected: One 1/2 Gallon Bag (Appx 8 lbs.)		60361 (1220)			
Geologist: C. Knight		Checked By / Date: Julian Robbins Galdman		11/29/11			
Radiological Background: 17MR / 3617 / 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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	17	Sandy silt with gravel: Brown (10YR 4/3), dry, medium stiff, no odor, 20% fine sand, 10% angular fine sandstone gravel, 70% silt, cohesive, low plasticity, trace roots and rootlets	ML	
1.0			0.0	17			
2.0					TD: 0.5' No GW encountered		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 4	Location ID: 234	
Drilling Company: HGL		Driller: J. Stone		Ground Elevation: NA		Total Depth Drilled: 2'10" <small>cc #bgs.</small>	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: 10/6/11 12:10		Date/Time Total Depth Reached: 10/6/11 12:55	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60362 (1230)			
Geologist: C. Knight				Checked By / Date: Judian Robbins Hedman 11/29/11			
Radiological Background: 172R/3617/62		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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings +0.5 3557 (CPM)
					Surface: soil and gravel		
0.5			0.0	86	Sandy Silt with gravel: Brown (10YR 4/3), dry, medium stiff, no odor, 20% fine sand, 10% angular sandstone gravel, 90% silt, cohesive, low plasticity, trace roots and rootlets	ML	4589
			0.0	97		5472	
1.0			0.0	76		5979	
			0.0	87		6121	
2.0			0.0	97		6000	
			0.0	75	Somewhat above: Sandy Silt		6071
3.0					2'10" Sandstone Bedrock	ML	
					NO GW encountered		
					Reburial in Sandstone at 2'10"		
					Sampled 1-2'10"		
4.0							
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 6, group 4	Location ID 235
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 7-25-11/0809	Date/Time Total Depth Reached 7-25-11/0815
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag, (#60363) (0815)		
Geologist C. Carmichael	Checked by/Date 12-12-11		

Radiological Background 17	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 <small>(CPM)</small>
0.5'			0.0	17	Sandy silt, (10YR, 4/3), pale brown, 70% silt, 30% fine to medium grained sand, trace sandstone/siltstone fragments, dry, soft, trace rootlets, no plasticity, hardness or odor. No GW reached.	ML		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 236
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 7-25-11/0748	Date/Time Total Depth Reached 7-25-11/0755
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60365) (0755)		
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 12-12-11	

Radiological Background 17	Radiological Equipment Used RP 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'				0.0 17	<p>Sandy silt, (10YR, 3/3), pale brown, 70% silt, 30% fine to medium grained sand, dry, soft, some rootlets, no plasticity, hardness or odor.</p> <p style="text-align: center; font-size: 2em;">No GW reached.</p>	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 4	Location ID: 236	
Drilling Company: Bort 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: 9-12-11 0800		Date/Time Total Depth Reached: 9-12-11 0825	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60366 (NO SAMPLE)			
Geologist: C. Knight				Checked By / Date: Chelsea Caruicchio / 11-10-11			
Radiological Background: 15mR/2441 / 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	Borehole Gamma Readings (CPM)
0.0			0.0	75	Surface: Soil and grass		
0.5			0.0	80	Sandy silt: Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 25% fine sand, 5% medium sand, 70% silt, cohesive, low plasticity, low toughness	ML	NO down-hole gamma readings collected
1.0			0.0	78	4" weathered sandstone bedrock: light olive brown (2.5Y 5/3), dry, very dense, no odor, fine grained sandstone	Bedrock	
2.0			0.0	90			
3.0					- Refusal at 1.5' bgs - NO GW encountered - NO LAB Sample collected		
4.0							
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 6.group 4	Location ID 237
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 7-21-11/1357	Date/Time Total Depth Reached 7-21-11/1405
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60367) (1405)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-12-11		

Radiological Background 16	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'				0.016	Silt with sand, (10 YR, 4/3), brown, 80% silt, 20% fine to medium grained sand, dry, medium stiff, trace rootlets, no plasticity, very low hardness, no odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: <u>4</u>	Location ID: <u>237</u>	
Drilling Company: <u>AL HGL</u> <u>Beart Longyear</u>		Driller: <u>CLC I-Store</u> <u>Don Hansen</u>		Ground Elevation: NA		Total Depth Drilled: <u>2'8"</u> ^{c/c} f/bgs.	
Drilling Equipment: <u>Geoprobe 6600 Handauger</u>		Borehole Diameter: <u>1.75 inches 3.0"</u>		Date/Time Drilling Started: <u>9/3/11 0830</u>		Date/Time Total Depth Reached: <u>10/3/11 0900</u>	
Type of Sampling Device: <u>CLC 1.75 inch Macrocore Handauger</u>		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<u>60368 (0830)</u>			
Geologist: C. Knight		Checked By / Date: <u>Chelsea Carmichael / 11-10-11</u>					
Radiological Background: <u>15mR/33317 69</u>		Radiological Equipment Used: <u>Micro R / Downhole / Pancake Meters</u>		PID Used: <u>Mini Rae 2000 - Background: 0.0</u>		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	78	Surface: Soil and gravel		+0.5' 3423
0.5			0.0	79	Silty Sand; Dark yellowish brown (10YR 7/4), dry, medium dense, no odor, 40% silt, 5% medium sand, 55% fine sand	SM	3828
1.0			0.0	95			5078
			0.0	75			5252
2.0			0.0	70			5396
			0.0	61	Same as above; Silty Sand	SM	5225
3.0					Refusal at 2'8" on Sandstone No GW encountered		3
4.0							4
5.0							5
6.0							6



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 238
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 7-22-11/0854	Date/Time Total Depth Reached 7-22-11/0902
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag, (#60369) (0902)		
Geologist C. Carmichael	Checked by/Date [Signature] 11-12-11		

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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.018	Silt with sand, (10YR, 4/4), brown, 80% silt, 20% fine sand, dry, soft, no plasticity, very low hardness, no odor. No BW reached.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 4	Location ID: 238	
Drilling Company: Bort 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: 8-19-11 / 1425		Date/Time Total Depth Reached: 8-19-11 / 1435	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60370 (1440)			
Geologist: T. Morse				Checked By / Date: Chelsea Carnichael / 11-10-11			
Radiological Background: 13 / 326 / 58		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	51	Surface Soil & Grass		+0.5' 3402
0.5			0.0	73	Silty Sand; Brown (10YR 4/3) dry, loose to medium dense, no odor, 30% silt, 5% medium grained sand, 65% fine grained sand 1 3/4" root in sample	SM	4751
1.0			0.0	65	1'4"		5808
2.0			0.0	52	weathered sandstone bedrock: Light yellowish brown (2.5Y 6/4), dry, hard, no odor, mechanically	Bedrock	5910
			0.0	89	1'0" weathers to SP fine grained sand and trace amounts of medium grained sand, trace rootlets at 1'7" bgs.		5440
					- Refusal on sandstone bedrock @ 2'0" bgs. - NO GW encountered		



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6.group4	Location ID 239
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 7-21-11/0824	Date/Time Total Depth Reached 7-21-11/0831
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60371) (0830)		
Geologist C. Carmichael	Checked by/Date R 12-12-11		

Radiological Background 17	Radiological Equipment Used M 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	Silt with sand, (10 YR, 5/4), light brown, 85% silt, 15% fine grained sand, dry, medium stiff ^{stiff} , no plasticity, very low hardness, no odor.	M		
No GW reached.								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: CIL 20 239
Drilling Company: Bort 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: 8/19/11 1110	Date/Time Total Depth Reached: 8/19/11 1420	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60372 (NO SAMPLE)			
Geologist: C. Knight	Checked By / Date: <i>Chelsea Carmichael</i> / 11-10-11			

Radiological Background: 12MR/2869/45	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 (CPM)
0.0			0.0	55	Surface: soil and gravel		
0.5			0.0	60	Sandy silt: Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 30% fine sand, 5% medium sand, 65% silt	ML	No downhole gamma recorded
1.0			0.0	62	Silty Sand: Yellowish brown (10YR 5/6), dry, medium dense to dense, no odor, 5% medium sand, 30% silt, 65% fine sand	SM	
1.4			0.0	60	Weathered Sandstone Bedrock: Yellow (10YR 7/6) dry, dense, no odor, fine grained sandstone	Bedrock	
1.5					Refusal on sandstone at 1.5' bgs		
2.0					No GW encountered		
3.0							
4.0							
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 6, group 4	Location ID 240
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 7-21-11/1458	Date/Time Total Depth Reached 7-21-11/1508
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60373) (1508)		
Geologist C. Carmichael	Checked by/Date [Signature] 11-11-11		

Radiological Background 17	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'			0.0	17	Silt with sand, (10YR, 4/4), brown, 85% silt, 15% fine sand, dry, soft, semi-cemented, no plasticity, very low hardness, no odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 4	Location ID: 240	
Drilling Company: Boart Longyear <i>OK HGL</i>		Driller: <i>OK Don Hansen - I. Stone</i>		Ground Elevation: NA		Total Depth Drilled: 2.0 ft bgs.	
Drilling Equipment: Geoprobe 6600 <i>OK Hand Auger</i>		Borehole Diameter: 1.75 inches <i>3"</i>		Date/Time Drilling Started: 10/3/11 0910		Date/Time Total Depth Reached: 10/3/11 1010	
Type of Sampling Device: 1.75 inch Macrocore <i>OK Hand Auger</i>				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) <i>69374 (0940)</i>			
Geologist: C. Knight				Checked By / Date: <i>Andrew Robbins & Goldman 11/29/11</i>			

Radiological Background: <i>17mR/3663/60</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, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings 3609 : ±0.5' (CPM)
			0.0	95	Surface: Soil and grass			
0.5			0.0	77	Silty Sand: Dark yellowish brown (10YR 4/4), dry, medium dense, no odor, 40% silt, 5% medium sand, & 5% fine sand	SM		4184
1.0		0.0	72					5547
1.5		0.0	75					6183
2.0			0.0	90	<i>16"</i> Sandstone: Yellowish brown (10YR 5/8), <i>OK</i> dry, dense, no odor	SM		6490
2.5								5897
3.0					Refusal on Sandstone at 2' bgs No GW encountered			
4.0								
5.0								
6.0								



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 241
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trussel/shovel	Borehole Diameter NA	Date/Time Drilling Started 7-22-11/1122	Date/Time Total Depth Reached 7-22-11/1130
Type of Sampling Device trussel/shovel	Samples Collected 1 1/2 gall bag (#60375) (1130)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-12-11		

Radiological Background 5	Radiological Equipment Used M R meter	PID Used Mini Raz 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 16	Sand with silt, (10 YR, 5/4), light brown, 85% fine to medium grained sand, 10% silt, 5% cobbles, concrete 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: 6	Group: 4	Location ID: 241	
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: 8/22/11 1150		Date/Time Total Depth Reached: 8/22/11 1245	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60376 (1200)			
Geologist: C. Knight				Checked By / Date: Chelsea Carnichael / 11-10-11			
Radiological Background: 10pR / 2589 / 51			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) C/K
0.0			0.0	65c 42	Surface: soil and grass		10.5' 3353 3050
0.5			0.0	55c 64	Fill: Silty Sand; Dark yellowish brown (10YR 4/4), dry, loose, no odor, 35% silt, 5% subangular fine gravel (fill rock), 5% coarse sand, 5% medium sand, 50% fine sand	AF / SM	4325 3655
1.0			0.0	69c 74	1" trace charcoal		5685 5653
2.0			0.0	70			5854 5718
2.0			0.0	62	1' 4" Silty Sand; Brown (7.5YR 4/4), moist, medium dense, no odor, 5% medium sand, 30% silt, 65% fine sand	SM	5977 c/k 5763
3.0			0.0	77c 57			5854 5734
3.0			0.0	86c 63			6058 5670
4.0			0.0	81c 55			5793 5734
4.0			0.0	43c 60			6004 5804
5.0			0.0	45c 64			5866 5688
5.0			0.0	79c 85	5' 0" Poorly graded sand with silt; Light yellowish brown (2.5Y 6/4), moist, medium dense, no odor, 10% silt, 90% fine sand, trace iron oxide staining	SP	5767 5671
6.0			0.0	57c 60			5830 5756
6.0			0.0	44c 62			5833 5876

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	6	4	241		
Radiological Background:		Radiological Equipment Used:		PID Used:			
10.0 R/2989 / S1		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	78 62	Same as above: Poorly graded sand with silt	SP	6 5833 5876 CIC
			0.0	83			5725 5809 CIC
7.0			0.0	CK 75 60			7 5958 5767 CK
			0.0	CK 80 55			CK 5766 5786
8.0			0.0	CK 81 75			8 6176 6117 CK
			0.0	73			CK 6107 5709
9.0			0.0	CK 94 77			9 6264 5786 CK
			0.0	CK 48 71			CK 6199 5836
10.0			0.0	CK 75 56			10 6144 6105 CK
							Same as above: Poorly graded sand with silt
					Total Depth: 10.0		
					No GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID: 6, group 4	Location ID: 242
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: 7-22-11/1522	Date/Time Total Depth Reached: 7-22-11/1530
Type of Sampling Device: trowel/shovel	Samples Collected: 1 1/2 gall bag (#60377) (1530)		
Geologist: C. Carmichael	Checked by/Date: [Signature] 7-22-11		

Radiological Background: 15	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.0 15	Sand with silt and gravel, (10 YR, 4/4) brown, 75% fine to coarse grained sand, 15% gravel fill, concrete and asphalt fragments, 10% silt, dry, dense, no plasticity, hardness or odor.	SW		
					No GW reached			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 242
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 100 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/22/11 1050	Date/Time Total Depth Reached: 8/22/11 1150	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60378 (1100)	
Geologist: C. Knight		Checked By / Date: Chelsea Carmichael / 11-10-11		

Radiological Background: 12uR / 2890 / 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	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	65	Surface: Soil and grass		0.5	5353
			0.0	59	Fill: Silty Sand: Dark grayish brown (10YR 4/2), dry, medium dense, no odor, 30% silt, 5% coarse sand, 15% medium sand, 50% fine sand, trace fine sandstone gravel, mottled	AF / SM	1.0	4325
			0.0	64			1.5	5510
			0.0	70			2.0	5685
			0.0	62	2'0"		2.5	5884
			0.0	77	Silty Sand: Brown (10YR 4/3), dry, medium dense, no odor, 35% silt, 5% coarse sand, 5% medium sand, 55% fine sand, trace rutlets.	SM	3.0	5937
			0.0	88			3.5	5854
			0.0	81			4.0	6058
			0.0	93			4.5	5993
			0.0	90			5.0	6004
			0.0	79	5'0"		5.5	5866
			0.0	52	Poorly graded sand with silt; yellowish brown (10YR 5/6), moist, medium dense, no odor, 10% silt, 5% medium sand, 85% fine sand, trace iron oxide staining	SP	6.0	5965
			0.0	48			6.5	5830
							6.6	5833

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: E	Group: 4	Location ID: 242		
Radiological Background: 12.2.2890/40		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	48	Same as above; Poorly graded sand with silt	SP	6 5833
			0.0	62			7 5925
7.0			0.0	72			8 5958
			0.0	80			9 5966
8.0			0.0	81			10 6176
			0.0	73			11 6107
9.0			0.0	99			12 6264
			0.0	98			13 6199
10.0			0.0	75			14 6144
							Total Depth: 10.0' bgs No GW encountered
11.0					16		
12.0					17		
13.0							18



BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 243
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 7-22-11/1449	Date/Time Total Depth Reached 7-22-11/1457
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60379) (1456)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-12-11		

Radiological Background 16	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	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'			0.0	16	Sandy silt, (10YR, 4/3), pale brown, 70% silt, 30% fine to medium grained sand, trace sandstone fragments, dry, medium stiff, no plasticity, hardness or odor. No GW reached	ML	

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 244
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 7-22-11/1507	Date/Time Total Depth Reached 7-22-11/1513
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60381) (1512)		
Geologist C. Carmichael	Checked by/Date M 11-12-11		

Radiological Background 15	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.015		Silt with sand, (10 YR, 4/4), brown, 75% silt, 20% fine to medium grained sand, 5% sandstone rock fragments, dry, soft, no plasticity, hardness or odor. Metal rod (1/4" x 2" long) found. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 7	Location ID: 244	
Drilling Company: Beart Longyear AL HGL		Driller: Don Hansen ck Ir Stone		Ground Elevation: NA		Total Depth Drilled: 1.5 ft bgs.	
Drilling Equipment: Geoprobe 6600 ck Handauger		Borehole Diameter: 4.75 inches ck 3.0"		Date/Time Drilling Started: 10/3/11 1500		Date/Time Total Depth Reached: 10/3/11 1525	
Type of Sampling Device: 1.75 inch Macrocore ck Hand auger		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (00382 (NO SAMPLE))		Checked By / Date: Chelsea Carnichael / 11-11-11			
Radiological Background: 15MR/3344/82		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			0.0	63	Surface: Soil and grass			
0.5			0.0	74	Silty Sand: Fill 1/2 light yellowish brown (10YR 6/4), dry, medium dense, no odor, 40% silt, 57% medium sand, 55% fine sand, mottled 6" pipe coupler 3" diameter	AF / SW		NO downhole readings collected
			0.0	75	trace glass			
			0.0	69	sandstone 1.5' bgs			
					Refusal on sandstone at 1.5' bgs NO GW encountered			

Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 245
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 7-25-11/1128	Date/Time Total Depth Reached 7-25-11/1140
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60383) (1140)		
Geologist C. Carmichael	Checked by/Date [Signature] 11-12-11		

Radiological Background 17	Radiological Equipment Used w/ 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	15	Silty sand, (10 YR, 4/4), brown, 65% fine to medium grained sand, 30% silt, 5% sandstone rock fragments, dry, dense, trace rootlets, no plasticity, hardness or odor.	SM	
No GW reached.							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 246
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 6'5" ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/25/11: 0825	Date/Time Total Depth Reached: 8/25/11: 0845	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60385 (0845)	
Geologist: L. Robbins Goldman	Checked By / Date: Chelsea Carmichael / 11-16-11			

Radiological Background: 11/2/2817/41	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			0.0	45	Surface: soil + grass			3216
0.5			0.0	53	Silt w/ sand: dark brown (10 yr 3/3), dry, med. stiff, 85% silt, 15% fine grained sand, no odor, cohesive, tough, low dry strength, mottled, pinhole pores, trace charcoal flecks, some gravel (med. - ≤ 1" dia)	AF / ML		3958
1.0			0.0	58				5389
			0.0	54				5524
2.0			0.0	63				5531
			0.0	68				5490
3.0			0.0	68				5335
			0.0	75	unit same as above, note color change dark yellowish brown (10 yr 3/4)	AF / ML		5531
4.0			0.0	60	Silt w/ sand: dark brown (10 yr 3/3), semi-moist, med. stiff, 85% silt, 15% sand, no odor, cohesive, tough, med. mottled w/ yellow + reddish flecks, trace charcoal flecks,	ML		5664
			0.0	64				5858
5.0			0.0	72				5749
			0.0	85				5832
6.0			0.0	67				NM

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	6	5	# 246		
Radiological Background:		Radiological Equipment Used:		PID Used:			
11/R/2817/41		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	<p>Sandy silt: dark yellowish brown (10yr 4/6), moist, low stiffness, 75% silt, 25% fine grained sand, no odor, cohesive, mottled w/ yellow + reddish flecks. last 1/2 hole collapsed, no gamma</p> <p>6.5'</p>	ML	NM
7.0					<p>Sandstone, mechanically weathered to SP light yellowish brown (2.5 y 4/4)</p>	Bedrock	
8.0					<p>refusal on sandstone @ 6'5"</p> <p>no GW encountered</p>		
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area PA Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 247			
Radiological Background: 10UR/33 2767/52		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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	87	- continued from first page - pinhole pores 6'3"	ML	6	7001
			0.0	115	Siltstone bedrock (interbedded), olive yellow (2.5 y 6/6) mechanically weathered to ML	Red Rock		7199
7.0							7	
8.0							8	
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: 6	Group: CL 5	Location ID: 248
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 6'7" <i>ck ft bgs.</i>	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/24/11 1350	Date/Time Total Depth Reached: 8/24/11 1505	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60387 (1400)	
Geologist: C. Knight	Checked By / Date: chelsea carrichael 11-11-11			

Radiological Background: 16mR/2575/47	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)
					Surface: grass and soil			4052970
			0.0	60	Fill: Silt ^{ck} Sandy Silt with clay; Yellowish brown (10YR 5/4), dry, soft to medium stiff, no odor, 5% gravel fine or concrete debris, 5% coarse sand, 5% medium sand, 15% fine sand, 10% clay, 60% silt, non cohesive, low plasticity, low toughness, mottled	Af / ML		3021
0.5			0.0	63				3359
1.0			0.0	67				4492
2.0			0.0	66				4874
			0.0	64	2'3" Silt, Sand; Very dark grayish brown (10YR 3/2), moist, medium dense, no odor, 30% silt, 5% medium sand, 5% coarse sand, 60% fine sand	SM	2	4902
			0.0	74				5218
3.0			0.0	83				5558
			0.0	57				5623
4.0			0.0	50				5630
			0.0	66				5536
			0.0	59	5'0" Poorly graded Sand with silt; Yellowish brown (10YR 5/4), moist, medium dense, no odor, 10% silt, 90% fine sand	SP	5	5403
			0.0	58				5350
6.0			0.0	47				5334

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04.03		6	5	248	
Radiological Background:			Radiological Equipment Used:			PID Used:	
10MR/2575/47			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, minerology, bedding, plasticity, density, consistency, etc., as applicable)		
6.0			47	47	Same as above: Poorly Graded sand with silt	SP	5334
			66	66	6'7" Sandstone bedrock in bottom of shoe		6579
7.0							
8.0					Refusal on sandstone at 6'7" bgs		
					No GW encountered		
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: 6	Group: 5	Location ID: 249
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: 8-24-11 10:30	Date/Time Total Depth Reached: 8-29-11 11:20	
Type of Sampling Device: 1.75 inch Macrocore	Geologist: C. Knight	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)	60532 (MT) Add DRP 60388 (1040)	
Checked By / Date: Chelsea Carmichael 11-11-11				

Radiological Background: 11.2/2729 / 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	87	Surface: soil and gravel			4954
0.5			0.0	85	Fill: Sandy silt; light to live brown (2.5% silt), dry, medium stiff, no odor, 25% fine sand, 5% medium sand, 5% subrounded fine gravel (fill rock), 65% silt, cohesive, low plasticity, low toughness	AF/ML		5305
1.0			0.0	89				5212
2.0			0.0	86				5084
2.0			0.0	84	-2' bgs fibrous material white		2	5230
3.0			0.0	80	2' 5" some asphalt debris and drywall (gypsum board)			5500
3.0			0.0	84	2' 8" Fill: silty sand with gravel: light yellowish brown (2.5% silt), moist, medium dense, no odor, 35% silt, 5% coarse sand, 10% medium sand, 10% fine subrounded gravel, 40% fine sand, mottled, trace concrete, trace cast iron	AF/SM	3	5568
4.0			0.0	88	3' 2" concrete debris			5583
4.0			0.0	80	4' 0" to 4' 3" sandstone cobble		4	5927
5.0			0.0	83	weathered sandstone bedrock: olive yellow (2.5% silt), dry, dense, no odor, 5% medium sand, 95% fine sand, mechanically weathered to SP, fine grain calc sandstone	AF/SM		5087
5.0			0.0	82			5	6220
6.0					Refusal on sandstone at 5' bgs no GW encountered			

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 252
Drilling Company: Bort 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: 8/26/11 8:15	Date/Time Total Depth Reached: 8/26/11 0825	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60391(0825)	
Geologist: L. Robbins Goldman		Checked By / Date: Chelsea Caruochina 11-16-11		

Radiological Background: 114R/2719/41	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.	70.5" Borehole Gamma Readings (CPM)
			0.0	65	Surface: sand + grass AF=artificial fill			3782
0.5			0.0	76	Silt w/ sand: yellowish brown (10YR 5/4), dry, stiff, no odor, 90% silt, 10% fine to med grained sand, low plasticity, cohesive, low toughness, med. dry strength, no dilatancy, pinhole pores, trace rootlets, trace asphalt debris (2mm dia.)	ML / AF		5153
1.0			0.0	70				5353
			0.0	67				5645
2.0			0.0	75				5592
			0.0	82	2'3" unit same as above interbedded with sandy silt unit described below			5568
3.0			0.0	85	2'8" ----- gradational contact ----- Sandy silt: yellow (2.5Y 7/6), dry, stiff, no odor, 75% silt, 25% fine to medium grained sand, low plasticity, cohesive, med. toughness, med. dry strength, slow to no dilatancy, fine gravel ~10mm diameter throughout unit	AF/ML ML/AF		5314
4.0			0.0	88	3'9" - garbage = black canvas			5379
			0.0	65	4'4" unit same as above: color change to light greenish gray GLEY 1 (7/1)	AF/ML ML/AF		5505
5.0			0.0	47	4'7" : silt w/ sand: dark brown (10YR 4/3), moist, stiff, no odor, 90% silt, 10% fine sand, low plast. cohesive, med. dry strength, pinhole pores, mica flecks	ML / AF		5734
6.0			0.0	52	4'9" : sandy silt: olive brn (2.5Y 4/4), moist, dense, 75% silt, 25% fine to med grained sand, low plasticity, cohesive, med. dry strength, no dilatancy.	ML / AF		NM

continue next page

JRG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 252			
Radiological Background: 11/2/279/41		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					Continue from above @ 4'9" depth: sandy silt. bottom 2" of unit contains abundant asphalt debris	ML AF	6	
7.0					5'0" interbedded siltstone olive yellow (2.5% g/o) Bedrock	Bedrock	7	
8.0					Refusal on siltstone total depth 5'5" no GW encountered no anomalies		8	
9.0							9	
10.0							10	
11.0							11	
12.0							12	
13.0							13	

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 253
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 7-25-11/1412	Date/Time Total Depth Reached 7-25-11/1421
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60392) (1420)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-12-11		

Radiological Background 15	Radiological Equipment Used w/ 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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.016	Sand with silt, (10 YR, 5/4), light brown, 80% fine to coarse grained sand, 10% silt, 10% sandstone rock fragments, trace asphalt pieces, dry, dense, no plasticity, hardness or odor.	SW SM		
					No GW reached.			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 5	Location ID: 253	
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: 8/24/11 0920		Date/Time Total Depth Reached: 8/25/11 1015	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Appex 8 lbs.) 60393 (0930)			
Geologist: C. Knight				Checked By / Date: Julian Robbins & Muldman 11/29/11			
Radiological Background: 12MR/3476/51		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 grass		10.5' 3071
			0.0	60	Fill: Artificial Fill	AF	3609
0.5			0.0	55	Fill: Silty: Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 15% fine sand, 85% silt, cohesive, low plasticity, low toughness, mottled	ML	5158
1.0			0.0	64			5470
			0.0	69			5592
2.0			0.0	64	1 1/2" Fill: Poorly sorted Sand: Pale yellow (2.5Y 7/4), dry, medium dense, no odor, 20% medium sand, 80% fine sand	AF/SP	5795
			0.0	60	Fill: Silty Sand: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 35% silt, 5% subrounded fine gravel, 10% medium sand, 50% fine sand, mottled	AF/SM	5978
3.0			0.0	54			5966
			0.0	58			6001
4.0			0.0	53			6133
			0.0	48			6206
5.0			0.0	50	4' 10" trace asphalt	AF/SM	6301
			0.0	67	Weathered Sandstone Bedrock: Yellow (2.5Y 7/6), dry, very dense, no odor, 5% coarse sand, 15% medium sand, 80% fine sand, mechanically weathered to SP, fine grained sandstone	SP/SC	6086
6.0			0.0	64			6460

Refusal on sandstone at 6.0' bgs. No (2.1) encountered

Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6.group5	Location ID 254
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 7-25-11/1339	Date/Time Total Depth Reached 7-25-11/1350
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60394) (1350)		
Geologist C. Carmichael	Checked by/Date [Signature] 11-11-11		

Radiological Background 18	Radiological Equipment Used w/ R meter	PID Used Mini Rac 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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0017		Sand with silt, (10YR, 4/4), brown, 85% fine to coarse grained sand, 10% silt, 5% sandstone rock fragments, dry, dense, no plasticity, hardness or odor.	SW SM		
					No GW reached.			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 255
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 7-25-11/0933	Date/Time Total Depth Reached 7-25-11/0941
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60396) (0940)		
Geologist C. Carmichael	Checked by/Date [Signature] 11-12-11		

Radiological Background 16	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (Bkgd: 0.0ppm)
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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 <small>(CPM)</small>
0.5'			0.017		<p>Silty sand with rock fragments, (10YR, 5A) SM 70% fine to medium grained sand, 15% silt, 15% sandstone rock fragments, dry, dense, compact, no plasticity, hardness or odor.</p> <p>No GW reached.</p>		



Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 256
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 7-25-11/1014	Date/Time Total Depth Reached 7-25-11/1025
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag, (# 60398) (1025)		
Geologist C. Carmichael	Checked by/Date 12-12-11		

Radiological Background 17	Radiological Equipment Used w/ 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	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.016	Silty sand, (10YR, 4/4), brown, 60% fine to medium grained sand, 30% silt, 10% sandstone rock fragments, dry, dense, compact, no plasticity, hardness or odor. No GW reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 259
Drilling Company: Bort 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: 9-1-11 1100	Date/Time Total Depth Reached: 9-1-11 1145	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60402 (1110)	
Geologist: C. Knight	Checked By / Date: J. Dan Robbins / 11/2/11			

Radiological Background: 11uR/2218/57	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)
					Surface: soil and grass			+0.5 2770
			0.0	42	Fill: Gravely well graded sand: light gray (10YR 7/2) dry, dense, no odor, 20% sub rounded fine gravel, 5% silt, 20% coarse sand, 30% medium sand, 25% fine sand, aggregate base	AF / SW		2901
0.5			0.0	50				3407
1.0			0.0	59	Fill: Sandy silt: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 30% fine sand, 5% medium sand, 65% silt, cohesive, low plasticity, low toughness	AF / ML	1	4560
			0.0	58				5179
2.0			0.0	70	110' Silty Sand: Brown (10YR 4/3), moist, medium dense, no odor, 40% silt, 60% fine sand, trace coarse sand	SM	2	5400
			0.0	76				5662
3.0			0.0	75			3	5533
			0.0	70				5242
4.0			0.0	90			4	5302
			0.0	93				5174
5.0			0.0	83	Same as above	SM	5	5134
			0.0	69	Poorly graded sand with silt: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 10% silt, 10% medium sand, 80% fine sand	SP		5306
6.0			0.0	67			6	5451

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	6	5	259		
Radiological Background:		Radiological Equipment Used:		PID Used:			
112R/2218/37		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	67	Same as above	SP	5451
			0.0	70	6'9" Weathered Sandstone Bedrock: Olive yellow (2-576/6), moist, dense, no odor, mechanically weathered to SP, fine grained Sandstone	Bedrock	5498
7.0			0.0	77			5492
8.0					Refusal on sandstone at 7' bgs No GW encountered		
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: 6	Group: 5	Location ID: 260
Drilling Company: Bort 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: 9-1-11 1335	Date/Time Total Depth Reached: 9-1-11 1420	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60403 (1350)	
Geologist: C. Knight	Checked By / Date: Chelsea Carnichael / 11-11-11			

Radiological Background: DAR 2506/38	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	87	Surface: Soil and grass			2574
			0.0	85	Fill: Silty Sand with gravel: Yellowish brown (10YR 5/4), dry, medium dense, no odor, 15% fine subrounded gravel, 20% silt, 5% coarse sand, 20% medium sand, 40% fine sand	Af		3525
0.5			0.0	83		SM		4575
1.0			0.0	80		16"		5178
			0.0	85	Silty Sand: Brown (10YR 4/3), moist, medium dense, no odor, 40% silt, 60% fine sand, trace coarse sand	SM		5353
2.0			0.0	90				5217
			0.0	88				5448
3.0			0.0	79				5555
			0.0	73	Same as above			5396
4.0			0.0	82				5491
			0.0	85		SM		5232
5.0			0.0	85	Poorly graded sand with silt: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 10% silt, 10% medium sand, 80% fine sand	SP		5381
			0.0	89				5281
6.0			0.0	89				5535

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	6	5	260		
Radiological Background:		Radiological Equipment Used:		PID Used:			
12AR/2506/38		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background:			
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			0.7	89	Same as above; Poorly graded sand with silt	SP	5535
			0.7	105	Weathered Sandstone Bedrock: olive yellow (2.5Y 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone		5545
7.0			0.7	103			5475
8.0					Refusal on sandstone at 7.0' bgs		
					No GW encountered		
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: 6	Group: 5	Location ID: 261
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: 9-6-11 0920	Date/Time Total Depth Reached: 9-6-11 1105	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		68404 (0935)	
Geologist: C. Knight	Checked By / Date: Julian Robbins Heldman 11/29/11			

Radiological Background: 10mR/2260/43	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. 20.5' 25.27' (CPM)
			0.0	79	surface soil and gravel		3097
0.5			0.0	76	Fill: Silty Sand: Dark yellowish brown (10YR 4/4), moist, medium dense, 20% silt, 5% medium sand, 5% coarse sand, 70% fine sand, mottled	AR / SM	4581
1.0			0.0	72			5166
			0.2	82			5240
2.0			0.0	74	slight gray/olive stained soil. No odor		5297
			0.0	75	2' Silty Sand: Grayish brown (10YR 5/2), moist, medium dense, no odor, 30% silt, 70% fine sand, some iron oxide staining	SM	5378
3.0			0.0	71	3' dashed		5515
			0.0	94	Silty Sand: Brown (7.5YR 4/4), moist, medium dense, no odor, 25% silt, 75% fine sand	SM	5501
4.0			0.0	97			5399
			0.0	100			5386
5.0			0.0	93			5459
			0.0	61			5290
6.0			0.0	59	Same as above: Silty Sand	SM	5293

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 262
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 6' 9" <i>ck #bgs.</i>	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 9-1-11 0825	Date/Time Total Depth Reached: 9-1-11 0920	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60405 (0840)	
Geologist: C. Knight	Checked By / Date: Lubian Robbins Alderman (1/29/11)			

Radiological Background: 13uB/25i7/49	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 <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 Feet bgs. (CPM)
					Surface: soil and grass		70.5' 2847 (CPM)
0.5			0.0	55	Fill: Gravelly well-graded sand: light gray (2.5Y 7/2), clay, medium dense, no odor, 20% subrounded fine gravel, 40% fine sand, 10% medium sand, 30% coarse sand, aggregate base	AF	3371
			0.0	56		SW	4803
1.0			0.0	64	Silty sand: Dark brown (10YR 3/3), moist, medium dense, no odor, 25% silt, 52% medium sand, 70% fine sand, abundant pinhole pores	SM	5288
			0.0	65			5369
2.0			0.0	68	3'2" dashed	SM	5519
			0.0	65			5613
			0.0	65			5580
3.0			0.0	76	Silty sand: Strong brown (7.5YR 4/6), moist, medium dense, no odor, 15% silt, 85% fine sand	SM	5152
			0.0	74			5112
4.0			0.0	73	Poorly graded sand: Yellowish brown (10YR 5/4), moist, dense, no odor, 5% silt, 95% fine sand	SP	5381
			0.0	70			5760
			0.0	80			5434
5.0			0.0	86			5794
6.0			0.0	86			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 262		
Radiological Background: 3mR / 2517 / 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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	86	Same as above	SP	5794
			0.0	83	6'6" weathered sandstone bedrock: yellow (2.5Y 6/6), moist, very dense, no odor, mechanically weathered to SP, fine grained sandstone		NM
7.0							
8.0					Refusal on sandstone at 6'9" bgs		
					No GW encountered		
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: 6	Group: CK 5	Location ID: 265
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: 10/11/11 0840	Date/Time Total Depth Reached: 10/11/11 0930	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60408 (0850)			
Geologist: C-Knight	Checked By / Date: Chelsea Carmichael / 11-11-11			

Radiological Background: 15x 13xR/2406/44	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	USCS Symbol	Borehole Gamma Readings (CPM)
					surface: soil and grass		10.5 2615
0.0			0.0	46	Fill: silty sand with gravel: Dark brown (10YR 3/3), moist, medium dense, no odor, 10% subangular fine gravel	AF	26 (CIS) 3039
0.5			0-0	49	(fill rock) 30% silt, 5% clay, 10% medium sand, 45% fine sand, mottled, trace asphalt	SM	4648
1.0			0.0	51	Silty sand: Dark yellowish brown (10YR 3/6), moist, medium dense, no odor, 40% silt, 60% fine sand	SM	4378
2.0			0.0	54			5637
3.0			0.0	61			5784
4.0			0-1	55	2' 8" — — — dashed — — —		6023
5.0			0-1	60	Silty sand: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 15% silt, 5% medium sand, 80% fine sand	SM	5790
6.0			0-1	59			5927
			0-1	67			6234
			0-1	78			6363
			0-1	52	4' 8" weathered sandstone Bedrock: Light olive brown (2.5Y 5/4), moist, dense no odor, mechanically weathered to SP, 5% silt, 5% medium sand, 90% fine sand some iron oxide staining	Bedrock	6355
					Refusal on sandstone at 5' bgs No GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 266
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: 9-1-11 0950	Date/Time Total Depth Reached: 9-1-11 1030	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60409 (1000)			
Geologist: C. Knight	Checked By / Date: Julie Robbins-Kelchman 11/22/11			

Radiological Background: Burb/2700/47	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 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 (CPM)
			0.0	48	Surface: Soil and grass		10.5 2738
0.5			0.0	57	Fill: Gravelly well-graded sand (light gray (10YR 7/2), dry, dense, no odor, 20% subangular fine gravel, 5% silt, 20% coarse sand, 30% medium sand, 25% fine sand, egg rogate base	AF / SW	2808
1.0			0.0	56	Fill: Sandy silt; Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 30% fine sand, 5% medium sand, 65% silt, cohesive, low plasticity, low toughness, mottled	AF / ML	3524
2.0			0.0	58	11" silt; Sand: Brown (10YR 4/3), moist, medium dense, no odor, 40% silt, 60% fine sand, trace coarse sand	SM	4692
3.0			0.0	76			5104
4.0			0.0	84			5250
5.0			0.0	88			5409
6.0			0.0	105			5470
			0.0	89			5613
			0.0	95			5544
			0.0	96	Same as above	SM	5525
			0.0	68	Poorly graded sand with silt; yellowish brown (10YR 5/6), moist, medium dense, no odor, 10% silt, 10% medium sand, 80% fine sand	SP	5535
			0.0	64			5357
			0.0				5256

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04.03		6	5	266	
Radiological Background:			Radiological Equipment Used:			PID Used:	
12MR/2700/747			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	64	Same as above	SP	5256
			0.0	62			5126
7.0			0.0	63	<i>Weathered sandstone Bedrock: olive yellow (2.5Y 6/6), moist dense, no odor, mechanically weathered to SP, fine grained sandstone</i>		5236
			0.0	66			5269
8.0					Refusal on sandstone at 7.5' bgs No GW encountered		
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: 6	Group: 5	Location ID: 267
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: 8-30-11 0805	Date/Time Total Depth Reached: 8-30-11 0900	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.)		60410 (0810)	
Geologist: C. Knight	Checked By / Date: Liz Jan Robbins Feldman 11/29/11			

Radiological Background: 11.2R/2748 MO	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	75	Surface: soil and wood chips			45' 3139 (CPM)
0.5			0.0	67	Fill: Sandy silt; yellowish brown (10YR 5/4), dry, medium stiff, no odor, 35% fine sand, 5% medium sand, 60% silt, trace fine subangular gravel, cohesive, low plasticity, low toughness, mottled	AF/ML		4468
1.0			0.0	71				5423
			0.0	65				5595
2.0			0.0	65	1" Asphalt debris 2" thickness			5504
			0.0	65				5615
			0.0	80	2' 6"			5642
3.0			0.0	94	Fill: Poorly graded Sand w. th silt (2.5Y 7/4) and gravel dry, medium dense, no odor, 10% angular to sub angular sandstone and claystone gravel, 10% silt, 80% fine sand, mottled 3' trace concrete debris	AF/SP		5454
			0.0	105				5428
4.0			0.0	110				5301
			0.0	109				5390
5.0			0.0	120	No Recovery			5383
			0.0	75	Fill: Poorly graded Sand with gravel; light yellowish brown (2.5Y 6/4), dry, dense, no odor 10% angular to sub angular sandstone gravel (fine to medium gravel), 90% fine sand, mottled	AF/SP		5560
6.0			0.0	79				5948

Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 268
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 7-25-11/1449	Date/Time Total Depth Reached 7-25-11/1500
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60411) (1500)		
Geologist C. Carmichael	Checked by/Date <i>[Signature]</i> 12-12-11		

Radiological Background 16	Radiological Equipment Used up Reiter	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'			0017		Silty sand, (10YR, 4/4), brown, 70% fine to coarse grained sand, 20% silt, 10% 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: 6	Group: 5	Location ID: 268
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 6' 7" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 10/6/11 10:00	Date/Time Total Depth Reached: 10/6/11 11:25	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		DUP 60536 (PPM) 60412 (1020)	
Geologist: I. Robbins Goldman	Checked By / Date: Chelsea Carmichael / 11-11-11			
Radiological Background: 3216 / 63	Radiological Equipment Used: Micro / 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. 10.5 = 3268 Borehole Gamma Readings (CPM)
			0.0	62	Surface: soil + grass		
			0.0	86	AF = artificial fill		
0.5			0.0	86	silty sand: dark yellowish brown (10YR 4/6), loose, dry, no odor, 80% fine grained sand, 20% silt, cohesive, no plasticity or hardness, trace rootlets, pieces of asphalt, chalk, concrete w/ fibrous black fuzz, metal washer, corroded metal bolt, large fibrous fuzz, layer glass, chunk	AF / SM	3488
1.0			0.0	91	unit same as above, larger asphalt chunks encountered (>10mm), rootlets + chalk present	AF / SM	4911
			0.0	68		AF / SM	5426
			0.0	68	----- gradational contact -----		5598
2.0			0.0	82	silty sand: dark yellowish brown (10YR 3/6), loose, moist, no odor, 80% fine to med. grained sand, 20% silt, cohesive, low plasticity, low toughness, small asphalt flecks (~2mm); Chalky debris not abundant, trace rootlets	AF / SM	5854
			0.0	68		AF / SM	6282
			0.0	118			6266
			0.0	112			6366
			0.0	119			6495
			0.0	118	--- asphalt debris		6252
			0.0	75			6236
5.0			0.0	81	--- granitic gravel (~1mm), sub rounded		6261
			0.0	92			6459

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 269
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: 9-11-10	Date/Time Total Depth Reached: 9-12-11 1130	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60413 (1020)		Checked By / Date: Chelsea Carmichael / 11-11-11	
Geologist: C. Knight		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. TGS 2997 (CPM)
0.0			0.0	57	surface: soil and wood chips		
0.5			0.0	52	Fill: Silty Sand: Dark yellowish brown (10YR 4/4), dry; medium dense; no odor, 25% silt, 10% medium sand, 5% sub angular fine gravel (fill rock), 60% fine sand, mottled	Af SM	3254 4446
1.0			0.0	55			4871
1.3'			0.0	61	Weathered Sandstone bedrock: Pale yellow (2.5Y 7/4), dry, dense; no odor, mechanically weathered to SP, fine grained sandstone, trace iron oxide staining	Brk	5145
2.0			0.0	67			5381
3.0			0.0	69			5488
3.0			0.0	60			NM
4.0					Refusal at 3.0' bgs on sandstone No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 5	Location ID: 271	
Drilling Company: HGL		Driller: I. Stone		Ground Elevation: NA		Total Depth Drilled: 2 ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: 10/5/11 0815		Date/Time Total Depth Reached: 10/5/11 0850	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60415 (0840)	
Geologist: L. Robbins Goldman				Checked By / Date: Chelsea Carmichael / 11-11-11			
Radiological Background: 15uR/3iR/64		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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.
			0.0	69	Surface: soil + grass AF = artificial fill		+0.5 = 2973 Borehole Gamma Readings (CPM)
0.5			0.0	41	Sandy silt: very dark grayish brown (10YR 3/2), dense, moist, no odor, 85% fine sand, 15% silt, cohesive, low plasticity, low toughness, med. dilatancy.	AF / SM	3204
1.0			0.0	48	10" Sandstone: yellowish brown (10YR 5/6), med/fine grained sandstone (weathered)		3957
			0.0	92	10mm + charcoal pieces, trace rootlets, large metal debris @ 6" bgs		4871
2.0			0.0	76		Bedrock	5212
					total depth = 2.0' bgs no GW encountered no anomalies		5331
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 272
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-8-11 0840	Date/Time Total Depth Reached 8-8-11 0946
Type of Sampling Device 1 3/4" Macrocore	Samples Collected C1) 1/2-gallon bags #402 Per 60416 @ 850		
Geologist C. Knight	Checked By/Date Chelsea Carmichael 11-11-11		

Radiological Background 45 / 1457 / 8uR	Radiological Equipment Used Pancake / downhole / MicroB	PID Used Mini Rae 2000 (Bkgd: 40.0 ppm)
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Depth	Interval	Recovery	RFD	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: Asphalt		2287
0.5			0.0	45	5" Asphalt thickness	AF	2788
			0.0	47	5" ck		515.8
1.0			0.0	45	Fill: Silty Sand: light olive brown (2.5% silt), moist, medium dense, no odor, 30% silt, 5% medium sand, 5% angular to subangular medium ^{ck} sandstone gravel, 60% fine sand, mottled, trace asphalt	AF / SM	5532
			0.0	55			5644
2.0			0.0	58			5747
			0.0	59			5810
3.0			0.0	63			5801
			0.0	62	3'8" Fill: Sand, silt with gravel: Dark yellowish brown (10YR 4/4) moist, medium stiff, no odor, 35% fine sand, 10% medium to fine gravel, 55% silt, non cohesive, low plasticity, low toughness, mottled	AF / ML	5781
4.0			0.0	67	4'1" Same as above: 5" to 3'8"		5679
			0.0	65	Fill: Silty Sand: some medium subrounded gravel (fill rock)	AF / SM	5741
5.0			0.0	62	No Recovery		5824
			0.0	52	Fill: Silty Sand: Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 35% silt, 5% angular sandstone and fill rock medium gravel, 10% medium sand, 50% fine sand, mottled, trace angular medium sandstone gravel.	AF / SM	5955
6.0			0.0	51			5779

Radiological Background 45/1957/8, R				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 272		
Depth	Interval	Recovery	RTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micaceous, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
						Inches	(CPM)	
6.0		0.0	51		Same as above: Fill: Silty Sand 7-10" trace angular sandstone gravel	AF	5779	
		0.0	54			SM	5696	
7.0		0.0	59				5716	
		0.0	65				5696	
8.0		0.0	70				5719	
		0.0	70				5711	
9.0		0.0	71				5885	
		0.0	67				5814	
10.0		0.0	73			Same as above: Fill: Silty Sand	AF/SM	5691
						Total Depth: 10' logs No GW encountered		



Project Name: SSEL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 273
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-8-11 0725	Date/Time Total Depth Reached 8-8-11 0830
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 402 gal 60417 (0730)		
Geologist C. Knight	Checked by/Date Julian Robbins/Joldman 11/22/11		

Radiological Background 43 / 2513 / 10	Radiological Equipment Used Pancake / downhole / MicroB	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
					Surface Asphalt		
			0.0	63	3" Asphalt	AF	3773
0.5			0.0	69	Well graded sand with gravel: Grayish brown (10YR 5/2), dry, medium dense, no odor, 15% sub rounded gravel (fill rock), 10% coarse sand, 5% silt, 30% medium sand, 40% fine sand, road base	AF SM	5450
1.0			0.0	62	Fill: Silty sand; Yellowish brown (10YR 5/6), moist, medium dense, no odor, 30% silt, 10% medium sand, 5% sandstone fine to medium angular gravel, 55% fine sand, mottled	AF SM	9534 5513
2.0			1.8	75			5719
			0.4	53			5865
3.0			0.4	60			5779
			0.1	67			5663
4.0			0.1	65			5733
			0.1	88			5827
5.0			0.1	75			5866
			0.0	56	Same as above; Fill: Silty Sand	AF SM	5850
6.0			0.0	59			5721

Radiological Background 43/2513/10				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 273		
Depth	Interval	Recovery	FTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micaceous, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
6.0		0.0	99		Same as above: Fill: silty sand	AF SM	5721	
		0.0	60				5888	
7.0		0.0	67				5697	
		0.0	110		7'3" Fill: Poorly graded sand with silt; Pale yellow (2.5Y 7/4), moist, medium dense, no odor, 10% medium sand, 10% silt, 80% fine sand, mottled	AF SP	5711	
8.0		0.0	89		5684			
		0.0	69		8'4" Fill: Silty sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 30% silt, 20% medium sand, 50% fine sand, mottled	AF SM	5674	
9.0		0.0	58		5826			
		0.0	70		9'3" Sandy silt: Very dark grayish brown (10YR 3/2), moist, medium stiff, no odor, 5% coarse sand, 15% medium sand, 15% fine sand, 65% silt, non cohesive, low plasticity, low toughness	ML	5617	
10.0		0.0	67		5706			
					Total Depth: 10.0' hgs			
					No GW Encountered			

Project Name: SSFL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group Subarea 6, group 1	Location ID 274
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-5-11 1150	Date/Time Total Depth Reached 8-5-11 1240
Type of Sampling Device 1 3/4" Macrocore	Samples Collected +402 Jar C1) 1/2 gallon bags 60418 (1200)		
Geologist C. Knight	Checked by/Date Julian Robbins Goldman 11/29/11		

Radiological Background 50 / 2522 / 10.0 R	Radiological Equipment Used Pancake / downhole / Macro	PID Used Mini Rae 2000 (Bkgd: 30.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: Asphalt		10.5' 3023
					3" Asphalt	AF	3815
0.5			0.0	70	Fill: well graded sand with gravel: light brownish gray (2.5Y 6/2), dry, medium dense, no odor, 15% sub rounded gravel, 5% silt, 10% coarse sand, 25% medium sand, 45% fine sand, Aggregate base material.	AF / SM	5411
1.0			0.0	74			5350
			0.0	85	Fill: silty sand: yellowish brown (10YR 5/4), moist, medium dense, no odor, 15% silt, 15% medium sand, 70% fine sand, extremely mottled, trace angular fine gravel	AF / SM	5588
2.0			0.0	90			5450
			0.0	80			5544
3.0			0.0	96			5818
			0.0	85	3' 5" Fill: Sandy Silt: Brown (7.5YR 4/4), moist, medium stiff, no odor, 40% fine sand, 60% silt, low plasticity, low toughness, slow dilatancy, mottled	AF / ML	5725
4.0			0.0	72	4' 0"		5719
			0.0	84	Fill: silty sand: Brown (10YR 5/3), moist, medium dense, no odor, 25% silt, 5% coarse sand, 10% medium sand, 60% fine sand, mottled	AF / SM	5664
5.0			0.0	64			5713
			0.0	67			5796
6.0			0.0	79			5855

Radiological Background 50/2522/10HR				Project Name SSL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 274	
Depth	Interval	Recovery	FTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, microology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
						inches	(CPM)
6.0		0.0	79		Same as above: Fill: Silty Sand	AF	5855
		0.0	60			SM	5985
7.0		0.0	72		6'9" Silty Sand: Strong brown (2.5YR 4/6), moist, medium dense, no odor, 5% coarse sand, 35% silt, 10% medium sand, 50% fine sand	SM	5766
		0.0	82				5681
8.0		0.0	100				5506
		0.0	85				5452
9.0		0.0	68				5338
		0.0	63				5117
10.0		0.0	66		Same as above	SM	5025
Total Depth 10.0' bgs No GW encountered							

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 6 Group 1	Location ID: 275
Drilling Company: Boat Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 1010 Ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7-12-11 1130	Date/Time Total Depth Reached: 7-12-11 1240
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: 60419 (1140) (1) 1/2 gallon bags + 4oz Jar		
Geologist: C. Knight	Checked by/Date: Chelsea Carnichael 11-11-11		

Radiological Background: 40 / 2460	Radiological Equipment Used: Pancake / downhole	PID Used: Mini Rae 2000 (Bkgd: 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 Inches (CPM)
					Surface: Soil		2535
0.0			0.0	48			3029
0.5			0.0	48	Fill: Silty Sand: Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 5% coarse sand, 10% medium sand, 50% fine sand, 30% silt, 5% angular fine gravel, extremely mottled	AF/SM	4066
1.0			0.0	52			4731
			0.0	55			4866
2.0			0.0	61			4734
			0.0	60			4930
3.0			0.0	57	2'7" Fill: Sandy silt: Brown (7.5YR 4/4), moist, medium stiff, no odor, 5% medium sand, 5% angular sandstone gravel, 20% fine sand, 30% silt, slow dilatancy, cohesive, low plasticity	AF/ML	5000
			0.0	56			5122
4.0			0.0	53			4999
			0.0	58			4937
5.0			0.0	58			5015
			0.0	57	5' 5" trace angular granitic gravel ~ 3/4" diameter		5214
6.0			0.0	62	— — — — — contact — — — — —		5239

Radiological Background 40/2460				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 275	Subarea 6 group 1	
Depth	Interval	Recovery	FTD	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)
6.0		0.0	62		Fill: Sandy silt: Brown (7.5YR 5/4), moist, medium stiff, no odor, 10% coarse sand, 15% medium sand, 15% fine sand, 55% silt, 5% angular fine gravel, mottled	AF	5239	
		0.0	59			ML	5129	
7.0		0.0	57					5091
		0.0	60			7'6" red concrete debris 1/2" diameter		4884
8.0		0.0	62			7'10" Fill: Well graded Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 20% coarse sand, 40% medium sand, 40% fine sand, subangular grains	AF/SW	4679
		0.0	65				AF	4635
9.0		0.0	63		Fill: Poorly graded Sand with silt: Yellowish brown (10YR 5/8), moist, medium dense, no odor, 10% silt, 90% fine sand, Some Iron oxide staining, mottled	AF/SP	4710	
		0.0	67					4850
10.0		0.0	68					4941
<p>Total Depth 10.0' bgs No GW encountered</p>								
11.0								
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 6 group 1		Location ID 276	
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 1010 ft. bgs	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 7-12-11 1410		Date/Time Total Depth Reached 7-12-11 1510	
Type of Sampling Device 1 3/4" Macrocore				Samples Collected 60420 (1420) (1) 1/2 gallon bags + 4oz Jar			
Geologist C. Knight				Checked by/Date L. Van Robins Mallman 11/29/11			
Radiological Background 56 / 2699		Radiological Equipment Used Pancake / downhole		PID Used Mini Rae 2000 (Bkgs: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface - grass and soil		+0.5' 3787
0.5			0.0	75	Fill: Silty Sand with gravel; Yellowish brown (10YR 5/4), dry, medium dense, no odor, 20% fine to medium gravel (fill rock), 25% silt, 10% coarse sand, 10% medium sand, 35% fine sand, mottled	AF/SM	3046
			0.0	78			3975
1.0			0.0	76			4601
			0.0	71			4634
2.0			0.0	77			4615
			0.0	76	2' 8" trace fine asphalt debris		4871
3.0			0.0	82	3' 2" Fill: Silty Sand with gravel; Brown (10YR 4/3), moist, medium dense, no odor, 30% silt, 10% fine angular gravel (fill rock), 5% medium sand, 55% fine sand	AF/SM	4405
			0.0	80			5072
4.0			0.0	77	3' 7" Fill: Sandy Silt; Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% medium sand, 35% fine sand, 60% silt, cohesive, low plasticity, slow to rapid dilatancy, mottled	AF/ML	4936
			0.0	79			4819
5.0			0.0	82			4864
			0.0	82	Fill: Poorly graded sand with silt; Dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 10% silt, 90% fine sand, rapid dilatancy	AF/SP	4797
6.0			0.0	60			4655

Radiological Background 56 / 2699				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 276	
Depth	Interval	Recovery	FID	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
						inches	(CPM)
6.0		0.0	60		Same as above: Poorly graded sand with silt	AF	4653
		0.0	58			SP	4707
7.0		0.0	59				4588
		0.0	65				4699
8.0		0.0	60				4834
		6.0	56	8'5"	Poorly graded sand: Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 5% coarse sand, 5% medium sand, 5% silt, 85% 80% fine sand, some iron oxide staining	AF	5118
9.0		0.0	51	8" trace fine asphalt debris		SP	5121
		0.0	53				5401
		0.0	59				5379
10.0							
<p>Total Depth: 10.0' bys No G.W. encountered</p>							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 Group 1	Location ID 277
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-19-11 1018	Date/Time Total Depth Reached 7-19-11 1040
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60421 (1020)		
Geologist C. Knight	Checked by/Date Julie Robbins Melman 11/29/11		

Radiological Background 55 / 3306 / 16	Radiological Equipment Used Pancake / downhole / Micro R	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches
					Description: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: Soil and grass		10.5' 3306 (CPM)
0.5			0.0	59	Fill: Silty sand with gravel (10% R 4/4), dry to moist, medium dense, no odor, 25% silt, 10% fine to coarse subangular gravel, 10% coarse sand, 15% medium sand, 40% fine sand, mottled, trace rootlets near surface	AF	3475
			0.0	58		SM	4431
1.0			0.0	49	Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 15% silt, 85% fine sand		5035
			0.0	58			5152
2.0			0.0	60	1'10" Weathered Sandstone Bedrock: light yellowish brown (2.5Y 5/3), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SM Bedrock	5447
			0.0	55			5400
3.0					Refusal on sandstone at 2.5' bgs		
					No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 278				
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 7-13-11/0802	Date/Time Total Depth Reached 7-13-11/0840				
Type of Sampling Device trowel/shovel		Samples Collected 4-oz jar (#60422) (0810) 1 1/2 gallon bag						
Geologist C. Carmichael		Checked by/Date [Signature] 12-12-11						
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
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'			8.2	17	3" of asphalt on top. Silty sand with gravel, (10 VR, 4/3), brown, 60% fine sand, 25% silt, 15% asphalt and sandstone fragments, dry, no plasticity, hardness or odor. No GW reached.	SM		

Field Dup
60512
(CNT)

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 6, group 1		Location ID 279	
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 7-29-11/0734		Date/Time Total Depth Reached 7-29-11/0745	
Type of Sampling Device trowel/shovel				Samples Collected 1 1/2 gallon bag (#60424) (0745)			
Geologist C. Carmichael				Checked by/Date [Signature] 12-12-11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
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			0.0	13	Gravelly, sandy silt, (10YR, 4/5), brown, 50% silt, 25% fine to medium grained sand, 25% gravel fill rock, asphalt and concrete fragments, dry, medium stiff, no plasticity, hardness, odor. No GW reached.	ML / AF	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 6, group 1		Location ID 279	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 10'	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 8-22-11/0903		Date/Time Total Depth Reached 8-22-11/1148	
Type of Sampling Device 2 3/4" hand auger		Samples Collected 8-oz jar 1 1/2 gall bag (#60424) (1135)		Checked by/Date d... 60425 12-17-11			
Geologist C. Carmichael							
Radiological Background 71,3648 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PID	6 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 Inches (CPM)
			0.0	62			0.5 - 3614
1'			0.0	70	Sandy silt, (10 YR, 3/4), dark brown, 75% silt, 20% fine grained sand, 5% pea gravel, trace carbon pieces, dry, soft, no plasticity, hardness, no odor.	ML	3905
			24.9	70			4789
			0.0	70			5581
			46	75	<u>Gradational Contact</u>		5646
2'			60	78	Sand with silt, (10 YR, 4/6), reddish-brown, 85% fine to very fine sand, 10% silt, 5% clay, medium dense, dry, no plasticity, hardness or odor, trace CaCO ₃ nodules.	SM	5730
			1.1	100	Same as above, except semi-moist and (2)		5923
3'			0.8	67			6150
			2.4	71	Same as above, except clayey: 75% fine to very fine sand, 15% clay, 10% silt		6078
			1.7	89			6050
4'			0.8	88	<u>Gradational Contact</u>		6265
			0.5	71	Sandy silt, (10 YR, 4/6), reddish-brown, 60% silt, 40% fine sand, semi-moist, dense, no plasticity, hardness, no odor.	ML	6240
			0.3	73			6108
5'							6218
6'							

Radiological Background 71, 3648 cpm					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 279
Depth	Interval	Recovery	PTD	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>
					Sandy silt (same as above)	ML	6092
			5.175				
7'							6104
			05.93				6292
			4.284				6066
8'							6098
			3.078				6105
			4.381				6125
9'					Gradational Contact Silty sand, (10 YR, 4/6), reddish-brown, 55% fine sand, 45% silt, semi-moist, dense, no plasticity, hardness or odor.	SM	
			2.375				
			7.474				
10'					10' goal depth reached. No GW reached.		
			1.777				

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group i	Location ID 280
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 7-12-11/1530	Date/Time Total Depth Reached 7-12-11/1540
Type of Sampling Device trowel/shovel	Samples Collected 4-oz jar (#60426) (1540) 1 1/2 gallon bag		
Geologist C. Carmichael	Checked by/Date [Signature] 12-12-11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.8 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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.0 12	Sandy silt with gravel, (10 YR, 4/4), brown, 50% silt, 35% fine to medium grained sand, 15% gravel fill and concrete cobbles, dry; medium stiff, no plasticity, hardness or odor. No GW reached	ML		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group Subarea <u>6</u> group <u>1</u>	Location ID 280			
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 4.5'			
Drilling Equipment hand auger		Borehole Diameter NA	Date/Time Drilling Started 8-12-11/1307	Date/Time Total Depth Reached 8-12-11/1356			
Type of Sampling Device 2 3/4" hand auger			Samples Collected 1 1/2 gall bag, 1 8-oz jar (#60427) (1405)				
Geologist S. Lapierre-Montrose			Checked by/Date C. Carmichael 12-12-11				
Radiological Background 59, 3312		Radiological Equipment Used Pancake, Downhole meter		PID Used Mini Rac 2000 (Bg/d: 0.0 ppm)			
Depth - ft	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)
			0.0	74			0.5 - 3099
			0.0	93	Sandy clay, (10YR, 3/3), dark brown, 55% clay, 35% fine to medium grained sand, 10% gravel fill and sandstone fragments, dry, medium stiff, no odor, low plasticity and hardness, trace charcoal.	CL	4511
1'			0.0	81	Sandy silt, (10YR, 3/3), dark brown, 60% silt, 30% fine grained sand, 10% gravel fill & sandstone fragments, dry, loose, no plasticity, hardness or odor.	ML	5037
			0.0	103			5134
2'			0.0	98	Same as above, except no more fill, just sandstone fragments.		5879
			0.0	83			5869
3'			0.0	67			6115
			0.0	67			6038
4'			0.0	92			6114
			0.0	110			5879
Refusal at 4.5' - bedrock No GW reached.							



BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6. group 1	Location ID 281
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 7-12-11/1426	Date/Time Total Depth Reached 7-12-11/1435
Type of Sampling Device trowel/shovel	Samples Collected 4-oz jar 1 1/2 gall bag (#60428) (1435)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-12-11		

Radiological Background 11	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.011	Sitty sand with gravel, (10 YR, 5/4), light brown, 50% fine to coarse grained subrounded sand, 30% silt, 20% gravel fill and concrete, dry, 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: 6	Group: 1	Location ID: 282
Drilling Company: Boad Longyear CK HGL	Driller: T. Store/T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 11/30/11 1235	Date/Time Total Depth Reached: 11/30/11 1235	
Type of Sampling Device: Trowel/shovel	Samples Collected: (1) 4oz jar 60430(1230) One 1/2 Gallon Bag (Appox 8 lbs.)		Checked By / Date: J. Dan Robbins & Alderman 12/1/11	
Geologist: C. Knight				

Radiological Background: 12AR/2896/79	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	12	Fill: Silty Sand with gravel: Dark brown (7.5YR 3/4), moist, medium dense, no odor, 10% subangular to subrounded fine to coarse gravel, 20% silt, 5% coarse sand, 15% medium sand, mottled, trace concrete, 50% fine sand	AF / SM	MA
0.5			0.0	14			
1.0					<p style="text-align: center;">TD: 0.5' bgs</p> <p style="text-align: center;">No GW encountered</p>		
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: 6	Group: 1	Location ID: 282
Drilling Company: Boart Longyear	Driller: Justin Kilgore	Ground Elevation: NA	Total Depth Drilled: 4.0 ft bgs.	
Drilling Equipment: Sonic DB3200 LAR 100C	Borehole Diameter: 4 inches	Date/Time Drilling Started: 11/30/11 1500	Date/Time Total Depth Reached: 11/30/11 1540	
Type of Sampling Device: 4" Sonic Drive Casing	Samples Collected: + 4oz Jar 60431 (1505) One 1/2 Gallon Bag (Approx 8 lbs.)		Checked By / Date: Julian Robins & Goldman 12/1/11	
Geologist: C. Knight				

Radiological Background: RAR/2898/795	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' 3233 (CPM)
0.0			0.0	11.5 12.25 14.0 17.9	Fill: Silty Sand with gravel: Dark brown (7.5YR 3/4), moist, medium dense, no odor, 20% sub angular to sub rounded fine to coarse gravel, 20% silt, 5% coarse sand, 15% medium sand, 50% fine sand, mottled, trace concrete near surface	AF SM	4649 5816
1.0			0.0	62			5969
1.5			0.0	61	1' 3" Poorly graded Sand: Yellowish brown (10YR 5/8), moist, dense, no odor, fine grained sand, moderate cementation, 5% medium sand, 95% fine sand	SP	5997
2.0			0.0	64			6194
2.5			0.0	91			6754
3.0			0.0	87	2' 9" Weathered Sandstone Bedrock: Pale brown (2.5Y 7/4), moist, very dense - hard, no odor, fine grained sandstone, some areas mechanically weathered in to SP.	Bedrock	6296
4.0			0.0	97	4' 6" Refusal on Sandstone bedrock at 4' bgs No GW encountered		5634 5461
5.0			0.0	0.0			
6.0			0.0	0.0			

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 283
Drilling Company: Beart Longyear & K HGL	Driller: P. Store / T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 11/30/11 1005	Date/Time Total Depth Reached: 11/30/11 1015	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60432(1005)		Checked By / Date: Julian Robert Melman 12/1/11	
Geologist: C. Knecht				

Radiological Background: DMP / 2596 / 66	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)	
							Feet bgs.	
0.0			0.0	66	Fill : Silty Sand with gravel : Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 35% silt, 5% clay, 10% angular sandstone fine to medium gravel (1/4" to 3/4" dia.), 10% medium sand, 40% fine sand, mottled, trace 1/2" volcanic angular gravel TD : 0.5' bgs No GW encountered	AF	NA	
0.5			0.0	66		SM		
1.0			0.0	106				
2.0			0.0	17				
3.0								
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 283
Drilling Company: Boart Longyear	Driller: Justin Kilgore	Ground Elevation: NA	Total Depth Drilled: 20.0 ft bgs.	
Drilling Equipment: Sonic DB3200 LAR 100C	Borehole Diameter: 4 inches	Date/Time Drilling Started: 11/30/11 1110	Date/Time Total Depth Reached: 11/30/11 1340	
Type of Sampling Device: 4" Sonic Drive Casing	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		+14oz Jar 60433 (1120) 60544 (1210)	
Geologist: C. Knight		Checked By / Date: Chiff [Signature] 12-1-11		

Radiological Background: 12AR/2596/95	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 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 +0.5" 2810 (CPM)
0.0			0.0	95	<p>Fill: Silty Sand with gravel; Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 35% silt, 5% clay, 10% angular sandstone fine to medium gravel (1/4" to 3/4" diameter), 10% medium sand, 40% fine sand, mottled, trace 1/2" volcanic angular gravel</p> <p>(K)FD:0.5' NO GWD encountered</p>	AF/SM	3641
0.5			0.0	106		5024	
1.0			0.0	64		5669	
			0.0	91		5749	
2.0			0.0	82		5956	
			0.0	84		5909	
3.0			0.0	101	<p>Fill: Sandy Silt with clay; Dark yellowish brown (10YR 3/6), moist, stiff, no odor, 5% fine to medium subangular sandstone gravels, 20% clay, 5% medium sand, 25% fine sand, 45% silt, cohesive, low plasticity, low toughness, no dilatancy, mottled</p>	AF/ML	6044
			0.0	90		5823	
4.0			0.0	96		5930	
			0.0	97		6022	
5.0			0.0	105		6122	
			0.0	85		5973	
6.0			0.0	81	Silty Sand: Brown (7.5YR 4/4), moist, medium dense, no odor, 25% silt, 75% fine sand, trace Carbon specs	SM	6079

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 283			
Radiological Background: 12mR / 2596 / 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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	81	Same as above: silty sand	SM	6	6079
			0.0	83			7	6025
7.0			0.0	86			7	6022
			0.0	103	Poorly graded sand with silt: Dark yellowish brown (10YR 4/6), moist, dense, no odor, 10% silt, 90% fine sand, trace coarse sand, some carbon specs, trace iron oxide staining.	SP		6003
8.0			0.0	82			8	6047
			0.0	91				5976
			0.0	78			9	6049
9.0			0.0	94				6067
			0.0	112			10	5921
			0.0	75		5963		
			0.0	94		11	5959	
			0.0	95			5741	
12.0			0.0	85	Same as above! Poorly graded sand with silt	SP	12	5685
			0.0	87				5879
			0.0	107	Sandy silt: Yellowish brown (10YR 5/4)	ML		5918
13.0			0.0		cont next page - - -		13	

Project Name: SSFL Area IV Radiological Study			Project Number: EP038.01.22.04.03		Subarea: 6	Group: 1	Location ID: 283	
Radiological Background: 12MR/2546/95			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	Feet bgs.	Borehole Gamma Readings(CPM)
13			0.0	107	moist, stiff, no odor, 15% fine sand, 80% silt, 5% clay, trace carbon specs	ML		5918
			0.0	89				5878
			0.0	95				5907
14			0.0	104	Sample: 60544			5941
			0.0	92				5959
			0.0	86			Weathered Sandstone bedrock: Yellowish brown (10YR 5/4), moist, dense, no odor, 95% fine sand, 5% silt, fine grained sandstone mechanically weathered to SP, abundant iron oxide staining	Hand Bedrock
15			0.0	114		5925		
			0.0	101		6059		
			0.0	96		5998		
17			0.0	98	*drillers note: increasing density in drilling			5978
			0.0	94				6317
			0.0	95			Same as above: very dense and abundant iron oxide staining	
18			0.0	85		6105		
			0.0	100	Sample 60433 3Σ anomaly			6394
			0.0	99			6326	
20			0.0	99				

Refusal on Sandstone Bedrock at 20.0 bgs
NO GW encountered, TD: 20.0 bgs

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6 Group: 1		Location ID: 284	
Drilling Company: Boat Longyear CK HGL		Driller: I. Stone / T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 4/30/11 0815		Date/Time Total Depth Reached: 4/30/11 0825	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx. 8 lbs.) 60434 (0820)			
Geologist: C. Knight				Checked By / Date: Audrey Robbins Muldman 12/1/11			
Radiological Background: 12MR/3020/66			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)
0.0			0.0	12MR 66cpm 93cpm 12MR	<p>Artificial Fill</p> <p>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</p> <p>Fill: Silty Sand? Dark yellowish brown (10YR4/6), moist, medium dense, no odor, 25% silt, 5% medium sand, 5% clay, 65% fine sand, mottled, clay is in pockets, trace fine to medium sandstone gravel</p> <p>TD: 0.5' bgs No GW encountered</p>	AF SM	NA

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 284
Drilling Company: Boart Longyear	Driller: Justin Kilgore	Ground Elevation: NA	Total Depth Drilled: 19.0 ft bgs.	
Drilling Equipment: Sonic DB3200 LAR 100C	Borehole Diameter: 4 inches	Date/Time Drilling Started: 11/30/11 0810	Date/Time Total Depth Reached: 11/30/11 1030	
Type of Sampling Device: 4" Sonic Drive Casing	Samples Collected: 7 1/2 Jar x2 (60435 (0830)) One 1/2 Gallon Bag (Approx 8 lbs.) (60545 (0925)) (60521 (MT) Field)		Checked By / Date: Cliff Knudby 12-1-11	
Geologist: C. Knight				

Radiological Background: 12/19/3020/66	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 +0.5' 2839 (CPM)
0.0			0.0	66	Fill: Silty Sand, Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 25% silt, 5% medium sand, 5% clay, 65% fine sand, mottled, clay is in pockets, trace fine to medium sandstone gravel	AF / SM	3857
0.5			0.0	98			4815
1.0			0.0	89			5588
			0.0	84			5894
2.0			0.0	86			5853
			0.0	88			5882
3.0			0.0	77	Same as above: Fill: Silty Sand	AF / SM	6092
			0.0	127			6227
4.0			0.0	97			5937
			0.0	80			6113
5.0			0.0	102			5856
			0.0	59			6054
6.0			0.0	75	5911	AF / ML	

4" Sandstone cobble ~3" thick: light yellowish brown (10YR 6/4), slightly moist, very dense, no odor, 10% medium sand, 90% fine sand, fine grained sandstone

5" Fill: Clayey silt with Sand: Brown (7.5YR 4/4), moist, medium stiff, no odor, 20% clay, 5% medium sand, 10% fine sand, 65% silt, cohesive, slow dilatancy, low plasticity, low toughness, mottled, trace roots

Project Name: SSFL Area IV Radiological Study				Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 284
Radiological Background: 2mR/3020/66				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	75	Same as above: Fill: Silty clay Clayey silt with sand	AF/ML	6 5911
			0.0	128	----- dashed -----		5687
7.0			0.0	112	Fill: Sandy silt with clay; Dark brown (7.5YR 3/2), moist, medium stiff, no odor, (CL)	AF/ML	7 5730
			0.0	84	45% silt, 20% fine sand, 5% medium sand, 5% coarse sand, 25% clay, cohesive, medium plasticity, low toughness, no dilatancy, mottled, trace brick fragments (size of coarse sand)		5643
8.0			0.0	75			8 5639
			0.0	87			5686
9.0			0.0	98			9 5727
			0.0	89			5734
10.0			0.0	77	Same as above: Fill: Sandy silt with clay	AF/ML	10 5549
			0.0	96	Sandy silt: Brown (7.5YR 4/3), moist, medium stiff to stiff, no odor, trace coarse sand, 5% medium sand, 25% fine sand, 5% clay, 65% silt, iron oxide staining	ML	5502
11.0			0.0	115			11 5728
			0.0	130	1/8" trace carbon flakes		5619
12.0			0.0	124			12 5681
			0.0	110			5494
13.0			0.0	113	Same as above: Sandy silt	ML	13 5418

Project Name: SSFL Area IV Radiological Study					Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 284
Radiological Background: 12MR/3020/66			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)	
13			0.0	113	Same as above: Sandy Silt	ML	5418	
			0.0	106			5309	
14			0.0	84			5307	
			0.0	86			5330	
15			0.0	119			5322	
			0.0	71			5779	
16			0.0	59	Same as above: Sandy Silt		5139	
			0.0	106			5382	
17			0.0	128	16'6" Sandstone Bedrock: Olive yellow (2.5Y 6/6), slightly moist, no odor, very hard/dense, 5% medium sand, 95% fine sand, fine grained sandstone, mechanically weathered to SP with sandstone gravel	ML	5825	
			0.0	107			5949	
18			0.5	90			6022	
			0.1	99			6024	
19			0.0	84	Same as above: Sandstone Bedrock		6438	
20					Refrused 19.0' bgs on sandstone No GW encountered			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 285
Drilling Company: HGL	Driller: Ian Stone	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 11/24/11 1320	Date/Time Total Depth Reached: 11/24/11 1325	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) + 402 Jar 60436(1330)			
Geologist: C-Knight	Checked By / Date: [Signature] 11-1-11			

Radiological Background: 11mR/2410/74	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	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)	
							Feet bgs.	
0.0 - 0.5			0.0	105	Fill : Silty Clay : Brown (10YR 5/3), moist, soft, no odor, 30% silt, 5% fine sand, 65% clay, medium plasticity, medium toughness, cohesive, trace fine sandstone gravel	AF CL	1	
0.5 - 1.0			0.0	65			2	
1.0 - 2.0							3	
2.0 - 3.0							4	
3.0 - 4.0							5	
4.0 - 5.0							6	
5.0 - 6.0								

T.D.: 0.5' bgs
No GW encountered

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 285
Drilling Company: Boart Longyear	Driller: Justin Kilgore	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Sonic DB3200 LAR 100C	Borehole Diameter: 4 inches	Date/Time Drilling Started: 11/20/11 1320	Date/Time Total Depth Reached: 11/24/11 1500	
Type of Sampling Device: 4" Sonic drive casing	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) + 4oz Jar	604137 (1345) 60546 (1415)		
Geologist: C. Knight	Checked By / Date: Cliff Thumma 12-1-11			

Radiological Background: 11/24/2010/74	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	Feet bgs.	Borehole Gamma Readings +0.5 3204 (CPM)	
0.0			0.0	105	Fill: Silty Clay: Brown (10YR5/3), moist, salt, no odor, 30% silt, 5% fine sand, 65% clay, medium plasticity, medium toughness, cohesive, trace sandstone fine gravel	AF CL		5373	
0.5			0.0	65			5994		
1.0			0.0	89	Fill: Silty Sand with gravel: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 25% silt, 5% coarse sand, 15% fine to coarse and angular to subrounded gravel, 10% medium sand, 45% fine sand, mottled, trace asphalt	AF SM	1	6381	
			0.0	113			6294		
2.0			0.0	104			2	6271	
			0.0	95			6270		
3.0			0.0	96			3	6425	
			0.0	112				6503	
4.0			0.0	100	Weathered Sandstone Bedrock: Pale brown (2.5Y 8/4), dry, dense, no odor, 20% silt, 10% medium sand, 5% coarse sand, 65% fine sand, mechanically weathered fine grained sandstone	No contact with Bedrock	4	6226	
			159	108			5951		
5.0			4256	92			PID reading not sustained	5	5820
			0.0	118			5614		
6.0			0.0	123			6	5557	



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 286				
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 7-15-11/1453	Date/Time Total Depth Reached 7-15-11/1500				
Type of Sampling Device trowel/shovel		Samples Collected 1 1/2 gall bag, 1 4-oz jar (#60438) (1500)						
Geologist C. Carmichael		Checked by/Date [Signature] 12-12-11						
Radiological Background 15		Radiological Equipment Used up Rater		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
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'				0014	Sandy silt, (10 YR, 4/4), brown, 55% silt, 40% fine to medium grained sand, 5% gravel fill rock, dry, medium stiff, some rootlets, no plasticity, hardness or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 287
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 7-12-11/0859	Date/Time Total Depth Reached 7-12-11/0906
Type of Sampling Device trowel/shovel	Samples Collected 4 jars 1 1/2 gall bag (#60440) (0905)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-12-11		

Radiological Background 17	Radiological Equipment Used up Rater	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	16	Silty sand, (10YR, 4/4), brown, 70%. fine to coarse grained sand, 25%. silt, 5%. sandstone fragments, dry, loose, trace rootlets, no plasticity, hardness or odor.	SM	
No GW reached.							



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6.group 1	Location ID 288				
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 7-12-11/0815	Date/Time Total Depth Reached 7-12-11/0823				
Type of Sampling Device trowel/shovel		Samples Collected ^{4-oz jar} 1 1/2 gall bag (#60442) (0822)						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 12-12-11						
Radiological Background 15		Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)					
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	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	14	Sandy silt, (10 YR, 4/4), brown, 55% very fine to medium grained sand, 40% silt, 5% sandstone fragments, dry, medium stiff, trace rootlets, no plasticity, hardness, no odor.	ML		
					No GW reached.			

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 288
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-15-11 1030	Date/Time Total Depth Reached 7-15-11
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 60443 60443 (1040) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date Julie Ann Robbins Alderman 11/29/11		

Radiological Background 08 / 2284	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: Soil and grass		+0.5' 2295
			0.0	44			2334
0.5			0.0	72	Fill: Silty Sand: light yellowish brown (10YR 6/4), dry, medium dense, no odor, 25% silt, 5% coarse sand, 10% medium sand, 5% angular granitic medium gravel, 55% fine, trace asphalt	AF/SM	2711
1.0			0.0	66			2971
			0.0	60	Weathered sandstone bedrock: Yellowish brown (10YR 5/4), dry, dense, no odor, 10% silt, 90% fine sand, mechanically weathered to SP		3046
2.0			0.0	90	Sandstone Bedrock: Light yellowish brown (2.5YR 6/3), dry, very dense, no odor, 100% fine grained sandstone	BR/SS	3269
			0.0	84			3655
3.0		NR			No Recovery		
		NR			- Refusal on sandstone at 3.5' bgs - Only able to widen boring to 2.5' bgs - Recovery to 2.5' bgs - No GW encountered		
4.0							
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 6, group 1	Location ID 289				
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 7-11-11/1543	Date/Time Total Depth Reached 7-11-11/1553				
Type of Sampling Device trowel/shovel		Samples Collected ^{4-oz jar} 1 1/2 gall bag (#60444) (1550)						
Geologist C. Carmichael		Checked by/Date 12-12-11						
Radiological Background 16		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
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	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	15	Silty sand, (10YR, 6/3), light greyish-brown, 75% fine to coarse grained sand, 20% silt, 5% gravel rock and sandstone fragments, dry, no plasticity, hardness, no odor. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 6 group 1	Location ID 289
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.5 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-25-11 0740	Date/Time Total Depth Reached 7-25-11 0830
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 60048 CK (1) 1/2 gallon bags + 4oz Jar 60445 (0750)		
Geologist C. Knight	Checked by/Date Julia Robbins Holdman 11/29/11		

Radiological Background 42 / 2446 / 12	Radiological Equipment Used Pancake / downhole / Micro R.	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	Borehole Gamma Readings	
							Inches	(CPM)
					Surface: soil and grass		10.5	2826
0.5			0.0	48	Poorly graded sand with silt: Pale yellow (2.5Y 7/4), dry, no odor, 10% silt, 5% coarse sand, 10% medium sand, 75% fine sand.	SP	2986	4210
1.0			0.0	74	12" Silt. Sand: light yellowish brown (10YR 6/4), moist, medium dense, no odor, 35% silt, 5% coarse sandy, 15% medium sand, 45% fine sand, trace fine gravel	SM	5103	5634
2.0			0.0	59			5742	
3.0			0.0	50	2'4" weathered sandstone bedrock: yellow (2.5Y 7/6), moist, dense, no odor, mechanically weathered to SP fine grained sandstone	SP	5823	5800
4.0			0.0	72			5852	
4.0			0.0	80			5976	
4.0			0.0	88			5933	
5.0					Refusal on sandstone 4.5' bgs No GW encountered			



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 290				
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 7-11-11/1215	Date/Time Total Depth Reached 7-11-11/1223				
Type of Sampling Device trowel/shovel		Samples Collected ^{4-oz jar} 1 1/2 gall bag (#6044b) (1220)						
Geologist C. Carmichael		Checked by/Date [Signature] 12-12-11						
Radiological Background 33		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 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'				0023 4R 191 cpm	Silty sand, (10YR, 4/4), brown, 70%. fine to coarse grained sand, 30%. silt, dry, loose, trace rootlets, no plasticity, hardness, no odor. No GW reached. (labeled possibly contaminated)	SM		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 290
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 18"
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 8-26-11/0805	Date/Time Total Depth Reached: 8-26-11/0824	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#60447) (u/a)		Checked By / Date: <i>[Signature]</i> 11-12-11	
Geologist: Chelsea Carmichael				

Radiological Background: 23, 136, 4706	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			390		Sandy silt, (10YR, 4/3), greyish-brown, 65% silt, 35% fine to medium grained sand, dry, soft, some cementation, trace rootlets, no plasticity, hardness, or odor.	ML		
0.5			112					
1.0					to 1' Asphalt (~2-3")		1	
					Sandy silt (same as 0'-1')	ML		
0.0			89		Refusal hit at 18" - bedrock No GW reached No sample collected			
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 291
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 7-11-11/1524	Date/Time Total Depth Reached 7-11-11/1533
Type of Sampling Device trowel/shovel	Samples Collected ^{4-oz jar} 1 1/2 gall bag (#60448) (1532)		
Geologist C. Carmichael	Checked by/Date A 11-12-11		

Radiological Background 20	Radiological Equipment Used w/ R meter	PID Used Mini Rac 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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 19	<p>Silty sand, (10YR, 4/2), greyish-brown, 55% fine to coarse grained sand, 40% silt, 5% fine gravel (sandstone, concrete), dry, medium dense, no plasticity, hardness or odor.</p> <p>No GW reached.</p>	SM	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 292				
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 7-11-11/1149	Date/Time Total Depth Reached 7-11-11/1201				
Type of Sampling Device trowel/shovel		Samples Collected ^{4-oz jar} 1 1/2 gall bag (#60450) (1200)						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 12-12-11						
Radiological Background 19		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 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'				0.018	Sandy silt, (10YR, 4/3), brown, 65% silt, 30% fine to medium grained sand, 5% concrete fragments, dry, medium stiff, no plasticity or hardness, no odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / Group 6 / group 1	Location ID 293
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 7-18-11 0825	Date/Time Total Depth Reached 7-18-11 0850
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gal bag + 100 g jar 60453(0830)		
Geologist C. Knight	Checked by/Date John Robbins/7/21/11		

Radiological Background 60 pR	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Blkgd: 0.0 ppm)
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Depth ft.	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)
0.25			0.0	25	Fill: Silty Sand; light yellowish brown (10YR 6/9) dry, medium dense, no odor, 5% medium sand, 20% silt, 75% fine sand, mottled	AF/SM	
0.5					No GW encountered TD: 0.5'		

Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID 293
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-2-11 0840	Date/Time Total Depth Reached 8-2-11 0955
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 60453 (0850)		
Geologist C. Knight		Checked by/Date Chelsea Carvich / 11-11-11	

Radiological Background 41 / 7324 / 30	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: soil		10.5' 3904 (CPM)
0.5			0.0	78	Fill: Silty Sand: Brown (10YR 5/3), dry, medium stiff, no odor, 35% silt, 5% coarse sand, 5% medium sand, 55% fine sand	AF	4305
			0.0	72	6" sand	SM	4729
1.0			0.0	59	Fill: Poorly graded sand with silt: Very pale brown (10YR 7/4), dry, medium dense, no odor, 10% silt, 5% medium sand, 85% fine sand	AF	7686
			0.0	65	9" Fill: Silty sand: Dark yellowish brown (10YR 4/4), dry, medium sand, 75% silt, non-cohesive, low stiffness, no odor, 25% fine plasticity, low toughness	ML	7141
2.0			0.0	43	2' 4" Weathered sandstone Bedrock: Light yellowish brown (2.5Y 6/3), dry, dense, no odor, fine grained sandstone		6573
3.0			0.0	52			6435
4.0					Refusal on sandstone at 2.5 bgs.		
5.0					No GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 1	Location ID 294				
Drilling Company HGL		Driller I. Stone	Ground Elevation NA	Total Drilled Depth CK 0.25 ft. bgs				
Drilling Equipment trowel/shovel		Borehole Diameter NA	Date/Time Drilling Started 7-16-11 0755	Date/Time Total Depth Reached 7-18-11 0820				
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gal bag + 4oz Jar 60454(0800)						
Geologist C. Knight		Checked by/Date Chelsea Carmichael / 11-11-11						
Radiological Background 28pR		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
Depth ft.	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)
0.25			0.0	28	<p>Artificial Fill</p> <p>Fill: Silty sand; light yellowish brown (10YR 6/4), dry, medium dense, no odor, 5% coarse sand, 10% medium sand, 40% fine sand, 5% angular coarse gravel (fill rate), 40% silt.</p> <p>Concrete blk at 3" bgs</p> <p>No GW encountered</p> <p>Refusal at 3" bgs</p>	AS S _u		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group i	Location ID 295
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 7-11-11/1036	Date/Time Total Depth Reached 7-11-11/1044
Type of Sampling Device trowel/shovel	Samples Collected 4oz jar 1 1/2 gall bag (#60456) (1040)		
Geologist C. Carmichael	Checked by/Date <i>[Signature]</i> 12-9-11		

Radiological Background 16	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0016	Silty sand, (10YR, 4/4), brown, 65%. fine to medium grained sand, 30%. silt, 5%. sandstone & concrete fragments dry, dense, no plasticity, hardness, or odor. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 6 Group 1		Location ID 296 295	
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 2.0 ft. bgs	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 7-15-11 0830		Date/Time Total Depth Reached 7-15-11 0915	
Type of Sampling Device 1 3/4" Macrocore				Samples Collected (1) 1/2 gallon bags + 402 Jar			
Geologist C. Knight				Checked by/Date Chelsea Carmichael/11-14-11			
Radiological Background 36 / 239		Radiological Equipment Used Pancake / downhole		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: soil and grass		+0.5' 2390 (CPM)
0.5			0.0	45	Fill; Silty Sand; yellowish brown (10YR 5/4), dry, medium dense, no odor, 30% silt, 5% medium sand, 5% coarse sand, 5% granitic angular gravel, 55% fine sand, trace rootlets, trace asphalt Sandstone Bedrock: Pale yellow (2.5Y 7/4), dry, very dense, no odor, fine grained sandstone, 100% fine sand		2971
			0.0	41		AF	3656
1.0			0.0	32		SM	3821
			0.0	61			4032
2.0			0.0	60			3919
3.0					Refusal on sandstone at 2.0' bgs No GW encountered		
4.0							
5.0							
6.0							



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 296				
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 7-15-11/1408	Date/Time Total Depth Reached 7-15-11/1413				
Type of Sampling Device trowel/shovel		Samples Collected 4-oz jar (#60458) (1412) 1 1/2 gallon bag						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 11-9-11						
Radiological Background lb		Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 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 lb		Sandy silt, (10 YR, 4/3), brown, 65% silt, 30% fine to medium grained sand, 5% gravel fill and sandstone fragments, dry, soft, some rootlets, no plasticity, hardness or odor. No GW reached	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 29b
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 6"
Drilling Equipment Hand auger Trowel/shovel	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-25-11/1326	Date/Time Total Depth Reached 8-25-11/1336
Type of Sampling Device Hand auger Trowel/shovel 2 3/4" hand auger	Samples Collected 1/2 gall bag, 8-oz jar (#60459) (n/a)		
Geologist C. Carmichael	Checked by/Date 12-9-11		

Radiological Background 20, 82, 4001	Radiological Equipment Used Pancake meter M/R meter, Downhole meter	PID Used Mini Rae 2000 (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	Borehole Gamma Readings (CPM)
			0.089		Silty sand (10YR, 4/3), greyish-brown, 80% fine to medium grained sand, 20% silt, dry, loose, no plasticity, hardness or odor.	SM	
					Asphalt - 4"		
					Bedrock at 10"		
1'					Refusal hit at 6" - bedrock under asphalt		
2'					No GW reached.		
					No sample collected.		



6_297



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6.group 1	Location ID 297
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 7-11-11/093p	Date/Time Total Depth Reached 7-11-11/0951
Type of Sampling Device trowel/shovel	Samples Collected 4-oz jar 1 1/2 gall bag (#60460) (0945)		
Geologist C. Carmichael	Checked by/Date [Signature] 12-9-11		

Radiological Background 18	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0ppm)
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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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.0	19	Silty sand, (10 YR, 4/3), brown, 70% fine to coarse grained sand, 25% silt, 5% gravel / angular cobbles, dry, medium dense, no plasticity or hardness, no odor, glass and piece of glass found. No GW reached.	Sm		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 6, group 1		Location ID 297	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth ^{7' 9"} 12"	
Drilling Equipment Hand auger / shovel		Borehole Diameter 2 3/4"		Date/Time Drilling Started 8-25-11/1357		Date/Time Total Depth Reached 8-25-11/1407	
Type of Sampling Device hand auger / shovel 2 3/4" hand auger				Samples Collected 1/2 gall bag, 8-oz jar (#60461) (n/2)			
Geologist C. Carmichael				Checked by/Date 12-9-11			
Radiological Background 20, 91, 3820		Radiological Equipment Used Pancake meter up R meter, Downhole meter		PID Used Mini Rae 2000 (0.0ppm)			
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>
			0.0	77	Silty sand, (10YR 4/3), greyish-brown, 75% fine to coarse grained sand, 25% silt, dry, loose, no plasticity, hardness or odor. Pieces of metal found; rope	SM	} soil
			0.0	62	Asphalt 2" - 3" ^{9"}		
			0.0	96	Asphalt (3" thick) ^{1'}		} Asphalt
<p>Refusal at ^{7' 9"} 12" bedrock right under asphalt</p> <p>No GW reached</p> <p>No sample collected.</p>							



6_298



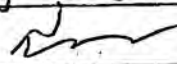
BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 298
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 7-11-11/0829	Date/Time Total Depth Reached 7-11-11/0838
Type of Sampling Device trowel / shovel	Samples Collected ^{4-oz jar} 1 1/2 gall bag, (#60462) (0835)		
Geologist C. Carmichael	Checked by/Date <i>[Signature]</i> 12-9-11		

Radiological Background 19	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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.021	Silty sand, (10 YR, 4/4), brown, 70% fine to coarse grained sand, 25% silt, 5% plastic pieces, beer can, dry, medium dense, no plasticity or hardness, no odor.	SM		
					No GW reached			

Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 299
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 7-12-11/1124	Date/Time Total Depth Reached 7-12-11/1131
Type of Sampling Device trowel/shovel	Samples Collected 4-oz jar 1 1/2 gall bag (#60464) (1130)		
Geologist C. Carmichael	Checked by/Date  12-9-11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Raz 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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0014	<p>Silty sand, (10 YR, 4/4), brown, 60% fine to coarse grained sand, 35% silt, 5% sandstone fragments, some rootlets, dry, medium dense, no plasticity, hardness or odor.</p> <p>Piece of plastic and coiled up wire found.</p> <p>No GW reached.</p>	sm	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 299
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 10'	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 8-28-11 0757	Date/Time Total Depth Reached: 8-28-11 0848	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: 8 oz jar 9-6-11		Field DWP: One 1/2 Gallon Bag (Approx 8 lbs.) (#60465) (0850) #60517 (NT)	
Geologist: Chelsea Carmichael	Checked By / Date: <i>[Signature]</i> 12-9-11			

Radiological Background: 22, 105, 3520	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	110	Sandy silt, (10 YR, 4/4), brown, 70% silt, 30% fine to medium grained sand, dry, soft, trace rootlets, trace glass, trace asphalt, no plasticity, hardness or odor, trace gravel fill rocks.	ML		3685
			0.0	108			5134	
1.0			0.0	96			5414	
			0.0	68			5630	
2.0			0.0	79	Gradational Contact Sandy silt, (10 YR, 4/4), brown, 55% silt, 35% fine to medium grained sand, 10% clay, dry, medium stiff, no plasticity, hardness or odor.	ML	2	5837
			0.0	87	5629			
3.0			0.0	108	Same as above, except mottled color with light greyish-brown and reddish-brown iron-oxide tinting.		3	5609
			0.0	93			5550	
4.0			0.0	91			5542	
			0.0	87			5720	
5.0			0.0	68			5	5724
			0.0	61				5641
6.0			0.0	59			6	5804

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 300
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 7-12-11/1501	Date/Time Total Depth Reached 7-12-11/1511
Type of Sampling Device trowel/shovel	Samples Collected 4oz jar (#60466) (1510) 1-1/2 gall bag		
Geologist C. Carmichael	Checked by/Date J. Deun Ralpins, Feldman 12/2/11		
Radiological Background 16	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 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'				0015	Silty sand, (10 YR, 4/3), brown, 60% fine to coarse grained sand, 35% silt, 5% gravel fill and concrete, dry, dense, no plasticity or hardness, no odor.	SM		
					No GW reached.			



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 2	Location ID 301			
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 7-19-11/0759	Date/Time Total Depth Reached 7-19-11/0807			
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (#60468) (0805)					
Geologist C. Carmichael		Checked by/Date Julian Robbins & Goldman 12/2/11					
Radiological Background 16		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 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 (CPM)
0.5'				0.016	Sandy silt, (10 YR, 3/4), dark brown, 70% silt, 30% fine to coarse grained sand, dry, soft, trace rootlets, no plasticity, very low hardness, no odor. No GW reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 2	Location ID: 301
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 7'3"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 2 3/4 inches	Date/Time Drilling Started: 10-5-11/0748	Date/Time Total Depth Reached: 10-5-11/0850	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs) (#60469) (0850)		Checked By / Date: Julian Robbins Edman 12/2/11	
Geologist: Chelsea Carmichael				

Radiological Background: 24,439, 117	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 (Pancake)	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	83	Sandy silt, (10YR, 3/3), dark brown, 50% silt, 45% fine to medium grained sand, 5% sandstone rock fragments, some rootlets, semi-moist, no plasticity, hardness or odor, too soft.	ML		05-4181	
0.5			0.0	84			5762		
1.0			0.0	95			5866		
			0.0	93			5957		
2.0			0.0	103	Gradational Contact Sand with clay, (7.5YR, 3/4), reddish-brown, 80% fine sand, 20% clay, semi-moist, medium dense, no plasticity, hardness or odor.	SC	2	5752	
			0.0	90				5589	
3.0			0.0	96			3	5581	
			0.0	112				5791	
4.0			0.0	111			4	5686	
			0.0	75				5784	
5.0			0.0	97	Same as above, except dense and 10YR, 5/4		5	5874	
			0.0	88					5980
6.0			0.0	82				6	6028

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 30i			
Radiological Background: 24, 4139, 117		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	82	Same as above, except 10 YR, 6/4 ← some sandstone/siltstone fragments	SC	6	6028
			0.0	91			5902	
7.0			0.0	93			7	6070
8.0					Refusal at 7'3" - bedrock No GW reached.		8	
9.0						9		
10.0						10		
11.0						11		
12.0						12		
13.0						13		



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 6, group 1		Location ID 302	
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 7-15-11/0823		Date/Time Total Depth Reached 7-15-11/0832	
Type of Sampling Device trowel/shovel				Samples Collected 1-1/2 gall bag (#60470) (0832)			
Geologist C. Carmichael				Checked by/Date Julian Robbins Yedman 12/2/11			
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rax 2000 (Bkgd: 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 (CPM)
0.5'			0.014		Silty sand, (10YR, 4/4), brown, 60% fine to coarse grained sand, 30% silt, 10% sandstone rock fragments, common rootlets, trace broken glass found, dry, medium dense, no plasticity, hardness, no odor. No GW reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group Subarea 6 group 1	Location ID SA-6/grp 1/#302
Drilling Company Boat Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2' 2" Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-9-11 0857	Date/Time Total Depth Reached 8-9-11 0903
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 60471 (0903)		
Geologist L. Robbins Goldman	Checked by/Date Chelsea Carmichael 11-16-11		

Radiological Background 51 / 2775 / 11	Radiological Equipment Used Pancake / downhole / Micro R 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		Inches (CPM)
					Surface: grass + soil		0.5 = 3225
0.5			0.0	50	sandy silt: brown (10yr 4/3), dry, semi-dense, no odor, 85% silt, 15% fine sand, cohesive, low plasticity, low toughness, low dilatancy, angular cement chunks in upper 4" of unit, rootlets.	ML / AF	3768
			0.0	48			4528
1.0			0.0	47	(silt w/ sand)		4896
			0.0	51	gradational contact to mechanically weathered bedrock (SP) sandstone: pale yellow (2.5y 8/3)	BE D R O C K	5026
2.0			0.0	52	fine grained, rootlets, composition predominately silica + mica.		5084
				2' 2"	refused @ 2' 2" sandstone no GW encountered no anomalies PGRAY #26		



Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 303
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 7-15-11/0850	Date/Time Total Depth Reached 7-15-11/0900
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60472) (0900)		
Geologist C. Carmichael	Checked by/Date John Robinson Goldman 12/2/11		

Radiological Background 17	Radiological Equipment Used w/ 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'			0.0	17	Sandy silt, (10 YR, 3/3), dark greyish-brown, 60% silt, 35% fine to medium grained sand, 5% sandstone rock fragments, dry, ^{soft} some rootlets, no plasticity, hardness or odor. No GW reached	ML		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 1	Location ID 304				
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 7-15-11/0912	Date/Time Total Depth Reached 7-15-11/0919				
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (#60474) (0918)						
Geologist C. Carmichael		Checked by/Date Sh. Paul Robbins, 12/2/11						
Radiological Background 16		Radiological Equipment Used up R meter	PID Used Mini Raz 2000 (Bkgd: 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'			0.0/15		Sandy silt, (10 YR, 3/4), dark brown, 70% silt, 30% fine to medium grained sand, common rootlets, dry, soft, no plasticity, very low hardness, no odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 1	Location ID: 304
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: 8-25-11 / 0739	Date/Time Total Depth Reached: 8-25-11 / 0755	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#60475) (0805)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>Judith Robbins Waldman</i> 12/2/11			

Radiological Background: 20, 62, 4032	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	85	Silt with sand, (10 YR, 3/3), dark brown, 80% silt, 20% fine to medium grained sand, dry, soft, some rootlets, very low hardness, plasticity, no odor, trace charcoal	ML		4007
1.0			0.0	76				4566
			0.0	92				5004
			0.0	72				4931
2.0					Refusal hit at 20"-bedrock No GW reached.		2	
							3	
3.0							4	
							5	
4.0							6	
5.0								
6.0								



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / Group 6 / 3		Location ID 305	
Drilling Company HGL		Driller I: Stone		Ground Elevation NA		Total Drilled Depth 10"	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 8/30/11 1030		Date/Time Total Depth Reached 8/30/11 1200	
Type of Sampling Device trowel / shovel				Samples Collected one 1/2 gal Bag (approx 8 lbs) 60496 (1040)			
Geologist C. Knight				Checked by/Date John Robbins Goldman 11/29/11			
Radiological Background 15µR / 4237/57		Radiological Equipment Used up R meter / downhole / pancake			PID Used Mini Rae 2000		
					Background: 0.0 ppm		
Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Inches
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		CK Borehole Micro R Gamma Readings (CPM)
			0.0	105	Surface: Asphalt		
			0.0	102	4" Asphalt 4" thick		19µR
					Fill: Sandy Clay with gravel: Brown (10µR 4/3), moist, stiff, no odor, 5% coarse sand, 10% medium sand, 20% fine sand, 15% subrounded fine gravel and asphalt debris, 50% clay, medium plasticity, 10" cohesive, medium toughness, trace asphalt	AF CL	22µR
<p>Total Depth: 10" bgs</p> <p>No GW encountered</p>							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 6.group 4		Location ID 306	
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 7-22-11/1013		Date/Time Total Depth Reached 7-22-11/1026	
Type of Sampling Device trowel/shovel				Samples Collected 1-1/2 gall bag (#60478) (1025)			
Geologist C. Carmichael				Checked by/Date Julian Robbins Feldman 12/2/11			
Radiological Background 120.4R/328cpm		Radiological Equipment Used 4R meter, pancake		PID Used Mini Rae 2000 (Bkgd: 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 (CPM) Inches
0.5'				0.0 125	<p>Silty sand, (10YR, 4/6), reddish-brown, 60% fine to medium grained sand, 30% silt, 10% fill gravel/cobbles, dry, medium dense, no plasticity, hardness or odor.</p> <p>~6" bgs = 175 4R</p> <p>No GW reached.</p> <p>PERA 1 #37 (LRG)</p>	SM	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 306
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5 1'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 7-22-11/1323	Date/Time Total Depth Reached 7-22-11/1335
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60540) (1335)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Feldman 7/2/11		

Radiological Background # 125	Radiological Equipment Used w/ R meter, pancake	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
			0.0	125				
			0.0	170	No Recovery in top 6" Top 6" was sampled previously...			
0.5'			0.0	170	Silty sand, (10YR, 4/6), reddish-brown, 50% fine to medium grained sand, 40% silt, 10% fill gravel, cobbles, dry, dense, no plasticity, hardness or odor.	SM		
1.0'			0.0	130				
					No GW reached			
					PGRAY #37			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 4	Location ID: 306	
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: 8-30-11 1355		Date/Time Total Depth Reached: 8-30-11 1455	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60479 (1410)			
Geologist: C. Knight				Checked By / Date: Julian Robbins, Melman 11/29/11			
Radiological Background: 10 ⁶ / 20,388 / 50		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 +0.5' 9121 (CPM)
					Surface: Asphalt		13938
0.5			0.0	90	3" Asphalt		
			0.0	85	Fill: Sandy silt: Dark yellowish brown (104R 7/4), dry, medium stiff, no odor, 15% fine sand, 85% silt, cohesive, low plasticity, low toughness, trace mottling	AF	2,136
1.0			0.0	83		ML	13956
			0.0	110			7747
2.0			0.0	107			6548
			0.0	104			6160
3.0			0.0	111			6246
			0.0	96	3'3" Sandy silt: Strong brown (7.5YR 4/6), dry, medium stiff, no odor, 5% medium sand, 5% clay, 15% fine sand, 75% silt, cohesive, low plasticity, low toughness, trace coarse sand	ML	5923
4.0			0.0	89			5881
			0.0	75			6044 6054
5.0			0.0	110			6250 6094
			0.0	102	5'3" Poorly graded sand with silt: Very pale brown (104R 7/4), moist, medium dense, no odor, 10% medium sand, 90% fine sand, some iron oxide staining	SP	6250
6.0			0.0	108			6362

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 306		
Radiological Background: 100 / 20,388 / 50		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	88	Same as above: Poorly graded sand	SP	6 6362
	6'4"		0.0	101	Silty Sand: Yellowish brown (10YR 5/6), moist, dense, no odor, 35% silt, 65% fine sand, trace iron oxide staining	SM	6 6562
7.0			0.0	97	Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), moist, dense, no odor, 5% coarse sand, 10% medium sand, 85% fine sand, mechanically weathered to SP, fine grained sandstone		7 7094
	7'4"		0.0	85		Bedrock	7 7500
8.0					Refusal on sandstone at 7.5' bgs No GW encountered		
9.0					Downhole anomaly encountered at 0.0, 0.5 and 1.0 ft bgs for being over 10,000 cpm. Sample interval went to default 1-5' bgs because a surface sample was previously collected.		
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 307
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 7-22-11/1411	Date/Time Total Depth Reached 7-22-11/1420
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60480) (1420)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins Mellman 12/2/11		

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'				0.018	Silt with sand, (10YR, 4/3), pale brown, 75% silt, 25% fine to medium grained sand, dry, soft, trace rootlets, no plasticity, hardness or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 308
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 7-22-11/1351	Date/Time Total Depth Reached 7-22-11/1400
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60482) (1400)		
Geologist C. Carmichael	Checked by/Date Sub Area Robinson/Brubaker 12/2/11		

Radiological Background 17	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 (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'				0.017	Silt with sand, (10 YR, 4/4), brown, 80% silt, 20% fine to medium grained sand, dry, medium stiff, very low hardness, no plasticity, no odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 309
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 7-22-11/1432	Date/Time Total Depth Reached 7-22-11/1440
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60484) (1440)		
Geologist C. Carmichael	Checked by/Date Lucretia Robbins Goldman 12/2/11		

Radiological Background 16	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, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	16	Silt with sand, (10YR, 4/3), pale brown, 80% silt, 20% fine to medium grained sand, dry, soft, common rootlets, no plasticity, very low hardness, no odor. No GW reached	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 310
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 7-20-11/1349	Date/Time Total Depth Reached 7-20-11/1358
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag (#60486) (1358)		
Geologist C. Carmichael	Checked by/Date Chelsea Carmichael/11-14-11		

Radiological Background 14	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 (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	13	Surface: top soil and vegetation (weeds) SM silty sand, brown (10YR 5/3) trace sandstone gravel - subangular 25% silt, 75% fine-medium grained sand, trace clay, SM non-low plasticity, very soft, loose, dry piece of metal wire TD=0.5' bgs No GW encountered			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 4	Location ID: 310	
Drilling Company: Bort 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: 8/22/11 0900		Date/Time Total Depth Reached: 8/22/11 2010	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60487 (0910)			
Geologist: C. Knight				Checked By / Date: Sublan Robbins Holman 11/27/11			
Radiological Background: N.R./2788 / 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	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: soil and gravel		70.5 3489
0.5			0.0	80	Fill: Sandy silt with gravel: yellowish brown (10YR 5/4), dry, soft to medium stiff, no odor, 5% coarse sand, 10% sub angular fine to medium gravel (fill rock), 5% medium sand, 20% fine sand, 60% silt, low plasticity, low toughness, non-cohesive	AF/ML	3523
			0.0	66			4382
1.0			0.0	77			5571
			0.0	76			5715
2.0			0.0	70	1 1/4" Sandy silt with clay: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 15% clay, 25% fine sand, 60% silt, low plasticity, low toughness, cohesive	ML	5842
			0.0	73			5892
3.0			0.0	59			5790
			0.0	62			5742
4.0			0.0	60	3' 10" silty clay with sand: dark brown (7.5YR 3/3), moist, medium stiff, no odor, 10% fine sand, 20% silt, 70% clay, medium toughness, medium plasticity, cohesive	CL	5730
			0.0	53			6540
5.0			0.0	67			5598
			0.0	57	Sandy clay with silt: dark brown (10YR 3/3), moist, stiff, no odor, 15% fine sand, 10% silt, 75% clay, cohesive, medium plasticity, medium toughness	CL	5746
6.0			0.0	53			5590

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: ck 4	Location ID: 310 - Subarea 6		
Radiological Background: 14AR/2785/46		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 (CPM)
6.0			0.0	53	Same as above: Sandy clay with silt	CL	5590
			0.0	40			5576
7.0			0.0	47	6' 8" Sandstone Bedrock: Yellowish brown (10YR 6/4), moist, very dense, waxy, 5% coarse sand, 30% medium sand, 65% fine sand.	Sp. Silt. S.	5923
8.0					Refusal on Sandstone at 7.0' bgs No GW encountered		
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 311				
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 7-26-11/1119	Date/Time Total Depth Reached 7-26-11/1131				
Type of Sampling Device trowel/shovel		Samples Collected 1-2 gall bag (#60488) (1130)						
Geologist C. Carmichael		Checked by/Date Julian Robbins, Goldman 12/2/11						
Radiological Background 17		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
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'				0017	<p>Sand, gravelly silt, (10YR, 4/4), brown, 50% silt, 30% fine to medium grained sand, 20% gravel fill rock, ^(ca) dry, stiff, no plasticity, hardness or odor, 1 oxidized iron nail.</p> <p>No GW reached</p>	ML		



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 312
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 7-26-11/1040	Date/Time Total Depth Reached 7-26-11/1046
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall bag (#60490) (1045)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins Goldman 12/2/11		

Radiological Background 14	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 <small>(CPM)</small>
0.5'			0.013		Sandy, fine silt with gravel, at 55% silt, 30% fine to medium grained sand, 15% pea gravel fill, dry, medium stiff, no plasticity, hardness, or odor, oxidized iron nails and cast-iron pieces found. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 5	Location ID: 312	
Drilling Company: Bort Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 6'3" ck bgs.	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1.75 inches		Date/Time Drilling Started: 9-7-11 1335		Date/Time Total Depth Reached: 9-7-11 1450	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60491 (1360)			
Geologist: C. Knight				Checked By / Date: Julian Robbins Feldman 11/29/11			
Radiological Background: DPR 12071/52		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 +0.5' 2229 (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface: soil and leaves		2669
0.5			0.1	62	Fill silty sand with gravel; Dark brown (2.5 Y 3/4), dry, medium dense, no odor, 20% sub angular fine gravel (fill rock), 25% silt, 5% medium sand, 50% fine sand, mottled	AF / SM	4901
1.0			0.0	90	1" Abundant roots ~ 1/4" diameter	SM	5351
2.0			0.0	75	Silty sand; Dark yellowish brown (10 Y R 3/6), dry, dense, no odor, 30% silt, 70% fine sand, trace roots and rootlets	SM	5603
3.0			0.0	70			5577
4.0			0.0	62	2" root ~ 1/3" diameter		5412
5.0			0.0	52	Silty sand; Yellowish brown (10 Y R 5/4), dry, dense, no odor, 15% silt, 85% fine sand, trace iron oxide staining	SM	5454
			0.0	55			5617
			0.0	65			5333
			0.0	85			5478
			0.0	65			5375
			0.0	58			5463
6.0			0.0	66	Same as above: Silty Sand	SM	5050

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 312		
Radiological Background: 12M R / 2071 / 52		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: ²¹⁵ 312 90 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					<p>Some as above: s. lty sand</p> <p>6'3" —————</p> <p>Refusal on s. lty sand at 6'3" bgs</p> <p>NO GW encountered</p>		6
7.0						7	
8.0							8
9.0							9
10.0							10
11.0							11
12.0							12
13.0							13



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 313				
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 7-21-11/0843	Date/Time Total Depth Reached 7-21-11/0849				
Type of Sampling Device trowel/shovel		Samples Collected 1/2 gall bag (#60492) (0848)						
Geologist C. Carmichael		Checked by/Date Julian Patton Medina 12/2/11						
Radiological Background 15		Radiological Equipment Used MP Meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	17	Some pea gravel on top. Silty sand, (10YR, 5/4), light brown, 60% fine to medium sand, 40% silt, dry, loose, no plasticity, hardness, no odor. Concrete slab hit at ~5" bgs. No GW reached.	SM		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 313
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: <u>2.0</u> ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/19/11 0207	Date/Time Total Depth Reached: 8/19/11 1215	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60493 (1210)	
Geologist: C. Knight	Checked By / Date: Chelsea Carrinich / 11-14-11			

Radiological Background: 12MB/2957/47	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 (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' 2800 (CPM)
					Surface: soil and grass		
0.0			0.0	56	Sandy silt: light, yellowish brown (10YR 6/4), clay, medium stiff, no odor 5% medium sand, 20% fine sand,	ML	3235
0.5			0.0	65	75% silt, cohesive, low plasticity, low toughness, trace rootlets		4864
1.0			0.0	75	Weathered siltstone bedrock: Olive yellow (2.5Y 6/6), moist, dry, hard, no odor, interbedded layers of siltstone, trace rootlets	Bedrock	5564
			0.0	113	16" weathered sandstone bedrock: Olive yellow (2.5Y 6/6), dry, dense, no odor, 5% silt, 95% fine sand, fine grained sandstone		5504
2.0			0.0	85			5357
3.0					Refusal on sandstone at 2.0 bgs No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 314				
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 7-21-11/1309	Date/Time Total Depth Reached 7-21-11/1319				
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (#60494) (1318)						
Geologist C. Carmichael		Checked by/Date Julian Robbins Goldman 12/1/11						
Radiological Background 18		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Bkgd: 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'			0.020		Sandy silt, (10 YR, 3/3), dark brown, 60% silt, 40% fine sand, dry, medium stiff, semi-cemented, trace rootlets, no plasticity, hardness or odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 4	Location ID: 314	
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: 8-18-11 / 1035		Date/Time Total Depth Reached: 8-18-11 1046	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60495 (1050)			
Geologist: T. Morse				Checked By / Date: Chelsea Carmichael / 11-16-11			
Radiological Background: 15/2836/69		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	Borehole Gamma Readings Feet bgs. +0.5 3821 (CPM)
			0.0	91	Surface: soil and vegetation		
			0.0	101	Silty sand: Brown (10YR 4/3), dry, medium dense to loose, no odor, 15% coarse grained sand, 30% silt, 55% TM fine grained sand, trace rootlets	SM	4520 6094
			0.0	109	1'3"		5735
			0.0	99	Silty sand: Yellowish brown (10YR 5/4), dry, medium dense, no odor, 25% silt, 15% medium grained sand, 60% fine grained sand, presence of pinhole pores	SM	5303
			0.0	104			5431
			0.0	112			5547
			0.0	97	3'4"		5431
			0.0	131	Sand with silt: Light olive brown (2.5Y 5/6), dry, dense, no odor, 10% silt, 25% medium grained sand, 65% fine grained sand, dense sand layers inundated with silt.	SM	5546
			0.0	83	3'9" 4'0" weathered sandstone bedrock: Light olive brown (2.5Y 5/4), hard, dry, no odor, mechanically weathers to SP with fine grained sand and trace medium grained sand	Bedrock	5650
					Refusal on sandstone bedrock 4'0" No GW encountered		



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6.group 4	Location ID 315				
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 7-21-11/1334	Date/Time Total Depth Reached 7-21-11/1342				
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (# 60496) (1340)						
Geologist C. Carmichael		Checked by/Date Julian Robbins Holman 12/1/11						
Radiological Background 19		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
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	Inches	Borehole Gamma Readings (CPM)
0.5'				0019	Sandy silt, (10 YR, 4/3), pale brown, 70% silt, 30% fine to medium grained sand dry, trace rootlets, medium stiff, semi-cemented, no plasticity, hardness or odor.	ML		
					No GW reached.			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 315
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: 8/19/11 0740	Date/Time Total Depth Reached: 8/19/11 0830	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60497 (0750)	
Geologist: Orknight		Checked By / Date: Chelsea Carmichael / 11-15-11		

Radiological Background: M, R / 3420 / 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	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: Soil and Grass		10.5 3750
0.0			0.0	53	Fill: Silty Sand: Yellowish brown (10YR 5/4), dry, medium dense, no odor, 35% silt, 5% medium sand,	Af	4165
0.5			0.0	71	60% fine sand, trace silt and fine subrounded gravel (fill rock)	SM	5319
1.0			0.0	64			5283
			0.0	75			5235
2.0			0.0	71	1'8" Fill: Well graded sand with gravel light gray (10YR 7/2), dry, dense, no odor, 25% granitic subangular fine gravel (fill rock), 20% medium sand, 15% coarse sand, 5% silt, 35% fine sand	Af / SW	5476
			0.0	80		SM	5645
3.0			0.0	68	Silty Sand: Dark yellowish brown (10YR 4/4), moist, medium dense no odor, 30% silt, 10% medium sand, 60% fine sand		5603
			0.10	55	3'6" Weathered Sandstone Bedrock: Olive yellow (10YR 6/6), dry, very dense, no odor, 10% medium sand, 90% fine sand, fine grained sandstone	Bedrock	5407
4.0			0.0	53			5381
5.0					Refusal at 4.0 on Sandstone No CW encountered		
6.0							



6_316

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 316
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 7-21-11/1418	Date/Time Total Depth Reached 7-21-11/1426
Type of Sampling Device trowel/shovel	Samples Collected 1-1/2 gall. bag (#60498) (1425)		
Geologist C. Carmichael	Checked by/Date John Robbins/12/1/11		

Radiological Background 17	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 (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.018	Sandy silt, (10YR, 4/3), brown, 70% silt, 30% fine to medium grained sand, dry, semi-cemented, medium stiff, trace rootlets, no plasticity, hardness, no odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 316
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 11" CK R.bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 8/14/11 0845	Date/Time Total Depth Reached: 8/14/11 0920	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60499 (NO SAMPLE)	
Geologist: C.Knight	Checked By / Date: Chelsea Carnichael / 11-15-11			

Radiological Background: 13AR/3149 / 53	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rac 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	67	Surface: soil		
0.5			0.0	75	Sandy silt: Blue brown (2.5Y 4/3) dry, soft, no odor, 3" 30% sand fine, 5% medium sand, 65% silt, low plasticity, low toughness	ML	No downhole Readings Collected
1.0			0.0	69	Sandstone Bedrock: Olive yellow (2.5Y 6/8), dry, very dense, no odor, mechanically weathered to SP, fine grained sandstone	B G s ck	
2.0					Refusal at 11" bgs on sandstone No GW encountered		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 5	Location ID 317				
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 7-26-11/1148	Date/Time Total Depth Reached 7-26-11/115p				
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (#60500) (1155)						
Geologist C. Carmichael		Checked by/Date Julian Rethin Madman 12/1/11						
Radiological Background 22		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.023	Silty sand, (10VR, 4/3), pale brown, 65% fine grained sand, 35% silt, dry, loose, no plasticity, hardness or odor. No GW reached.	Sm		



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 318				
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 7-21-11/1440	Date/Time Total Depth Reached 7-21-11/1449				
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (#60502) (1448)						
Geologist C. Carmichael		Checked by/Date Julie Ann Robbins Goldman 12/1/11						
Radiological Background 16		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
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	Inches	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	17	Silt with sand, (10 YR, 4/3), pale brown, 85% silt, 15% fine sand, dry, soft, trace rootlets, no plasticity, very low hardness, no odor. No GW reached.	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 6	Group: 4	Location ID: 318
Drilling Company: Bort 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: 8/19/11 0905		Date/Time Total Depth Reached: 8/19/11 0940
Type of Sampling Device: 1.75 inch Macrocore		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60503 (0915)	
Geologist: Cal Knight		Checked By / Date: <i>Chelsea Carmichael / 11-15-11</i>			
Radiological Background: 13mR / 3062 / 41		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 <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>+0.5' 3498 (CPM)</small>
			0.0	67	Surface: Soil and grass		4321
0.5			0.0	57	Sandy silt: Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 5% medium sand, 35% fine sand, 60% silt, cohesive, low plasticity, low toughness, trace fine gravel	ML	5369
1.0			0.0	63			5425
			0.0	72	1' 5" weathered sandstone bedrock? Pale yellow (2.5Y 7/4), dry, very dense, no odor, mechanically weathered to SP, fine grained sandstone	Bedrock	5699
2.0			0.0	85			5689
3.0					Refusal on sandstone at 2.0' bgs No GW encountered		
4.0							
5.0							
6.0							



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 6, group 5		Location ID 319	
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 7-26-11/1021		Date/Time Total Depth Reached 7-26-11/1031	
Type of Sampling Device trowel/shovel				Samples Collected 1-1/2 gall bag (#60504) (1030)			
Geologist C. Carmichael				Checked by/Date William Robbins/Saldman 12/1/11			
Radiological Background 17		Radiological Equipment Used Mkometer		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
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 (CPM)
0.5'			0.0	17	Silty sand, (10 YR, 4/4), brown, 70% fine to medium grained sand, 25% silt, 5% sandstone, asphalt and concrete pieces, dry, loose, no plasticity, hardness or odor. No GW reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 6	Group: 5	Location ID: 319
Drilling Company: HGL	Driller: J. Stone	Ground Elevation: NA	Total Depth Drilled: 6.9 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 10/5/11 0915	Date/Time Total Depth Reached: 10/5/11 1015	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		60505 (1015)	
Geologist: L. Robbins Goldman	Checked By / Date: Chelsea Carnicchia / 11-16-11			

Radiological Background: 16 / 3362 / 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)
					Surface = soil + grass		+0.5 = 3280	
					AF = artificial fill			
0.5			0.0	64	sandy silt w/ clay : dark yellowish brown (10YR 4/4), moist, dense, no odor, 85% fine sand, 15% silt, 5% clay, cohesive, low plasticity, some dilatancy, large (>10mm) charcoal pieces, trace rootlets, @ 6" bgs, encountered a 1" thick asphalt layer.	AF/SM	3605	4616
1.0			0.0	83	sandy silt : brown (7.5YR 4/4), moist, dense, no odor, 85% sand (fine grained), 15% silt, cohesive, low plasticity, med. dilatancy, small charcoal pieces (<10mm)	AF/SM	5261	5481
2.0			0.0	63			5501	5386
3.0			0.0	85			5571	5457
4.0			0.0	55	4'0" silty sand w/ clay: BROWN (7.5YR 4/4), moist, dense, no odor, 80% sand, 15% silt, 5% clay, cohesive, low plasticity, ^{med.} dilatancy, trace charcoal flecks (~2mm)	SM	5456	5463
5.0			0.0	75			5887	5953
6.0			0.0	81	5'5" silty sand w/ clay - same as above - note color change: dark yellow brown (10YR 4/6)	SM	5903	
			0.0	93				

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 6, group 4	Location ID 320
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 7-22-11/0831	Date/Time Total Depth Reached 7-22-11/0836
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gall bag (#60506) (0835)	
Geologist C. Carmichael		Checked by/Date Dan Robbins Medman 12/1/11	

Radiological Background 17	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PTD	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	18	Silt with sand, (10YR, 4/4), brown, 80% silt, 15% fine sand, 5% sandstone fragments, dry, soft, no plasticity, very low hardness, no odor. Bedrock at 4-5" bgs No GW reached	ML		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: <u>4</u>	Location ID: <u>320</u>	
Drilling Company: HGL		Driller: <u>T. Stone / C. Knight</u>		Ground Elevation: NA		Total Depth Drilled: <u>2</u> ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: <u>10/4/11 805</u>		Date/Time Total Depth Reached: <u>10/4/11 0825</u>	
Type of Sampling Device: Hand Auger		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)				<u>60907 (825)</u>	
Geologist: <u>L. Robbins Goldman</u>		Checked By / Date: <u>Chelsea Carmichael / 11-15-11</u>					
Radiological Background: <u>17/3806/68</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 (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	90	Surface: grass + soil		+0.5' = 3687
0.5			0.0	68	Silty sand: yellowish brown (10YR 5/4), dense, dry, no odor, 70% sand, 15% silt, 10% sandstone cobble, 5% clay, no dilatancy, low plasticity, low toughness, low dry strength, cohesive, rootlets (trace), cobble is angular	SM	3801
1.0			0.0	62	Silty sand: ^{w/ gravel} brownish yellow (10YR 6/6), dense, dry, no odor, 75% sand, 15% silt, 10% sandstone ^{gravel} _{LRG} cobble , cohesive, some dilatancy, low plasticity, low toughness, low dry strength, trace rootlets, cobbles are angular	SM	5265
2.0			0.0	67	Sandstone: yellow (10YR 7/6), dense, dry, no odor, mechanically weathered to SP, predominately fine grain	BR	5972
3.0							6274
4.0							5891
5.0							
6.0							

Final depth = 2.0' bgs
no GW encountered
no anomalies

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / Group 6 / group 3		Location ID 321	
Drilling Company HGL		Driller I. Stone		Ground Elevation NA		Total Drilled Depth 0.5 ft. bgs	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 7-20-11 1010		Date/Time Total Depth Reached 7-20-11 1030	
Type of Sampling Device trowel/shovel				Samples Collected 1 - 1/2 gal bag 60508 (1020)			
Geologist C. Knight				Checked by/Date Chelsea Carnichael / 11-15-11			
Radiological Background 16 uR		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Blkgd: 0.0 ppm)			
Depth ft.	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.25			0.0	17	Surface: soil and gravel		
0.5					<p>Fill: Silty Sand with gravel: light yellowish brown (10YR 6/4), dry, medium dense, no odor, 10% sub angular medium gravel and concrete, 25% silt, 5% coarse sand, 10% medium sand, 50% fine sand, trace asphalt, trace granitic gravel</p> <p>Total Depth 10.5' bgs No GW encountered</p>	AF / SM	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 6	Group: 3	Location ID: 321	
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: 8/16/11 1850		Date/Time Total Depth Reached: 8/16/11 1125	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 60509 (1100)			
Geologist: C. Knight				Checked By / Date: DuDean Robinsy, Moldovan 11/29/11			
Radiological Background: RmR/3100/63			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 +0.5' 3461 (CPM)
			0.0	80	Surface: soil and gravel			
0.5			0.0	77	Fill: Silt, sand with gravel: Yellowish brown (10YR 5/4)	AF		3584
					dry, medium dense, no odor, 15% fine subangular gravel or concrete debris, 20% silt, 5% medium sand, 60% fine sand,	SM		4156
1.0			0.0	66				5037
			0.0	70	18" Sandy silt: Olive brown (2.5Y 4/4), dry, medium stiff, no odor, 15% fine sand, 5% medium sand, 80% silt, trace mudstone gravel, low plasticity, low toughness, cohesive	ML		5437
2.0			0.0	85				5992
			0.0	95				5995
3.0			0.0	71	21" weathered sandstone light olive brown (2.5Y 5/6), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone w/ traces siltstone	BS		6175
4.0								
5.0								
6.0								

Refusal on sandstone at 3.0' bgs
No GW encountered

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / group 6 / group 3	Location ID 322			
Drilling Company HGL		Driller I. Stone	Ground Elevation NA	Total Drilled Depth 0.5 ft. bgs			
Drilling Equipment trowel/shovel		Borehole Diameter NA	Date/Time Drilling Started 7-20-11 1045	Date/Time Total Depth Reached 7-20-11 1105			
Type of Sampling Device trowel/shovel		Samples Collected 1-1/2 gal bag 60510 (1050)					
Geologist C. Knight		Checked by/Date Chelsea Carmichael 11-15-11					
Radiological Background 16		Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgcd: 0.10 ppm)				
Depth ft.	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.25			0.0	16	<p>Surface: soil and grass</p> <p>Fill: Silty Sand: Brown (10YR 5/3), dry, medium dense, no odor, 5% subrounded medium granitic and sandstone gravel, 5% ^{blk} coarse sand, 5% medium sand, 30% silt, 55% fine sand, trace asphalt</p>	AF/SM	
0.5					<p>Total Depth: 0.5' bgs</p> <p>No GW encountered</p>		

