

ATTACHMENT 2

Boring Logs

The boring logs will be provided with the final version in a separate pdf on SharePoint due to size restrictions.

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Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID <i>group</i> 8 N/1	Location ID 1
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-11-11/0913	Date/Time Total Depth Reached 4-11-11/0916
Type of Sampling Device stainless steel shovel, trowel	Samples Collected 1 2 1/2 gall bags (#40001) (0915)		
Geologist C. Carmichael	Checked by/Date Julian Reilly / Jldman 4/11/11		

Radiological Background 10 cpm	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, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.010		Sandy clay, (10 YR, 3/3), dark brown, 50% clay, 40% fine sand, 10% silt, common rootlets, semi-moist, soft, low plasticity and hardness, no odor.	CL		
No groundwater encountered.								

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SN - Corp 1	Location ID # 1
Drilling Company none Boart Longyear	Driller I. Stone D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Handauger Geoprobe 6600	Borehole Diameter 1 3/4" 3 1/4" in	Date/Time Drilling Started 5/24/11 - 1046	Date/Time Total Depth Reached 5/26/11 - 1130
Type of Sampling Device 1 3/4" Macrocore 3 1/4" Handauger	Samples Collected (1) 1/2 gallon bags 40002 (1050)		
Geologist L. Robbins Goldman	Checked by/Date L. Robbins Goldman 9/9/11		

Radiological Background 55 / 2659	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 Inches +0.5 = 2646 (CPM)
0.0			0.0	58	silt w/ sand: brown (10yr 4/2), moist, fine soil, no odor, 85% silt, 10% fine sand, 5% med. sand, med. plasticity, cohesive, low toughness, low density, slow dilatancy, rootlets, some trace mica flecks LFG	ML	2690
0.5			0.0	88			3454
1.0			0.0	56			3874
			0.0	72			3973
2.0			0.0	65	2' 0" silt w/ sand: strong brown (7.5yr 4/6), moist, fine soil, no odor, 85% silt, 15% fine sand, low plasticity, cohesive, low toughness, low density, slow dilatancy, trace CaCO ₃ nodules, trace Fe-oxidized (FeO ₂) nodules, pin hole pores, trace amounts of charcoal flecks between 8'-9'bgs.	ML	3924
			0.0	60	3895		
3.0			0.0	70	4046		
			0.0	70	4208		
4.0			0.0	68	4294		
			0.0	65	4359		
5.0			0.0	85	4469		
			0.0	50	4360		
6.0			0.0	72	LFG 4726		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID group 8N/1		Location ID 2	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 4-11-11/0927		Date/Time Total Depth Reached 4-11-11/0931	
Type of Sampling Device stainless steel shovel, trowel				Samples Collected 1 2 1/2 gall bags (#40003) (0930)			
Geologist C. Carmichael				Checked by/Date L. Robinson/Holman 9/9/11			
Radiological Background 11		Radiological Equipment Used w/ R meter			PID Used Mini Rae 2000		
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	11	Sandy clay, (10.YR, 3/4), brown, 50% clay, 40% fine sand, 10% silt, some rootlets, semi-moist, too soft, low plasticity and hardness, no odor. No groundwater encountered.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SN - Grp. 1	Location ID #2
Drilling Company: none Boart Longyear LRG	Driller: I. Stone D. Hansen LRG	Ground Elevation NA	Total Drilled Depth 10' ft. bgs
Drilling Equipment: Handauger Geo probe 6600 LRG	Borehole Diameter + 3/4" 3/4"	Date/Time Drilling Started 5/26/11 - 1402	Date/Time Total Depth Reached 5/26/11 - 1445
Type of Sampling Device 3/4" Macrocore 3/4" hand auger	Samples Collected (1) 1/2 gallon bags 40004 (1410)	Geologist L. Robbins Goldman	
Radiological Background 04 / 21093		Radiological Equipment Used Pancake / downhole	
Checked by/Date L. Robbins Goldman 9/9/11		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	PID	Radiological	Surface: soil + grass 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			0.0	84	silt w/ sand:		2959
0.5			0.0	85	sandy silt: dark yellowish brown (10 yr 3/6), moist, fine soil, no odor, 85% silt, 10% fine grained sand, 5% med. sand, low plasticity, cohesive, low toughness, low dry strength, slow dilatancy, trace rootlets, bits of plastic debris, trace mica flecks		3910
1.0			0.0	80			4050
			0.0	72		ML	4191
2.0			0.0	85	2'8" - - - - -		4294
			0.0	70	silt w/ sand: strong brown (7.5 yr 4/6), moist, fine soil, no odor, 85% silt, 5% med ^{LS} sand, 5% fine sand, 5% coarse sand, low plasticity, cohesive, low toughness, ^{LRG} low d, slow dilatancy, abundant CaCO ₃ stringers + nodules, trace Fe-oxidized nodules, pin hole pores, trace rootlets in upper 2 feet, trace charcoal fleck present in 6'-9' bgs interval		4391
3.0			0.0	84			4461
			0.0	80		ML	4433
4.0			0.0	65			4657
			0.0	87			4516
5.0			0.0	90			4486
			0.0	72			4701
6.0			0.0	80			4588

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID group 8N/1	Location ID 3				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment stainless steel shovel		Borehole Diameter n/a	Date/Time Drilling Started 4-11-11/0939	Date/Time Total Depth Reached 4-11-11/0945				
Type of Sampling Device stainless steel shovel, trowel			Samples Collected 1 2 1/2 gall bag (#40005) (0945)					
Geologist C. Carmichael			Checked by/Date Lillian Robbins Alderman 9/9/11					
Radiological Background 10		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000				
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	10	Clayey sand, (10 YR, 3/4), brown, 50% fine sand, 40% clay, 10% silt, common rootlets, dry, loose, low hardness, very low plasticity, no odor. No groundwater encountered.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N - Grp 1	Location ID #3
Drilling Company Boart Longyear HGL	Driller I Stone Dittmanson	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4" 3 1/4"	Date/Time Drilling Started 5/27/11 - 0847	Date/Time Total Depth Reached 5/27/11 - 0925
Type of Sampling Device 3 1/4" Macrocore 3 1/4" Handauger	Samples Collected (1) 1/2 gallon bags	40006 (0900)	
Geologist L. Robbins Goldman	Checked by/Date L. Robbins Goldman 9/9/11		

Radiological Background 64 / 2571	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 10.5 = 2601 (CPM)
0.5			0.0	85	Silt w/ sand: yellowish brown (10yr 5/8), ^{leg} moist fine soil, no odor, 85% silt, 10% fine sand, 5% med. sand, low plasticity, cohesive, med. toughness, low dry strength, no dilatancy, rootlets, trace CaCO ₃ nodules, pin hole pores		3138
			0.0	80		3939	
1.0			0.0	65		4256	
			0.0	80		4336	
2.0			0.0	85		4362	
			0.0	85	4331		
3.0			0.0	62	3'0" - - - - -		4364
			0.0	80	Silt w/ sand: dark brown (10yr 3/3), moist, fine soil, no odor, 85% silt, 10% fine sand, 5% med. sand, low plasticity, cohesive, med. toughness, low dry strength, no dilatancy, rootlets (trace), trace CaCO ₃ nodules, small nodules of above described unit, pin hole pores		4503
4.0			0.0	60		4423	
			0.0	65		4622	
5.0			0.0	85	4'0" silt w/ sand: strong brown (7.5 yr 4/6) moist, fine soil, no odor 85% silt, 10% fine sand, 5% med. sand, low plasticity, cohesive, med. toughness, med. dry strength, no dilatancy, rootlets ^{leg} trace CaCO ₃ nodules, pin hole pores, mica flecks, trace charcoal flecks present at 7'-9' bgs interval, Fe-oxidized (cont)		4720
			0.0	70		4675	
6.0			0.0	77			4551

Radiological Background				Project Name	Project Number	Location	
64/2571CPM				SSPL Area IV Radiological Study	EP9038.01.22.04.03	8N-6P1#3	
Depth	Interval	Recovery	PD	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)
6.0		0.0	77		silt w/ sand (cont from above): \varnothing LRG nodules (trace amount)		4551
		0.0	80				4771
7.0		0.0	70				4535
		0.0	62				4695
8.0		0.0	75				4558
		0.0	80				4631
9.0		0.0	75				4569
		0.0	65				4231
10.0		0.0	75				4038
					Hand augered to 10' 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 8 N/1	Location ID 4
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-11-11/0951	Date/Time Total Depth Reached 4-11-11/0959
Type of Sampling Device stainless steel shovel, trowel	Samples Collected 1 2 1/2 gall bags (#40007) (0959)		
Geologist C. Carmichael	Checked by/Date Julian K. ... / 9/2/11		

Radiological Background 10	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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				0.08	Silty sand, (10 VR, 4/4), brown, 65% fine sand, 30% silt, 5% clay, dry, medium-dense, some rootlets, trace gravel, no odor.	SM		
No groundwater encountered.								

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 4
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0'
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-21-11 0900	Date/Time Total Depth Reached 4-21-11 1020
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40008 (1) 1/2 gallon bags (0910)		
Geologist C. Knight	Checked by/Date J. Robbins Medman 9/9/11		

Radiological Background 44 / 2213	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 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	Artificial Fill	AF	2510
0.5			0.0	50	Fill; silt: light yellowish brown (10YR 6/4) moist, stiff, no odor, 80% silt, 20% fine sand, trace roots	AF/ML	3026
1.0			0.0	45	Fill; clay w/ gravel: Brown (10YR 5/3), moist, medium stiff, no odor, 25% medium angular gravel (fill rock), 10% fine sand, 65% clay	AF/CL	3208
			0.0	43			3774
2.0			0.0	46	1' 9" Fill; clay: strong brown (7.5YR 4/6), moist, medium stiff, no odor, 10% silt, 90% clay, cohesive, low plasticity	AF/CL	3913
			0.0	58	2' 5" Clay: strong brown (7.5YR 4/6), moist, medium stiff, no odor 10% silt, 90% clay, low plasticity, medium toughness, cohesive, pin hole pores, root lets trace.	CL	4233
3.0			0.0	58			4621
			0.0	55			4539
4.0			0.0	50			4642
			0.0	48			4705
5.0			0.0	53			4475
			0.0	45			4357
6.0			0.0	43	Same as above: Clay	CL	4366



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID group 8N/1	Location ID 5
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-11-11/1007	Date/Time Total Depth Reached 4-11-11/1012
Type of Sampling Device stainless steel shovel, trowel	Samples Collected 1 2 1/2 gal bags (#40009) (1012)		
Geologist C. Carmichael	Checked by/Date Subdan Robbins/Jetman 9/9/11		

Radiological Background 9	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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	10	Sandy gravel, (10YR, 4/4), brown, 65% subangular pea gravel, 30% fine sand, 5% silt, dry, dense, dry, some rootlets, no plasticity or hardness, no odor. No groundwater encountered.	GM	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N-1		Location ID 6	
Drilling Company HGL		Driller P. Skeeth		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 4-11-11/1020		Date/Time Total Depth Reached 4-11-11/1025	
Type of Sampling Device stainless steel shovel, trowel				Samples Collected 1 1/2 gall bag (# 40011) (1025)			
Geologist C. Carmichael				Checked by/Date J. Roberts/Goldman 9/9/11			
Radiological Background 10		Radiological Equipment Used up R meter		PID Used Mini Rae 2000			
Depth	Interval	Recovery	PID	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 11	Clay with sand, (40% ^{CL} 7.5 VR, 4/4), reddish-brown, 80% clay, 20% fine sand, dry, hard, trace rootlets, iron-oxide tinted throughout, veins of calcium carbonate precipitation, no odor, high hardness, medium plasticity. No groundwater encountered		CL	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N Group 1	Location ID 6
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-21-11 1400	Date/Time Total Depth Reached 4-21-11 1510
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40012 (1) 1/2 gallon bags		(1180) CL (1410)
Geologist C. Knight	Checked by/Date Lee Van Robbins, Feldman 4/21/11		

Radiological Background 45 / 1919	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	45		AF: Artificial Fill		10.5	2188
0.5		0.0	33		Fill: Sandy clay with gravel; Strong brown (7.5YR 5/8), dry, medium stiff, no odor, 30% fine sand, 10% medium sand, 15% fine angular gravel, 55% clay	AF/CL		2964
1.0		0.0	48		8" Clay; Strong brown (7.5YR 5/6), moist, stiff, no odor, 10% silt, 90% clay, pinhole pores, abundant CaCO ₃ stringers and some CaCO ₃ precipitated nodules, medium plasticity, medium toughness, cohesive	CL		4071
		0.0	48					4275
		0.0	46					4326
2.0		0.0	56					4174
		0.0	56					4391
3.0		0.0	55					4304
		0.0	62					4289
4.0		0.0	51		4' to 4'3" up to 60% CaCO ₃ with clay	CL		3849
		0.0	53					3335
5.0		0.0	55					2872
		0.0	41					2783
6.0		0.0	41		Same as above	CL		2670



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N-1		Location ID 7	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 4-11-11/1036		Date/Time Total Depth Reached 4-11-11/1041	
Type of Sampling Device stainless steel shovel, trowel				Samples Collected 1 1/2 gall bags (#40013) (1040)			
Geologist C. Carmichael				Checked by/Date Julian Robbins/Feldman 9/9/11			
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000			
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	11	Sandy clay, (10YR, 3/3), 65% clay, 35% fine sand, some rootlets, trace metal pieces, dry, low hardness and plasticity, no odor. No groundwater encountered		

Project Name: SSEL Area IV Radiological Study	Project Number EP2038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 7
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-22-11 0815	Date/Time Total Depth Reached 4-22-11 0950
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40014 (0820) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date LuAnn Robbins Melman 9/9/11		

Radiological Background 4 / 2542	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	Inches	Borehole Gamma Readings (CPM)
					AF: Artificial Fill surface: sand and soil			2459
0.5		0.1	50		Fill: Clay with silt: Brown (10YR 4/3), moist, soft, no odor, 25% silt, 75% clay, cohesive, medium plasticity, low toughness	AF / CL	3305	
		0.1	45			4176		
1.0		0.1	40			4160		
		0.1	40			4207		
		0.1	40			4227		
2.0		0.1	45	2'5"		4579		
		0.1	50			4470		
3.0		0.1	45			4520		
		0.1	40			4572		
4.0		0.1	40			4395		
		0.1	40		4481			
5.0		0.2	40		4456			
		0.2	40		4521			

6.0

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N-1		Location ID 8	
Drilling Company HGL		Driller P. Skeeth		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 4-11-11/1054		Date/Time Total Depth Reached 4-11-11/1100	
Type of Sampling Device stainless steel shovel, trowel				Samples Collected 1 2 1/2 gall bag (#40015) (11.00)			
Geologist C. Carmichael				Checked by/Date			
Radiological Background 11		Radiological Equipment Used up R meter			PID Used Mini Rae 2000		
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	11	Silty sand, (10YR, 3/6), brown with reddish tint, 65% fine to medium grained subrounded sand, 35% silt, dry, medium dense, some rootlets, no plasticity or hardness, no odor. No groundwater encountered.	SM	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID #, Group 8N-1	Location ID # 8
Drilling Company Beart Longyear LLC Handauger	Driller D. Hansen LLC I. Stone	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geo probe 6600 LLC Handauger	Borehole Diameter +3/4" US 3/4"	Date/Time Drilling Started 5/26/11 - 0850	Date/Time Total Depth Reached 5/26/11 - 0950
Type of Sampling Device 1 3/4" Macrocore 3/4" Handauger	Samples Collected (1) 1/2 gallon bags	40016 (855)	
Geologist L.R. Goldman	Checked by/Date <i>L.R. Goldman</i> 9/9/11		
Radiological Background 47/2788 cpm	Radiological Equipment Used Pancake / downhole	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 Inches +0.5 = 2925 (CPM)
			0.0	70	Sandy silt: Silty sand dark yellowish brown (10yr 4/4), moist, low density, no odor, 75% silt, 15% fine sand, 10% med. sand, low plasticity, cohesive, med. toughness, med. dilatancy, rootlets, mica flecks		3519
0.5			0.0	71			4255
1.0			0.0	70			4428
			0.0	85			4548
			0.0	75		ML	4528
2.0			0.0	85			4515
3.0			0.0	85	30" 106 sandy silt: silty sand: dark yellowish brown (10yr 3/4), moist, low density, no odor, 85% silt, 10% fine sand, 5% med sand, low plasticity, cohesive, med. toughness, slow dilatancy, mica flecks		4576
			0.0	82			4495
4.0			0.0	51		ML	4598
			0.0	80			4336
5.0			0.0	75	5'011 silt w/ sand: silty sand: strong brown (7.5yr 4/6), moist, dense, no odor, 90% silt, 5% med sand, 5% fine sand, low plasticity, cohesive, low plasticity, cohesive, low toughness, no dilatancy, CaCO3 nodules, mica flecks		4570
			0.0	70		ML	4436
6.0			0.0	68			4521

Radiological Background 47/2788 ^{COM}					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location EN-Grp. 1-#8
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)
6.0					Same as above: silty sand w/ silt & sand	ML	4521
			0.0	63			4741
7.0			0.0	55			4748
			0.0	60			4750
8.0			0.0	80			4663
			0.0	68			4876
9.0			0.0	60			4742
			0.0	58			4796
10.0			0.0	70			4785
				10'0"			
					Hand augered to 10' 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 grp # 8N-1	Location ID 9
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-11-11/1243	Date/Time Total Depth Reached 4-11-11/1250
Type of Sampling Device stainless steel shovel, trowel	Samples Collected 1 1/2 gall bag (# 40017) (1250)		
Geologist C. Carmichael	Checked by/Date Julian Robbins, Julian 9/9/11		

Radiological Background 11	Radiological Equipment Used R meter	PID Used Mini Rae 2000
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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				0.011	Clay, (7.5 YR, 4/4), reddish-brown, 90% clay, 10% fine sand, speckled texture, stiff, dry, high hardness, medium plasticity, no odor. Top 3" is asphalt. No groundwater encountered.	CL		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 9
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1'3"
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-21-11 1525	Date/Time Total Depth Reached 4-21-11 1610
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40018 (1530) NOSAMPLE (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Julian Robbins/Jedman 9/2/11		

Radiological Background 40 / 2096	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	60	Surface soil		2232
0.5			6.0	65	Fill: Sandy clay w/ silt: Strong brown (7.5YR 5/8), moist, medium stiff, no odor, 10% coarse sand, 10% medium sand, 10% fine sand, 20% silt, 50% clay, trace fine gravel, low plasticity, non cohesive. refusal concrete	CL	2910
1.0			0.0	60			4076
					Refusal on concrete at 1'3"		4306
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 8N-1	Location ID 10				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment stainless steel shovel		Borehole Diameter n/a	Date/Time Drilling Started 4-11-11/1255	Date/Time Total Depth Reached 4-11-11/1302				
Type of Sampling Device stainless steel shovel, trowel		Samples Collected 1 to 1/2 gall bag (#40019) (1300)						
Geologist C. Carmichael		Checked by/Date Jim Alan Robinson Giddeman 9/12/11						
Radiological Background		Radiological Equipment Used w/ Rater		PID Used Mini Rac 2000				
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	11	Clayey sand, (10 YR, 3/4), brown, 60% fine grained sand, 40% clay, some rootlets, medium hardness, low plasticity, dry, medium stiff, no odor. No groundwater encountered.	SC		



Project Name: SSFL Area IV Radiological Study		Project Number: EP9038.01.22.04.03	Subarea ID 8N-1	Location ID 11			
Drilling Company: HGL		Driller:	Ground Elevation: NA	Total Drilled Depth: 0.5'			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 4-11-11/1307	Date/Time Total Depth Reached: 4-11-11/1313			
Type of Sampling Device: stainless steel shovel, trowel		Samples Collected: 1 to 1/2 gall bags (#40021) (1311)					
Geologist: C. Carmichael		Checked by/Date: Julian Robbins Yeldman 9/13/11					
Radiological Background		Radiological Equipment Used: w/ R meter		PID Used: Mini Rae 2000			
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	11	Sand with clay, (10YR, 3/4), brown, 65% fine to medium grained sand, 30% clay, 5% gravel/cobbles, dry, very low plasticity, no hardness, medium dense, no odor. No groundwater encountered.	SC	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N Group 1	Location ID 11
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-22-11 12:10	Date/Time Total Depth Reached 4-22-11 1:30
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40022 (1215) (1) 1/2 gallon bag		
Geologist C. Knight	Checked by/Date Julian Robbin Edman 9/13/11		

Radiological Background 41 / 2550	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	Inches	Borehole Gamma Readings (CPM)
					Surface: gran and soil			2355
0.5		0.0	30		Fill Clay: Strong brown (7.5YR 4/6), moist, medium stiff, no odor, 5% medium sand, 5% fine sand, 10% silt, 80% clay, low plasticity, trace rootlets, trace concrete	AF CL		3046 4153 4355 4320 4338
2.0		0.0	30		2' 5" ← Clay: Strong brown (7.5YR 5/8), moist, stiff, no odor, 10% fine sand, 10% silt, 80% clay, low plasticity, some CaCO ₃ nodules and stringers	CL		4522 4517 4682 4738
3.0		0.0	35					4748
4.0		0.0	50		Same as above transitional contact	CL		4676 4720
5.0		0.0	50					4706
6.0		0.0	50		Clayey Sand: See next page	SL		

Radiological Background 41/2550				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 11	
Depth	Interval	Recovery FT	Radiological CK	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		50	0.0	Clayey Sand: Reddish yellow (7.5YR 6/6) moist stiff med. dense, no odor, 40% clay, 10% silt, 30% fine sand, 20% medium, CaCO ₃ stringers - trace	SC		4720
		45	0.0			4706	
7.0		50	0.0			4676	
		50	0.0	Clay: strong brown (7.5YR 4/6), moist, med. stiff, no odor, 5% medium, 5% fine sand, 10% silt, 80% clay, some CaCO ₃ stringers	CL		4651
8.0		45	0.0			4653	
		45	0.0			4627	
9.0		45	0.0			4592	
		50	0.0			4523	
10.0		50	0.0				4702
Total Depth: 10 bgs No GW encountered							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N _{grp.1}	Location ID 12			
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1028	Date/Time Total Depth Reached 4-12-11/1035			
Type of Sampling Device stainless steel shovel			Samples Collected 1 1/2 gall bag (#40023) (1035)				
Geologist C. Carmichael			Checked by/Date L. Rollins-Heldman 9/13/11				
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000			
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	11	Clayey sand, (10-YR, 3/3), 65% fine sand, 35% clay, common rootlets, dry, loose, low plasticity and hardness, no odor. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 12
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-2-11 0830	Date/Time Total Depth Reached 5-2-11 1000
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 4024 (0840) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date [Signature] 9/13/11		

Radiological Background 47 / 2557	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 +0.5' 2470 (CPM)
			0.0	50	Surface: silt and soil		
0.5			0.0	58	silt with clay & dark brown (10YR 3/3), medium sh. ff, no odor, moist, 20% clay, 80% silt, low toughness, low plasticity, cohesive	ML	2694
1.0			0.0	52		3854	
			0.0	52		4510	
			0.0	52		4704	
2.0			0.0	48			4859
			0.0	52	2' 6" Clay: Brown (7.5YR 5/4), moist, medium sh. ff, no odor, 10% silt, 90% clay, cohesive, medium plasticity, medium toughness	CL	4993
3.0			0.0	58		4715	
			0.0	62			4724
4.0			0.0	59			4932
			0.0	63			4956
5.0			0.0	69			5016
			0.0	38	Same as above: Clay	CL	5016, 5101
6.0			0.0	44		5192	

Radiological Background 42 / 2557				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 12	
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)
6.0			6.0	44	Some carbonate clay	CL	5192
			0.0	32	Weathered sandstone & olive yellow (2.5Y 6/8) matrix, hard, no odor, mechanically weathered to SP, fine grained sand	SP	5121
7.0			6.0	39			5309
8.0					Refusal on sandstone at 7' bgs.		
9.0					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 8 N gp. 1		Location ID 13	
Drilling Company HGL		Driller J. Morse		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 4-11-11/1358		Date/Time Total Depth Reached 4-11-11/1412	
Type of Sampling Device stainless steel shovel, trowel				Samples Collected 1 2 1/2 gall bags (#40025) (1410)			
Geologist C. Carmichael				Checked by/Date J. Robbins Helman 9/13/11			
Radiological Background U		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000			
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'				0.010	Clayey sand, (10YR, 4/4), 70% fine to medium grained subrounded sand, 30% clay, some rootlets, semi-moist, medium dense, low hardness, very low plasticity, no odor. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8 N gp. 1		Location ID 14	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 4-11-11/1425		Date/Time Total Depth Reached 4-11-11/1432	
Type of Sampling Device stainless steel shovel, trowel				Samples Collected 1 2 1/2 gall bags (#40027) (1432)			
Geologist C. Carmichael				Checked by/Date Ludlow Robbins Feldman 9/13/11			
Radiological Background 10		Radiological Equipment Used up R meter		PID Used Mini Rac 2000			
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 11	Sand with clay, (10 YR, 4/6), reddish-brown, 70% fine to medium grained sand, 30% clay, low hardness, very low plasticity, common rootlets, dry, medium dense, no odor. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SN group 1	Location ID 14
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 52'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-29-11 1333	Date/Time Total Depth Reached 4-29-11 1415
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 4002-B (1340) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins/Goldman 9/13/11		

Radiological Background 38 / 2285	Radiological Equipment Used Percate / Downhole	PID Used Mini RAE 2000 (Bkgd: 00 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <i>Artificial FIV</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 10.5' 2461 (CPM)
			0.0	65	Surface: granular soil		2809
0.5			0.0	61	Sandy silt: Reddish yellow (7.5YR 6/6), moist, medium stiff, no odor, 70% silt, 30% fine sand, low plasticity, non cohesive, mottled, trace stringers	AR/ML	3764
1.0			0.0	60	12" Silt, Sandy Strong brown (7.5YR 5/6), moist, medium dense, no odor, 90% silt, 50% fine sand, 10% medium sand	SM	4254
			0.0	40			4412
2.0			0.0	35			4485
			0.0	60			4578
3.0			0.0	50			4558
			0.0	68	44" CL		4632
4.0			0.0	60	Some air above		4747
			0.0	70	44" weathered sandstone: Strong brown (7.5YR 4/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SM	4896
5.0			0.0	50			4981
			0.0	75	Refusal at 5.0' bgs 5.5' No GWS encountered		NM



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8 Ngrp.1		Location ID 15	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-12-11/0931		Date/Time Total Depth Reached 4-12-11/0938	
Type of Sampling Device stainless steel shovel				Samples Collected 1 1/2 gall bag (#40029) (0936)			
Geologist C. Carmichael				Checked by/Date J. Rabbin & M. Aldman 9/13/11			
Radiological Background 11		Radiological Equipment Used up Rniter			PID Used Mini Rae 2000		
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	11	Clayey sand, (10YR, 3/4), brown, 65% fine sand, 35% clay, common rootlets, dry, loose, low plasticity and hardness, no odor. No groundwater encountered.	SC	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 15
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-3-11 1005	Date/Time Total Depth Reached 5-3-11 1650
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40030 C1010 (1) 1/2 gallon bags		
Geologist C. Light	Checked by/Date J. Rollins/Geldman 9/13/11		

Radiological Background 31 / 2544	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 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	38	surface (grass and soil)		2545
0.5			0.0	48	Silt: dark brown (7.5YR 3/4), moist, medium stiff, no odor, 10% fine sand, 10% clay, 80% silt, non cohesive, low plasticity, face rootlets near X surface, low toughness	ML	2981
1.0			0.0	56			4029
			0.0	60			4498
			0.0	65			4832
2.0			0.0	72			4850
			0.0	67	Silty Clay: Brown (7.5YR 4/4), moist, medium stiff, no odor, 35% silt, 10% fine sand, 55% clay, cohesive, low plasticity, medium toughness	CL	4722
3.0			0.0	60			4622
			0.0	60			4827
4.0			0.0	60	Sandy silt with clay: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 35% fine sand, 20% clay, 45% silt, cohesive, low plasticity, low toughness	ML	4747
			0.0	65			4894
5.0			0.0	63			4899
			0.0	45	Weathered sandstone: light yellowish brown (2.5Y 6/4), moist, dense, no odor, mechanically weathered 5'6" to SP, fine grained sandstone		4875
			0.0	43			

Refusal on sandstone at 6' ^{CK} bgs
No GW encountered

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N _{grp-1}		Location ID 16	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-12-11/0910		Date/Time Total Depth Reached 4-12-11/0917	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#40031) (0915)			
Geologist C. Carmichael				Checked by/Date J. Rathin Yelman 9/14/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Ra2 2000			
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 11	Clayey sand, (10 VR 3/3), brown, 65% fine sand, 35% clay, semi-moist, loose, common rootlets, low hardness and plasticity, no odor. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group EN Group 1	Location ID 16
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-3-11 1105	Date/Time Total Depth Reached 5-3-11 1145
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected: 10032 (111) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins/Goldman 9/14/11		

Radiological Background 52 / 2394	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 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, micromerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	62	Surface ground soil		2450
0.5			0.0	62	Silt & dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 10% sand, 10% clay, 80% silt, cohesive, low plasticity	ML	2737
1.0			0.0	54			3872
			0.0	53			4533
			0.0	52			4740
2.0			0.0	52	2'2" weathered bedrock: Olive yellow (2.5Y 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	Bedrock	4925
			0.0	52			5523
3.0			0.0	57	A vertical contact between weathered sand stone and silty clay exists from 3-4' bgs. The clay possibly filled in a sandstone joint or fracture. ML brown (7.5YR 4/4), moist, stiff, no odor, 10% finesand, 30% silt, 60% clay non cohesive, low plasticity		5933
			0.0	55			6071
4.0			0.0	64			5327
					Refusal on sandstone at 4' bgs		
					No GW encountered		
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N exp-1	Location ID 17
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-11-11/1446	Date/Time Total Depth Reached 4-11-11/1455
Type of Sampling Device stainless steel shovel, trowel	Samples Collected 1 2 1/2 gall bags (#40033) (1455)		
Geologist C. Carmichael	Checked by/Date Julia Rollins Gidman 9/14/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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'				0011	Sand with clay, (10YR, 3/4), brown, 75% fine to medium grained sand, 25% clay, some rootlets, dry, medium dense, low hardness, very low plasticity, no odor. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8 N group 1	Location ID 17
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-25-11 1425	Date/Time Total Depth Reached 4-29-11 1635
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected 40034 (1430) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins/Helman 9/14/11		

Radiological Background 40 / 2590	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.1 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 grass and soil		+0.5 2552
0.5			0.1	35	Silty Clay: Brown (2.5YR 4/9), moist, medium sh ^t , no odor, 35% silt, 10% fine sand, 55% clay, cohesive, low plasticity, trace rootlets near surface	CL	3026
			0.1	47		4189	
1.0			0.1	55		4629	
			0.1	62		4734	
2.0			0.1	51	1' 10" clayey silt & strong brown (2.5YR 5/6), moist, medium sh ^t , no odor, 5% medium sand, 5% fine sand, 90% clay, box silt, low plasticity, low toughness	ML	4843
			0.1	45	2' 6" Silty Sand: brownish yellow (10YR 6/8), moist, medium dense, no odor, 5% clay, 30% silt, 65% fine sand	SM	4525
3.0			0.1	72			4970
			0.1	68			4994
4.0			0.1	65			^{CL} 4990 4909
			0.1	55			5036
5.0			0.1	58			4833
			0.1	60	Same as above: Silty Sand	SM	4852
6.0			0.1	35			4880

Radiological Background 40 / 2590					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 17
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)
6.0			0.1	35	Same as above	SM	4880
			0.1	76			4763
7.0			0.1	50	Poorly graded sand with silt & yellowish brown (10YR 5/6), moist, medium dense, no odor, 15% silt, 85% fine sand, trace iron oxide staining	SP	4840
			0.1	51			4839
8.0			0.1	76	8' 10" weathered sandstone: olive yellow (2.5Y 6/6) slightly moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	4720
9.0					Refusal at 8.0' by S No LW encountered		
10.0					9' 10" weathered sandstone: olive yellow (2.5Y 6/6) slightly moist, dense, no odor, mechanically weathered to SP, fine grained sandstone		
11.0							
12.0							
13.0							



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8Ngrp.1	Location ID 18
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/0848	Date/Time Total Depth Reached 4-12-11/0855
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40035) (0855)		
Geologist C. Carmichael	Checked by/Date J. Robbins/Edman 9/14/11		

Radiological Background 10	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000
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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	Clayey sand, (10 YR, 3/3), brown, semi-moist, 65% fine sand, 35% clay, common rootlets, medium dense, low hardness, very low plasticity. No groundwater encountered.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8M group 1	Location ID 18
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-3-11 1315	Date/Time Total Depth Reached 5-3-11 1405
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40036 (1320) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date S. Robinson/Jedman 9/14/11		

Radiological Background 45 / 2502	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	39	Surface: grass and soil		2601
0.5			0.0	37	Silt: light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 10% clay, 5% fine angular gravel, 10% fine sand, 75% silt, non cohesive, low plasticity	AF	2862
1.0			0.0	45			4029
			0.0	44			4515
2.0			0.0	38	2' 2" Clay: Dark reddish brown (5YR 3/4), moist, stiff, no odor, 10% fine sand, 10% silt, 80% clay, cohesive, medium toughness, low plasticity	CL	4601
			0.0	42			4915
			0.0	45			4904
3.0			0.0	56	3' 7" Clay with sand and silt: Very dark brown (2.5YR 2.5/3), moist, stiff, no odor, 20% fine sand, 20% silt, 55% clay, non cohesive, low plasticity	CL	4989
4.0			0.0	70			5011
			0.0	71			4986
5.0			0.0	75	Weathered sandstone: light olive brown (2.5Y 5/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	5205
			0.0	53			5193
6.0					Refusal on sandstone at 5.5' bgs No GW encountered		5428

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gr. 1	Location ID 19
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1105	Date/Time Total Depth Reached 4-12-11/1111
Type of Sampling Device Stainless Steel shovel	Samples Collected 1 1/2 gall. bag (#40037) (U110)		
Geologist C. Carmichael	Checked by/Date L. Robbins Medner 9/14/11		

Radiological Background 10	Radiological Equipment Used w/ Rater	PID Used Mini Rae 2000
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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'				11	Clayey sand, (10YR, 3/3), brown, 60% fine sand, 40% clay, common rootlets, dry, loose, low-medium hardness, low plasticity, no odor. No groundwater encountered.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 1	Location ID 20
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1124	Date/Time Total Depth Reached 4-12-11/1129
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40039) (1128)		
Geologist C. Carmichael	Checked by/Date L. Robbins/Gelman 9/14/11		

Radiological Background 11	Radiological Equipment Used 4" R meter	PID Used Mini Rae 2000
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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 11	Sand with clay, (10YR, 3/3), brown, 80% fine sand, 20% clay, dry, loose, common rootlets, low hardness, very low plasticity, no odor. No groundwater encountered	SC		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group B N 5A ^{all} group 1	Location ID 20
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-3-11 0840	Date/Time Total Depth Reached 5-3-11 0940
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected (1) 1/2 gallon bags		(0845)
Geologist C. Knight	Checked by/Date J. Robbins-Heldman 9/14/11		

Radiological Background 42 / 2523	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 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
					surface to grass and soil		405 2408 (CPM)
		0.0	50		Fill: Artificial Fill		2572
0.5		0.0	51		Sandy silt: Brown (10YR 5/3), dry, medium stiff, no odor, 30% fine sand, 5% medium sand, 65% silt, noncohesive, low plasticity, trace rootlets, some mottled texture, pinhole pores	Af/ML	3594
1.0		0.0	55				4340
		0.0	57		Silt with sand: Strong brown (7.5YR 4/6), moist, medium stiff, no odor, 15% fine sand, 10% clay, 75% silt, trace rootlets, trace mottled texture, pinhole pores	Af/ML	4641
2.0		0.0	58				4792
		0.0	59		2'4" Clay with silt: Dark brown (7.5YR 3/4), moist, stiff, no odor, 20% silt, 80% clay, cohesive, low plasticity, medium dry strength	CL	4818
3.0		0.0	55				4566
		0.0	54				4687
4.0		0.0	50				4717
		0.0	44				4892
5.0		0.0	53				4726
		0.0	35				4812
6.0		0.0	48		Same as above: Clay with silt	CL	4757

Radiological Background 42 / 2523				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 20	
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	49	Same as above: clay with silt	CL	4757
			0.0	60			4771
7.0			0.0	69	7'3" Silty clay: Brown (7.5YR 4/3), moist, stiff, no odor, 35% silt, 65% clay, cohesive, low plasticity	CL	4836
			0.0	64			4870
8.0			0.0	63	8'2" Clayey silt: Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 40% clay, 60% silt, low plasticity, cohesive	ML	4757
			0.0	62			4636
9.0			0.0	55	Weathered Sand stone: Yellowish brown (10YR 5/4), moist, dense, no odor, mechanically weathered to SP, fine grained sand stone 5% coarse, 95% fine sand	SP	4592
					Refusal at 9' bgs on sandstone 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 8N gp.1		Location ID 21	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-12-11/1312		Date/Time Total Depth Reached 4-12-11/1317	
Type of Sampling Device stainless steel shovel				Samples Collected 1 1/2 gall bag (#40041) (1316)			
Geologist C. Carmichael				Checked by/Date J. Robbins Feldman 9/14/11			
Radiological Background 10		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000			
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	11	Gravelly sand, (10YR, 4/3), brown, 60% fine sand, 30% fill gravel, 10% clay, dry, loose, no plasticity or hardness, some rootlets, no odor. No groundwater encountered	SP	

Radiological Background					Project Name	Project Number	Location
7 / 2681					SSFL Area IV Radiological Study	EP9038.01.22.04.03	21
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	45	Same as above: silty clay	CL	5247
			0.0	51			4859
7.0			0.0	66	7'1" Clay with silt: yellowish brown (10YR 5/6), moist, medium stiff, no odor, 25% silt, 75% clay, medium toughness, low plasticity, cohesive, abundant CaCO ₃ stringers	CL	4909
			0.0	58			4775
8.0			0.0	53			4621
			0.0	55			4597
9.0			0.0	55			4616
			0.0	55			4554
10.0			0.0	57	clay w/ silt: Same as above	CL	4657
<p>Total Depth: 10.0' bgs No GW encountered</p>							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 N grp. 1	Location ID 22
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1345	Date/Time Total Depth Reached 4-12-11/1350
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (# 40043) (1350)		
Geologist C. Carmichael	Checked by/Date Sub Area Robbins Goldman 9/14/11		

Radiological Background 11	Radiological Equipment Used AP R meter	PID Used Mini Rae 2000
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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'				0.011	Clayey sand, (10 YR, 3/3), brown, 60% fine sand, 40% clay, common rootlets, semi-moist, loose, low plasticity and hardness, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N Group 1	Location ID 22
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-2-11 1115	Date/Time Total Depth Reached 5-2-11 1230
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40044 (1120) (1) 1/2 gallon bags DWP 40257 (CNT)		
Geologist C. Knight	Checked by/Date J. Robbins/Geldman 9/14/11		

Radiological Background 42 / 2722	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
					AF: Artificial Fill (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable) surface: grass and soil			+0.5 2462
0.5			0.0	44			0.220	
			0.0	39	Fill: silt. Brown (7.5YR 4/4), moist, medium sh. ff, no odor, 10% clay, 10% fine sand, 80% silt, ^{ck} cohesive, low plasticity, low toughness	AF	4.024	
1.0			0.0	41			4.487	
			0.0	49			4.527	
2.0			0.0	47			4.460	
			0.0	50	2' 4" Clay with silt: Dark brown (2.5YR 3/4), moist, stiff, no odor, 25% silt, 75% clay, cohesive, low plasticity	CL	4.586	
3.0			0.0	43			4.545	
			0.0	45			4.540	
4.0			0.0	55			4.775	
			0.0	52			4.874	
5.0			0.0	54			4.805	
			0.0	55	Silty clay: Yellowish brown (10YR 5/4), moist, medium sh. ff, no odor, 40% silt, 60% clay, cohesive, low plasticity, low toughness, no dilatancy, trace CaCO ₃ stringers	CL	4.774	
6.0			0.0	52			4.774	47.53

Radiological Background 42 / 2722				Project Name SSF: Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 22	
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)
6.0			52		Silty Clay: same as above	CL	4753
			54				4670
7.0			63				4814
			72				4751
8.0			66				4585
			78				4601
9.0			70		Silty Clay: yellowish brown (10YR 5/8), moist, medium stiff, no odor, 35% silt, 65% clay, low plasticity, cohesive, low toughness, some CaCO ₃ nodules and stringers	CL	4500
			67				4591
10.0			75				4367
					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 8 N gp. 1	Location ID 23
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1410	Date/Time Total Depth Reached 4-12-11/1415
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40045) (1415)		
Geologist C. Carmichael	Checked by/Date L. Dan Robbins/J. Alderman 9/14/11		

Radiological Background II	Radiological Equipment Used APR meter	PID Used Mini Rae 2000
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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	II	Clayey sand, (10 YR, 3/3), brown, 60% fine sand, 40% clay, common rootlets, dry, loose, low plasticity and hardness, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study	Project Number: EP0028.01.22.04.03	Subarea ID & Group: 8N group 1	Location ID: 23
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 1010
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-2-11 1445	Date/Time Total Depth Reached: 5-2-11 1540
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected 40046 (M50) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: Judean Rollins/Geldman 9/14/11		

Radiological Background: 49 / 2337	Radiological Equipment Used: Pancake / Downhole	PID Used: MiniRAE 2000 (Bkgd: 0.10 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>
					Surface: grass and soil		10.5' 2437 CK
0.5			0.0 53		Silt with clay: Brown (10YR 4/3), moist, medium stiff, no color, 10% fine sand, 20% clay, 70% silt, cohesive, low plasticity, pin hole pores	ML	3220 3749 CK
			0.0 34				4024 4389 CK
1.0			0.0 51				448 4548 CK
			0.0 63				4527 4484 CK
2.0			0.0 54		Clay with silt: Brown (7.5YR 4/4) moist, medium stiff, no odor, 25% silt, 75% clay, low plasticity, cohesive, trace CaCO ₃ stringers	CL	4460 4350 CK
			0.0 57				4486 4547 CK
3.0			0.0 52				4545 4583 CK
			0.0 55				4550 4694 CK
4.0			0.0 73				4774 4514 CK
			0.0 56				4874 4597 CK
5.0			0.0 58				4805 4720 CK
			0.0 75				4754 4620 CK
6.0			0.0 74		Silty clay (CL) yellowish brown (10YR 5/6), moist, stiff, no color, clay w/ silt, 15% silt, 85% clay, cohesive, low plasticity, some CaCO ₃ stringers and nodules	CL	4753 4523 CK
			0.0 73				



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N Grp. 1	Location ID 24
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/0930	Date/Time Total Depth Reached 4-13-11/0935
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40047) (0935)		
Geologist C. Carmichael	Checked by/Date Julia Robbins / Solomon 9/14/11		

Radiological Background 10	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000
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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'				20.11	Clayey sand, (10YR, 4/4), brown, 55% fine sand, 45% clay, some rootlets, semi-moist, medium dense, low-medium hardness and plasticity, no odor. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N Group 1	Location ID: 24
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10.0'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4-26-11 0825	Date/Time Total Depth Reached: 4-26-11 0930
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 40048 (0830) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: Julie Ann Robbins Eldner 9/14/11		

Radiological Background: 42 / 2482	Radiological Equipment Used: Pancake / Downhole	PID Used: MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	RF	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 70.5' 2568 (CPM)
			0.0	40	Surface: Soil and gravel		
0.5			0.0	43	Silt with Clay: dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 20% clay, 80% silt, low plasticity, cohesive	ML	3869
1.0			0.0	43			4162
							4200
			0.0	60	1 3/4" ^{ck} Clay Silty Clay: Brownish yellow (10YR 6/6), moist, medium stiff, no odor, 40% silt, 60% clay, low plasticity, cohesive, trace CaCO ₃ stringers	CL	4127
2.0			0.0	58			4094
			0.0	55			3530
3.0			0.0	49			3427
			0.0	52	Clayey silt: Strong brown (2.5YR 4/6), moist, medium stiff, no odor, 35% clay, 60% silt, 5% CaCO ₃ nodules and stringers, low plasticity, cohesive	ML	3779
4.0			0.0	49			3948
			0.0	48	Clay with silt: Brown (7.5Y 4/4), moist, medium stiff, no odor, 20% silt, 5% CaCO ₃ nodules, 25% clay, low plasticity, cohesive	CL	4199
5.0			0.0	45			4150
			0.0	40			4261
6.0			0.0	55			4448

Radiological Background 42 / 2482				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 24		
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	55	6'3" Clay: dark brown (7.5YR 3/4), moist, stiff, nodular, 90% clay, 10% CaCO ₃ nodules and stringers, low plasticity, cohesive, trace rootlets Abundant 3" thick CaCO ₃ nodules 8" 10" Abundant 1" thick CaCO ₃ nodules and stringers 4'6" Same as above: increase CaCO ₃ in fine grained CaCO ₃ packets Total Depth: 10.0' logs No GW encountered	CL	4448	
			0.0	55			4471	
7.0			0.0	56			4220	
			0.0	48			4160	
8.0			0.0	45			4148	
			0.0	50			4147	
9.0			0.0	56			3970	
			0.0	58			3891	
10.0			0.0	56			3964	
11.0								
12.0								
3.0								



Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 1	Location ID 25			
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/0914	Date/Time Total Depth Reached 4-13-11/0920			
Type of Sampling Device stainless steel shovel			Samples Collected 1 1/2 gall bag (#40049) (0920)				
Geologist C. Carmichael			Checked by/Date L. Dan Robbins, M. J. Gorman 9/14/11				
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Ra2 2000			
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 10	Clayey sand, (10YR, 4/3), brown, 70% fine to coarse grained subrounded sand, 30% clay, common rootlets, semi-moist, no hardness or plasticity, no odor. No groundwater encountered.	SC	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 25
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-25-11 1515	Date/Time Total Depth Reached 4-25-11 1600
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40250 (1520) (1) 1/2 gallon bags 40256 (NT) field POP		
Geologist C. Knight	Checked by/Date Julian Robbins / Alan 9/14/11		

Radiological Background 51 / 234	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 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 40.5' 2590 (CPM)	
0.5			0.0	49	Clay with silt: strong brown (7.5YR 5/6) moist, medium stiff, no odor, 20% silt, 80% clay, trace roots near surface, low plasticity, cohesive, medium toughness	CL	3801	
			0.0	52			4009	
1.0			0.0	50			4237	
2.0			0.0	58	1 3/4" Clayey silt: yellowish brown (10YR 5/6) moist, medium stiff, no odor, 40% clay, 60% silt, low toughness, low plasticity, cohesive	ML	4117	
			0.0	58			4183	
3.0			0.0	58	2 2" Clay with silt: light yellowish brown (10YR 6/4) moist, stiff no odor, 25% silt, 70% clay, 5% CaCO ₃ nodules and stringers	CL	3979	
			0.0	58			At 3' Abundant CaCO ₃ nodules.	3848.
			0.0	58			At 3' Abundant CaCO ₃ nodules	3758
4.0			0.0	60	At 3' Abundant CaCO ₃ nodules		3965	
5.0			0.0	55			3843	
			0.0	53	At 5' lgs ~ 60% CaCO ₃ and 40% clay	CL	3945	
			0.0	57			4133	
6.0			0.0	55			4054	

Radiological Background 51/2324				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 25	
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
6.0			0.0	55	At 6' Abundant CaCO ₃ nodules		4054
			0.0	51	Same as above: clay	CL	4124
7.0			0.0	54	At 6' 7" Abundant CaCO ₃ nodules		4064
			0.0	51	7' 3" Clay with silt: yellowish red (5Y 4/6), med, stiff, no odor, 25% silt, 10% CaCO ₃ , 65% clay, cohesive, low plasticity	CL	3984
8.0			0.0	54	At 8' bgs in 2" thick bed fine grained CaCO ₃ sand material		3977
			0.0	51	At 8' 3" Abundant CaCO ₃ nodules and stringers	CL	4071
9.0			0.0	55	At 9' Abundant CaCO ₃ nodules and stringers	CL	3984
			0.0	61			3966
10.0			0.0	65	Same as above: clay with silt	CL	4462
<p>Total depth: 10.0'</p> <p>No GW encountered</p>							



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N	Location ID 26			
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment shovel/trawel		Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/0902	Date/Time Total Depth Reached 4-13-11/0903			
Type of Sampling Device Stainless Steel Shovel			Samples Collected 1 1/2 gall bag (#40051) (0907)				
Geologist C. Carmichael			Checked by/Date Julian Robbins / Edman				
Radiological Background 10		Radiological Equipment Used M R meter		PID Used Mini Rae 2000			
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	11	Clayey sand, (10YR, 3/3), brown, 70% fine sand, 30% clay, common rootlets, semi-moist, no plasticity or hardness, no odor, medium dense.	SC	
No groundwater encountered.							

Radiological Background 43 / 2456				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 26	
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	62		Same as above: Clay, abundant CaCO ₃ in pockets and stringers throughout the clay abundant CaCO ₃ at total depths up to 60% CaCO ₃	CL	4102
		0.6	65				4065
7.0		0.0	54				4246
		0.0	58				3788
8.0		0.0	62				3925
		0.0	60				4207
9.0		0.0	63				4220
		0.0	55				4345
10.0		0.0	56				CL 4103
						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 8N grp. 1	Location ID 27
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/1011	Date/Time Total Depth Reached 4-13-11/1018
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40053) (1018)		
Geologist C. Carmichael	Checked by/Date LuLan Robbins Mldman 9/14/11		

Radiological Background 10	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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	Silty sand, (10 YR, 3/3), brown, 50% fine sand, 40% silt, 5% clay, 5% gravel, semi-moist, common rootlets, trace asphalt, wire, nails, loose, no hardness or plasticity, no odor. No groundwater encountered.	SM		

Project Name: SSEL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 27
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-26-11 1010	Date/Time Total Depth Reached 4-26-11 1105
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected: 40054 (1020) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date: Julian Robinson Alderman 9/14/11		

Radiological Background 46 / 2410	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.1 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' 2504 (CPM)
			0.0	59	surface soil and grass		
0.5		0.0	51		Fill: Clay with silt; strong brown (7.5YR 4/6), moist, medium stiff, no odor, 25% silt, 70% clay, 5% fine sand, trace rootlets, blacky texture, mottled, trace CaCO ₃	AF/CL	3250 4189
1.0		0.0	56		Stringers, low plasticity, non cohesive		4244
		0.0	55		1.7" some charcoal up to 1/4" diameter		4308
2.0		0.0	52		Cl. Fill: Clay: Strong brown (7.5YR 4/6), moist, stiff, no odor, 90% clay, 10% CaCO ₃ stringers and nodules, mottled, low plasticity, cohesive, high dry strength	AF/CL	4209 4090
3.0		0.0	49		3'4" Fine grained CaCO ₃ packet and stringers ~ 2" thick within clay		4136
		0.0	42		3'10" Abundant coarse CaCO ₃ nodules ~ 3" thick		4073
4.0		0.0	45				3913
		0.0	49		4'6" Abundant coarse CaCO ₃ nodules ~ 2" thick	AF/CL	3930
5.0		0.0	48		5' Approximately 70% fine to coarse CaCO ₃ with 30% clay		3969
		0.0	51		5' 1" A 2" diameter aluminum debris with one side painted white		
		0.0	51		Fill: Clay with silt; strong brown (7.5YR 5/6) moist, stiff, no odor, 20% silt, 80% clay, some CaCO ₃ stringers, trace mottling	AF/CL	4142
6.0		0.0	50				4355



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 N grp. 1	Location ID 28
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel / trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/ 1025	Date/Time Total Depth Reached 4-13-11/ 1030
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40055) (1030)		
Geologist C. Carmichael	Checked by/Date Subhan Robbins/Mehran 9/14/11		

Radiological Background 11	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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	11	Sand with clay, (10 YR, 3/3), brown, 75% fine sand, 25% clay, semi-moist, trace sandstone & charcoal cobbles (~2-3"), iron ring found, wire, very low hardness, no plasticity, no odor.	SC		
No groundwater encountered								

Project Name: SSFL Area IV Radiological Study	Project Number EP0038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 28
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-26-11 1125	Date/Time Total Depth Reached 4-26-11 1225
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 400 56 (1150) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date: L. Van R. [Signature] 9/14/11		

Radiological Background
36 / 2454

Radiological Equipment Used
Pancake / Downhole

PID Used
MiniRAE 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 Inches (CPM)
			2.0	48			40.5' 2333
0.5		0.0	46		Fill: Silt with clay: dark brown (10YR 3/3), moist, soft, light burnt odor, 15% clay, 10% fine sand, 75% silt, low plasticity, non cohesive, trace rootlets near surface, trace fine angular gravel, trace charcoal	AF/ML	2737
1.0		0.0	53				3751
		0.0	56		headspace PID hit of 2.8ppm (1-2' hys)		4228
		0.0	55		Clay: light to brown (2.5Y 5/3), moist, stiff, no odor, 90% clay, 10% CaCO ₃ nodules and stringers, low plasticity, cohesive	CL	4317
2.0		0.0	50				4308
		0.0	52				3895
3.0		0.0	55				3833
		0.0	56				3708
4.0		0.0	56		At 5' hys 50% CaCO ₃ nodules and 50% clay for 4" thickness	CL	3829
		0.0	60				3579
5.0		0.0	33				3328
		0.0	35		Clay: Brown (2.5Y 5/4), moist, stiff, no odor, 10% silt, 90% clay, low plasticity, cohesive, abundant CaCO ₃ nodules and stringers		3326
6.0		0.0	35				3727

Radiological Background 36 / 2454				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 28	
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	35		Same as above: Clay	CL	3727
		0.0	40				3932
7.0		0.0	45				4239
		0.0	44				4256
8.0		0.0	47		Abundant CaCO ₃ nodules 60% volume	CL	4090
		0.0	52				3867
9.0		0.0	50		8'6" weathered sandstone & Pale yellow (2-5Y 8/4); moist, dense, no odor, mechanically weathered to fine-grained sandstone	Ss f c s	4077
		0.0	52				4331
10.0		0.0	50				NM
11.0		0.0			Total Depth: 10.0' bgs No GW encountered		
12.0		0.0					
13.0							



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8Ngrp.1	Location ID 29
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/1039	Date/Time Total Depth Reached 4-13-11/1045
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40057) (1045)		
Geologist C. Carmichael	Checked by/Date L. Deane Robbins/Goldner 9/14/11		

Radiological Background 11	Radiological Equipment Used up R. meter	PID Used Mini Rae 2000
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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	11	Clayey sand, (10 VR, 3/4), brown, 60% fine sand, 40% clay, trace gravel, semi-moist, common rootlets, low hardness and plasticity, no odor. No groundwater encountered.	SC	

Radiological Background 42 / 2428				Project Name SSFEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 29	
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	46	Clay with S.H. Same as above	CL	3204
			0.0	45	6'8" Abundant CaCO ₃ stringers		3489
7.0			0.0	49			3497
			0.0	45	Clay with S.H. Same as above, some CaCO ₃ stringers	CL	3751
8.0			0.0	50			4020
			0.0	50	8'3" some fine grained CaCO ₃ w/ 1" thick		4050
9.0			0.0	47	Clay with S.H. Same as above	CL	3865
			0.0	47			3901
10.0			0.0	50	4'8" Abundant fine grained CaCO ₃ and nodules w/ 4" thick	CL	4180
<p>Total depth 10.0' by 5 No GW encountered</p>							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8Ngrp-1	Location ID 30
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/1226	Date/Time Total Depth Reached 4-13-11/1230
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall. bag (# 40059) (1230)		
Geologist C. Carmichael	Checked by/Date LuAnn Collins Medwan 9/14/11		

Radiological Background 10	Radiological Equipment Used up R meter	PID Used Mini Rac 2000
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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 11	Clayey sand, (10YR, 3/4), brown, 70% fine to medium grained sand, 30% clay, some rootlets, semi-moist, medium dense, very low hardness and plasticity, no odor. No groundwater encountered	SC	

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8 N group 1	Location ID: 30
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4-27-11 1015	Date/Time Total Depth Reached: 4-27-11 1115
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected 40060 (1020) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date:		

Radiological Background: 50 / 2550	Radiological Equipment Used: Pancake / Downhole	PID Used: MiniRAE 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	45	surface soil and gravel		70.5 2682
0.5		0.0	0.0	47	Fill: Sandy silt; dark brown (7.5YR 3/3), moist, medium stiff, no odor, 35% fine sand, 60% silt, 5% angular siltstone	AF	3303
1.0		0.0	0.0	53	medium gravel, trace asphalt, trace pebbles, low plasticity, non cohesive	ML	4407
		0.0	0.0	54	At 1' 8" A 1" thick section of asphalt		4987
2.0		0.0	0.0	51	2' 10" Clay with silt; Brown (7.5YR 4/4), moist, medium stiff,	CL	4308
		0.0	0.0	62	no odor, 25% silt, 65% clay, 10% CaCO ₃ fine grained material and nodules and stringers, low plasticity, non cohesive		3795
3.0		0.0	0.0	65	3' 3" abundant CaCO ₃ nodules ~ 2" thickness		3488
		0.0	0.0	65	3' 7" CaCO ₃ fine material ~ 1/2" thick		3106
4.0		0.0	0.0	68	4' Abundant stringers CaCO ₃		3148
		0.0	0.0	68			3153
5.0		0.0	0.0	65	At 5' ~ 10% CaCO ₃ fine grained material and 60% clay	CL	3106
		0.0	0.0	58	Clay with silt: Same as above		3329
		0.0	0.0	55			3605
6.0		0.0	0.0	55			3507

Radiological Background 50 / 2550				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 8N / gyp. 1 / #30	
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)
6.0			0.0	55	At 6' Abundant CaCO ₃ stringers		3507
			0.0	58	6" x 1/4" seam of CaCO ₃ fire material	CL	3447
7.0			0.0	52	Clay with silt: Same as above except Strong brown (7.5YR 5/6), stiff, moist, no odor, 20% silt, 70% clay, 10% CaCO ₃		3681
			0.0	45			3830
8.0			0.0	48	At 8' Abundant CaCO ₃ nodules and CaCO ₃ fire material for 1' thickness 35% CaCO ₃ , 65% clay		3531
			0.0	49			3319
9.0			0.0	59	Clay with silt: Same as above	CL	3186
			0.0	65			3207
10.0			0.0	63			3450
<p>Total Depth: 10.0' bgs</p> <p>No GW encountered</p>							



Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp. 1	Location ID 31
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/travel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/1239	Date/Time Total Depth Reached 4-13-11/1238 1243
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40061) (1243)		
Geologist C. Carmichael	Checked by/Date L. Dan Roberts, M. Alden 9/14/11		

Radiological Background II	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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 II	Silty sand, (10YR, 3/4), brown, 60% fine sand, 35% silt, 5% gravel fill, common rootlets, dry, loose, no plasticity, no odor, piece of wire and iron found. No groundwater encountered.	SM	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 31
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-27-11 1145	Date/Time Total Depth Reached 4-27-11 1225
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40062 (1140) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Julian Robbins/Hedman 9/14/11		

Radiological Background 50 / 2597	Radiological Equipment Used Percutane / 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	45	Surface: grass and soil		2512
0.5			0.0	45	Fill: ^{CK} Clay Silty Clay: Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 40% silt, 60% clay, low plasticity, cohesive, trace fine to coarse sand, mottled	AF CL	3481 4416
1.0			0.0	54			4631
			0.0	50			4332
2.0			0.0	51			4221
			0.0	54	2'6" —————		4176
3.0			0.0	52	Clay with silt: Brown (7.5YR 4/4), moist, medium stiff, no odor, 25% silt, 65% clay, 10% CaCO ₃ nodules, stringers and fine grained material, low plasticity, cohesive	CL	3843
			0.0	56			3854
4.0			0.0	52	4' Abundant CaCO ₃ nodules		3742
			0.0	57			3636
5.0			0.0	62	4'10" Abundant CaCO ₃ nodules and fine grained CaCO ₃ , 40% CaCO ₃ , blocky	CL	3512
			0.0	48			2309
6.0			0.0	50			3322

Radiological Background 50 / 2597				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 31	
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)
6.0			0.0	50	Clay with silt: Same as above		3322
			0.0	52	6" -	CL	3115
7.0			0.0	55	Clay with silt: Strong brown (7.5YR 5/6), moist, stiff, no odor, 60% clay, 20% silt, 20% CaCO ₃ nodules/stringers and fine grained material, low plasticity, non cohesive	CL	2989
			0.0	61			2874
8.0			0.0	54	7'8" to 8' bgs heavily inundated CaCO ₃ stringers in the clay		2633
			0.0	56			2624
9.0			0.0	55	9' to 9'3" Abundant CaCO ₃ nodules		2620
			0.0	55			2560
10.0			0.0	50	Clay with silt: Same as above	CL	2684
<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 8N gp. 1	Location ID 32
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/1248	Date/Time Total Depth Reached 4-13-11/1255
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40063) (1255)		
Geologist C. Carmichael	Checked by/Date Julien Robbins/Hellman 9/14/11		

Radiological Background 11	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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	11	Silty sand, (10 VR, 3/4), brown, 65% fine sand, 30% silt, 5% gravel fill, dry, medium dense, no hardness or plasticity, no odor, common rootlets. No groundwater encountered	Sm	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SN Group 1	Location ID 32
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-27-11 1357	Date/Time Total Depth Reached 4-27-11 1415
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40064 (1400) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Julian Robbins Helman 9/14/11		

Radiological Background
39 / 2698

Radiological Equipment Used
Pancake / Downhole

PID Used
MiniRAE 2000 (Bkgd: 0.2 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)
			0.0	50			79.5' 2622 (CPM)
0.5			0.0	55	Silt; Brown (10YR 5/3), dry, medium stiff to soft, no odor, 10% fine sand, 10% clay, 80% silt, low plasticity, cohesive, trace rootlets	ML	3227
1.0			0.0	58			4496
			0.0	53	Clay with silt; Strong brown (7.5YR 4/6), moist, medium stiff, 20% silt, 80% clay, low plasticity, cohesive, trace CaCO ₃ stringers, trace coarse sand, trace CaCO ₃ nodules		4341
2.0			0.0	50			4318
			0.0	50			4392
			0.0	50			4476
3.0			0.0	54			4373
			0.0	62			4345
4.0			0.0	58			4100
			0.0	60			3867
5.0			0.0	57	Same as above; Clay w/ silt	CL	3497
			0.0	32			2808
			0.0	38	Clay with silt; Strong brown (7.5YR 4/6), moist, stiff, 20% silt, 80% clay, low plasticity, cohesive, (cont next page)		2372

Radiological Background				Project Name	Project Number	Location	
39 / 2698				SSFL Area IV Radiological Study	EP9038.01.22.04.03	32	
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	38		5'5" to 5'8" Abundant CaCO ₃ fine grained material (silt) and CaCO ₃ strings		2372
		0.0	47		6' silt. Clayey silt with abundant CaCO ₃ inclusions; Pale yellow (2.5Y 8/4), moist, medium stiff, no odor, 50% silt, 20% clay, 30% CaCO ₃	ML	1804
7.0		0.0	50			1594	
		0.0	49				1542
8.0		0.0	52			ML	1771
		0.0	30		same as above;		1850
9.0		0.0	48		increase brown color in clay ^{oil} area		2063
		0.0	52				2157
10.0		0.0	55				2146
<p>Total depth: 10.0' bgs No GW encountered</p>							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8 N grp.1	Location ID 33				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel / trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/ 1306	Date/Time Total Depth Reached 4-13-11/ 1310				
Type of Sampling Device stainless steel shovel			Samples Collected 1 1/2 gall. bag (#40065) (1310)					
Geologist C. Carmichael			Checked by/Date Julian Robbins / Yellman 9/14/11					
Radiological Background 11		Radiological Equipment Used M R meter		PID Used Mini Rae 2000				
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	11	Silty sand, (10 YR, 3/4), brown, 60% fine sand, 35% silt, 5% gravel fill, common rootlets, dry, loose, no plasticity or hardness, no odor. No groundwater encountered	SM		

Radiological Background				Project Name	Project Number	Location		
50 / 2541				SSFL Area IV Radiological Study	EP9038.01.22.04.03	33		
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		Clay: same as above	CL	4622	
		0.0	53				4337	
7.0		0.0	48				4184	
		0.0	45		Clay ^{w/silt} : Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 20% silt, 75% clay, 5% CaCO ₃ , some CaCO ₃ stringers, trace CaCO ₃ nodules, low plasticity	CL	3971	
8.0		0.0	44		7'8" CaCO ₃ fine grained material ~ 2mm wide		3929	
		0.0	43		8'6" CaCO ₃ fine grained material ~ 1mm wide	CL	3623	
9.0		0.0	55		9'0" Abundant CaCO ₃ nodules	CL	3320	
		0.0	52		4'6" Abundant CaCO ₃ nodules, stringers, and fine grained CaCO ₃ material ~ 50% CaCO ₃ / 50% clay		3113	
10.0		0.0	53		purple quartzite found at 10' bgs, cobble or gravel	CL	3055	
<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 8Ngrp-1	Location ID 34
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/1325	Date/Time Total Depth Reached 4-13-11/1329
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40067) (1328)		
Geologist C. Carmichael	Checked by/Date Julian Robbins/Goldman 9/14/11		

Radiological Background II	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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	II	Sand with clay, (10 YR, 3/3), brown, 80% fine sand, 20% clay, piece of glass found, common rootlets, dry, medium dense, no hardness or plasticity, no odor. No groundwater encountered.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N Group 1	Location ID 34
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0'
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-27-11 0850	Date/Time Total Depth Reached 4-27-11 0947
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected: 400 68 (0855) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Lu. Dan Robbins, L. Helman 9/14/11		

Radiological Background
46 / 2594

Radiological Equipment Used
Pancake / Downhole

PID Used
MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	RID	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: grass and soil		+0.5' 2419
0.5			0.0	42	Fill: Silty clay light olive brown (7.5YR 5/4) moist, medium stiff, no odor, 35% silt, 5% medium sand, 5% fine sand, 5% fine gravel, 50% clay, low plasticity, non cohesive, trace asphalt, trace granitic fine gravel, mottled, trace rootlets	AK / CL	2767
1.0			0.0	42			3853
			0.0	43			4142
			0.0	43			4151
			0.0	43			4126
2.0			0.0	43	Clay with silt: Brown (7.5YR 4/4), moist, stiff, no odor, 26% silt, 70% clay, 5% CaCO ₃ nodules and stringers, low plasticity, cohesive At 4.6" Abundant CaCO ₃ nodules up to 1/2" diameter	CL	4107
			0.0	49			3774
3.0			0.0	49			3815
			0.0	45			3667
			0.0	50			3712
4.0			0.0	53	Clay with silt: Same as above At 5' Abundant fine grained CaCO ₃ inundated into clay	CL	3912
			0.0	53			3575
5.0			0.0	55			3504
6.0			0.0	55			

Radiological Background 46 / 2594					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 34
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)
0.0			0.0	55	Same as above	CL	3904
			0.0	55			3679
2.0			0.0	56	Clay with silt and CaCO ₃ ; Strong brown (7.5YR 4/6), moist, stiff, no odor, 20% silt, 15% CaCO ₃ , 65% clay, low plasticity, non cohesive, CaCO ₃ stringers and nodules (trace), some areas heavily inundated with CaCO ₃ fine material within clay	CL	3518
			0.0	53			3609
8.0			0.0	45	7' 2" Abundant and thick CaCO ₃ stringers in clay 7' 5" Abundant CaCO ₃ stringers and some nodules		3332
			0.0	48			3401
4.0			0.0	45	8' 7" Abundant CaCO ₃ nodules and fine CaCO ₃ material in clay		3054
			0.0	43	9' 5" Abundant and thick (>2mm) CaCO ₃ stringers, abundant CaCO ₃ fine material and trace nodules		3068
10.0			0.0	44			3131
<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 8Ngrp.1	Location ID 35
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/1339	Date/Time Total Depth Reached 4-13-11/1343
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40069) (1343)		
Geologist C. Carmichael	Checked by/Date Duane Robbins/Heldman 9/14/11		

Radiological Background 11	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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	11	Clayey sand, (10YR, 3/6), reddish-brown, 55% fine sand, 45% clay, Common rootlets, semi-moist, medium dense, low-medium hardness and plasticity, no odor. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP0038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 35
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-26-11 1515	Date/Time Total Depth Reached 4-26-11 1615
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40070 (1530) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date John Robbins Yedman 9/14/11		

Radiological Background 55 / 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 <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	50	Surface soil and grass		4052	2602	
0.5			0.0	54	Foil Clay with silt; Strong brown (7.5YR 5/8), moist, medium stiff, no odor, 25% silt, 75% clay, trace asphalt, mottled, low plasticity, cohesive, medium toughness	AF	3454		
1.0			0.0	42		CL	4420		
			0.0	42				4333	
			0.0	42				4512	
2.0			0.0	50	Clay with silt; Strong brown (7.5YR 5/8), moist, medium stiff, no odor, 20% silt, 80% clay, trace CaCO ₃ stringers, low plasticity, cohesive	CL	4541		
			0.0	52			4447		
			0.0	50			4214		
3.0			0.0	42	3'7" - Clay with silt; Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 20% silt, 80% clay, some CaCO ₃ stringers and nodules	CL	4008		
4.0			0.0	44			3993		
			0.0	44			3738		
5.0			0.0	48	Clay with silt; Brownish yellow (10YR 6/6), moist, stiff, no odor, abundant CaCO ₃ inclusions, low plasticity, non cohesive, 20% silt, 80% clay	CL	3697		
			0.0	45			3658		
			0.0	42			3515		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp.1	Location ID 36
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1423	Date/Time Total Depth Reached 4-12-11/1430
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40071) (1430)		
Geologist C. Carmichael	Checked by/Date J. Dan Robbins & Moldman 9/14/11		

Radiological Background 11	Radiological Equipment Used up Rater	PID Used Mini Rae 2000
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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	11	Clayey sand, (10 YR, 3/3), brown, 60% fine sand, 40% clay, semi-moist, common rootlets, no low plasticity and hardness, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N group 1	Location ID: 36
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4-25-11 1000	Date/Time Total Depth Reached: 4-25-11 1115
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 40072 (1010) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: Lul Dan Robinson Alderman 9/14/11		

Radiological Background: 38 / 2530	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>
					Surface: grass and soil		10.5' 2423 (CPM)
0.5		0.0	60		Silt with clay: dark yellowish brown (10YR 4/4), moist, soft; no odor, 25% clay, 75% silt, cohesive, low plasticity, low toughness	ML	3641
1.0		0.0	62				4244
		0.0	68				4334
		0.0	67				4558
2.0		0.0	64				4344
		0.0	62		2' 2" Clay with silt: Brown (10YR 4/3), moist, medium stiff, no odor, 20% silt, 80% clay, trace CaCO ₃ stringers	CL	4453
3.0		0.0	61				4460
		0.0	70				4594
4.0		0.0	65				4432
		0.0	57				4565
5.0		0.0	54		No Recovery		4651
		0.0	55		Same as above: CL	CL	4647
6.0		0.0	60				4704

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 1	Location ID 37
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1445	Date/Time Total Depth Reached 4-12-11/1450
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gally bag (#40073) (1450)		
Geologist C. Carmichael	Checked by/Date Ludla Robbins Goldman 9/15/11		

Radiological Background 11	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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	11	Clayey sand, (10YR, 3/2), to dark brown, semi-moist, 60% fine sand, 40% clay, common rootlets, low-medium plasticity and hardness, no odor. No groundwater encountered	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N Group 1	Location ID 37
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 101.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-25-11 0835	Date/Time Total Depth Reached 4-25-11 0945
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40074 (0840) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Julian Robbins Feldman 9/15/11		

Radiological Background 36 / 251A	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 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)
			6.0	5.0	Surface (grass and soil)		+0.5 2299
0.5		0.0	45		Clay with silt Silt with clay : dark yellowish brown (10YR 3/4) moist, medium stiff, no odor, 25% silt, 75% clay, medium plasticity, medium toughness, high dry strength, rootlets in upper surface, cohesive	CL ML CL	2916 4115 4282
1.0		0.0	45				4347
2.0		0.0	50				4444
		0.0	45				4475
3.0		0.0	45				4395
		0.0	50				4389
4.0		0.0	60		Same as above: CL 25% silt, 70% clay, 5% medium sand		4327
		0.0	60		No Recovery		4356
5.0		0.0	54				4430
		0.0	54		Clay: Brown (7.5YR 4/4), moist, stiff, no odor, 10% silt, 90% clay, trace carbon flecks, cohesive, medium plasticity, medium dry strength, medium toughness	CL	4604
6.0		0.0	51				4500

Radiological Background 36/2512				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 37	
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	51		Same as above: Clay	CL	4500
		0.0	50				4533
7.0		0.6	52				4759
		0.0	56				4656
8.0		0.0	54				4519
		0.0	51				4602
9.0		0.0	45				4447
		0.0	38				4637
10.0		0.0	38				4548
					Total depth : 10.0' hrs		
					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 8N	Location ID 38
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/0850	Date/Time Total Depth Reached 4-13-11/0855
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40075) (0855)		
Geologist C. Carmichael	Checked by/Date Jul Clark Rollins/Goldman 9/15/11		

Radiological Background 10	Radiological Equipment Used M/R meter	PID Used Mini Rae 2000
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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'				11	Clayey sand, (10YR, 4/3), brown, 60% fine to medium grained sand, 40% clay, some rootlets, semi-moist, medium dense, low-medium hardness and plasticity, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 38
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-25-11 1145	Date/Time Total Depth Reached 4-25-11 1230
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected 46076 (1150) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Ludlow Robbins Medman 9/15/11		

Radiological Background: 38 2554 / 2588
 Radiological Equipment Used: Pancake / Downhole
 PID Used: MiniRAE 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: grass and soil		+0.5' 2391
0.5		0.0	66		Clay with silt: Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 20% silt, 80% clay, low plasticity, cohesive, trace charcoal near surface, trace rootlets near surface, medium toughness		3715
		0.0	62			CL	4188
1.0		0.0	58				4342
		0.0	53				4399
2.0		0.0	50				4421
		0.0	48				4573
3.0		0.0	50				4520
		0.0	48				4292
4.0		0.0	50				4235
		0.0	52			At 4'6" Clay, same as above 20% silt, 70% clay, 10% CaCO ₃ nodules and stringers	CL
5.0		0.0	41				4062
		0.0	52				4174
6.0		0.0	47				4162

Radiological Background 38/2588				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 38		
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	52		At 6' bgs abundant $CaCO_3$ precipitate in the form of nodules and stringers at 40% $CaCO_3$, 60% clay same as above. Strong reaction with HCl.	CL	4162	
		0.0	47				4076	
7.0		0.0	52			CL	4162	
		0.0	55		4133			
8.0		0.0	59		At 8' bgs ^{ok} $CaCO_3$ fine grained lenses of $CaCO_3$ sand	CL	4318	
		0.0	54		3908			
9.0		0.0	57			CL	4104	
		0.0	56		4151			
10.0		0.0	60		Clay same as above		4350	
<p>Total depth 10.0' bgs No GW encountered</p>								
11.0								
12.0								
13.0								



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp.1	Location ID 39
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/1014	Date/Time Total Depth Reached 4-14-11/1017
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40077) (1015)		
Geologist C. Carmichael	Checked by/Date John Robbins Goldman 9/15/11		

Radiological Background 14	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000
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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'				14	Sand with silt and gravel, (10 YR, 4/4), brown, 70% fine to medium grained sand, 15% silt, 15% cobbles/rock fragments/asphalt, dry, medium dense, no plasticity or hardness, no odor. No groundwater encountered.	SM	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group B N 5X ^{CL} Group 1	Location ID 39
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-28-11 1420	Date/Time Total Depth Reached 4-28-11 1530
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40078 (1430) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date		

Radiological Background 44 / 2560	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 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 (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: grass and soil		+0.5' 3049
0.5			0.0	48	Silty sand w/ gravel; Brown (10YR 5/3), dry, moist loose, no odor, 70% silt, 50% fine sand, 20% angular fine to coarse gravel (fill rock)	AF / SM	3941
1.0			0.0	51			4822
1.0			0.0	52	1' 3"		5249
2.0			0.0	55	Sandy silt w/ gravel; dark brown (10YR 3/3), moist, soft, no odor, 30% fine sand, 65% silt, 15% angular fine to medium gravel, low plasticity, non cohesive.	AF / ML	5174
2.0			0.0	57			5086
3.0			0.0	58	2' 6"		5147
3.0			0.0	58	Clay with silt; Dark brown (10YR 3/3), moist, medium stiff, no odor, 35% silt, 75% clay, low plasticity, cohesive, medium toughness; pin hole pores - trace.	CL	5366
4.0			0.0	60			5270
4.0			0.0	67	No Recovery		5196
5.0			0.0	53			5052
5.0			0.0	58			4902
6.0			0.0	37	Clay; dark brown (7.5YR 3/4), moist, medium stiff, no odor, 10% silt, 90% clay, low plasticity cohesive, trace CaCO ₃ stringers	cl	4816
6.0			0.0	42			4509

Radiological Background 44 / 2560				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 39	
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	42		Clay: same as above	CL	4509
		0.10	48				4468
7.0		0.0	46		7'3" Sandy silt: brownish yellow (10YR 6/6), moist, medium stiff, no odor, 18% coarse sand, 16% med. fine sand, 5% fine sand, 70% silt, low plasticity, non cohesive, trace mottling	ML	4419
		0.0	42				4551
8.0		0.0	45		9'3" Silty sand Sandy silt with gravel: yellowish brown (10YR 5/4), moist, dense, no odor, 35% silt, 15% fine gravel, 10% coarse sand, 10% medium sand, 30% fine sand	SM	4726
		0.0	45				4379
9.0		0.0	50				4421
		0.0	45				4293
10.0		0.0	53				3855
<p>Total Depth 10.0' bgs No GW encountered</p>							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N	Location ID 40
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/0959	Date/Time Total Depth Reached 4-14-11/1004
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 galy bag (#40079) (1003)		
Geologist C. Carmichael	Checked by/Date Julian Robbins/Gelman 9/15/11		

Radiological Background 4	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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 12	Sand with silt, (10 YR, 4/4), brown, 70% fine to medium grained sand, 20% silt, 10% rock fragments (sandstone and asphalt), common rootlets, dry, medium dense, no odor. No groundwater encountered.	SM		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 4D
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-29-11 0810	Date/Time Total Depth Reached 4-29-11 0920
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40080 (0815) (1) 1/2 gallon bag		
Geologist C. Knight	Checked by/Date L. Dan Robbins/J. Edman 9/15/11		

Radiological Background 48 / 2562	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)
					AF; Artificial Fill (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		+0.5' 2686
					Surface is sand and soil		
0.5			0.0	27	Silt, Sand: Dark yellowish brown (10YR 4/4) moist, medium dense, no odor, 40% silt, 10% angular fine to medium gravel (fill rock), 30% fine sand, 10% medium sand, 10% coarse sand, rootlets in upper surface, trace asphalt	AF	3637
			0.0	26			4577
1.0			0.0	40			4989
			0.0	50			5104
2.0			0.0	55	18" Clay: dark brown (10YR 3/3), moist, stiff, no odor, 10% silt, 90% clay, low plasticity, cohesive, trace stringers	CL	5185
			0.0	40			4973
3.0			0.0	41			4707
			0.0	34			4696
4.0			0.0	51			4625
			0.0	44	No Recovery		4629
5.0			0.0	48			4706
			0.0	50	Clay: Same as above, some CaCO ₃ stringers	CL	4647
6.0			0.0	52			4486

Radiological Background					Project Name	Project Number	Location
48 / 2562					SSFL Area IV Radiological Study	EP9038.01.22.04.03	40
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				52	Same as above: Clay	Cb	4486
				70			4427
7.0				75			4169
				58	Sandy Silt: light yellowish brown (2.5Y 6/4), moist, medium stiff, no odor, 35% fine to coarse sand, 65% silt, non-cohesive, low plasticity	ML	3445
				54			3735
8.0				44			3732
				32			3762
9.0				32	8'7" Silt with clay: Brown (7.5YR 4/4), moist, medium stiff, no odor, 20% clay, 80% silt, blocky texture, abundant cracks, some CaCO ₃ stringers	ML	3745
				37			4178
					Total depth: 10.0' bgs No GW encountered		

Radiological Background 48 / 2500				Project Name SSFEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 41	
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	68	Clay with silt: Same as above 6'2" trace CaCO ₃ nodules	CL	4590
			0.0	70			4571
7.0			0.0	70	6'9" some CaCO ₃ nodules		4559
			0.0	65	8'7" some CaCO₃ stringers (CL)		4611
8.0			0.0	62			4300
			0.0	61	8'7" some CaCO ₃ stringers		4353
9.0			0.0	63			4282
			0.0	60	Clay with silt: partially inundated w/ CaCO ₃	CL	4180
10.0			0.0	60			4078
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 & Group 8N group 1	Location ID 42
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0'
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-28-11 0950	Date/Time Total Depth Reached 4-28-11 1050
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 4/082 (0955) (1) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date L. D. Robinson / J. D. Man 9/15/11		
Radiological Background 41 / 2483		Radiological Equipment Used Pancake / Downhole	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	
							Inches	(CPM)
			0.0	40	Surface: concrete V-ditch, grass and soil		10.5'	2467
0.5			0.0	49	Clay: dark yellowish brown (10YR 3/4), dry, medium stiff, no odor, 10% silt, 90% clay, non-cohesive, low plasticity, medium toughness	CL		3091
1.0			0.0	48		CL		3998
					12" - - - - -			4206
			0.0	50	Clay with silt: Brown (7.5YR 4/4), moist, medium stiff, no odor, 25% silt, 75% clay, low plasticity, medium toughness, cohesive, some CaCO ₃ stringers			4337
2.0			0.0	MS		CL		4244
			0.0	51				4328
3.0			0.0	55				4441
			0.0	53				4420
4.0			0.0	40				4434
			0.0	60				4468
5.0			0.0	60				4606
			0.0	37	Clay with silt: same as above			4486
6.0			0.0	35		CL		4516

Radiological Background					Project Name	Project Number	Location	
41 / 2485					SSFL Area IV Radiological Study	EP9038.01.22.04.03	42	
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	35	Clay with silt: same as above	CL		4516
			0.0	36	— — — — —			4321
7.0			0.0	39	Clay with silt and CaCO ₃ ; Light brown (7.5YR 6/3), moist, medium stiff, no odor, 20% silt, 55% clay, 25% CaCO ₃ stringers, nodules or fine grained CaCO ₃ material, low plasticity, horn cohesive, very inundated with CaCO ₃	CL		3995
			0.0	47				3687
8.0			0.0	49	7' 0" Abundant CaCO ₃ nodules			3295
			0.0	55	8' 0" Abundant fine grained CaCO ₃ material and nodules			3048
9.0			0.0	49	4' 0" Abundant fine grained CaCO ₃ material 60% CaCO ₃ /40% clay			3081
			0.0	47		CL		2548
10.0			0.0	49				3027
					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 8N-Grp 1	Location ID #43
Drilling Company Boart Longyear LRS none HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth ft. bgs
Drilling Equipment Ereoprobe 6600	Borehole Diameter 3 3/4" ISA 3 1/4"	Date/Time Drilling Started 5/27/11 - 1137	Date/Time Total Depth Reached 5/27/11 - 1320
Type of Sampling Device 3 1/4" Macrocore	3 1/4" Hand auger	Samples Collected (1) 1/2 gallon bags	40083 (1140)
Geologist L Robbins Goldman	Checked by/Date L Robbins Goldman 9/15/11		

Radiological Background 61 / 2625	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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches +0.5 = 2604 (CPM)
			0.0	70	silt w/ sand: dark brown (10yr 3/3), moist, fine soil; no odor, 85% silt, 5% fine med sand, 10% fine sand, low plasticity, cohesive, low toughness, med dry strength, no dilatancy, trace rootlets, pin hole pores, trace charcoal flecks, (1-5mm), trace angular non-native rocks, trace CaCO ₃ nodules, trace Fe-oxidation nodules		3135
0.5			0.0	75		3951	
1.0			0.0	80		4198	
			0.0	90		4383	
2.0			0.0	70		ML 4306	
			0.0	60		4215	
3.0			0.0	69		4317	
			0.0	75		4391	
4.0			0.0	75		4522	
			0.0	55		4474	
5.0			0.0	95	4581		
			0.0	70	4646		
6.0			0.0	100	4723		

Radiological Background 6V 2025 cpm				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 8N-Grp 1 - #43		
Depth	Interval	Recovery	PTD	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)
6.0		0.0	100	Silt w/ sand (same as previous unit)				4723
		0.0	80					
7.0		0.0	82	- 7'0" - unit same as above except for color - change: yellowish brown (10YR 5/4)		ML		4589
		0.0	70					4600
		0.0	70					4464
8.0		0.0	73					4652
		0.0	90			ML		4693
9.0		0.0	85					4651
		0.0	75					4446
10.0		0.0	80					4457
				Total depth = 10' bgs Hand augured 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 8 N _{gr.1}	Location ID 44
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/0923	Date/Time Total Depth Reached 4-14-11/0926
Type of Sampling Device Stainless Steel shovel	Samples Collected 1 1/2 gall bag (#40084) (0925)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Goldman 9/15/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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	12	Sand with clay, (10 YR, 3/3), brown, 80% fine sand, 20% clay, common rootlets and plant matter, dry, loose, no plasticity or hardness, no odor. ~2-3" of soil or plant matter No groundwater encountered.	SC		



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N app. 1	Location ID 45				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/1359	Date/Time Total Depth Reached 4-13-11/1405				
Type of Sampling Device stainless steel shovel			Samples Collected 1 1/2 gall bag (#40085) (1405)					
Geologist C. Carmichael			Checked by/Date J. Robbins Feldman 9/15/11					
Radiological Background II		Radiological Equipment Used up R meter		PID Used Mini Rae 2000				
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	II	Silty sand, (10 YR, 3/4), brown, 60% fine sand, 35% silt, 5% rock fragments (concrete, sandstone), common rootlets, dry, loose, no plasticity or hardness, no odor. ~4 ft depth in trench No groundwater encountered.	SM		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8Ngrp.1	Location ID 46
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-13-11/0833	Date/Time Total Depth Reached 4-13-11/0840
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40086) (0840)		
Geologist C. Carmichael	Checked by/Date Duane Robinson, 9/15/11		

Radiological Background 10	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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 10	<p>Silty sand, (10 VR, 4/3), brown, 60% fine sand, 40% silt, common rootlets, dry, loose, no hardness or plasticity, no odor.</p> <p>Only about 3" of sediment in drainage.</p> <p>No groundwater encountered.</p>	SM	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8 N grp. 1	Location ID 47				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1330	Date/Time Total Depth Reached 4-12-11/1335				
Type of Sampling Device stainless steel shovel			Samples Collected 1 1/2 gall bag (#40087) (1335)					
Geologist C. Carmichael			Checked by/Date Julie Robbins Goldman 9/15/11					
Radiological Background 11		Radiological Equipment Used M/R meter		PID Used Mini Ra2 2000				
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'			0.2	11	Clayey sand, (10 YR, 4/3), brown, 70% fine sand, 30% clay, common rootlets, dry, loose, black netting in drainage ~ 2" deep, no plasticity or hardness, no odor. No groundwater encountered	SC		



Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID 8N grp. 1	Location ID 48
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1008	Date/Time Total Depth Reached 4-12-11/1014
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall. bag (#40088) (1012)		
Geologist C. Carmichael	Checked by/Date John Robbins Aldman 9/15/11		

Radiological Background
12

Radiological Equipment Used
up R meter

PID Used
Mini Rac 2000

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	11	Clayey sand, (10YR, 3/2), brown, 55% fine sand, 45% clay, common rootlets, black plastic net/mesh in drainage - throughout sample, dry, loose, medium plasticity and hardness, no odor.	SC		
No groundwater encountered								



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 N grp.1	Location ID 49
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-11-11/1319	Date/Time Total Depth Reached 4-11-11/1325
Type of Sampling Device stainless steel shovel, trowel	Samples Collected 1 2 1/2 gall bag (# 40089) (1325)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Goldman 9/15/11		

Radiological Background 11	Radiological Equipment Used up R meter	PID Used Mini Rac 2000
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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'				11	Sand with clay, (10YR, 4/4), brown, 70% fine grained sand, 30% clay, dry, medium dense, common rootlets, low hardness and very low plasticity, no odor.	SC	

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N group 1	Location ID: 49
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 9.0'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4-24-11 1020	Date/Time Total Depth Reached: 4-24-11 1120
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected 40090 (1025) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: J. Dan Robbins/Meldman 9/15/11		

Radiological Background: 54 / 2534	Radiological Equipment Used: Pencate / Downhole	PID Used: MiniRAE 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	34	Surface: Soil @ grade		+05 2446 (CPM)
0.5			0.0	36	Sandy silt: Strong brown (7.5Y 5/6), moist, medium stiff, no odor, 25% fine sand, 10% medium sand, 65% silt, trace rathlets near surface, low plasticity, non cohesive	ML	2881 4070
1.0			0.0	38			4392
			0.0	58	1'3" Silty Sand: Brown (7.5YR 5/4), moist, medium dense, no odor, 40% silt, 30% fine sand, 20% medium sand, 10% coarse sand, slow to rapid dilatancy	SM	4676
2.0			0.0	61			4686
			0.0	43			4882
3.0			0.0	44			4939
			0.0	43			4993
4.0			0.0	48			4990
			0.0	60	Same as above: Silty Sand		4943
5.0			0.0	55		SM	5238
			0.0	65	Sandy silt with clay: Strong brown (7.5YR 5/6), moist, medium stiff, no odor, 15% clay, 5% medium sand, 25% fine sand, 55% silt, low plasticity, non cohesive	ML	5216
6.0			0.0	75			5279

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 N grp.1	Location ID 50
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1038	Date/Time Total Depth Reached 4-12-11/1057
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40091) (1048) Field Dup: 40259 (NT)		
Geologist C. Carmichael	Checked by/Date J. Dan Robbins/Yeldman 9/14/11		

Radiological Background II	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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 II	Clayey sand, (10 YR, 3/3), brown, 60% fine sand, 40% clay, common rootlets, semi-moist, loose, low plasticity and hardness, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 1	Location ID 50
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-2-11 6:40	Date/Time Total Depth Reached 5-2-11 1:00
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected 400 g (0.950) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Lucretia Dennis Sedman 9/15/11		

Radiological Background 78 / 2396	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 9.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include Ethology, 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		Surface 2' gravel and soil		1052562
0.5			0.0		Silt: Brown (7.5YR 4/4), moist, medium stiff, no odor, 10% fine sand, 10% clay, 80% silt, cohesive, low plasticity, gravellets in upper surface	ML	3000
1.0			0.0			4260	
			0.0			4775	
			0.0			4715	
2.0			0.6			4833	
			0.0		Clay: Brown (7.5YR 4/4), moist, medium stiff to stiff, no odor, 10% silt, 90% clay, cohesive, low plasticity, medium toughness	CL	4693
3.0			0.0			4752	
			0.0			4819	
4.0			0.0			4875	
			0.6			5059	
5.0			0.0		4' 7" Sandy silt: Strong brown (7.5YR 4/6), moist, stiff, no odor, 5% coarse sand, 5% medium sand, 20% fine sand, 60% silt, cohesive, low plasticity, low toughness	ML	4859
			0.0			4825	
6.0			0.0			4925	



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N grp 2	Location ID 51				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-18-11/1311	Date/Time Total Depth Reached 4-18-11/1315				
Type of Sampling Device stainless steel shovel			Samples Collected 1 8-oz jar 1 1/2 gall bag (#40095) (1315)					
Geologist C. Carmichael			Checked by/Date Ludan Robbins, Eldman 9/15/11					
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Ra2 2000				
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'				0.4-13	<p>Clayey sand, (10 YR, 4/3), brown, 70% fine sand, 30% clay, semi-moist, medium dense, some rootlets, low hardness and plasticity, no odor.</p> <p>No groundwater encountered.</p>	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SN group 2	Location ID 51
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8' 10" ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-6-11 0855	Date/Time Total Depth Reached 6-6-11 0930
Type of Sampling Device 1 3/4" Macrocore	Samples Collected NO SAMPLE Collected () 1/2 gallon bags		
Geologist C. Knight	Checked by Date Julian Roberts Feldman 9/19/11		

Radiological Background 45cpm/10MR	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)
0.5			0.0	55	Surface; grad sand soil		
0.5			0.0	80	Fill: Clayey silt with sand; pale brown (10YR 6/3), dry, ^(CK) soft, no odor, 30% clay, 15% fine sand, 55% silt; low plasticity, cohesive, mottled, trace rootlets near surface	AF/ML	
1.0			0.0	75			
			0.0	62			
2.0			0.0	55			
			0.0	60			
3.0			0.0	64	Fill: ^(CK) Clay with silt and sand; yellowish brown (10YR 5/4), dry, medium stiff, no odor, 20% silt, 15% fine sand, 5% medium sand, 60% clay, cohesive, medium plasticity, trace root and rootlets, mottled	AF/CL	
			0.0	70			
4.0			0.0	66			
			0.0	60			
5.0			0.0	50	No recovery		
			0.0	48	Same as above:		
6.0			0.0	56			

Radiological Background					Project Name	Project Number	Location
45 / 10 MR					SSFL Area IV Radiological Study	EP9034.01.22.04.03	51
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)
6.0		0.0	55		Same as above	AK / CL	
		0.0	50				
7.0		0.0	53				
		0.0	60				
8.0		0.0	58		7'9" - Fill: clay; dark grayish brown (10YR 3/2), dry, stiff, no odor, 5% fine gravel, 5% silt, 5% fine sand, 85% clay, cohesive, low plasticity, mottled	AK / CL	
		0.0	53				
9.0					8'10" -		
					<ul style="list-style-type: none"> • Refusal on sandstone at 8'10" by 5 • No GW encountered encountered • Sandstone noted in macrocore shoe at refusal depth • Able to widen boring with 3.25" Macro-core to refusal depth • Bore hole stayed open upon remaining 3.25" Macrocore 		
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 8N group 2	Location ID 51
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 0' 8" 8" 8" 10" ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-17-11 0940	Date/Time Total Depth Reached 6-17-11 1045
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 40096 (0945) (1) 1/2 gallon bags + (1) 4oz Jar		
Geologist C. Knight	Checked by/Date J. Dan Robbins/H. Helman 9/19/11		

Radiological Background 46 / 225cpm	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: grass and soil		2502
0.5			0.0	65	Fill: silt with clay: Yellowish brown (10YR 5/4), dry, medium dense, no odor, 10% clay, 90% silt, cohesive, low plasticity, low toughness, trace rootlets	AF / ML	2782
			0.0	61			3790
1.0			0.0	72	1'4"		3633
			0.0	65	Fill: Silty clay with sand: light yellowish brown (10YR 6/4), moist, medium dense ^{stiff} , no odor,	AF / CL	3643
2.0			0.0	60	25% silt, 10% fine sand, 65% clay, medium plasticity, medium toughness, cohesive, mottled		3660
			0.0	58			3793
3.0			0.0	63	3' subangular quartzite gravel 3/4" diameter		3860
			0.0	80	3'6"		3904
4.0			0.0	55	Fill: Silty clay: light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 20% silt, 80% clay, low plasticity, low medium toughness, cohesive	AF / CL	3702
			0.0	59	4' trace rootlets		3689
5.0			0.0	60			3791
			0.0	60			3783
6.0			0.0	77	Same as above	AF / CL	4215

Radiological Background 46/2255				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 51	
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			0.6	77	Same as above		4215
			0.0	68	6'6" asphalt piece 1/2" diameter	AF CL	4264
7.0			0.0	76			4101
			0.0	60	Sandy clay with silt, light yellowish brown (10YR 6/4), moist, stiff, no odor, 25% coarse sand, 5% medium sand, 15% fine sand, 20% silt, 55% clay, low plasticity, medium toughness, non-cohesive		3978
8.0			0.0	65	Weathered Sandstone Bedrock: Pale yellow (5Y 7/4), dry, dense, no odor, fine grained Sandstone	AF CL	4355
			0.0	72	8'4" Sandstone		4602
8'10"					Refusal at 8'10" on sandstone No GW encountered	DRILL	
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 8N gp.2	Location ID 52
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-18-11/1326	Date/Time Total Depth Reached 4-18-11/1339
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1 1/2 gall bag (#40097) (1330)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Medmar 9/19/11		

Radiological Background 14	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000
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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'			0.4	13	Sand with clay, (10 YR, 4/4), brown, 80% fine sand, 20% clay, dry, dense, common rootlets, no plasticity, very low hardness, no odor. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N Group 2	Location ID: 52
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-6-11/1012	Date/Time Total Depth Reached: 5-6-11/1026
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: (1) 1/2 gallon bags, 1 4-oz jar (#40098) (1100)		
Geologist: C. Carmichael	Checked by/Date: Julian Robbins Goldman 9/19/11		
Radiological Background: 42 / 2724	Radiological Equipment Used: Pancake / Downhole 4R meter	PID Used: MiniRAE 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	43	AF: Artificial Fill (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)		0.5 - 266
1.0			0.0	47	Clay with silt and sand, (10 YR, 5/4), light brown with orange and tan speckles, 60% clay, 20% silt, 20% fine sand, brown plastic netting on surface, dry, medium stiff, low-medium plasticity and hardness, no odor.	AF/CL	0 - 302
2.0			0.0	46			3782
			0.0	52			3824
			0.0	48			4048
			0.0	2.25'			4344
3.0			0.0	66	Clay with silt and sand, (10 YR, 3/3), dark brown, 50% clay, 25% silt, 20% fine sand, 5% gravel fill, dry, medium stiff, low plasticity and hardness, no odor.	CL	4264
			0.0	64	Same as 0' - 2.25'	CL	4270
			0.0	58			4126
			0.0	55			4070
			0.0	64			4048
4.0			0.0	75	5' Same as above, except flakey and brittle texture.		4268
			0.0	86			4598
5.0			0.0	89			4383
6.0			0.0				

Radiological Background 42/2724					Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 52
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	76	Same as above - Clay with silt and sand	CL	4298
7.0			64	4236			
			40	4242			
8.0			51	4262			
			46	4327			
9.0			78	4658			
			70	4756			
10.0		V	73		Refusal at 10' No groundwater reached.		4813
11.0							
12.0							
13.0							



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 2	Location ID 53
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-18-11/1341	Date/Time Total Depth Reached 4-18-11/1345
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1 1/2 gallon bag (# 40099) (1345)		
Geologist C. Carmichael	Checked by/Date Julie Robbins Feldman 9/19/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Ra2 2000
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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'				0.5' 14	Sand with clay, (10 YR, 4/4), brown, 80% fine sand, 20% clay, dry, medium dense, common rootlets, low hardness, no plasticity, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study		Project Number EP0038.01.22.04.03	Subarea ID & Group 2 8N	Location ID 53
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8'
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-6-11/1155	Date/Time Total Depth Reached 5-6-11/1206
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected (1) 1/2 gallon bags, 14-oz jar (#40100) (1220)		
Geologist C. Carmichael		Checked by/Date Julian Robbins Feldman 9/19/11		
Radiological Background 51 / 2848	Radiological Equipment Used Pancake / Downhole 4R meter		PID Used Mini-RAE 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	RID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	UNCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.0		0.0	84	84	AF: Artificial Fill		0.5-264
0.5		0.0	68	84	Clay with silt and sand, (10 YR, 5/4), light brown with tan and orange/red speckles, 60% clay, 20% silt, 20% fine sand, dry, medium stiff, brown plastic netting on surface, low-medium plasticity and hardness, no odor.	AF/CL	3857
1.0			84	85			3924
			85	85			3950
2.0			82	82		2.25'	4233
			94	94		Same as above, except dark brown (10 YR, 3/3)	4311
3.0			53	53	2.75'	4192	
			88	88	Same as 0' - 2.25'	4025	
4.0			96	96		4334	
			58	58		4383	
5.0			58	58	5'	4574	
			78	78	Same as 0' - 2.25' and 2.75' - 5', except stiff and flakey.	4684	
6.0			56	56		4527	

Radiological Background					Project Name	Project Number	Location
51 / 2848					SSPL Area IV Radiological Study	EP9038.01.22.04.03	53
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)
6.0			0.0	69	Same as above - Clay with silt and sand	CL	4350
7.0				78			4462
7.5			57	7.5'	Gravel fill rock (10YR, 6/1), gray, well sorted, 90% gravel, 10% clay, no odor	AF/GW	4380
8.0		V	91		Same as 5' - 7.5'	AF/CL	4916
					Refusal at 8'		
					No groundwater reached.		
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 8N grp2	Location ID 54				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/1323	Date/Time Total Depth Reached 4-15-11/1328				
Type of Sampling Device stainless steel shovel			Samples Collected 1 8-oz jar 1 1/2 gall bag (# 40101) (1328)					
Geologist C. Carmichael			Checked by/Date LuAnn Robbins Goldman 9/19/11					
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rae 2000				
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'				0013	Clayey sand, (10 YR, 4/4), brown, 70% fine sand, 30% clay, common rootlets, semi-moist, medium dense, low plasticity and hardness, no odor. No groundwater encountered.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5BN, group 2	Location ID 54
Drilling Company Boart WG HGT Longyear	Driller D. Hansen T. Morse WG	Ground Elevation NA	Total Drilled Depth 7'3" bgs.
Drilling Equipment 1 3/4" Macro WG hand auger	Borehole Diameter WG 1 3/4"	Date/Time Drilling Started 6-17-11 / 1413	Date/Time Total Depth Reached 6-17-11 / 1602
Type of Sampling Device WG 2 3/4" hand auger	Geoprobe 6600	Samples Collected 1 1/2 gall bag (#40102)	(1500)
Geologist C. Carmichael Knight	Checked by/Date Julian Rollins Feldman 7/19/11		

Radiological Background 58/2701 cpm	Radiological Equipment Used Downhole scanner, HP meter, Pancake meter etc	PID Used Mini Rae 2000	Background: (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 and soil		2602
			53		AF: Artificial Fill		3283
			63		Fill: silt with clay: yellowish brown (10YR 5/4), dry, medium dense, no odor, 10% clay, 90% silt,	AF/ML	3855
			64		cohesive, low plasticity, medium toughness, trace rootlets		3813
			60				3749
2'			66		2' Fill: silty clay: light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 35% silt, 65% clay, medium plasticity, medium toughness, cohesive	AF/CL	3812
			64				3840
			62				3746
			62				3762
4'			57		Same as above: 15% silt, 85% clay, stiff		4086
			49				4288
5'			58				4397
			68		Same as above	AF/CL	4299
6'			53				4513

Radiological Background				Project Name	Project Number	Location	
58/2701				SSPL Area IV Radiological Study	EP9034.01.22.04.03	54	
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	53	Same as above; Silty clay	AF CL	4513
			0.0	57	Sandstone: Pale yellow (2-5 7/16), dry, dense, no odor, fine grained sandstone		4416
7.0			0.0	58			4732
					7'2" 7'3"	No GW	4949 (7'3")
					Refusal on sandstone at 7'3" No GW encountered		
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 8 N grp. 2	Location ID 55				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/1334	Date/Time Total Depth Reached 4-15-11/1339				
Type of Sampling Device stainless steel shovel		Samples Collected 8-oz jar 1 1/2 gall bag (# 40103) (1338)						
Geologist C. Carmichael		Checked by/Date Luc Van Robins Meldman 9/19/11						
Radiological Background 2		Radiological Equipment Used up R meter		PID Used Mini Rae 2000				
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	Inches	Borehole Gamma Readings (CPM)
0.5'				0.0 12	Sand with clay, (10YR, 4/4), brown, 80% very fine sand, 20% clay, some rootlets, dry, medium dense, very low plasticity, no hardness, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study	Project Number: EP2038.01.22.04.03	Subarea ID & Group: 8N Group 2	Location ID: 55
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 7'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-6-11/1411	Date/Time Total Depth Reached: 5-6-11/1421
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: (1) 1/2 gallon bags, (1) 4-oz jar (#40104) (1430)		
Geologist: C. Carmichael	Checked by/Date: JR Gidman 9/19/11		

Radiological Background: 47/2893	Radiological Equipment Used: Pancake / Downhole 4R meter	PID Used: Mini RAE 2000 (Bkqd: 0.0 ppm)
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Depth	Interval	Recovery	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	Artificial Fill: AF <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>		0.5 - 2762
0.5			0.060	Clay with silt and sand, (10 YR, 5/4), light brown, 50% clay, 25% silt, 25% fine sand, dry, medium stiff, some rootlets in top 2", brown plastic netting at surface, low plasticity and hardness, no odor, speckled texture.	AF/CL	3940
1.0			68			4193
			50			4250
2.0			68		2' Same as above, except dark brown (10YR, 3/3)	CL
			72	Clay with silt and sand, (10 YR, 4/4) brown, 65% clay, 20% silt, 15% fine sand, dry, medium stiff, medium plasticity and hardness, speckled texture (orange and tan), no odor.	CL	4214
3.0			70			4161
			50			4447
4.0			60			4901
			65		4851	
5.0			60		4486	
			45	5.5' Same as above, except more brittle, flakey.		4202
6.0			50			4236

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N grp2		Location ID 56	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-18-11/1047		Date/Time Total Depth Reached 4-18-11/1052	
Type of Sampling Device Stainless steel shovel				Samples Collected 8-oz jar 1 1/2 gall bag (#40105) (1050)			
Geologist C. Carmichael				Checked by/Date LuDean Robbins/Geldman 9/19/11			
Radiological Background 14		Radiological Equipment Used up R meter			PID Used Mini Rae 2000		
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				0.5 14	Clayey sand, (10 YR, 4/3), brown, 70% fine sand, 30% clay, common rootlets, semi-moist, medium dense, trace gravel, low plasticity and hardness, no odor. No groundwater encountered.	SC	

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group 2: 8N	Location ID: 56
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 9'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-5-11/0918	Date/Time Total Depth Reached: 5-5-11/0930
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: (1) 1/2 gallon bags, 1-4-oz jar (#40106) (0940)		
Geologist: C. Carmichael	Checked by/Date: J.R. Feldman 9/19/11		

Radiological Background: 53 / 10	Radiological Equipment Used: Pancake / Porapak 4R meter	PID Used: MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Inches	Borehole Gamma Readings (CPM)	
0.5			0.0	55	Clay with silt and sand, (10 YR, 4/4), light brown with speckles, 60% clay, 20% silt, 20% fine sand, trace rootlets in top 3", dry, low-medium plasticity and hardness, medium stiff, no odor.	AF/CL	4095	0.5 - 2810	
1.0			60				4500	0 - 3131	
			64					4115	
2.0			67			Piece of gravel found at 2'.		3970	
			60					4003	
3.0			58				4307		
			55	3.5'	Sandy clay, (10 YR, 3/2), dark brown, with some speckles, 65% clay, 35% fine to medium grained sand, semi-moist, low plasticity and hardness, trace concrete pieces found; no odor; medium stiff.	CL/AF	4557		
4.0			55				5031		
			55				5195		
5.0			50				5150		
			45	5.5'	Some gravel fill found at 5.5'.	AF/SC	5407		
6.0			47		Clayey sand, (10 YR, 4/4), light brown with orange sand, 60% fine to medium grained sand, 40% clay, semi-moist, medium dense, very low plasticity, no hardness, no odor.		5463		

Radiological Background 53 / 10				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 56	
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)
					Same as above - Clayey sand	SC	
			0.0	45 Gradational Contact.....		5429
7'				63	Sand, (10YR, 5/6), orangeish-brown, 100% fine to medium grained sand, dry, medium dense, no plasticity or hardness, no odor. (weathered bedrock)	SP	5796
				63			6159
8'				70			5567
				70	↓ No change, except denser.		4868
9'				75	Refusal at 9'. No groundwater reached.		4867

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N <i>grp 2</i>	Location ID 57				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-18-11/1006	Date/Time Total Depth Reached 4-18-11/1011				
Type of Sampling Device stainless steel shovel			Samples Collected 8-oz jar 1 1/2 gall bag (#40107) (1010)					
Geologist C. Carmichael			Checked by/Date <i>Ju. Dan Robbins/Goldman</i> 9/19/11					
Radiological Background 13		Radiological Equipment Used <i>up R meter</i>		PID Used <i>Mini Ra2 2000</i>				
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'				0.4 14	Sand with clay, (10 YR, 5/3), light brown, 75% fine sand, 25% clay, some rootlets, dry, dense, no plasticity, low hardness, no odor. No groundwater encountered.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N Group 2	Location ID 57
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-5-11/0831	Date/Time Total Depth Reached 5-5-11/0845
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected (1) 1/2 gallon bags, 1 4oz jar (#40108) (0845)		
Geologist C. Carmichael	Checked by/Date LuAnn Robbins Feldman 9/9/11		
Radiological Background 48 / 10	Radiological Equipment Used 4R meter Pencake / Downhole	PID Used MiniRAE 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)
0.5			0.0	46	<p>AF: Artificial Fill</p> <p>Clay with silt and sand, (10YR, 4/3), light brown, 60% clay, 20% silt, 20% fine grained sand, speckled texture with light tan speckles of fine sand, dry, ^{medium} stiff, low-medium plasticity and hardness, no odor.</p>	AF	0.5 - 2853
1.0			48	CL		3644	
			48			3879	
			48			3807	
2.0			45			3946	
			55			3909	
3.0			53			4238	
			47			4372	
4.0			45			4177	
			48			4011	
5.0			45		CL	3856	
			38		4016		
6.0			36		4058		

5' Gradational contact
Same as above, except lighter brown in color (10YR, 5/4), also somewhat "flaky" texture.

Radiological Background					Project Name	Project Number	Location
48 / 10					SSFL Area IV Radiological Study	EP9038.01.22.04.03	57
Depth	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)		Inches
7'			0.037		Same as above - Clay with silt and sand	CL	4048
				38			3937
				35			4115
8'				52			4378
					Refusal at 8'		
					No groundwater reached.		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N gsp2	Location ID 58			
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/1247	Date/Time Total Depth Reached 4-15-11/1251			
Type of Sampling Device stainless steel shovel		Samples Collected 1 8-oz jar Field DUP 40260(NP)-125 1-1/2 gall bag (#40109) (1250)					
Geologist C. Carmichael		Checked by/Date J. J. J. 9/19/11					
Radiological Background 4		Radiological Equipment Used up R meter		PID Used Mini Rae 2000			
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 12	Clayey sand, (10 YR, 3/3) dark brown, 60% fine sand, 40% clay, common rootlets, semi-moist, medium dense, low-medium hardness and plasticity, no odor. No groundwater encountered	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 58A, group 2	Location ID 58
Drilling Company HGL	Driller I. Stone F. Morse	Ground Elevation NA	Total Drilled Depth 7.5'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-17-11/1412	Date/Time Total Depth Reached 6-17-11/1539
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 4-oz jar, 1 1/2 gall bag (#40110) (1550)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Madman 9/20/11		

Radiological Background 2512, 61 cpm	Radiological Equipment Used Downhole scanner, 4R meter, pancake meter	PID Used Mini Rae 2000	Background: (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
1'			0.0	50	Silt, (10YR, 5/3), light brown, 95% silt, 5% fine grained sand, dry, soft, trace rootlets, very low plasticity and hardness, no odor.	ML	3844	05-2595
			0.0	62	1' Gradational Contact		3972	
2'			0.0	45	Clayey sand with silt, (10YR, 5/4), light brown, 50% fine to medium grained sand, 40% clay, 10% silt, dry, stiff, speckled texture, low plasticity and hardness, no odor.	SC	3869	
			0.0	40	Same as above, except (10YR, 4/4) brown and trace gravel fill.		3920	
3'			0.0	40			4199	
			0.0	87	3' Same as 1'-2'		4269	
4'			0.0	70			4225	
			0.0	56			3956	
5'			0.0	46			3930	
			0.0	80	5' Gradational Contact		4021	
6'			0.0	42	Clayey silt, (10YR, 5/4), light brown, 60% silt, 35% clay, 5% fine sand, dry, stiff, low-medium plasticity, medium hardness, no odor.	ML	4057	
			0.0	68			4258	

Radiological Background 2572, 61 cpm					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 58	
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)
							ML	
				0.068	Same as above - Clayey silt			4406
				0.055				4485
7'				0.059				5012
					Refusal hit on sandstone - 7.5'			
8'					No GW reached.			
9'								
10'								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8 Ngp.2		Location ID 59	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel / trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-15-11/1006		Date/Time Total Depth Reached 4-15-11/1010	
Type of Sampling Device stainless steel shovel				Samples Collected 1 8-oz jar 1 1/2 gall bag (# 40111) (1010)			
Geologist C. Carmichael				Checked by/Date Shawn Robbins / M. Sildman 9/20/11			
Radiological Background 14		Radiological Equipment Used w/ R meter		PID Used Mini Ratz 2000			
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)
0.5'				0.013	Clayey sand, (10 YR, 4/3), brown, 70% fine sand, 30% clay, some rootlets, dry, medium dense, very low hardness and plasticity; no odor. No groundwater encountered	SC	

Radiological Background 2806, 45 cpm				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 59	Borehole Gamma Readings		
Depth	Interval	Recovery	PD	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	(CPM)	
			0.0	60	Silt with clay (same as above)	ML		3919	
7'			0.0	50	Clayey silt, (10 VR, 4/3), brown with speckles, 55% silt, 35% clay, 10% fine to medium grained sand, semi-moist, medium plasticity and hardness, medium stiff, no odor.	ML		4009	
			0.0	48					4296
8'			0.1	60					4596
			0.1	71					4466
9'			0.1	88	Same as above, except moist.			4377	
			0.1	65					
10'					Refusal at bedrock - 9'9" No GW reached				

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 N gp. 2	Location ID 60
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/0915	Date/Time Total Depth Reached 4-15-11/0918
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1 1/2 gall bag (# 40113) (0917)		
Geologist C. Carmichael	Checked by/Date Lu Dean Robbins/Gedman 9/20/11		
Radiological Background 13	Radiological Equipment Used up R meter	PID Used Mini Rae 2000	

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	Clayey sand, (10 YR, 4/3), brown, 60% fine sand, 40% clay, common rootlets, semi-moist, medium dense, low-medium plasticity and hardness, no odor. No groundwater encountered	SC		

Project Name: SSFL Area IV Radiological Study	Project Number: FP9038.01.22.04.03	Subarea ID & Group 2: 8N	Location ID: 60
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 3.5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-5-11/1349	Date/Time Total Depth Reached: 5-5-11/1358
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: (1) 1/2 gallon bag, 1 4-oz jar (#40114) (1400)		
Geologist: C. Carmichael	Checked by/Date: Lu Dean Robbins Feldman 9/20/11		

Radiological Background: 49 / 11	Radiological Equipment Used: 4R meter Pencate / Fluorimeter	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	RBD	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	45	Clay with silt and sand, (10 YR, 4/4), light brown, 60% clay, 20% silt, 20% fine sand, dry, some rootlets in top 3", medium stiff, medium plasticity and hardness, no odor, speckled texture.	AF	0.5	3045
1.0			55	CL		4498	4195	3304
			55			4657	4498	4195
			59			4331	4657	3301
2.0			65			3760	4331	
3.0			68			3776	4331	
			64		Sand (bedrock at 3.5')		4092	
4.0					Refusal at 3.5'			
5.0					No groundwater reached.			



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N-2	Location ID 61
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/0848	Date/Time Total Depth Reached 4-15-11/0852
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1-1/2 gall. bag (# 40115) (0852)		
Geologist C. Carmichael	Checked by/Date Julian Robbins/Mallman 10/25/11		

Radiological Background 14	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000
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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 14	Sand with clay, (10 YR, 4/4), brown, 85% fine sand, 15% clay, dry, medium dense, some rootlets, very low plasticity, no hardness, no odor.	SC	
No groundwater encountered.							

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N group 2	Location ID: 61
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 5.5
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-9-11 1014	Date/Time Total Depth Reached: 5-9-11 1030
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 40116 (1015) (1) 1/2 gallon bags + (1) 4oz jar (LTC)		
Geologist: C. Knight	Checked by/Date: J.R. Helman 9/20/11		

Radiological Background: 54 / 10MR
 Radiological Equipment Used: Pancake / Downhole
 PID Used: MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches +0.5 2818 (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			0.0	65	Fill: silt with sand (grayish brown (10YR 5/2), dry, medium stiff, no odor, 20% fine sand, 80% silt, low plasticity, cohesive, trace rootlets, trace fine angular gravel	AF	3692
1.0			0.0	65		ML	4492
			0.0	55			3824
			0.0	53			3770
2.0			0.0	46	Silt: light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 10% clay, 10% fine sand, 80% silt, cohesive, low plasticity, trace angular fine gravel (fill rock)	AF/ML	3720
			0.0	35			3733
3.0			0.0	48			3773
			0.0	50			3934
4.0			0.0	60			4138
			0.0	54	angular fine gravel (fill rock) at 5'1"		4439
5.0			0.0	50	Weathered bedrock: olive yellow (2.5 6/6), moist, dense, no odor, mechanically weathered to SA, fine grained sandstone	AF/ML	4520
			0.0	45	Refusal on sandstone at 5.5' hgs No GW encountered		4654



8N_062

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp.2	Location ID 62
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/0901	Date/Time Total Depth Reached 4-15-11/0907
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1 1/2 gall bag (#40117) (0907)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins Alderman 9/20/11		

Radiological Background 13	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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	Sand with clay, (10 YR, 4/4), brown, 85% fine sand, 15% clay, some rootlets, dry, medium dense, very low plasticity, no hardness, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N Group 2	Location ID: 62
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 7.5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-5-11/1138	Date/Time Total Depth Reached: 5-5-11/1150
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: (1) 1/2 gallon bags, 1 4-oz jar (#40118) (210)		
Geologist: C. Carmichael	Checked by/Date: L. Dan Robbins / Sedman 9/20/11		

Radiological Background: 52 / 11	Radiological Equipment Used: Pancake / Disc ^{4R meter}	PID Used: MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	RPD	57 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	0.0-0.55		0	57	Clay with silt and sand, (10YR, 4/4), light brown with orange and tan speckles. 60% clay, 20% silt, 20% fine sand, dry, medium stiff, medium plasticity and hardness, no odor, trace gravel fill rocks.	AF/CL	0.5 - 294 0 - 3242
1.0	0.55-1.0		64				4173
			65				4456
			65				4307
2.0	1.0-2.0		65		1.75' Same as above, except darker brown (10YR, 3/3)		3899
			70				3690
			65				3778
3.0	2.0-3.0		60				3618
			60				3533
4.0	3.0-4.0		64				3698
			66				3979
5.0	4.0-5.0		70		5.5' Same as above, except more flakey/brittle.		4158
6.0	5.0-6.0		65				4049

Radiological Background					Project Name	Project Number	Location
52 / 11					SSFL Area IV Radiological Study	EP9038.01.22.04.03	62
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)
7'			0.065		Same as above - Clay with silt and sand	CL	4071
			0.070				4330
			0.078				4940
8'					Refusal at 7.5'		
					No groundwater reached.		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N _{gpp.2}	Location ID 63			
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/1400	Date/Time Total Depth Reached 4-15-11/1405			
Type of Sampling Device stainless steel shovel		Samples Collected 1 8-oz jar 1 1/2 gall bag (#40119) (1405)					
Geologist C. Carmichael		Checked by/Date L. Deane Robbins/Gedman 9/10/11					
Radiological Background 3		Radiological Equipment Used w/ R. meter		PID Used Mini Rae 2000			
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	13	Sand with clay (10 YR, 3/3), brown, 80% fine sand, 20% clay, some rootlets, dry, medium. dense, very low plasticity and hardness, no odor. No groundwater encountered	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 2	Location ID 63
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.5 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-17-11 1110	Date/Time Total Depth Reached 6-17-11 1230
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar 40120 (1120)		
Geologist C. Knight	Checked by/Date L. Dan Pettis/Medman 9/21/11		

Radiological Background 46 / 2436	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Blkgd: 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	37	Surface: soil + grass		70.5 2827 2927
0.5			0.0	35	Fill: silt with clay; yellowish brown (10YR 5/4) dry, medium stiff, no odor, 10% clay, 90% silt, cohesive, low plasticity, low toughness, trace 1/3" ratholes	AF	3212 2716
			0.0	48		ML	4270 3831
1.0			0.0	65 54		ML	4331 4174
			0.0	66 52	Fill: silty clay with sand; light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 30% silt, 5% fine sand, 5% medium sand, 60% clay, cohesive, medium plasticity, medium toughness, mottled		4098 4270
2.0			0.0	82 47		AF/CL	3928 4116
			0.0	47 49		CL	3666 3993
3.0			0.0	43 51		CL	3673 3788
			0.0	59 57		CL	3745 3774
4.0			0.0	62 52	CL	3833 3769	
			0.0	90 58	5' 0"		3774 3844
5.0			0.0	63 55		AF/ML	3773 4311
			0.0	64 55		ML	3552 4232
6.0			0.0	53 56	CL	3222 4188	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 N gp 2	Location ID 64
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel / trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-15-11 / 1348	Date/Time Total Depth Reached 4-15-11 / 1352
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1 1/2 gall bag (# 40121) (1352)		
Geologist C. Carmichael	Checked by/Date Luella Robbins Alderman 9/20/11		

Radiological Background 12	Radiological Equipment Used M R meter	PID Used Mini Rae 2000
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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 13	Clayey sand, (10 YR, 4/2), brown, 55% fine sand, 45% clay, semi-moist, some rootlets, medium dense, medium plasticity and hardness, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group 2: 8N	Location ID: 64
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-6-11/1503	Date/Time Total Depth Reached: 5-6-11/1510
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: (1) 1/2 gallon bags, (1) 4-oz jar (#40122)(1520)		
Geologist: C. Carmichael	Checked by/Date: Julian Perkins Feldman 9/20/11		

Radiological Background: 50 / 2767	Radiological Equipment Used: Pancake / Downhole AR meter	PID Used: Mini-RAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	Radiological	Description	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
			6.0	AF: Artificial Fill <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>			0.5-2615
0.5		0.048	60	Clay with silt and sand, (10 YR, 4/3), brown with orange and tan speckles, rootlets and sand dust on surface, 60% clay, 20% silt, 20% fine sand, dry, medium dense ⁽²⁾ stiff, low-medium plasticity and hardness, no odor.	AF-CL	3676	0-278
1.0			58		4358		
			85		4704		
2.0			65		4943		
			50		4659		
3.0			60		4437		
			65		4587		
4.0			65	4564			
			67	4.5' Same as above, except drier, flakey and more compact and lighter brown (10 YR, 5/3)		4348	
5.0			70	Refusal at 5'		4645	
				No groundwater reached.			

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8 N gp. 2	Location ID 65			
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/1307	Date/Time Total Depth Reached 4-15-11/1311			
Type of Sampling Device stainless steel shovel		Samples Collected 1 8-oz jar 1 1/2 gall bag (# 40123) (1310)					
Geologist C. Carmichael		Checked by/Date Jude Pettis/Gledman 9/20/11					
Radiological Background 12		Radiological Equipment Used w/ R. meter		PID Used Mini Rae 2000			
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 12	Clayey sand, (10 YR, 3/5), brown, 60% fine sand, 40% clay, common rootlets, semi-moist, medium dense, low-medium plasticity and hardness, no odor. No groundwater encountered.	SC	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 2 8N	Location ID 65
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth: 10
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-5-11/1506	Date/Time Total Depth Reached 5-5-11/1515
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected Field DUP: 46262 (1) 1/2 gallon bags, (1) 4-oz jar (#40124) (1525)		
Geologist C. Carmichael	Checked by/Date J. Feldman 9/20/11		

Radiological Background 39 / 10	Radiological Equipment Used Pancake / Down ^{4R meter}	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USGS Symbol	Borehole Gamma Readings (CPM)
			0.0	50	AF: Artificial Fill (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		0.5-2633
0.5				50	Clay with silt and sand, (10 YR, 4/4), light brown, with speckled texture, 60% clay, 20% silt, 20% fine sand, dry, medium stiff, medium plasticity and hardness, no odor.	AF/CL	0-2833
1.0				50			3877
				49			3952
				49			4229 @
2.0				58			4281
				58			4235
3.0				58			4423
				55			4313
4.0				55			4195
				63			4284
5.0				55	Same as above, except lighter brown (10YR, 5/3) and flakey texture.	4300 @ 4284	
				67		4584 4300	
6.0				65		4636 @ 4589	

Radiological Background					Project Name	Project Number	Location
39 / 10					SSF: Area IV Radiological Study	EP9038.01.22.04.03	65
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>
7'			0060		Same as above - Clay with silt and sand	CL	4630
			55				4683
			55				4584
8'			50				4504
			49				4976
9'			55				5192
			60		5148		
10'		N	58		Refusal at 10'. No groundwater reached		5391

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 Ngrp-2	Location ID 66
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-18-11/0919	Date/Time Total Depth Reached 4-18-11/0923
Type of Sampling Device Stainless steel shovel	Samples Collected 1 8-oz jar 1 1/2 gall bag (#40125) (0922)	Checked by/Date Julie Ann Robbins Yeldman 9/20/11	
Geologist C. Carmichael			

Radiological Background 15	Radiological Equipment Used w/ R meter	PID Used Mini Rac 2000
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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'				0.2/15	Sand with clay, (10 YR, 5/3), light brown, 80% fine sand, 20% clay, some rootlets, semi-moist, dense, low hardness, no plasticity, no odor. No groundwater encountered.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group CN group 2	Location ID 66
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1' 2"
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-4-11 12:20	Date/Time Total Depth Reached 5-4-11 12:30
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40126 (NO SAMPLE) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Jim Dan Robinson Feldman 10/17/11		

Radiological Background 43 / 2679	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 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 <small>(CPM)</small>
0.0		0.0	42		Silt: Pale Yellow (2.5Y 7/3), dry, medium stiff, no odor, 10% fine sand, 10% clay, 80% silt, non cohesive, low plasticity		2946
0.5		6.0	41		Sandstone: light yellowish brown (2.5Y 5/4), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone		3060
1.0		0.0	65			ML	4024
1.2					Refusal on sandstone at 1' 2"		4553
2.0					No GW encountered		
3.0					No sample collected		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N gp-2	Location ID 67			
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/1035	Date/Time Total Depth Reached 4-15-11/1040			
Type of Sampling Device stainless steel shovel		Samples Collected 1 8-oz jar 1 1/2 gally bag (# 40127) (1040)					
Geologist C. Carmichael		Checked by/Date Julian Rollins Feldman 9/20/11					
Radiological Background 14		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000			
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	Clayey sand, (10YR 4/2), brown, 65% fine sand, 35% clay, common rootlets, semi-moist, medium dense, no odor, low-medium hardness and plasticity. No groundwater encountered.	SC	

Project Name: SSEL Area IV Radiological Study	Project Number HP9038.01.22.04.03	Subarea ID & Group 8N 910-P 2	Location ID 67
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-4-11 1350	Date/Time Total Depth Reached 5-4-11 1450
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40/28 (1400) (1) 1/2 gallon bags + 4oz jar		
Geologist C. Knight	Checked by/Date J.R. Goldman 9/20/11		

Radiological Background 51 / 2054	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 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 gravel		40.5 3742
0.5			60	60	Fill: silty clay: dark brown (7.5 YR 3/3), moist, soft, no odor, 35% silt, 66% clay, cohesive, low plasticity, mottled, trace rootlets near surface, low toughness	AF/CL	2916
1.0			55	55			3749
			30	30			4081
			45	45	1'6" Fill: clay: Brown (10YR 5/3), moist, medium stiff, no odor, 10% silt, 90% clay, cohesive, low plasticity, medium toughness, trace coarse sand, mottled	AF/CL	4087
2.0			45	45			3782
			55	55			3892
3.0			65	65	2'11" Clayey silt: dark brown (7.5 YR 3/3), moist, medium stiff, no odor, 40% clay, 60% silt, trace fine gravel, cohesive, low plasticity, low toughness	ML	3943
			70	70			4327
4.0			70	70			4597
			57	57			4606
5.0			55	55	weathered sandstone: light olive brown to tan (2.5Y 5/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone		4072
			50	50			3862
			48	48	No GW encountered		
			46	46	Refusal on sandstone at 5.5' bgs		4097

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp 2	Location ID 68
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel / trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-18-11/0936	Date/Time Total Depth Reached 4-18-11/0941
Type of Sampling Device stainless steel shovel	Samples Collected 8-oz jar 1 1/2 gall bag (#40129) (0940)		
Geologist C. Carmichael	Checked by/Date Julian Robbins/Gedmen 9/20/11		

Radiological Background 15	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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'			0.2	15	Sand with clay, (10YR, 4/4), brown, 80% fine sand, 20% clay, some rootlets, dry, medium dense, low hardness, no plasticity, no odor. No groundwater encountered	SC		

Project Name: SSEL Area IV Radiological Study	Project Number: HP9038.01.22.04.03	Subarea ID & Group: SN group 2	Location ID: 68
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 6.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-4-11 11:15	Date/Time Total Depth Reached: 5-4-11 12:10
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 40130 (1120) (1) 1/2 gallon bags + (1) 4oz. jar (UAG)		
Geologist: C. Knight	Checked by/Date: Luc Don Robbison Medman 9/21/11		

Radiological Background: 48 / 2724	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkqd: 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 <small>(CPM)</small>
		0.0	46		surface ig. sands, silt		705' 2653
0.5		0.0	50		Silty clay: light olive brown (2.5Y 5/3), dry, medium stiff, no odor, 10% fine sand, 35% silt, 55% clay, low plasticity, trace rootlets in upper surface.	CL	3889
1.0		0.0	78			CL	3884
		0.0	56			CL	3841
		0.0	52			CL	3889
2.0		0.0	65		Clay with silt: Olive brown (2.5Y 4/4), moist, stiff, no odor, 25% silt, 5% coarse sand, 5% medium sand, 65% clay, cohesive, low plasticity, medium toughness.	CL	3879
		0.0	63			CL	3854
3.0		0.0	74			CL	4143
		0.0	69			CL	4395
4.0		0.0	54		Silt: Very pale brown (10YR 7/4), dry, medium stiff, no odor, 10% clay, 10% fine sand, 80% silt, cohesive, low plasticity, low toughness.	ML	4373
		0.0	45			ML	4258
5.0		0.0	32			ML	4031
		0.0	13			ML	4016
6.0		0.0					4333

Refusal on silt at 6.0' bgs
No GW encountered

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N gp.2		Location ID 69	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-18-11/0950		Date/Time Total Depth Reached 4-18-11/0956	
Type of Sampling Device stainless steel shovel				Samples Collected 1-8-oz jar 1-1/2 gall bag (#40131) (0955)			
Geologist C. Carmichael				Checked by/Date John Robbins/Myrdman 9/21/11			
Radiological Background 14		Radiological Equipment Used w/ Rmeter			PID Used Mini Rae 2000		
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'			0.3	15	Sand with clay, (10YR, 4/4), light brown, 80% fine sand, 20% clay, some rootlets, dry, medium dense, no plasticity, low hardness, no odor. No groundwater encountered.	SC	

Project Name: SSEL Area IV Radiological Study	Project Number: FP9038.01.22.04.03	Subarea ID & Group: SN group	Location ID: 69
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 9'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-4-11 1500	Date/Time Total Depth Reached: 5-4-11 1555
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected 40732 (1510) (1) 1/2 gallon bags + (1) 4oz. jar (UR)		
Geologist: C. Knight	Checked by/Date: Lu Dan Robbins, Feldman 9/21/11		

Radiological Background: 46 / 2546	Radiological Equipment Used: Pancake / Downhole	PID Used: MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	RTD	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					surface: soil and gravel		2761
0.5			0.0	35	Clayey silt; light yellowish brown (2.5Y 6/3), dry, soft, no odor, 30% clay, 70% silt, non cohesive, low plasticity, trace angular volcanic gravel (med. gravel), mottled, trace rootlets near surface	AF/ML	2866
			0.0	39		3806	
1.0			0.0	76		4098	
			0.0	80		3942	
2.0			0.0	20		4011	
			0.0	45		4085	
3.0			0.0	42	Fill Clay with silt; strong brown (7.5Y 12 n/6), moist, medium stiff, no odor, 5% coarse sand, 5% medium sand, 5% angular gravel (fill rock), 25% silt, 60% clay, low plasticity, cohesive, medium toughness, mottled	AF/CL	4318
			0.0	55		4671	
4.0			0.0	75		4357	
			0.0	90		3999	
5.0			0.0	70		3914	
			0.0	65		3933	
6.0			0.0	90		3901	

Radiological Background 38 / 2546				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 69		
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)	
6.0			0.0	90	<p>Fill w/ sand</p> <p>Silty clay: light olive brown (2.54 5/6), slightly moist, stiff, no odor, 5% coarse sand, 5% medium sand, 10% fine sand, 35% silt, 45% clay, non-cohesive, low plasticity</p>	AF	3901	
			0.10	50		CL	3985	
7.0			0.0	48				3834
			0.0	80				3978
8.0			0.0	60				4234
			0.0	24	<p>Sandstone: Pale yellow (2.54 7/4), dry, very dense, no odor, fine grained sandstone 5% medium grains</p>		4132	
9.0			0.0	55			4494	
					End Boring 9' bgs			
					Refusal on Sandstone at 9'0" 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 8 N grp 2	Location ID 70			
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-18-11/1236	Date/Time Total Depth Reached 4-18-11/1240			
Type of Sampling Device stainless steel shovel		Samples Collected 1 8-oz jar 1 1/2 gall bag (#40133) (1240)					
Geologist C. Carmichael		Checked by/Date Liz Jean Rollins/Gelman 9/21/11					
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000			
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'				03.15	Sand with clay, (10 YR, 4/3), brown, 80% fine sand, 20% clay, dry, some rootlets, medium dense, no plasticity, very low hardness, no odor. No groundwater encountered.	SC	

Radiological Background					Project Name	Project Number	Location
46/10					SSFL Area IV Radiological Study	EP9038.01.22.04.03	70
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)
7'			0.0	68	Same as above - Clay with silt and sand	CL	4494
				65		4377	
				68		4414	
8'				72		4914	
				65		4895	
9'				65		4872	
				69	5131		
10'				70	Refusal hit at 10'. No groundwater reached.		5498



Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N gp.2		Location ID 71	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-18-11/0831		Date/Time Total Depth Reached 4-18-11/0838	
Type of Sampling Device stainless steel shovel				Samples Collected 1 8-oz jar 1 1/2 gall bag (#40135) (0838)			
Geologist C. Carmichael				Checked by/Date Julian Rolli/Solomon 9/21/11			
Radiological Background 15			Radiological Equipment Used w/ R meter			PID Used Mini Rae 2000	
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	15	Silty sand, (10 YR, 2/2), dark brown, 65% fine sand, 35% silt, common rootlets, semi-moist, loose, no plasticity or hardness, no odor. No groundwater encountered.	SM	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N _{app. 2}		Location ID 72	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-14-11/1128		Date/Time Total Depth Reached 4-14-11/1131	
Type of Sampling Device stainless steel shovel				Samples Collected 1 1/2 gal bag (#40137) (1130)			
Geologist C. Carmichael				Checked by/Date Julian Palmino/Meldman 9/21/11			
Radiological Background 15		Radiological Equipment Used w/ Rater			PID Used Mini Rae 2000		
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	14	Silty sand, (10 YR, 4/4), brown, 65% fine sand, 35% silt, common rootlets, dry, medium dense, some cobbles and black netting lining drainage, no plasticity or hardness, no odor. No groundwater encountered.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SN-Grp 2	Location ID 72
Drilling Company Boart Longyear (UIC)	Driller I. Stone D. Hansen (UIC)	Ground Elevation NA	Total Drilled Depth 3.5 ft. bgs
Drilling Equipment Handauger Geo probe 6600 (UIC)	Borehole Diameter 3 3/4" 3/4"	Date/Time Drilling Started 5/27/11 - 1550	Date/Time Total Depth Reached 5/27/11 - 1622
Type of Sampling Device 1 3/4" Macrocore Handauger	Samples Collected (1) 1/2 gallon bags + 4oz. amber jar	40138 (1600)	
Geologist L Robbins Goldman	Checked by/Date L Robbins Goldman 9/21/11		

Radiological Background 59/3036	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 10.5 = 2885 (CPM)
0.5		0.0	88	88	silt w/ sand: yellowish brn (10yr 7/4), moist, fine soil, no odor, 85% silt, 10% fine sand, 5% coarse sand, low plasticity, cohesive, low toughness, low dry strength, low dilatancy, rootlets, trace Fe-oxidized nodules, pin hole pores	ML	2988
		0.0	84	84			3838
1.0		0.0	84	84			4613
		0.0	84	84			4767
2.0		0.0	84	2011	Sandy silt: yellowish brown (10yr 5/4), moist, fine soil, no odor, 75% silt, 10% fine sand, 10% med sand, 5% coarse sand, low plasticity, cohesive, low toughness, low dry strength, rapid dilatancy, pin hole pores	ML	4726
		0.0	84	84			4755
3.0		0.0	78	78			4957
		0.0	68	3151	fine to med. grained sandstone (10yr 5/4), moist, mechanically weathered to SD	Bedrock	4754
4.0					refusal @ 3.5" bgs on sandstone no GW encountered		
5.0							
6.0							



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N gr. 2	Location ID 73				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/1144	Date/Time Total Depth Reached 4-14-11/1148				
Type of Sampling Device stainless steel shovel			Samples Collected 1 1/2 gall bag (#40139) (1148)					
Geologist C. Carmichael			Checked by/Date Julian Rottis Madman 9/21/11					
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000				
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	Clayey sand, (10 YR, 4/2), brown, 55% fine sand, 45% clay, dry, medium dense, common rootlets, black netting found, some cobbles, medium plasticity and hardness, no odor. No groundwater encountered	SC		

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N group 2	Location ID: 73
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 5' 1" Ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 6-20-11 0905	Date/Time Total Depth Reached: 6-20-11 1010
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: 40140 (0930) (1) 1/2 gallon bags + 402 jar		
Geologist: C. Knight	Checked by/Date: Julian Robbins Feldman 9/21/11		

Radiological Background: SM / 3445	Radiological Equipment Used: Pancake / downhole	PID Used: Mini Rge 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 grass)		
0.5			0.0	77	Fill: Silty clay with sand; Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 25% silt, 10% fine sand, 65% clay, medium plasticity, medium toughness, cohesive, mottled.	AF/CL	3946
			0.0	75			4636
1.0			0.0	59			4860
			0.0	72			4805
2.0			0.0	69			4667
			0.0	64	Fill: Silty sand; Brown (10YR 5/3), moist, medium dense, no odor, 15% silt, 85% fine sand, rapid dilatancy, mottled.	AF/SM	4731
			0.0	80			4808
3.0			0.0	76			4961
4.0			0.0	89			4769
			0.0	81			4750
5.0			0.0	72	Sandstone Bedrock		4770
					Refusal on sandstone 5' 1" bgs		
					No GW encountered		
6.0							



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp.2	Location ID 74
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/1200	Date/Time Total Depth Reached 4-14-11/1205
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1 1/2 gall bag (#40141) (1205)		
Geologist C. Carmichael	Checked by/Date LuAnn Robbins/Medman 9/21/11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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'				0.014	Silty sand, (10 YR, 4/4), brown, 60% fine sand, 40% silt, some rootlets, dry, medium dense, no plasticity or hardness, no odor. No groundwater encountered	SM		

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N SAT group 2	Location ID: 74
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 41.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-9-11 07:30-12:5	Date/Time Total Depth Reached: 5-9-11 11:45
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 40142 (1170) (1) 1/2 gallon bags + (1) 4oz. jar (L6)		
Geologist: C. Knight	Checked by/Date: Julian Rollins Melman 9/21/11		

Radiological Background: 42 / 10MR	Radiological Equipment Used: Pancake / Downhole	PID Used: MiniRAE 2000 (Bkgd: 0.6 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					AF: Artificial Fill (Include Ethology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					surface: grass and soil		4052
0.5		0.0	50		silt		3124
		0.0	70		Fill: Brown (10YR 5/3), silty, medium stiff, no odor, 10% fine sand, 6% sub rounded gravel, 85% silt, cohesive, low plasticity, mottled	AF / ML	4084
1.0		0.0	62				4556
		0.0	74		2' 9"		4398
2.0		0.0	57		Fill: Silty Sand: Pale brown (10YR 6/3), moist, medium stiff no odor, 30% silt, 20% fine sand, trace mottled texture	AF / SP	4234
		0.0	50				4697
3.0		0.0	53		3' 3"		4973
		0.0	55		weathered sandstone light yellowish brown (10YR 6/4), moist, dense, no odor, mechanically weathered to SP, fine-grained sandstone 85% fine, 5% coarse sand	SP / SL	4588
4.0		0.0	75				4997
					Refusal on sandstone at 4.0' by 5"		
					No GW encountered		

Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N 00.2	Location ID 75
Drilling Company HGL	Driller T. Morris	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11/0850	Date/Time Total Depth Reached 4-19-11/0853
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1-1/2 gall bag (# 40143) (0855)		
Geologist P. Sweath	Checked by/Date L. Dean Robbins/Goldman 9/21/11		

Radiological Background 0 ppm, 4 uR	Radiological Equipment Used M/R meter	PID Used Mini Rae 2000
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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'				0.2 10	silt w/ clay, stark yellowish brown (10YR 3/4) ml dry, stiff, 80% silt, 20% clay, trace gravel fill fragments, no odor 5" of gravel fill No GW TD 0.5'			

Project Name: SSEL Area IV Radiological Study	Project Number: HP9038.01.22.04.03	Subarea ID & Group: SN group 2	Location ID: 75
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 1.5
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-9-11 1335	Date/Time Total Depth Reached: 5-9-11 1345
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 40194 (1500) NO SAMPLE (1) 1/2 gallon bags CL	Checked by/Date: J. Dan Robbins/Geldman 10/7/11	
Geologist: C. L. Wright			

Radiological Background: 35 / 10MR	Radiological Equipment Used: Pancate / ^{MR} Dozorholok	PID Used: MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: gravel road		10.5 2654
0.5			0.0	60	Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	AF	2759
			0.0	48	Fill! Sandy silt w/ gravel (dark yellowish brown (10YR 4/4) moist, medium stiff, no odor, 30% fine sand, 20% fine to medium angular gravel, mottled, 50% silt	ML	3662
1.0			0.0	60	weathered sandstone: olive yellow (2.5Y 6/6), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone	SP	4594
			0.0	45			4746
2.0					Refusal on gravel stone at 1.5' bgs		
					No log encountered		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N, grp. 2		Location ID 76	
Drilling Company HGL		Driller T. Morris		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-19-11/ 1405		Date/Time Total Depth Reached 4-19-11/ 1409	
Type of Sampling Device stainless steel shovel				Samples Collected 1 8-oz jar 1 1/2 gall bag (# 40145) (1410)			
Geologist P. Sireath				Checked by/Date Sergeant Robins Madman 10/7/11			
Radiological Background 0.0 ppm in soil		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PID	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'			0.14	Silt w/ clay, very dark brown (10 YR 3/2) moist, medium stiff, 80% silt, 20% clay, common rootlets, no odor			
				30 GW D 0.5'			

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N, group 2	Location ID 76
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 7'8" ⁽²⁴⁾ 8.5'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-8-11/0843	Date/Time Total Depth Reached 6-8-11/0953
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gail bag (#40146)	+ 4oz jar(s) field dup - 40246 (1030)	
Geologist C. Carmichael	Checked by/Date Julia Robbins Helman 10/7/11		

Radiological Background 3415, 70 cpm	Radiological Equipment Used Downhole scanner, pancake meter	PID Used Mini Rae 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	ID	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	70	Sandy silt, (10 YR, 3/3), dark brown, 60% silt, 40% fine to medium grained sand, semi-moist, soft, some rootlets, no plasticity or hardness, no odor.	ML	0.5	3240
1'			0.0	58	Gradational contact			
			0.0	56	Sand with silt and clay, (10 YR, 3/3), dark brown, 50% fine to medium grained sand, 25% silt, 25% clay, semi-moist, loose, some rootlets, very low plasticity and hardness, no odor.	SM		
2'			0.0	85	Gradational contact			
			0.0	68	Clayey sand, (10 YR 3/6), reddish-brown, 65% fine to medium grained sand, 35% clay, semi-moist, medium dense, some rootlets, very low plasticity and hardness, no odor.	SC		
3'			0.0	68				
			0.0	60				
4'			0.1	55	Same as above, except sandier - 70% sand, 30% clay.			
			0.0	70				
5'			0.0	78				
			0.0	70				
6'			0.0	85				

Radiological Background 3415, 70 cpm				Project Name SSFE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 76	
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)
					Same as above	SC	
			0.0	70	Same as above, except sandier - Sand with clay, 80% sand, 20% clay		5367
7'			0.0	80			5477
			0.0	110			5427
			0.0	85	Refusal at 7' 8" bedrock		5443
			0.0	97			5562
9'					No groundwater reached. Refusal at 8.5'		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp-2	Location ID 77
Drilling Company HGL	Driller T. Morris	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11/1020	Date/Time Total Depth Reached 4-19-11/1027
Type of Sampling Device stainless steel shovel	Samples Collected 1-8-oz jar 1-1/2 gall bag (#40147) (1025)		
Geologist P. Sireath	Checked by/Date Julian Roberto Feldman 10/7/11		

Radiological Background 0-0 ppm 13 p.p.m.	Radiological Equipment Used M/R meter	PID Used Mini Ra2 2000
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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'				0-13	clayey silt, very dark grey (10YR 3/1), moist, soft, 35% clay, 55% silt, 10% gravel fill, few rootlets, no odor.	ml	
					No GW TD 0.5'		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp. 2	Location ID 78
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/1101	Date/Time Total Depth Reached 4-14-11/1107
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1 1/2 gall bag (# 40148) (1105)		
Geologist C. Carmichael	Checked by/Date LaQuan Robbin Kridman 10/7/11		

Radiological Background 4	Radiological Equipment Used up R meter	PID Used Mini Rae 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'					Road pack / gravel			
	0.0-15				Silty sand, (10 YR, 3/2), dark brown, 65% fine sand, 35% silt, dry, very dense, trace fill gravel, low hardness, no plasticity, no odor. No groundwater encountered	SM		

Project Name: SSFL Area IV Radiological Study	Project Number EP9935.01.22.04.03	Subarea ID & Group 8N Group 2	Location ID 78
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.0'
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-9-11 0830	Date/Time Total Depth Reached 5-9-11 0900
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected (0835) 40149 (1) 1/2 gallon bags + (1) 4oz. jar		
Geologist C. K. Wright	Checked by/Date Lui Qian Robbins Medvar 10/7/11		

Radiological Background 42 / 10MR	Radiological Equipment Used Pancake / MR Deter / hole ck	PID Used MiniRAE 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
			0.0	43	surface gravel road		+0.5 3092 CK 2736 (CPM)
0.5			0.0	85	AF: 5" crushed gravel with sand: road base	AF/SW	4233 3092 CK
1.0			0.0	80	AF: Fill Sandy silt w/ clay: Brown (10YR 5/3) dry, medium stiff, no odor, 30% fine sand, 15% clay, 55% silt, cohesive, low plasticity, mottled, trace angular medium gravel (fill rock)	AF/ML	4233 4959
2.0			0.0	55			5004
			0.0	35			5076
			0.0	60	2' 8"		5331
3.0			0.0	70	Fill: Clay with silt and sand: dark yellowish brown (10YR 4/4), moist, stiff, no odor, 20% fine sand, 25% silt, 55% clay, cohesive, low plasticity, medium dry strength, trace angular medium gravel, mottled	AF/CL	5219
			0.0	44			5068
4.0			0.0	49			5321
			0.0	35	4' 5" light yellowish CK silty sand: light yellowish brown (10YR 6/4), moist, medium dense, no odor, 35% silt, 65% fine sand,	SM	5464
5.0			0.0	32			5483
			0.0	44	Weathered sandstone: light olive brown (2.5Y 5/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	CK 532 5403
6.0			0.0	38			5320

Refusal on sandstone 6.0' by 5

No GW encountered



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N _{grp.2}	Location ID 79
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/1629	Date/Time Total Depth Reached 4-14-11/1635
Type of Sampling Device stainless steel shovel	Samples Collected 1-802 jar 1-1/2 gall bag (#40150) (1635)		
Geologist C. Carmichael	Checked by/Date Julian Robbins & Feldman 10/7/11		

Radiological Background 16	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 background (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'			0.0	14	Clayey sand, (10 YR, 3/2), dark brown, 55% fine sand, 45% clay, loose, semi-moist, medium hardness and plasticity, common rootlets, no odor. No groundwater encountered	SC	

Radiological Background 57,3022				Project Name SSFE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 79	
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'		
			0.075		Same as above, except mottled texture with light brown and orange (10 YR, 5/4 and 5/8).	SC	4820
7'			0.080		7'		4819
			0.055		Same as above, except sandier - Sand with clay, 75% fine to medium grained sand, 25% clay.		5006
8'			0.080				4912
			0.082				4843
9'			0.085				4864
			0.0110				4754
10'			0.090				4798
					10' goal depth reached. No groundwater reached.		



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp.2	Location ID 80
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-18-11/1027	Date/Time Total Depth Reached 4-18-11/1033
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1 1/2 gall. bag (#40152) (1032)		
Geologist C. Carmichael	Checked by/Date Kullen Robbins Goldman 10/7/11		

Radiological Background 14	Radiological Equipment Used M/R meter	PID Used Mini Rac 2000 (background 0.4 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'				0.4 13	Clayey sand, (10YR, 3/3), brown, 65% fine sand, 35% clay, common rootlets, semi-moist, medium dense, low plasticity and hardness, no odor. No groundwater encountered.	SC		

Radiological Background 53 / 2834				Project Name SSFLE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 80		
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			45 0.0 50 CK	45 50	Clay: Same as above Weathered sandstone: light olive brown (2.5Y 5/6) moist, dense, no color, mechanically weathered to SP, fine grained sandstone	CL SP SC X	5577 5389	
7.0								
8.0					Refusal on sandstone at 6.5' hys 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 8 Ngrp.2	Location ID 81			
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/1416	Date/Time Total Depth Reached 4-14-11/1423			
Type of Sampling Device stainless steel shovel		Samples Collected 1-80z jar 1 1/2 gall. bag (#40154) (#40155) ^{n/a (aa)}					
Geologist C. Carmichael		Checked by/Date Juliana Robbins Gledhill 10/7/11					
Radiological Background 16		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
05'					<p>surface + subsurface (40154) (40155)</p> <p>No sample collected</p> <p>* Arch. site</p>		



Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 2	Location ID 82
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/1539	Date/Time Total Depth Reached 4-14-11/1545
Type of Sampling Device stainless steel shovel	Samples Collected 1 1/2 gall bag (#40156) (1545)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Goldman 10/7/11		
Radiological Background 17	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (background: 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 17	Sand with clay, (10 YR, 3/3), brown, 80% fine grained sand, 15% clay, 5% sandstone rock fragments, common rootlets, no hardness or plasticity, no odor. 6" depth - sandstone bedrock. No groundwater encountered.	SC		



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 2	Location ID 83
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/1020	Date/Time Total Depth Reached 4-15-11/1025
Type of Sampling Device stainless steel shovel	Samples Collected 8-oz jar 1 1/2 gall bag (#40158) (1025)		
Geologist C. Carmichael	Checked by/Date LuAnn Robbins Feldman 10/10/11		

Radiological Background 13	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (background) 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.014	Sand with clay, (10YR, 4/3), brown, 80% fine sand, 20% clay, dry, medium dense, common rootlets, no plasticity, very low hardness, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study		Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N Group 2	Location ID: 83
Drilling Company: Boart Longyear		Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 7'
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-5-11/1056	Date/Time Total Depth Reached: 5-5-11/1108
Type of Sampling Device: 1 3/4" macrocore acetate liner		Samples Collected: (1) 1/2 gallon bags, (1) 4oz jar (#40159) (1120)		
Geologist: C. Carmichael		Checked by/Date: Lu Dan Robbins/Geldman 10/10/11		
Radiological Background: 48 / 11		Radiological Equipment Used: Pancake / Detector 4R meter	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	PID D.P.	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			0.065	70	Clay with sand and silt, (10 YR, 4/4), light brown with red and tan speckles 60% clay, 20% silt, 20% fine sand, dry, medium stiff, medium plasticity and hardness, no odor.	AF/CL	0.5	2816
1.0			68	72		3787	0	3000
						3998		
						4063		
2.0			71	70		4043		
						3903		
3.0			70	73		3912		
						3777		
4.0			75	75		4049		
						3975		
5.0			77		3748			
				55	3790			
6.0				52	4173			

Same as above, except flakey texture.

Radiological Background					Project Name	Project Number	Location
48 / 11					SSFL Area IV Radiological Study	EP9038.01.22.04.03	83
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>
							Inches
0.0			0.058		Same as above	CL	4470
7.0			0.059		Refusal at 7'.		4764
8.0					No groundwater reached.		
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 8N grp. D	Location ID 84
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/1411	Date/Time Total Depth Reached 4-15-11/1415
Type of Sampling Device stainless steel shovel	Samples Collected 1-8-oz jar 1-1/2 gallon bag (# 40160) (1415)		
Geologist C. Carmichael	Checked by/Date Julian Robinson Yellman 10/10/11		

Radiological Background 13	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	14	Sand with clay, (10 YR, 4/3), brown, 80% fine sand, 20% clay, common rootlets, dry, medium dense, low plasticity and hardness, no odor. No groundwater encountered.	SC		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 2 8N	Location ID 84
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-5-11/1420	Date/Time Total Depth Reached 5-5-11/1430
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected (1) 1/2 gallon bags, (1) 4-oz jar (#4016)(1435)		
Geologist C. Carmichael	Checked by/Date Julian Robbins, Medvan 10/10/11		

Radiological Background 66 / 11	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 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	45	Clay with silt and sand, (10YR, 4/4), light brown with speckled texture, 60% clay, 20% silt, 20% fine sand, dry, medium stiff, medium plasticity and hardness, no odor.	AF/CL	0.5	292		
1.0			59				3896	0	3162	
			62					4452		
			62					4302		
2.0			57					4311		
			65					4272		
3.0			61					3893		
			59					3812		
4.0			65					3874		
			69					3957		
5.0			73					3938		
			52				3901			
6.0			53				3927			

Radiological Background					Project Name	Project Number	Location
66 / 11					SSFL Area IV Radiological Study	EP9038.01.22.04.03	84
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)		(CPM)
7'			0.051		Same as above	CL	4276
			48			4692	
			48			4789	
8'			52			4459	
			60			4908	
9'			65			5079	
			62		5219		
10'			65		Refusal at 10'. No groundwater reached.		5179



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N ^{grp. 2}	Location ID 85				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel / trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-18-11/0814	Date/Time Total Depth Reached 4-18-11/0820				
Type of Sampling Device stainless steel shovel			Samples Collected 8-oz jar 1 1/2 gall bag (#40162) (0820)					
Geologist C. Carmichael			Checked by/Date Julian Robbins Altman 10/14/11					
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (background) 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	Silty sand, (10 YR, 3/3), dark brown, 60% fine sand, 40% silt, common rootlets, dry, medium dense, trace rock fragments (sandstone), no odor. No groundwater encountered.	SM		

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N Group 2	Location ID: 85
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 2.5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-11-11 1157	Date/Time Total Depth Reached: 5-11-11 1245
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 40163 (1155) (1) 1/2 gallon bag, (1) 4oz jar		
Geologist: C. Knight	Checked by/Date: Julian Roberts Miller 10/10/11		

Radiological Background: 41 / 3426	Radiological Equipment Used: Pancake / Downhole	PID Used: MiniRAE 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>
			0.0	824	Surface: grass and soil		+95' 3220 3243
0.5			0.0	64.6	Silty Sand: Dark brown (7.5YR 3/4), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand, trace rootlets near surface, trace gravel (fine)	SM	3220
1.0		0.0	67.7	3360			
		0.0	72.4	4471			
		0.0	72.8	4793			
2.0			0.0	72.8	2' 4" Weathered Sandstone: Pale yellow (2.5Y 7/4), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone, some iron oxide staining	SP	5004
		0.0	51.5	4945			
3.0					Refusal on sandstone at 2.5'		
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 8N gp.2	Location ID 86
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-18-11/1254	Date/Time Total Depth Reached 4-18-11/1300
Type of Sampling Device stainless steel shovel	Samples Collected 1-8-oz jar 1-1/2 gall. bag (#40164) (1300)		
Geologist C. Carmichael	Checked by/Date Lillian Robbins Moldman 10/10/11		

Radiological Background 13	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000	background: 0.2 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'				0314	Sand with clay, (10YR, 4/3), brown, 80% fine sand, 20% clay, dry, medium dense, common rootlets, very low hardness, no plasticity, no odor. No groundwater encountered	SC		

Project Name: SSFL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group 8N Group 2	Location ID 86
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-6-11/0835	Date/Time Total Depth Reached 5-6-11/0848
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected (1) 1/2 gallon bag, 14-oz. jar (#40165) (0850)		
Geologist C. Carmichael	Checked by/Date Audrian Robbins, Feldman 10/10/11		
Radiological Background 39 / 2821	Radiological Equipment Used Pancake / Downhole meter ^{meter}	PID Used MiniRAE 2000 (Bkqd: 0.0 ppm)	

Depth	Interval	Recovery	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
			61	AF: Artificial Fill (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		0.5 - 253
0.5		0.1	63	Clay with sand and silt, (10 YR, 5/4), light brown with orange and tan speckles 60% clay, 20% fine sand, 20% silt, dry, medium stiff, brown plastic netting at very surface of soil, low-medium plasticity and hardness, no odor, trace pieces of concrete on surface (1/2" - 1").	AF/CL	0 - 2880
1.0		49			CL	3787
		58				3913
2.0		65				3896
		60				3891
3.0		63				3799
		67				4133
4.0		64				4073
		59				4049
5.0		57	5'			4131
		0.2	64	Same as above, except more brittle and flakey in texture.		4335
		0.2	55			4466
6.0						4526

Radiological Background					Project Name	Project Number	Location
39 / 2821					SSFL Area IV Radiological Study	EP9038.01.22.04.03	86
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) <td></td> <td></td>							
6.0					Same as above	CL	
			0.252				4400
7.0			0.253				4541
			0.263				4498
8.0					Refusal at 7.5' No groundwater reached.		
9.0							
10.0							
11.0							
12.0							
13.0							

Radiological Background				Project Name	Project Number	Location	
50cpm / 10µR				SSFL Area IV Radiological Study	EP9034.01.22.04.03	87	
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)
6.0		0.0	64		Silt: Same as above	ML	5201
		0.0	64			5290	
7.0		0.0	66			5336	
		0.0	65			5266	
8.0		0.0	63			5316	
		0.0	55			5412	
9.0		0.0	58			5404	
		0.0	70			5314	
10.0		0.0	65			5306	
						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 8N group 2	Location ID 88
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-9-11 MTS	Date/Time Total Depth Reached 5-9-11 1425
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40167 (1410) (1) 1/2 gallon bags, (1) 4oz jar		
Geologist C. Knight	Checked by/Date Lulu Robinson-Medmen 10/10/11		

Radiological Background 4M / 2mR	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PD	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	50	Surface gravel		+0.5' 2865
			0.0	50	3" Gravel on surface		2931
0.5			0.0	35	Silty sand: dark brown (7.5YR 3/3), moist, medium stiff, no color, 35% silt, 65% fine sand, trace rootlets,	SM	4418
1.0		0.0	65	4862			
		0.0	58	5205			
2.0		0.0	60	5338			
		0.0	55	5150			
3.0			0.0	42	Same as above! ^{ck} SM	SM	5285
		0.0	45	Weathered sandstone: light olive brown (2.5Y 5/3), moist, hard, no color, mechanically weathered to SP, fine grained sandstone	5122		
4.0		0.0	50		5219		
5.0							
6.0							



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N gp.2	Location ID 89				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/1611	Date/Time Total Depth Reached 4-14-11/1615				
Type of Sampling Device Stainless Steel Shovel			Samples Collected + 1 - 8oz. jar 1-1/2 gall. bag (#40168) (1615)					
Geologist C. Carmichael			Checked by/Date Kuldeep Kumar Redman 10/10/11					
Radiological Background 16		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (background: 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'				0.013	Clayey sand, (10 YR, 3/2), dark brown, 55% fine sand, 45% clay, loose, semi-moist, medium plasticity and hardness, common rootlets, no odor. No groundwater encountered.	SC		



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N grp 2		Location ID 90	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-14-11/1647		Date/Time Total Depth Reached 4-14-11/1655	
Type of Sampling Device stainless steel shovel				Samples Collected 1-1/2 gal bag (#40169) (1655)			
Geologist C. Carmichael				Checked by/Date Linda Robinson Goldman 10/10/11			
Radiological Background 14		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0-15	Clayey sand, (10 YR, 3/3), dark brown, 55% fine sand, 45% clay, loose, semi-moist, medium hardness and plasticity, common rootlets, no odor. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 2	Location ID 91				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel / trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/1448	Date/Time Total Depth Reached 4-14-11/1451				
Type of Sampling Device stainless steel shovel			Samples Collected 1- 8oz jar 1- 1/2 gall bag (#40170) (1450)					
Geologist C. Carmichael			Checked by/Date LuDon Collins Yeldman 10/10/11					
Radiological Background 18		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (background) 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'				0.017	Sand with clay, (10YR, 3/3), dark brown, 75% fine sand, 25% clay, semi-moist, loose, very low hardness, plasticity, common rootlets, no odor. No groundwater encountered	SC		



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 N gm.2	Location ID 92
Drilling Company HGL	Driller T. MORSE T. MORSE (LG)	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel / trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11/1330	Date/Time Total Depth Reached 4-19-11/1334
Type of Sampling Device stainless steel shovel	Samples Collected 1-8-oz jar 1-1/2 gall bag (# 40171) (1335)		
Geologist P. Sireath	Checked by/Date Julian Rollins-Hudman 10/10/11		

Radiological Background 0.0 ppm, 14 mR	Radiological Equipment Used M R meter	PID Used Mini Rae 2000 (background) 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0	14	silt w/ sand, very dark brown (10% R 3/2), dry, soft, 90% silt, 10% fine sand, many roots, no odor NO GW TO 0.5'	ML		

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID 8N grp. 2	Location ID 93
Drilling Company HGL	Driller T. Morris	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11/1345	Date/Time Total Depth Reached 4-19-11/1349
Type of Sampling Device Stainless Steel Shovel	Samples Collected 1-8-oz jar 1-1/2 gall. bag (#40172) (1550)		
Geologist P. Sireath	Checked by/Date Julian Robbins-Bledman 10/10/11		

Radiological Background 14 mR, 0.0 ppm	Radiological Equipment Used M/R meter	PID Used Mini Rae 2000 (background) 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole
								Gamma Readings (CPM)
0.5'				0.14	silt w/ sand, very dark brown (10YR 3/2), dry, soft, 40% silt, 10% fine sand, many rootlets, no odor			
					TO 0.5'			
					NO GW			



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 N grp. 2	Location ID 94
Drilling Company HGL	Driller T. Morse F. Morris (CR)	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel / trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11 / 1505	Date/Time Total Depth Reached 4-19-11 / 1509
Type of Sampling Device stainless steel shovel	Samples Collected 1-3-oz jar 1-1/2 gall bag (# 40173) (1510)		
Geologist P. Sreath	Checked by/Date Lu Grant/Robins, Medman 10/10/11		

Radiological Background 0.0 ppm, 13 mR	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (background 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0	13	silt w/ clay, dark silty brown (10YR 3/2) m dry, stiff, 30% clay, 70% silt, common rootlets, no odor No GW TD. 0.5'			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SN group 2	Location ID 94
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 5-13-11 0845	Date/Time Total Depth Reached 5-13-11 1035
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 40174 (1) 1/2 gallon bags + (1) 4oz. jar		
Geologist C. Knight		Checked by/Date Julie Ann Robbins Melman 10/10/11	

Radiological Background 47 / 2816	Radiological Equipment Used Panecake / downhole	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 (CPM)</small>
					Surface: soil & grass		40.5 3014
0.5			0.0	75	Fill: Silty Clay, dark yellowish brown (10YR 3/4), moist, soft, no odor, 20% silt, 80% clay, rootlets near surface, low plasticity	AP	3736
			0.0	90		CL	4342
1.0			0.0	75	Fill: Clay with Sand; Strong brown (2.5YR 5/6), moist, medium stiff, no odor, 10% fine to medium sand, 5% silt, 85% clay, low plasticity, low cohesive, mottled	AP	4580
			0.0	60		CL	4565
2.0			0.0	95			4701
			0.0	95			4904
3.0			0.0	60			4855
			0.0	70			4924
4.0			0.0	65			5109
			0.0	60	- - - gradational contact - - -		
			0.0	60		CL	5361
5.0			0.0	65	Sandy Silt: Strong br. Brown (7.5YR 4/3), moist, medium stiff, no odor, 25% fine sand, 10% clay, 65% silt, cohesive, low plasticity	ML	5715
			0.0	56			5713
6.0			0.0	70			5920

Radiological Background 47/2816				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location G4		
Depth	Interval	Recovery	PID	Radioteal	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>	
6.0			0.0	70	Same as above: ML	ML	5920	
			0.0	58				5768
7.0			0.0	65				5684
			0.0	65				5257
8.0			0.0	60	Weathered sandstone: Olive Yellow (2.5Y 6/8), moist, dense, mechanically weather to SP, fine grained sandstone, iron oxide staining	8.5 10.0	5306	
			0.0	70				5088
9.0					Refusal on sandstone at 8.5' bgs 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 8 N grp. 2	Location ID 95
Drilling Company HGL	Driller T. Morse F. Morse (RC)	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel / trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11 / 14:45	Date/Time Total Depth Reached 4-19-11 / 14:49
Type of Sampling Device stainless steel shovel	Samples Collected #8-oz jar 1-1/2 gall bag (# 40175) (1450)		
Geologist P. Sireath	Checked by/Date Julie Ann Robbins Goldman 10/10/11		

Radiological Background 0 ppm, 12 hr	Radiological Equipment Used M/R meter	PID Used Mini Rae 2000 (background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.12		sandy silt, dark brown (10YR 7/3), dry med. stiff, 35% med to fine sand, 65% silt, common rootlets, no odor	ml		
					TD 0.5' No GW			

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SN group 2	Location ID: 95
Drilling Company: Boat Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 6.0 ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-13-11 1100	Date/Time Total Depth Reached: 5-13-11 1148
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: 40176 (1110) (1) 1/2 gallon bags + (1) 4oz. jar		
Geologist: C. Knight	Checked by/Date: Julia Robbins Alderman 10/10/11		

Radiological Background: 43 / 2650	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	72	surface: grass and soil		2857
0.5			0.0	85	Fill: silt; dark yellowish brown (10YR 3/4), slightly moist, soft, no odor, 5% fine sand, 5% silt, 90% clay	AF/ML	2979 4379
1.0			0.0	75			5003
			0.0	60	1' 5"		4984
2.0			0.0	70	Fill: Sandy clay with silt; yellowish brown (10YR 5/6), moist, medium stiff, no odor, 15% fine sand, 5% medium sand, 5% coarse sand, 15% silt, 60% clay, cohesive, low plasticity	AF/CL	5070
			0.0	90			5021
3.0			0.0	75			4900
			0.0	80	3' 4"		4815
4.0			0.0	80	Clay with silt and sand: yellowish brown (10YR 5/6), medium dense, no odor, 10% silt, 10% fine sand, 80% clay, medium plasticity, cohesive, low toughness	CL	5077
			0.0	60			4807
5.0			0.0	66	5' i Clay: dark yellowish brown (10YR 3/6) moist, stiff, no odor, 5% silt, 5% fine sand, 90% clay, medium plasticity, cohesive		4997
			0.0	65	Weathered sandstone: Olive yellow (2.5Y 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	CL	4969
6.0			0.0	70			5067

Total depth and refusal at 6.0' bgs on sandstone
No GW encountered



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 N grp. 2	Location ID 46
Drilling Company HGL	Driller T. Morris	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11/ 1526	Date/Time Total Depth Reached 4-19-11/ 1524
Type of Sampling Device stainless steel shovel	Samples Collected 1-8-oz jar 1-1/2 gall bag (# 40177) (1525)		
Geologist P. Sireath	Checked by/Date Julie Ann Robinson Goldman 10/10/11		

Radiological Background 0.089-12 nR	Radiological Equipment Used M/R meter	PID Used Mini Ra2 2000 (background 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.12	clayey silt, very dark greyish brown (10 YR 3/2), dry, stiff, 40% clay, 60% silt, common rootlets, no odor, med. plasticity			
					No GW to 0.5'			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SN group 2	Location ID 96
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 5-13-11 0818	Date/Time Total Depth Reached 5-13-11 0915
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 40178 (0830) (1) 1/2 gallon bags + (1) 4oz. jar		
Geologist C. Knight	Checked by/Date Juliana Robbins, Goldman 10/10/11		

Radiological Background 49 / 2637	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 (CPM)</small>
			0.0	55	Surface: grab and soil		195 2883
0.5			0.0	90	Fill: lean clay with silt: dark yellowish brown (10YR 3/4), moist, med. stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness, mottled, trace CaCO ₃ nodules	AF	3008
1.0			0.2	85		CL	3872
			0.0	70			4456
2.0			0.0	75			4633
			0.0	60			4785
3.0			0.0	75			4645
			0.0	45	8' 9" Clay: dark brown (10YR 3/3), moist, medium stiff, nodular, 5% silt, 95% clay, medium plasticity, medium toughness.	CL	4833
4.0			0.0	60			4798
			0.0	50			4848
5.0		NR	0.2	50	No Recovery		5079
			0.0	45	Same as above: CL	CL	5111
6.0			0.0	50			5088
			0.0	50			5128

Radiological Background 49/2637				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 96		
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	90	Same as above: CL	CL	5128	
			0.0	47			4883	
7.0			0.0	95			5215	
			0.0	50			4929	
8.0			0.0	59			5059	
			0.0	66	5" 2" Silty Sand: dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 35% silt, 65% fine sand	SM	5227	
			0.0	55			5425	
9.0			0.0	75			5317	
			0.0	75			5179	
10.0			0.0	75				
11.0					Total depth: 10.0' by S No GLW encountered			
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 N grp. 2	Location ID 97
Drilling Company HGL	Driller T. Morse F. ... (USA)	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11/ 1535	Date/Time Total Depth Reached 4-19-11/ 1539
Type of Sampling Device Stainless Steel shovel	Samples Collected 1-8-oz jar 1-1/2 gall bag (# 40179) (1540)		
Geologist P. Sireath	Checked by/Date Ludlow Robbins Goldman 10/10/11		

Radiological Background 2.0 ppm, 12 mR	Radiological Equipment Used 4" R meter	PID Used Mini Rae 2000 (background) 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0 12	silt w/ clay, dark yellowish brown (10 YR 3/4), dry, med. stiff; 80% silt, 20% clay, many rootlets, no odor	ML		
					TD 0.5'			
					NO GW			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SN group 2	Location ID G7
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-12-11 1442 1437	Date/Time Total Depth Reached 8-12-11 1536
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 4080 (4440) (1) 1/2 gallon bags + (1) 4oz. jar		
Geologist C. Knight	Checked by/Date Audran Robbins MEdman 10/10/11		

Radiological Background 49 / 2763	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 is grass and soil		+0.5' 2747
0.5			0.0	55	Sandy silt; Brown (10YR 5/3), dry, medium stiff, no odor,		3093
			0.0	52	35% fine sand, 65% silt, non-cohesive, low plasticity, pin hole pores	ML	4317
1.0			0.0	65	1'2" ^{and sand}		4812
			0.0	50	clay with silt; dark yellowish brown (10YR 4/6), moist, medium stiff, no odor, 10% silt, 5% coarse sand, 5% medium sand, 10% fine sand, 70% clay, low plasticity,	CL	4969
2.0			0.0	42	cohesive, medium dry strength, trace pin hole pores, some CaCO ₃ nodules		4737
			0.0	38			4828
3.0			0.0	50			4721
			0.0	45			4937
4.0			0.0	55	3'10" Sandy clay with silt; yellowish brown (10YR 5/6), moist, medium stiff, no odor, 10% fine sand, 5% medium sand, 10% silt, 75% clay, trace stringers, trace CaCO ₃ nodules	CL	4876
			0.0	50			4998
5.0			0.0	61	NO Recovery		4855
			0.0	72	Fat clay; dark brown (7.5YR 3/4), moist, stiff, no odor, 5% silt, 5% fine sand, 90% clay, high plasticity, high toughness, high dry strength	EH	4990
6.0			0.0	54			5259

Radiological Background 44/2763				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 97	
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	54	Same as above: CH	CH	5259
			0.0	45	Poorly graded sand with silt: dark gray (10YR 3/1), moist, medium dense, no odor, fine grained sand, 10% silt, 90% fine sand	CH	4914
7.0			0.0	75	Sandstone: Very pale brown (10YR 7/3), dry, hard, no odor, fine grained sandstone, 95% fine, 5% medium sand	SM	5218
8.0					Refusal on sandstone at 7.0' bgs No GW encountered		
9.0							
10.0							
11.0							
12.0							
13.0							



Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp. 2	Location ID 98
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-20-11/1243	Date/Time Total Depth Reached 4-20-11/1248
Type of Sampling Device Stainless steel shovel	Samples Collected + (1) 4oz jar 1-1/2 gall bag (#40181) (1248)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Millman 10/10/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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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				0.012	Clayey sand, (10YR, 3/3), dark brown, 65% fine to medium grained sand, 35% clay, some rootlets, moist, medium dense, no odor, low plasticity and hardness. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N sample 2	Location ID 98
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 5-12-11 1320	Date/Time Total Depth Reached 5-12-11 1430
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 40182 (1370) (1) 1/2 gallon bags + (1) 4oz. jar		
Geologist C. Knight	Checked by/Date Shelley Robbins Melman 10/10/11		

Radiological Background 62 12852	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: 5' extraneous soil		4052775
0.5			0.0	70	Fill: Sandy silt; dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 25% finesand, 5% medium sand, 10% clay, 60% silt, cohesive, low plasticity, low toughness, mottled, trace angular fine sandstone gravel, trace rootlets near surface	AF	3332
1.0			0.0	85		ML	4521
			0.0	60	1'6"		4696
2.0			0.0	60	Clay with silt; dark yellowish brown (10YR 4/6), moist, medium stiff, no odor, 10% silt, 5% CaCO ₃ nodules, 85% clay, trace rootlets, ^(CL) medium plasticity, medium toughness, cohesive	CL	4784
			0.0	66			4777
			0.0	55			4770
3.0			0.0	66			7778
			0.0	75			4886
4.0			0.0	70			5053
			0.0	80			5175
5.0			0.0	65	Same as above: CL	CL	5492
			0.0	36	Silty Sand: Brown (10YR 5/3), ^{very moist} moist, medium dense, no odor, 25% silt, 10% medium sand, 65% fine sand, slow dilatancy	SM	5473
6.0			0.0	55			5620

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 2	Location ID 99
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-12-11 1110	Date/Time Total Depth Reached 5-12-11 1155
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 40183 (1120) (1) 1/2 gallon bags + (1) 4oz. jar		
Geologist C. Knight	Checked by/Date Julian Robbins/Moldovan 10/10/11		

Radiological Background 43 / 3015	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: gravel + soil		70.5' 2830
			6.0	50	Fill		3020
0.5			0.0	63	Af: Sandy lean clay: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% coarse sand, 5% medium sand, 10% fine sand, 5% angular sandstone gravel	Af	3488
1.0			0.0	55	fine, 75% clay, mottled, medium toughness, low plasticity, trace rootlets near surface	CL	4561
			0.0	66			5032
2.0			0.0	49	2' 2"		5042
			0.0	45	Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 25% silt, 75% fine sand, trace medium sand	SM	5159
3.0			0.0	64			5234
			0.0	70			4898
4.0			0.0	85			4757
			0.0	104			4501
5.0			0.0	68	Poorly graded Sand: light yellowish brown (10YR 6/4), saturated to very wet, dense, no odor, fine sand	SP	4624
			0.0	78	Weathered Sandstone: Pale yellow (5Y 7/3), dry, hard, no odor, mechanically weathered to SP, fine grained sandstone	SP	4717
6.0			0.0	50			4864

Refusal on sandstone at 6.0' bgs

No GW encountered

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N grp. 2		Location ID 100	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A		Date/Time Drilling Started 4-20-11/1252		Date/Time Total Depth Reached 4-20-11/1255	
Type of Sampling Device Stainless steel shovel				Samples Collected 1-1/2 gall bag (# 40184) (1255)			
Geologist C. Carmichael				Checked by/Date L. Dan Robbins Meldrum 10/10/11			
Radiological Background 12		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	12	Sand with clay, (10 YR, 3/4), dark brown, 75% fine to medium grained sand, 25% clay, moist, medium dense, low plasticity and hardness, no odor. No groundwater encountered.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID and group 8N group 2	Location ID 100
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0'
Drilling Equipment 1 3/4" Macrocore	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-12-11 1010	Date/Time Total Depth Reached 5-12-11 1100
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 40185 (1020) + (1) 4oz jar C1 1 1/2 gal bags 40263 (NT) field DUP		
Geologist C. Knight	Checked by/Date Joe Dean Retina Malden 10/10/11		

Radiological Background 35 / 2826	Radiological Equipment Used Pancake / Downhole	PID Used Mini Ace 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	60	Artificial Fill: AF swiftness: grain and soil		3039
0.5			0.0	63	Artificial Fill: AF Sand with silt; Yellowish brown (10YR 5/4), moist, medium dense, no odor, 10% silt, 10% medium sand, 15% coarse sand, 65% fine sand, mottled	AF SP	9354
1.0			0.0	55			4638
			0.0	40			5045
2.0			0.0	43	Silty Sand: Yellowish brown (10YR 5/6), moist, med. dense, no odor, 30% silt, 5% medium sand, 65% fine sand, rapid dilatancy	SM	5170
			0.0	80			5210
3.0			0.0	75			5129
			0.0	85	4'3" very moist SP. Pumping when pressed Weathered Sandstone: olive yellow (2.5Y 6/8), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone	SP SC	4919
4.0			0.0	64			4969
			0.0	60			5073
5.0			0.0	83	Refusal on Sandstone at 5' bygs NO GW encountered		5346
6.0							



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 2	Location ID 102 ^(CA) 101
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-20-11/1302	Date/Time Total Depth Reached 4-20-11/1310
Type of Sampling Device Stainless steel shovel	Samples Collected 1-4oz jar 1-1/2 gall bag (#40188 ^(CP)) (1310)	Checked by/Date Julian Robbins-Moldman 10/10/11	
Geologist C. Carmichael			

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (background: 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	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	12	Sand with clay, (10YR, 3/3), dark brown, 80%. Fine sand, 20% clay, trace sandstone rock fragments, moist, medium dense, some rootlets, very low plasticity and hardness, no odor. No groundwater encountered.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N, group 2	Location ID 101
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5' (C) 8.0
Drilling Equipment 6606 Geoprobe	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-11-11 1523	Date/Time Total Depth Reached 5-11-11 1635
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 40187 (1530) (1) 1/2 gal bag + (1) 4oz jar		
Geologist C. Knight	Checked by/Date Sub. Dan Robbins / Y. Feldman 10/10/11		

Radiological Background 49 / 2643	Radiological Equipment Used Pancake / Downhole	PID Used Mini Ace 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: oak leaves and soil		+0.5 = 2744
			0.0	65	Fill: Poorly graded sand with silt; dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 10% silt, 10% medium sand, 80% fine sand, trace leaves and rootlets, mottled	AF/SP	3083
0.5			0.0	75			4265
1.0			0.0	90			4917
			0.0	80			4838
2.0			0.0	70			4854
			0.0	75		4895	
3.0			0.0	70	3' Fill Poorly graded sand: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 5% silt, 15% medium sand, 80% fine sand	AF/SP	4834
			0.0	85		AF/SM	4973
4.0			0.0	68	Fill: Silty Sand: Brown (10YR 7/3), moist, medium dense, no odor, 25% silt, 5% coarse sand, 15% medium sand, 55% fine sand, mottled		5034
			0.0	65		AF/ML	4995
5.0			0.0	60	4' 5" Sandy silt: dark yellowish brown (10YR 3/6), very moist, soft, no odor, 30% fine sand, 70% silt, non cohesive, low plasticity, slow dilatancy, material pumps when pressed, broken leaves within sample, trace roots, trace mottling, seeping perched GW		5124
			0.0	50			5134
6.0			0.0	55	contact 6.0' bgs		5216

Radiological Background 49/2643				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 101		
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	55		Poorly graded sand with silt; light yellowish brown (10YR 6/4), very moist, no odor, 10% silt, 10% medium sand, 80% fine sand, Iron oxide staining	SP	5216	
		0.0	50				4796	
7.0		0.0	42	6'8"	Weathered sandstone: light yellowish brown (10YR 6/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	4708	
		0.0	50				4727	
8.0		0.0	55		Refusal on Sandstone at 7'5" by 8'0" No GW encountered, seepage noted at 4'5" by 5'		5234	
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 8N gp. 2	Location ID 101 ^(C) 102
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-20-11/1323	Date/Time Total Depth Reached 4-20-11/1330
Type of Sampling Device Stainless steel shovel	Samples Collected 1-4 oz jar 1-1/2 gall bag (# 40188) (1330)		
Geologist C. Carmichael	Checked by/Date Ludeca Robbins Melder 10/10/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0012	Sand with clay, (10 YR, 3/3), dark brown, 80% fine to medium grained sand, 20% clay, moist, medium dense, some rootlets, very low hardness and plasticity, no odor. No groundwater encountered	SC		



Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID: 8N group 2	Location ID: 103
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 4-0
Drilling Equipment: Creoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-0-11 0926	Date/Time Total Depth Reached: 5-12-11 0950
Type of Sampling Device: 3/4" Macrocore	Samples Collected: 40/90 (0930) (1) 1/2 gal bags + (1) 4oz. jar	Checked by/Date: Julie Ann Robbins Melman 10/10/11	
Geologist: C. Knight		PID Used: Mfri Rae 2000 C Blgd! 0.0 ppm	

Radiological Background: 57/ 2843	Radiological Equipment Used: Pancake / Downhole
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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	65	Silty Sand: yellowish brown (10YR 5/4), moist, medium dense, no odor, 30% silt, 5% medium sand, 65% fine sand, trace rootlets in upper 1.0', trace pinhole pores	SM	40.5 2478 (CPM)
1.0			0.0	60			3218
			0.0	70			4606
			0.0	65			5144
			0.0	60			5211
2.0			0.0	70			5356
			0.0	65			5398
3.0			0.0	75			5412
			0.0	70			5485
4.0			0.0	70			5272
5.0					Refusal on Sandstone at 4.0' bgs		
6.0					No CW encountered		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N group 2	Location ID 104
Drilling Company HGL	Driller I. Stone	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment hand auger	Borehole Diameter 3 7/8"	Date/Time Drilling Started 5-31-11 1420	Date/Time Total Depth Reached 5-31-11 1520
Type of Sampling Device hand auger	Samples Collected 40191 (1450) (1) 1/2 gallon bags + (1) 4oz jar		
Geologist C. Knight	Checked by/Date John Robbins Goldman 10/10/11		

Radiological Background: 63 / 3171
 Radiological Equipment Used: Pancake / Downhole
 PID Used: MiniRAE 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 Inches 0.5 = 3122 (CPM)
			0.0	63	Surface: leaves and soil		
0.5		0.0	90		Silty sand: dark yellowish brown (10YR 3/6), moist, medium dense, no odor, 35% silt, 65% fine sand, rapid dilatancy, rootlets near surface	SM	3571 4252
1.0		0.0	85		Sandy silt: Brown (2.5YR 4/3), moist, medium stiff, no odor, 40% fine sand, 60% silt, low plasticity, trace root and rootlets	ML	5003 5115
2.0		0.0	65				5361
		0.0	71				5170
3.0		0.0	67				5463
		0.0	72				5406
4.0		0.0	99				5485
		0.0	100				5354
5.0		0.0	45				5471
		0.0	74		Silty clay with sand; yellowish brown (10YR 5/4), moist, medium stiff, no odor, 20% silt, 10% fine sand, 90% clay, non cohesive, low plasticity, low toughness	CL	5636
6.0		0.0	72				5607

Radiological Background 63/3171				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 104	
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	72		Same as above	CL	5607
		0.0	99		Poorly graded sand with clay; Pale brown (10%R 6/3) very moist, medium dense, no odor, 10% clay, 90% fine sand, abundant roots	SP	5569
7.0		0.0	91				5373
		0.0	05		- seepage in boring		5420
8.0		0.0	70				5180
		0.0	79		- abundant roots		5116
9.0		0.0	94				5155
		0.0	90				4969
10.0		0.0	00		Same as above	SP	5406
Total depth 10.0' bgs							
11.0							
12.0							
13.0							



Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N Group 2	Location ID: 105
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 7'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-10-11/1139	Date/Time Total Depth Reached: 5-10-11/1147
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: (1) 1/2 gallon bag, (1) 4-oz jar (#40192) (J220)		
Geologist: C. Carmichael	Checked by/Date: Julie Patterson Feldman 10/10/11		

Radiological Background: 70 / 2820	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	Inches	Borehole Gamma Readings	
								(CPM)	
			0.0	45	AF: Artificial Fill			+0.5	278
0.5			0.0	47	Sandy clay, (10YR, 4/4), brown, some rootlets in top 3", 60% clay, 35% sand, 5% gravel fill, dry, soft, very low plasticity and hardness, no odor.	AF/CL	4389		3135
1.0				64 Gradational Contact.....		4682		
				43	Clay with sand, (10YR, 3/4), dark brown, 85% clay, 15% fine sand, dry, medium stiff, medium plasticity and hardness, no odor.	AF/CL	4873		
2.0				65			4714		
				73			4800		
3.0				61			4965		
				75			5060		
4.0				70			4950		
				75			4936		
5.0				70			4954		
				65	5.5' Gradational contact.....		5119		
				68	Sand with clay, (10YR, 4/4), brown, 85% fine to medium grained sand, 15% clay, dry, medium dense, very low hardness, no plasticity, no odor.	SC	5025		

Radiological Background				Project Name	Project Number	Location	
70 / 2820				SSPL Area IV Radiological Study	EP9038.01.22.04.03	105	
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
6.0					6' Sand, (10 YR, 5/4), light brown, 100% fine to coarse grained sand, dry, medium dense/dense, no plasticity or hardness, no odor.	SW	4903
7.0			0.084				5047
			0.082		Refusal at 7'		
8.0					No groundwater reached.		
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 8N_group 2		Location ID 106	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 3.5'	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 6-8-11/1142		Date/Time Total Depth Reached 6-8-11/1208	
Type of Sampling Device 2 3/4" hand auger				Samples Collected 1-4oz jar 1-1/2 gall bag (#40193) (1220)			
Geologist C. Carmichael				Checked by/Date Ludvan Robbins Yeldman 10/10/11			
Radiological Background 14, 77 cpm		Radiological Equipment Used yR meter, pancake meter		Downhole Scanner		PID Used Mini Rae 2000 (0.0 ppm)	
Depth	Interval	Recovery	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 68	3" of asphalt on top.			+0.5 -2871
			0.0 58	Clayey sand, (10YR, 5/3), light brown mottled with orange, 55% fine to medium grained sand, 45% clay, semi-moist, medium dense, low plasticity and low-medium hardness, no odor.		SC	0 3545
1'			0.0 75				4645
			0.0 76				5098
2'			0.0 68				5156
			0.0 64				5052
			0.0 64				5334
3'			0.0 67				5583
			0.0 95	Refusal at 3.5' bedrock			5610
4'				No groundwater reached.			
5'							
6'							



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N grp-2		Location ID 107	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 4-20-11/1334		Date/Time Total Depth Reached 4-20-11/1337	
Type of Sampling Device Stainless steel shovel				Samples Collected 1-4 oz jar 1-1/2 gall bag (#40194) (1337)			
Geologist C. Carmichael				Checked by/Date Julie Ann Pettins Moldman 10/10/11			
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000		(background: 0.0 ppm)	
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	12	Silty sand, (10YR, 4/4) brown, 70% fine to medium grained sand, 30% silt, trace wire and gravel, some rootlets, dry, loose, no hardness or plasticity, no odor. No groundwater encountered	SM	



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N grp. 2		Location ID 108	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A		Date/Time Drilling Started 4-20-11/1348		Date/Time Total Depth Reached 4-20-11/1352	
Type of Sampling Device Stainless steel shovel				Samples Collected 1-4 oz jar 1-1/2 gall bag (#40195) (1352)			
Geologist C. Carmichael				Checked by/Date Luis O. Robinson Yeldoran 10/10/11			
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000		(background: 0.0 ppm)	
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	12	Sandy silt, (10 YR 3/2), greyish-brown, 60% silt, 35% sand (fine to medium grained, 5% asphalt & concrete pieces (1/4" diameter), dry, loose/soft, no plasticity or hardness, no odor. ~3" depth in drainage. No groundwater encountered.	ML	

Radiological Background					Project Name	Project Number	Location
13,48 cpm					SSFL Area IV Radiological Study	EP9038.01.22.04.03	109
Depth	Interval	Recovery	FD	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	
7'			0.0	77	Same as above, except sandier - 70% sand, 30% clay	SC	4614
			0.0	55			4530
			0.0	98			4496
8'			0.0	87	Sand with clay (to 4% ^{2.54, 5/3}), greenish brown, 80% fine to medium grained sand, 20% clay, semi-moist, medium dense, very low hardness, no plasticity or odor.	SC	4454
			0.0	97			4491
			0.0	65			4488
9'			0.0	55			4744
10'			0.0	93			4693
					10' goal depth reached.		
					No groundwater reached.		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 2	Location ID 110				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment Stainless steel shovel		Borehole Diameter n/a	Date/Time Drilling Started 4-20-11/1401	Date/Time Total Depth Reached 4-20-11/1406				
Type of Sampling Device Stainless steel shovel		Samples Collected 1-4 oz jar 1-1/2 gall bag (#40197) (1405)						
Geologist C. Carmichael		Checked by/Date Lu Dean Robbins Holman 10/11/11						
Radiological Background 11		Radiological Equipment Used w/ R meter PID Used Mini Rae 2000 (background: 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	11	Silt with sand, (10 YR, 4/3), brown, 75% silt, 20% fine sand, 5% rock fragments (sandstone, asphalt, concrete), dry, medium stiff, very low plasticity, no hardness, no odor. ~3" depth to drainage. No groundwater encountered.	ML		



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N grp 3		Location ID 111	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A		Date/Time Drilling Started 4-21-11/1337		Date/Time Total Depth Reached 4-21-11/1342	
Type of Sampling Device Stainless steel shovel				Samples Collected 1-1/2 gall bag (#40217) (1342)			
Geologist C. Carmichael				Checked by/Date Andrew Robinson Alderman 10/11/11			
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5				0.015	Silty sand, (10 YR, 3/3), dark brown, 70% fine sand, 30% silt, some rootlets, semi-moist, loose, no plasticity or hardness, no odor. No groundwater encountered.	SM	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp.3	Location ID 112
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-21-11/1325	Date/Time Total Depth Reached 4-21-11/1330
Type of Sampling Device Stainless steel shovel	Samples Collected 1-1/2 gall bag (#40219) (1330)		
Geologist C. Carmichael	Checked by/Date Stephan Robbins Feldman 10/11/11		

Radiological Background 14	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'			0.0	14	Silty sand, (10 YR, 2/2), dark brown, 65% fine sand, 35% silt, semi-moist, loose, no plasticity or hardness, no odor. No groundwater encountered.	SM	



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N grp.3		Location ID 113	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A		Date/Time Drilling Started 4-21-11/1254		Date/Time Total Depth Reached 4-21-11/1300	
Type of Sampling Device Stainless steel shovel				Samples Collected 1-1/2 gall bag (#40221) (1300)			
Geologist C. Carmichael				Checked by/Date LuAnn Robbins Melman 10/11/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000		background: 0.0 ppm	
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.014	Silty sand, (10YR, 2/2), dark brown, 70% fine to medium grained sand, 30% silt, semi-moist, loose, some rootlets, no plasticity or hardness, no odor. No groundwater.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N, group 3	Location ID 113
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 5' 8"
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-10-11/1009	Date/Time Total Depth Reached 6-10-11/1044
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#40222) (1050)		
Geologist C. Carmichael	Checked by/Date Bkgd: 3552 <i>Linda Robbins Goldman</i> 10/11/11		

Radiological Background 15, 51 cpm	Radiological Equipment Used Downhole scanner, 4R meter, Pancake meter	PID Used Mini Rae 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	ID	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	57			0.5	3513
			0.0	85	Sandy silt, (10YR, 3/3), dark brown, 60% silt, 40% fine sand, some rootlets, leaf litter, dry, soft, no plasticity or hardness, no odor.	ML		4767
1'			0.0	55	Gradational Contact Sand with silt and clay, (10YR, 3/4), 65% fine to medium grained sand, 20% silt, 15% clay, semi-moist, medium dense, no plasticity or hardness, no odor.	SM		4998
			0.0	87				5084
2'			0.0	85				5055
			0.0	98				5054
3'			0.0	70				5122
			0.0	110				5105
4'			0.0	105				5056
			0.0	58				5135
5'			0.0	68				5125
			0.0	62				5044
6'					Refusal at 5' 8" - bedrock.			

No groundwater reached.



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N gp.3	Location ID 114				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A	Date/Time Drilling Started 4-21-11/1245	Date/Time Total Depth Reached 4-21-11/1248				
Type of Sampling Device Stainless steel shovel		Samples Collected 1-1/2 gall bag (#40223) (1248)						
Geologist C. Carmichael		Checked by/Date Lillian Robinson Meldman 10/11/11						
Radiological Background 13		Radiological Equipment Used M/R Meter		PID Used Mini Rae 2000 (background: 0-0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.013	Sand with silt, (10 YR, 3/3), dark brown, semi-moist, loose, some rootlets, 80% fine to medium grained sand, 20% silt, no plasticity or hardness, no odor. No groundwater encountered.	SM		



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp.3	Location ID 115
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter N/A	Date/Time Drilling Started 4-21-11/1235	Date/Time Total Depth Reached 4-21-11/1240
Type of Sampling Device Stainless steel shovel	Samples Collected 1-1/2 gal bag (#40225) (1240)		
Geologist C. Carmichael	Checked by/Date LuDeen Robbins Goldman 10/11/11		

Radiological Background 1514	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (back ground: 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	Sand with silt, (10 YR 3/3), dark brown, 85% fine to coarse grained sand, 15% silt, some rootlets, semi-moist, loose, no plasticity or hardness, no odor. No groundwater.	SM		

Project Name: SSFL Area IV Radiological Study		Project Number EP2038.01.22.04.03	Subarea ID 8N, group 3	Location ID 115
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 28"
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-9-11/1524	Date/Time Total Depth Reached 6-9-11/1542
Type of Sampling Device 2 3/4" hand auger		Samples Collected 1-1/2 gall bag (#40226) (1550)		
Geologist C. Carmichael		Checked by/Date JRY 10/11/11 (Downhole Background: 3376) Background: 0.0 ppm		
Radiological Background 17, 75 cpm		Radiological Equipment Used Botanoc scanner, PID Used Mini Rae 2000 (0.0 ppm) yR meter, Pancake meter		
Depth	Interval	Recovery	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	Borehole Gamma Readings Inches (CPM)
		CPD		
		0.0		
		0.0		
1'		0.0	Silty sand with clay, (10 YR, 3/3), dark brown, 55% fine to medium grained sand, 30% silt, 15% clay, dry, loose, some rootlets, very low plasticity, hardness, no odor.	3491
		0.0		4227
		0.0		4830
		0.0		4949
		0.0		5093
2'		0.0	Refusal at 28" - bedrock No groundwater reached.	4863
3'		0.0		
4'				
5'				
6'				



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 3	Location ID 116
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-21-11/1024	Date/Time Total Depth Reached 4-21-11/1031
Type of Sampling Device Stainless steel shovel	Samples Collected 1-1/2 gallon bag (#40227) (1030)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Feldman 10/11/11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rae 2000	background: 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.014	Sand with silt, (10YR, 2/2), dark brown, 80% fine to coarse grained sand, 20% silt, trace gravel, semi-moist, loose, no plasticity or hardness, no odor. No groundwater encountered.	SM		

10

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N, group 3	Location ID 116
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 7'3"
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-9-11/1114	Date/Time Total Depth Reached 6-9-11/1249
Type of Sampling Device 2 3/4" hand auger			Samples Collected 1-1/2 gall bag (#40228) (1255)	
Geologist C. Carmichael			Checked by/Date Julian Reelins Yeldman 10/11/11	
Radiological Background 17, 48 cpm		Radiological Equipment Used Botanrol scanner, PID Used 4R meter, Pancake meter Mini Rae 2000 (0.0 ppm) Background: 0.0 ppm		

Depth	Interval	Recovery	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)
1'			0.0 96	Sand with silt and clay, (10YR, 3/3), dark brown, 50% fine to medium grained sand, 25% silt, 25% clay, some rootlets, semi-moist, very low plasticity and hardness, no odor, loose.	SM	0.5	3424
			0.0 107			4066	
			0.0 95			4672	
2'			0.0 60	Same as above, except darker (10YR, 2/2)		4987	
			0.0 76			5116	
			0.0 80			5151	
3'			0.0 82	Clayey sand Gradational Contact Sandy clay with silt, (10YR, 2/2), dark brown, 50% clay, 30% sand, 20% silt, semi-moist, medium dense, trace rootlets, very low plasticity and hardness, no odor.	SC	5162	
			0.0 68			5133	
			0.0 100			5044	
4'			0.0 87			5087	
			0.0 90			5080	
			0.0 75			5145	
5'			0.0 90	5' Gradational Contact Same as 2'-3'	SM	5207	
			0.0 90				

Radiological Background					Project Name	Project Number	Location
17, - 48 cpm					SSFL Area IV Radiological Study	EP9038.01.22.04.03	116
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
					Same as above	SM	
				0.0 54	6.5' Gradational Contact		5171
				0.0 55	Sand with silt, (10 YR 3/3), brown, 75% medium sand, 25% silt, moist/wet, medium dense, no plasticity or hardness, no odor.	SM	4956
7'					Refusal at 7'3" - bedrock		
					Groundwater hit at 6'11"		



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 3	Location ID 117
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter N/A	Date/Time Drilling Started 4-21-11/0919	Date/Time Total Depth Reached 4-21-11/0925
Type of Sampling Device Stainless steel shovel	Samples Collected 1-1/2 gall bag (# 40229) (0925)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Goldman 10/11/11		

Radiological Background 5	Radiological Equipment Used up Reber	PID Used Mini Rae 2000 (background: 0.0 cpm)
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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	14	Sand with silt, (10 YR, 3/4), brown, 80% fine to medium grained sand, 15% silt, 5% rock fragments (sandstone), dry, medium dense, some rootlets, no plasticity or hardness, no odor. No groundwater.	SM		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N, group 3		Location ID 117	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 15"	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 6-9-11/1002		Date/Time Total Depth Reached 6-9-11/1016	
Type of Sampling Device 2 3/4" hand auger				Samples Collected 1-1/2 gall bag (#40230) (n/a)			
Geologist C. Carmichael				Checked by/Date LuAnn Rethers-Hedman 10/11/11			
Radiological Background 19, 76 cpm		Radiological Equipment Used 4R meter, Pancake meter		PID Used Mini Rac 2000		Background: 0.0 ppm	
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
1'			0.075	0.092	Silty sand, (10YR, 3/4), brown, 60% fine to medium grained sand, 35% silt, 5% rock fragments (sandstone) and gravel, dry, loose, some rootlets, no plasticity, hardness or odor.	SM	
2'					Refusal at 15" - bedrock		
3'					No groundwater reached.		
4'					<u>No sample collected</u>		
5'							
6'							



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 3	Location ID 118
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter N/A	Date/Time Drilling Started 4-21-11/0951	Date/Time Total Depth Reached 4-21-11/0958
Type of Sampling Device Stainless steel shovel	Samples Collected 1-1/2 gall bag (# 40231) (0958)		
Geologist C. Carmichael	Checked by/Date Duane Robbins, Mildman 10/11/11		

Radiological Background 15	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000	Background: (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	15	Sand with silt and rock fragments, (10 YR, 2/2), dark brown, 60% fine to medium grained sand, 20% silt, 20% rock fragments (asphalt, sandstone), semi-moist, loose, some rootlets, no plasticity or hardness, no odor. No groundwater.	SW		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N, group 3	Location ID 118			
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 11"			
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-9-11/1053	Date/Time Total Depth Reached 6-9-11/101			
Type of Sampling Device 2 3/4" hand auger		Samples Collected 1-1/2 gall bag (#40232) (n/a)					
Geologist C. Carmichael		Checked by/Date Julian Robbins & Goldman 10/11/11					
Radiological Background 17, 60 cpm		Radiological Equipment Used Dose rate scanner, yr meter, Pancake meter		PID Used Mini Rae 2000 (0.0 ppm) Background:			
Depth	Interval	Recovery	CPM	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)
			92				
			0.075		Sand with silt, (10 YR, 4/3), brown, 75% fine to medium grained sand, 25% silt, common rootlets, dry, loose, no plasticity or hardness, no odor.	SM	
1'					Refusal hit at 11"-bedrock		
2'					No groundwater reached.		
3'					<u>No sample collected</u>		
4'							
5'							
6'							



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N gp.3		Location ID 119	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A		Date/Time Drilling Started 4-21-11/0859		Date/Time Total Depth Reached 4-21-11/0910	
Type of Sampling Device Stainless steel shovel				Samples Collected 1-1/2 gall bag (#40233) (0910)			
Geologist C. Carmichael				Checked by/Date Ludlow Robinson Goldman 10/11/11			
Radiological Background 14		Radiological Equipment Used up R meter			PID Used Mini Rae 2000		
					background: 0.0 ppm		
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	14	Sand with silt, (10YR, 3/4), dark brown, 80% fine to medium grained sand, 15% silt, 5% rock fragments - sandstone, semi-moist, medium dense, no plasticity or hardness, no odor, trace burnt animal bones. No groundwater.	SM	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N, group 3	Location ID 119			
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 9"			
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-9-11/0909	Date/Time Total Depth Reached 6-9-11/0921			
Type of Sampling Device 2 3/4" hand auger		Samples Collected 1-1/2 gall bag (#40234) (w/a)					
Geologist C. Carmichael		Checked by/Date Julian Robert Goldman 10/11/11					
Radiological Background 18, 75 cpm		Radiological Equipment Used Downhole Scanner, yR meter, Pancake meter		PID Used Mini Rae 2000 (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)
			0.0	100	Silty sand with rock fragments (10VR, 4/3), brown, 55% fine to medium grained sand, 30% silt, 15% sandstone rock fragments, dry, medium dense, trace rootlets, no plasticity, hardness or odor.	SM	
1'					Refusal at 9" - bedrock		
2'					No groundwater reached		
3'					No sample collected		
4'							
5'							
6'							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N gp. 3		Location ID 120	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A		Date/Time Drilling Started 4-20-11/ 1003		Date/Time Total Depth Reached 4-20-11/ 1012	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (# 40235) (1012)			
Geologist C. Carmichael				Checked by/Date J. Dean Rollins, J. Gellman 10/11/11			
Radiological Background 12		Radiological Equipment Used up Rater		PID Used Mini Rae 2000		Borehole Gamma Readings (back ground) 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
0.5'			0.012		Sand with silt and rock fragments, (10 YR, 3/4), reddish-brown, 70% fine to medium grained sand, 15% rock fragments (sandstone), 15% silt, dry, medium dense, no plasticity or hardness, no odor. No groundwater encountered	SW	

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N Group 3	Location ID: 120
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-10-11/1533	Date/Time Total Depth Reached: 5-10-11/1539
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: (1) 1/2 gallon bags (#40236) (1615)		
Geologist: C. Carmichael	Checked by/Date: Julian Robino Yeldman 10/11/14		

Radiological Background: 57 / 2677	Radiological Equipment Used: Pancake / Downhole	PID Used: MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
			0.0	40	AF: Artificial Fill <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>			0.5 - 2744
			0.0	35	No recovery...		4534	0 - 3255
0.5				36	Sand with silt, (10 YR, 5/4), light brown, 85% fine to medium grained sand, 15% silt, trace gravel fill and asphalt, dry, medium dense, trace calcium carbonate nodules, trace siltstone fragments, no plasticity or hardness, no odor.	AF	4879	
1.0			54	SM		5128		
2.0			57	5154				
			60	5210				
3.0			55	3'	Gradational Contact	SM	5262	
			64		Sand with silt and clay, (10 YR, 4/6), orange-ish brown, 70% fine to medium grained sand, 15% silt, 15% clay, trace charcoal pieces, dry, medium dense, no hardness or plasticity, no odor.		5316	
4.0			63				5361	
			58				5325	
5.0			66				5488	
			57				5476 5518	
6.0			67				5498 5546	

Radiological Background 57/2677				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 120	
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>
6.0					Same as above	SM	5436 5476
7.0			0.047	57	Same as above, except ⁴⁵ 10% sand and 20% clay, 15% silt.		5085 5198
				45			5475 5436
8.0				58			5076 5085
				72			5077 5175
9.0				68	9' Gradational Contact Sandy clay, (10YR, 3/3), dark brown, 70% clay, 30% fine sand, semi-moist, medium stiff, low-medium plasticity and hardness, no odor.	CL	5076
				60			5077
10.0				80			5131
					10' goal depth reached. No groundwater encountered.		
11.0							
12.0							
13.0							



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8 N gyp.3	Location ID 121				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/0951	Date/Time Total Depth Reached 4-15-11/0955				
Type of Sampling Device stainless steel shovel			Samples Collected 1-8-oz jar 1-1/2 gall. bag (#40237) (0955)					
Geologist C. Carmichael			Checked by/Date John R. Johnson/Goldman 10/11/11					
Radiological Background 19		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000				
<p style="text-align: right;">background: 0.1 ppm</p>								
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	Gamma Readings (CPM)
0.5'				0.0-19	<p>Silty sand, (10 YR, 4/4), brown, 65% fine sand, 35% silt, some rootlets, dry, medium dense, no plasticity or hardness, no odor.</p> <p>No groundwater encountered.</p>	Sm		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N, group 2		Location ID 121	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 27"	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 6-7-11/0948		Date/Time Total Depth Reached 6-7-11/0958	
Type of Sampling Device 2 3/4" hand auger				Samples Collected 1-4oz jar 1-1/2 gall bag (#40238) (1010)			
Geologist C. Carmichael				Checked by/Date Lucy Ann Robbins Feldman 9/11/11			
Radiological Background 73,3902 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Rac 2000		Background: (0.0 ppm)	
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
			0.0	53			0.5-3822
			0.0	70	Silty sand, (10 YR, 3/3), dark brown, 40% silt 60% fine to medium grained sand, v dry, medium dense, some rootlets, trace sandstone fragments, no plasticity or hardness, no odor.	SM	0-4096
1'			0.0	67		4832	
			0.0	84		5102	
2'			0.0	120		5070	
					Refusal hit at bedrock at 27". No groundwater reached		5012
3'							
4'							
5'							
6'							



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp.2	Location ID 122
Drilling Company HGL	Driller T. Morse F. Morrison (HGL)	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11/1310	Date/Time Total Depth Reached 4-19-11/1304
Type of Sampling Device Stainless Steel Shovel	Samples Collected 1-8-oz jar 1-1/2 gall bag (#40239) (1315)		
Geologist P. Sneath	Checked by/Date Julie Robinson Goldman 10/11/11		

Radiological Background 0.02-0.15 µR	Radiological Equipment Used M/R meter	PID Used Mini Rae 2000
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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'				0.15	silt w/ sand, very dark greyish brown (10 YR 3/2), dry, soft, 85% silt, 15% fine sand, common rootlets, no odor	ml		
					No GW TD 0.5'			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N, group 2	Location ID 122
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 2' 3'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-7-11/1335	Date/Time Total Depth Reached 6-7-11/1351
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1- 4oz. jar 1- 1/2 gall bag (#40240) (1355)		
Geologist C. Carmichael	Checked by/Date L. VanRollins Goldman 10/11/11		

Radiological Background 18, 46 cpm	Radiological Equipment Used Downhole Scanner 4R meter, Pancake meter	PID Used Mini Rae 2000	Background: (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings		
							Inches	(CPM)	
1'			0.0	70	Sandy silt, (10YR, 3/3), dark brown, 70% silt, 30% fine to medium grained sand, soft, dry, some rootlets, no plasticity or hardness, no odor, trace weathered sandstone fragments.	ML	0.5	3875	
			0.0	67			4796	0	4024
			0.0	95			4832		
2'			0.0	70			5107		
			0.0	85			5059		
			0.0	84			5161		
3'					5258				
4'					Refusal at 3' - bedrock				
5'					No groundwater reached				
6'					H				

SSFL BORING LOG



8N_123

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 8N	Group: 2	Location ID: 123
Drilling Company: Stainless Steel Shovel	Driller: N/A	Ground Elevation: NA	Total Depth Drilled: 0.0 ft bgs.	
Drilling Equipment: Stainless Steel Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 6/7/11	Date/Time Total Depth Reached:	
Type of Sampling Device: N/A	Samples Collected: NO SAMPLE COLLECTED - ARCHEOLOGICAL SITE One 1/2 Gallon Bag (Appox 8 lbs.)			
Geologist: Chelsea Carmichael	Checked By / Date:			

Radiological Background:	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	Feet bgs.	Borehole Gamma Readings (CPM)
0.5					<div style="border: 1px solid black; padding: 10px; margin: 0 auto; width: 80%;"> <p>Archeological Site No Sample Collected</p> </div> <p style="font-size: 2em; margin-top: 20px;"><i>EPW</i></p> <p style="font-size: 1.5em; margin-top: 10px;"><i>10/25/11</i></p>			
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								



Project Name: SSEI Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp.3	Location ID 124
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter N/A	Date/Time Drilling Started 4-21-11/1038	Date/Time Total Depth Reached 4-21-11/1041
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#40243) (1040)		
Geologist C. Carmichael	Checked by/Date Judean Robbins Goldman 10/11/11		

Radiological Background 15	Radiological Equipment Used up Rater	PID Used Mini Rae 2000	Background: 0.1 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'					Silty sand, (10 YR, 3/3), dark brown, 70% fine to medium grained sand, 30% silt, dry, loose, no plasticity or hardness, no odor. No groundwater.	SM		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N, group 3		Location ID 124	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 18"	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 6-9-11/1451		Date/Time Total Depth Reached 6-9-11/1509	
Type of Sampling Device 2 3/4" hand auger				Samples Collected 1-1/2 gall bag (#40244) (n/a)			
Geologist C. Carmichael				Checked by/Date Julie Ann Robbins Alderman 10/11/11			
Radiological Background 21, 88 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Rac 2000		Background: 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)
1'			0.0	0.0	Sandy silt, (10YR, 3/3), dark brown, 60% silt, 40% fine to medium sand, dry, soft, trace rootlets, no plasticity or hardness, no odor.	ML	
			0.0	0.075			
			0.0	0.076			
2'					Refusal at 18"-bedrock		
					No groundwater reached.		
3'					No sample collected		
4'							
5'							
6'							



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 3	Location ID 125
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter N/A	Date/Time Drilling Started 4-21-11/1348	Date/Time Total Depth Reached 4-21-11/1356
Type of Sampling Device Stainless steel shovel	Samples Collected 1-1/2 gall bag (#40245) (1355)		
Geologist C. Carmichael	Checked by/Date Julian Robbins & Helman 10/10/11		

Radiological Background 16	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000	background: 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description (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'				16	Silty sand, (10 YR, 2/2), dark brown, 70% fine sand, 30% silt, 10% sandstone rock fragments, semi-moist, loose, some rootlets, metal washer found, no plasticity or hardness, no odor. No groundwater encountered.	SM		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N, group 3	Location ID 125
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 16"
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-10-11/1257	Date/Time Total Depth Reached 6-10-11/1307
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1-1/2 gall bag (#40246) (n/a)	Geologist C. Carmichael	
Checked by/Date Julie Ann Robbins Goldman 7/14/11			

Radiological Background 16,63 cpm	Radiological Equipment Used Downhole scanner, 4R meter, Pancake meter	PID Used Mini Rac 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	FPD P.P.	Radiological 100	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)
1'	0.0		0.0	68	Silt with sand, (10YR, 3/3), dark brown, 80% silt, 20% fine to medium grained sand, soft, dry, common rootlets, very low hardness, no plasticity, no odor.	ML	
2'					Refusal at 16" - bedrock		
3'					No groundwater reached.		
4'					No sample collected.		
5'							
6'							



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp. 3	Location ID 126
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-21-11/0941	Date/Time Total Depth Reached 4-21-11/0948
Type of Sampling Device Stainless steel shovel	Samples Collected 1-1/2 gall bag (# 40247) (0948.)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Yellman 10/14/11		

Radiological Background 15	Radiological Equipment Used w/ Ruler	PID Used Mini Rae 2000	background. 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'					Silty sand, (10 YR, 2/2), dark brown, 70% Fine grained sand, 30% silt, dry, loose, no plasticity or hardness, no odor, some rootlets. No groundwater.	SM		



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp.3	Location ID 127
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter N/A	Date/Time Drilling Started 4-20-11/0907	Date/Time Total Depth Reached 4-20-11/0915
Type of Sampling Device Stainless steel shovel	Samples Collected 1-1/2 gall bag (# 40249) (0915)		
Geologist C. Carmichael	Checked by/Date Judean Robbins Goldman 10/14/11		

Radiological Background 12	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description (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'				12	<p>3" of gravel/road pack on top.</p> <p>Sand with rock fragments, (10 YR, 3/4), reddish brown, 80%. Fine to medium grained sand, 15%. sandstone rock fragments, 5%. clay, semi-moist, dense, no plasticity or hardness, no odor.</p> <p>No groundwater encountered.</p>	SW		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 8N Group 3	Location ID 127
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-10-11/1022	Date/Time Total Depth Reached 5-10-11/1031
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected (1) 1/2 gallon bags (#40250) (1105)		
Geologist C. Carmichael	Checked by/Date LuDean Robbins Goldman 10/14/11		

Radiological Background 59 / 2640	Radiological Equipment Used Pencake / Downhole	PID Used MiniRAE 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>
0.0			70				0.5-2814
0.25					Gravel fill rock, (2.5 Y, 7/2), gray, 90% gravel, 10% sand	GW	0-3504
0.5			79		Sandy silt, (10 YR, 4/3) brown with some speckles, 70% silt, 30% fine sand, trace gravel fill rocks, dry, medium stiff, no plasticity or hardness, no odor.	ML	4849
1.0			55				5138
			82				5370
2.0			75		~2', heavy speckled texture		5095
			2.25'		with sand Gradational Contact		
2.5			85		Sandy silty clay (10 YR, 3/3), dark brown with some speckles, 50% clay, 30% silt, 20% fine sand, dry, medium stiff, low plasticity and hardness, no odor.	CL	5069
3.0			80				4982
			3.25'		Gradational Contact		
3.5			65		Sandy clay, (10 YR, 3/2), dark brown, with some speckles, 70% clay, 30% fine sand, dry, stiff, low-medium plasticity and hardness, no odor.	CL	5142
4.0			45				5059
			57				5118
5.0			40		Gradational Contact		5265
			75		Sand with clay, (10 YR, 5/4), light brown with speckles, 75% fine to medium grained sand, 25% clay, dry, dense, no hardness or plasticity, no odor.	SC	5178
6.0			80				5409



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 2	Location ID 128
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter N/A	Date/Time Drilling Started 4-20-11/0853	Date/Time Total Depth Reached 4-20-11/0900
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#40198) (0900)		
Geologist C. Carmichael	Checked by/Date Mike Ruffin / 10/14/11		

Radiological Background 11	Radiological Equipment Used RP R meter	PID Used Mini Rae 2000 (background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.112		3" gravel/road-pack on top. Sand, (10 YR, 3/4), reddish-brown, 95% fine to medium grained sand, 5% silt, dry, dense, no plasticity or hardness, no odor. No groundwater	SP		



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gop 2	Location ID 129
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter N/A	Date/Time Drilling Started 4-20-11/0833	Date/Time Total Depth Reached 4-20-11/0841
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#40200) (0840)		
Geologist C. Carmichael	Checked by/Date Judith Robbins Feldman 10/14/11		
Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Raz 2000 (background) 0.0 ppm	

Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.0 11	Sand, (10 YR, 3/4), reddish-brown, 90% fine to medium grained sand, 10% clay, semi-moist, dense, no plasticity or hardness, no odor. ~3" of gravel/road-pack on surface. No groundwater encountered.	SP		

Project Name: SSFL Area IV Radiological Study	Project Number: FP9038.01.22.04.03	Subarea ID & Group 2: 8N	Location ID: 129
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 7.5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-10-11/0823	Date/Time Total Depth Reached: 5-10-11/0834
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: (1) 1/2 gallon bags (#40201) (0900)		
Geologist: C. Carmichael	Checked by/Date: Linda Robbins Gledman 10/14/11		

Radiological Background: 52 / 2312	Radiological Equipment Used: Pancake / Downhole	PID Used: MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	SPD	Radio	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		Gravel fill, (2.5Y, 7/2), gray, 90% gravel, 10% sand	GW		0.5-2383
1.0			0.0	63	Clay with sand, (10 YR, 3/3), dark brown, 80% clay, 20% fine sand, dry, medium stiff, low plasticity and hardness, no odor.	CL	4700	0.0-2913
				55			5014	
				65	1.5' Gradational contact		5100	
2.0					Clay (7.5 YR, 4/3), dark reddish-brown, 95% clay, 5% fine sand, dry, stiff, medium plasticity and hardness, no odor.	CL	4983	
				50			5079	
3.0				65	3' Gradational Contact		5184	
				50	Clayey sand, (10 YR, 3/6), reddish-brown, 60% fine to medium grained sand, 40% clay, dry, medium dense, low plasticity and hardness, no odor, trace calcium carbonate nodules (~1mm diameter).	SC	5177	
4.0				55			5173	
				60			5071	
5.0				62	5' Gradational Contact		5166	
				60	Sand, (10 YR, 5/4), light brown, 90% fine to medium grained sand, 10% clay, dry, medium dense, no plasticity or hardness, no odor.	SP	4842	
6.0				55			5051	

Radiological Background					Project Name	Project Number	Location
52/2312					SSFL Area IV Radiological Study	EP9038.01.22.04.03	129
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)
6.0					Same as above	SP	5203
7.0			0.065				5228
			85				
			65		100% sand (weathered bedrock)		5553
					Refusal at 7.5'		
					No groundwater reached.		
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							



Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp.1	Location ID 130
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/0939	Date/Time Total Depth Reached 4-14-11/0946
Type of Sampling Device stainless steel shovel	Samples Collected sup: 40256 (NR) 2-1/2 gall bags (#40093) (0945)		
Geologist C. Carmichael	Checked by/Date Dan Robbins/Goldman 10/14/11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 13	Clayey sand, (10 YR, 3/3), brown, 70% fine sand, 30% clay, common rootlets, dry, loose, no plasticity, very low hardness, no odor. No groundwater encountered	SC		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N gp. 1	Location ID 131				
Drilling Company HGL		Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment shovel/trowel		Borehole Diameter n/a	Date/Time Drilling Started 4-12-11/1459	Date/Time Total Depth Reached 4-12-11/1505				
Type of Sampling Device stainless steel shovel			Samples Collected 1-1/2 gallon bag (#40094) (1505)					
Geologist C. Carmichael			Checked by/Date Julian Robbins Feldman 10/14/11					
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (background) (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	11	Sand with clay, (10YR, 3/4), brown, 70% fine sand, 30% clay, common rootlets, medium dense, dry, no plasticity or hardness, no odor. No groundwater encountered.	SC		



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N gp.2		Location ID 132	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-18-11/1356		Date/Time Total Depth Reached 4-18-11/1405	
Type of Sampling Device stainless steel shovel				Samples Collected 1-8-oz jar 1-1/2 gall bag (#40202) (1405)			
Geologist C. Carmichael				Checked by/Date Julie Ann Robbins Goldman 10/14/11			
Radiological Background 13		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000		Borehole Gamma Readings (background: 0.5 ppm)	
Depth	Interval	Recovery	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 (CPM)
0.5'			0.4/14	Sand with gravel and clay, (10YR, 4/3) brown, 60% fine sand, 25% gravel fill rock and sandstone (trace), 15% clay, dry, medium dense, no plasticity or hardness, no odor. No groundwater encountered.		SP	



Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp. 2	Location ID 133
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-14-11/1515	Date/Time Total Depth Reached 4-14-11/1520
Type of Sampling Device stainless steel shovel	Samples Collected 1-8oz jar 1-1/2 gall bag (#40203) (1520)		
Geologist C. Carmichael	Checked by/Date Julian Robbins/Goldman 10/14/11		

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rac 2000 (background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.014	Clayey sand, (10 YR, 3/3), brown, 55% fine sand, 45% clay, common rootlets, medium dense, semi-moist, medium plasticity and hardness, metal wire found, no odor. No groundwater encountered.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N, group 2	Location ID 133
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 8'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-6-11/1520	Date/Time Total Depth Reached 6-6-11/1624
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1-4oz jar 1-1/2 gall bag (#40204) (1705)		
Geologist C. Carmichael	Checked by/Date Lu Jean Robbins-Heldman 10/14/11		

Radiological Background 14, 59 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
			0.0	75			0.5	2644
1'			0.0	65	Silt with sand and clay, (10 YR, 3/4), dark reddish-brown, 60% silt, 20% fine to medium grained sand, 20% clay, dry, medium stiff, trace concrete rock fragments and gravel rocks, very no plasticity and 1.5 hardness, no odor	ML		3918
			0.0	95				4496
			0.0	76				4529
2'			0.0	85	Clayey sand, (10 YR, 3/6), dark reddish-brown, 60% fine to medium grained sand, 40% clay, semi-moist, medium stiff, low plasticity and hardness, no odor.	SC		4753
			0.0	75				4580
3'			0.0	60	Same as above, except lighter color (10 YR, 4/6) and stiff.			4662
			0.0	45				4574
4'			0.0	92				4592
			0.0	92				4513
5'			0.0	55				4468
			0.0	75				4438
6'			0.0	85				4585

Radiological Background				Project Name	Project Number	Location	
14, 59				SSFL Area IV Radiological Study	EP9038.01.22.04.03	133	
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)
					Same as above	SC	4813
7'			0.082				4998
			0.061				5331
			0.079		Same as above, except lighter colored (10YR, 5/4), and 70% sand, 30% clay.		5291
8'			0.070		Refusal at 8' (Bedrock hit)		
					No groundwater reached.		



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8 Ngrp2		Location ID 134	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment shovel/trowel		Borehole Diameter n/a		Date/Time Drilling Started 4-14-11/1403		Date/Time Total Depth Reached 4-14-11/1408	
Type of Sampling Device stainless steel shovel				Samples Collected 1-8oz. jar 1-1/2 gally bag (# 40205) (1408)			
Geologist C. Carmichael				Checked by/Date Julian Robbins Medman 10/14/11			
Radiological Background 4		Radiological Equipment Used w/ Rater		PID Used Mini Rae 2000 (background: 0.0 ppm)			
Depth	Interval	Recovery	PID	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	Sand with clay, (10YR, 3/3), brown, 80% fine sand, 20% clay, common rootlets, semi-moist, loose, no plasticity or hardness, no odor. No groundwater encountered.		SC	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N, group 2	Location ID 134
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 9"
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-6-11/1501	Date/Time Total Depth Reached 6-6-11/1507
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1-1/2 gall bag (#40206) (w/2)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Goldman 10/14/11		

Radiological Background 638, 144, 144	Radiological Equipment Used Downhole scanner, yR meter, Pancake meter	PID Used Mini Ra2 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.0			0.0	70	Sand with silt and rock fragments, (10% 4/3) SM 70% fine to coarse grained sand; 15% silt, 15% sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.			
1'					<p>Refusal at 9"</p> <p><u>No sample collected</u></p>			
2'								
3'								
4'								
5'								
6'								



Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8 Ngrp. 2	Location ID 135
Drilling Company HGL	Driller T. MOSE J. Morris (LRG)	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trawel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11/ 0910	Date/Time Total Depth Reached 4-19-11/ 0915
Type of Sampling Device stainless steel shovel	Samples Collected 1-8-oz jar 1-1/2 gall bag (# 40207) (0915)		
Geologist P. Sneath	Checked by/Date Linda Robbins Goldman 10/14/11		

Radiological Background 11 nR, 0.3 ppm	Radiological Equipment Used M/R meter	PID Used Mini Rae 2000 (Background 0.3 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	11	sand w/ silt, dark brown (10YR 3/5), moist red. dense sand, 65% red. sand, 25% silt, 10% gravel fill w/ trace sandstone fragments, no odor 2' of gravel fill over construction sand no GW to 0.5'	SM	

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 8N group 2	Location ID: 135
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 3.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 5-9-11 1305	Date/Time Total Depth Reached: 5-9-11 1330
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 40208 (1310) (1) 1/2 gallon bags + (1) 4oz jar		
Geologist: C. Knight	Checked by/Date: J. Dean Robbins Melder 10/14/11		

Radiological Background: 40 / 10 p.p.m.	Radiological Equipment Used: Pancake / ^{MR} Doornhole CK	PID Used: MiniRAE 2000 (Bkgd: 0.0 p.p.m.)
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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
0.0		0.0	46		Fill: Sandy silt with gravel; Brown (7.5YR 4/3), moist, medium stiff, no odor, 35% fine sand, 15% fine to coarse subrounded gravel (fill rock); 50% silt, non cohesive, low plasticity, heavily mottled.	Af / ML	+45 2578 ²⁵⁷¹ CK (CPM)
0.5		0.0	52				5124 2812
1.0		0.0	60				4084 3926
		0.0	56				ck 4556 4785
2.0		0.0	75				ck 4348 5223
		0.0	68				ck 4234 5251
3.0		0.0	67		2'3" Weathered Sandstone bedrock: Olive yellow (2.5Y 6/8), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone.	ck 4697 5065	
							5019
4.0					Refusal on sandstone at 3.0' bgs.		
5.0					No GW encountered		
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp.3	Location ID 136
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 4-20-11/0950	Date/Time Total Depth Reached 4-20-11/0955
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#40251) (0955)		
Geologist C. Carmichael	Checked by/Date J. Dean Robbins Feldner 10/14/11		

Radiological Background 13	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000	Background: 0.0ppm
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Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.112	Sand with rock fragments, (10 YR, 4/6) Sw light orange-ish brown, semi-moist, medium dense, 80% fine to coarse grained sand, 20% rock fragments (sandstone), no plasticity or hardness, no odor. No groundwater encountered			

Project Name: SSFL Area IV Radiological Study	Project Number EP0038.01.22.04.03	Subarea ID & Group 8N group 3	Location ID 136
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-11-11 0915	Date/Time Total Depth Reached 5-11-11 1012
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 40252 (0920) (1) 1/2 gallon bags 40258 (LMT)		
Geologist C. Knight	Checked by/Date Linda Robbins Hellman 10/14/11		

Radiological Background 44 / 2806	Radiological Equipment Used Pacake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches
					Surface: soil and grass		+0.5' 3074 (CPM)
0.5			0.0	50	Fill: Artificial Fill (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	AF	3738
			0.8	55	Silty Sand: Yellowish Brown (10YR 5/4), 35% silt, dry, loose, no odor, 35% silt, 10% angular gravel, 55% fine sand, mottled, trace rootlets near surface	SM	5024
1.0			0.0	60			5338
			0.0	55	13" Fill: Partly graded sand: Pale brown (10YR 6/3), moist, medium dense, no odor, 10% silt, 5% angular gravel, 85% fine sand, mottled	AF/SP	5497
2.0			0.0	75			5439
			0.0	55			5511
3.0			0.0	60			5528
			0.0	68			5456
4.0			0.0	65			5575
			0.0	70			5528
5.0		AR	0.0	85	No Recovery		5257
			0.0	70	Same as above: Fill: Partly graded sand	AF/SP	5264
6.0			0.0	75	contact 6.0'		5610

Radiological Background 44 / 2806				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 136	
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
6.0		0.0	75		Fill: Silty Sand: Strong brown (7.5YR 5/6), moist, medium dense, no odor, 5% medium sand, 40% silt, 55% fine sand	SM	5610
		0.0	64			AF / SM	5573
7.0		0.0	66				5798
		0.0	75		7.6" Fill: Sand with silt: Brownish yellow (10YR 6/6), moist, medium dense, no odor, 10% silt, 5% coarse sand, 5% medium gravel, 10% medium sand, 70% fine sand, mottled	AF / SP	5675
8.0		0.0	60				5648
		0.0	55				5730
9.0		0.0	60				5684
		0.0	65				5777
10.0		0.0	70				6065
<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 8N grp. 3	Location ID 137
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter N/A	Date/Time Drilling Started 4-20-11/1021	Date/Time Total Depth Reached 4-20-11/1027
Type of Sampling Device Stainless steel shovel	Samples Collected 1-1/2 gall bag (#40253) (1027)		
Geologist C. Carmichael	Checked by/Date Julia Robinson Sedman 10/14/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Ra2 2000 (background: 0.1 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'				0.1 12	Gravelly sand, (10 YR, 4/3), brown, 65% fine to medium sand, 35% gravel fill and sandstone rock fragments, dry, medium dense, no plasticity or hardness, no odor. No groundwater encountered.	SW		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 8N Group 3	Location ID 137
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-10-11/1424	Date/Time Total Depth Reached 5-10-11/1431
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected (1) 1/2 gallon bags (#40254) (1505)		
Geologist C. Carmichael		Checked by/Date Julia Robbins Goldman 10/14/11		
Radiological Background 55 / 2958		Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	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	AF: Artificial Fill		0.5	3017
0.5		0.0	50	Asphalt rock fragments.	AF/GW	4800	
1.0			60	Sand, (10 YR, 6/6), tan, 100% fine to medium grained sand, dry, loose, no plasticity or hardness, no odor.	AF/SP	5167	
			55			5395	
2.0			65	Sandy silt with gravel (10 YR, 4/4), brown, 50% silt, 30% fine sand, 20% gravel fill, dry, stiff, no plasticity, odor, hardness.	AF/ML	5461	
			85	Silty sand, (10 YR, 4/4), brown, 65% fine to medium grained sand, 35% silt, trace gravel fill, dry, medium dense, no plasticity or hardness, no odor.	SM/AF	5487	
3.0			75			5540	
			70			5437	
4.0			68	Gradational Contact		5494	
			70	Sand (10 YR, 2.5Y, 6/4), light yellowish brown, 90% fine to medium grained sand, 10% sandstone rock fragments, dry, medium dense, no plasticity or hardness, no odor.	SP/AF	5260	
5.0			72	Tree root at ~ 4.5' depth		5151	
			65			5303	
6.0			70			5464	

Switch

Radiological Background 55 / 2958				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 137	
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	70	6' Sandy silt, (10YR 6/6, 3/4), mottled texture - silt with sand, semi-moist, medium dense, trace sandstone rock fragments, 65% silt, 35% fine to medium sand, very low plasticity and hardness, no odor.	ML	5520
7.0			0.0	60			5292
				65			5345
8.0				50			5448
				60			5460
9.0				55			5389
				48	5427		
10.0			V 48		Sand at 10' (weathered bedrock)		5362
					10' goal depth reached.		
					No groundwater encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp. 2	Location ID 138
Drilling Company HGL	Driller T. MORSE T. MORSE (RS)	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel / trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11 / 1050	Date/Time Total Depth Reached 4-19-11 / 1054
Type of Sampling Device stainless steel shovel	Samples Collected 1 8-oz jar 1-1/2 gall bag (#40209) (loss)		
Geologist P. Sreath	Checked by/Date Duane Robbins Edman 10/14/11		

Radiological Background 0.0 ppm, 15 hr	Radiological Equipment Used M/R meter	PID Used Mini Raz 2000 (background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5'			0	14	sandy silt, dark brown (10 YR 3/3), dry soft, 40% fine sand, 60% silt, few rockers, no odor NO GW TD 0.5'	sm	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8N gp 2		Location ID 138	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 16"	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 6-7-11/1127		Date/Time Total Depth Reached 6-7-11/1135	
Type of Sampling Device 2 3/4" hand auger		Samples Collected 1-4oz jar 1-1/2 gall bag (#40210) (n/a)		Checked by/Date Julian Pelissier Goldman 10/14/11			
Geologist C. Carmichael		Radiological Background 17, 62 cpm		Radiological Equipment Used Downhole Scanner, Pancake meter		PID Used Mini Rae 2000 (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>
1'			0.095	130	Silty sand, (10 YR, 3/3), dark brown, 55% fine to medium grained sand, 45% silt, dry, some rootlets, loose, no plasticity or hardness, no odor.	SM	
2'			0.070		Refusal hit at 16" - bedrock		
3'					No groundwater reached.		
4'					<u>No sample collected.</u>		
5'							
6'							



Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N grp. 2	Location ID 139
Drilling Company HGL	Driller T. Morse J. Morris (RG)	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11/1115	Date/Time Total Depth Reached 4-19-11/1119
Type of Sampling Device stainless steel shovel	Samples Collected 1-8-oz jar 1-1/2 gall bag (#40211) (1120)		
Geologist P. Sneath	Checked by/Date Lucretia Robbins Medman 10/14/11		

Radiological Background 14 mR, 0.0 ppm	Radiological Equipment Used M/R meter	PID Used Mini Rae 2000 (background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0	14	Silt w/ sand, brown (10 YR 4/3), dry, med. stiff, 70 % silt, 20 % fine sand, 10 % sandstone, no odor, common rootlets	ML	
					TD 0.5'		
					NO GW		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 8N, group 2	Location ID 139
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 7"
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"	Date/Time Drilling Started 6-7-11/1107	Date/Time Total Depth Reached 6-7-11/1118
Type of Sampling Device 2 3/4" hand auger		Samples Collected 1-4oz. jar 1-1/2 gall bag (#40212) (n/a)		
Geologist C. Carmichael		Checked by/Date Julie Robbins Goldman 10/11/11		
Radiological Background 16, 70 cpm		Radiological Equipment Used Down hole scanner 4R Pancake meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)

Depth	Interval	Recovery	R.D. 6D	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>
1'			0.0	75	Silty sand, (10YR, 4/3), brown, 70% fine to medium grained sand, 30% silt, trace sandstone rock fragments, dry, loose, trace rootlets, no plasticity or hardness, no odor.	SM	
2'					Refusal at bedrock - 7"		
3'					No groundwater reached.		
4'					<u>No sample collected</u>		
5'							
6'							



Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID 8N grp 2	Location ID 140
Drilling Company HGL	Driller T. Morris	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-19-11/0940	Date/Time Total Depth Reached 4-19-11/0944
Type of Sampling Device stainless steel shovel	Samples Collected 2-8-oz jar DWP: 40201 (NT) 2-1/2 gall bag (# 40213) (0945)		
Geologist P. Sneath	Checked by/Date Julian Robbins/Sedman 10/19/11		

Radiological Background D.W.A. 0.08cpm	Radiological Equipment Used w/ R meter	PID Used Mini Rac 2000
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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	14	silt w/ sand, very dark grey (10YR 3.1) moist, soft, 65% silt, 15% fine sand no odor, few rootlets	ml		
					NO GW TO 0.5'			



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 8N gp2	Location ID 141
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment shovel/trowel	Borehole Diameter n/a	Date/Time Drilling Started 4-15-11/0830	Date/Time Total Depth Reached 4-15-11/0835
Type of Sampling Device stainless steel shovel	Samples Collected 1-8-oz jar 1-1/2 gall bag (#40215) (0835)		
Geologist C. Carmichael	Checked by/Date Julian Robbins & Edman 10/14/11		

Radiological Background 13	Radiological Equipment Used Rn meter	PID Used Mini Rae 2000 (background: 0.8 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	Sandy silt, (10YR, 5/4), medium stiff, dry, 70% silt, 30% fine sand, no plasticity or hardness, common rootlets, no odor. No groundwater encountered.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 3
Drilling Company: HGL	Driller: Ian Stone Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 1'0" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11-17-11 1354	Date/Time Total Depth Reached: 11-17-11 1410	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		40285 (NT) NO Sample	
Geologist: Ian Stone Timothy Morse	Checked By / Date: Jan [Signature] 1/11/12			

Radiological Background: 7 / 1982 / 45	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' (CPM)
0.0			0.0	51	Surface: silt + veg.		
0.5			0.0	71	Sandy silt: Pale Brown (2.5Y 7/4) 15% fine grain sand, 85% silt, trace mechanically weathered sandstone gravel fragments (0.5" - 1" bgs), dry, no odor, firm to hard consistency, low plasticity, non-cohesive	ML	NO Gamma performed
1.0			0.0	57			
2.0					1'0" Refusal on bedrock at 1'0" bgs. No GW encountered No sample collected		
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 4
Drilling Company: HGL	Driller: S. Lapeere-Montrose	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: stainless steel shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 9/29/11 0858	Date/Time Total Depth Reached: 9/29/11 0905	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		40286(0905)	
Geologist: L. Robbins Goldman	Checked By / Date: Chelsea Carnichael / 11-18-11			
Radiological Background: 9 uR / 73 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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	54	Surface: soil		
0.5			0.0	52	silt w/ sand: pale brown (2.5 Y 7/4), dry, stiff, no odor, 90% silt, 10% fine to med. sand w/ white precipitate (CaCO ₃), no dilatancy, low plasticity, no stiffness, trace rootlets, no groundwater encountered	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 4
Drilling Company: HGL	Driller: Ian Stone Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 7' 4" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11-15-11 1421	Date/Time Total Depth Reached: 11-15-11 1500	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		40287 (1525)	
Geologist: Ian Stone Timothy Morse	Checked By / Date: Dan [Signature] 1/13/12			

Radiological Background: 7 / 1817 / 63	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	62	surface: soil + veg.		10.5' 1702
0.5			0.0	42	Silt: Pale Brown (2.5Y 8/4) 95% ^m 95% silt, 5% siltstone gravel, calcium carbonate/limestone parent material, dry, no odor, soft, non-cohesive, low plasticity, trace calcium carbonate deposits	ML	1848
1.0			0.0	45			2326
			0.0	63			2735
			0.0	57			2922
2.0			0.0	63	2' 6" -----		3284
			0.0	51	Silt with sand: Pale Brown (2.5Y 8/4), 85% silt, 5% fine grained sand, 5% med. grained sand, 5% angular sandstone gravel, trace siltstone concretions and calcium carbonate deposits, dry, no odor, low plasticity, non-cohesive, firm	ML	3690
3.0			0.0	60	3' 0" -----	ML	3677
			0.0	44	Silt: Pale Brown (2.5Y 7/4), 100% silt, trace siltstone concretions and calcium carbonate deposits, dry, no odor, non-cohesive, low plasticity, hard consistency		3292
4.0			0.0	82			3089
5.0			0.0	58			2946
			0.0	65	5' 6" -----		3118
			0.0	52	same as above, except ↳ silt with gravel: 40% silt, 10% subangular siltstone gravel	ML	3166
6.0			0.0				3133

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 85	Group: 4	Location ID: 4			
Radiological Background: 7 / 1917 / 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 (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	52	Same as above...	ML	6	3133
			0.0	64			7	3596
7.0			0.0	62			7	4310
					7' 4"	Bedrock		
					Refusal on bedrock at 7' 4" bgs. NO GR encountered		8	
8.0							9	
9.0							10	
10.0							11	
11.0						12		
12.0						13		
13.0								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 85	Group: 1	Location ID: 5	
Drilling Company: HGL		Driller: S. Lapeyre-Montrose		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: stainless steel shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 9/29/11 0840		Date/Time Total Depth Reached: 9/29/11 0845	
Type of Sampling Device: stainless steel shovel/trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 40288 (0845)			
Geologist: L Robbins Goldman				Checked By / Date: Chelsea Caruich / 11-18-11			
Radiological Background: 8.12 / 59 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	Borehole Gamma Readings (CPM)
0.0			0.0	59	Silt w/ sand ^(clay) pale brown (2.5Y 8/2), dry, stiff, no odor, 90% silt, 10% fine to med. sand (CaCO ₃ composition), no dilatancy, no plasticity, no hardness, low toughness no groundwater encountered	ML	
0.5			0.0	52			
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 8s	Group: 1	Location ID: 5
Drilling Company: HGL	Driller: <i>TM Ian Stone</i> <i>Tim Morse/James Harris</i>	Ground Elevation: NA	Total Depth Drilled: 4' 10" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11-15-11 1316	Date/Time Total Depth Reached: 11-15-11 1349	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		40289 (¹⁴¹⁰ 1310)	
Geologist: <i>TM Ian Stone</i> <i>Timothy Morse</i>	Checked By / Date: <i>Ann [Signature]</i> 1/13/12			

Radiological Background: 7 / 1740 / 71	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	46	surface: soil		+0.5 1548
0.5			0.0	55	Silt: Pale Brown (2.5Y 8/5), 100% silt, Calcium carbonate / limestone parent material TM slightly moist, no odor, soft to slightly firm, trace rootlets, low plasticity, non-cohesive, trace calcium carbonate deposits	ML	1714
1.0		0.0	50	2149			
		0.0	51	2368			
		0.0	51	2518			
2.0		0.0	62	2656			
			0.0	58	2'0" — — — — Same as above, except firm consistency and dry	ML	2892
3.0		0.0	41	2852			
		0.0	57	2817			
4.0			0.0	47	4'0" — — — — Same as above except, ↳ color changes to Pale Brown (2.5Y 7/4) ↳ presence of mechanically weathered, angular siltstone gravel	ML	4 2938
		0.0	51	3380			
5.0					4'10" Refusal on bedrock at 4' 10" bgs. NO GW encountered	Bedrock	5
6.0							6

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 8S	Group: 1	Location ID: 6
Drilling Company: HGL	Driller: S. Lapeyre-Monrose	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: stainless steel shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 9/29/11	Date/Time Total Depth Reached: 0825	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		40290(825)	
Geologist: L. Robbins Goldman	Checked By / Date: Chelsea Carmichael / 11-18-11			
Radiological Background: 8 / 64	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			
0.5			0.2	88	silt ^(48%) & sand: pale brown (2.5Y 8/2), dry, stiff, no odor, 90% silt, 10% CaCO ₃ sand (fine to medium grained), no dilatancy, no ^(48%) plasticity, low toughness, no groundwater encountered.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 6
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 6' 0" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/15/11 1012	Date/Time Total Depth Reached: 11/15/11 1110	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		40291 (1130)	
Geologist: Ian Stone	Timothy Morse	Checked By / Date: 1/13/12		

Radiological Background: 5 / 1426 / 63	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	45	Surface: silt + gravel		1484
0.5			0.0	57	Silt; Pale Brown (2.5Y 8/3), 100% silt, calcium carbonate/limestone parent material, slightly moist, no odor, soft to slightly firm consistency, trace rootlets, low plasticity, non-cohesive, trace calcium carbonate deposits	ML	1494
1.0			0.0	70			1810
			0.0	80			2043
2.0			0.0	45	2' 0" --- Same as above, except dry, slightly firm to firm consistency		2251
			0.0	52			2277
			0.0	51		ML	2415
3.0			0.0	59			2488
			0.0	61			2567
4.0			0.0	49	4' 6" ---		2743
			0.0	70	Silt; Pale Brown (2.5Y 7/4), 100% silt, calcium carbonate/limestone parent material, dry, no odor, firm to hard consistency, trace calcium carbonate and trace very fine sandstone concretions,	ML	2967
5.0			0.0	75	5' 0" everything else same as above		3244
			0.0	68	Same as above, except ~ 20% angular sandstone gravel, mechanically broken bedrock		3380
6.0					Refusal on bedrock at 6' 0" bgs.		4354

Bedrock

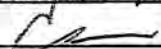
SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 85	Group: 1	Location ID: 7	
Drilling Company: HGL		Driller: S. Lapeyre-Montrose		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: stainless steel shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 9/29/11 0755		Date/Time Total Depth Reached: 9/29/11 0800	
Type of Sampling Device: stainless steel shovel/trowel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		40292 (0800)			
Geologist: L Robbins Goldman		Checked By / Date: Chelsea Carmichael / 11-18-11					
Radiological Background: 8/ 51		Radiological Equipment Used: Micro R Dewmore Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs.)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	48	<p>silt w/ sand: pale brown (2.5Y 8/2), dry, ^{very} stiff, no odor, 90% silt, 10% sand, trace ^{trace} of CaCO₃ composition, slow dilatancy, trace rootlets, low plasticity, low toughness.</p> <p>no groundwater encountered</p>	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 7
Drilling Company: HGL	Driller: <i>in Ian Stone Tim Morse/James Harris</i>	Ground Elevation: NA 11/15/11	Total Depth Drilled: 11/15/11 5' 2" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling: Started: 8/15/11 0855	Date/Time Total Depth Reached: 8/15/11 0930	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.) 40293 (0950)			
Geologist: <i>in Ian Stone Timothy Morse</i>	Checked By / Date: <i>Jim Stone</i> 1/13/12			

Radiological Background: 7 / 1813 / 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, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	42	Surface: soil, sandstone/calcium carbonate		1662
0.5			0.0	50	Silt: Pale Brown (2.5Y 8/4), 100% silt, calcium carbonate parent material, slightly moist, no odor, soft, noncohesive, low plasticity, trace calcium carbonate deposits	ML	1683
1.0		0.0	53	2191			
		0.0	69	2467			
2.0		0.0	54	2414			
		0.0	56	2518			
3.0			0.0	52	3'0" — — — — —	ML	2659
			0.0	74	Same as above, except firm consistency, dry presence of trace calcium carbonate bedding/concretions		2790
4.0			0.0	74	4'0" — — — — —	ML	2788
			0.0	58	Same as above, except firm to hard, dry color changes to Pale Brown (2.5Y 8m 7/4)		2909
5.0			0.0	53	5'0" — — — — — 5'2" presence of fine mechanically altered sandstone pieces	Bedrock	2820
					Refusal at 5'2" Bgs. on bedrock NO GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 8S	Group: 1	Location ID: 8
Drilling Company: HGL	Driller: B. Harris	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-30-11/0929	Date/Time Total Depth Reached: 9-30-11/0936	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#40294) (0935)			
Geologist: Chelsea Carmichael	Checked By / Date:  11-22-11			

Radiological Background: 14	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	14	Sandy silt, ⁶⁰ (10YR, 4/3), pale brown, 60% silt, ³⁵ 40% fine sand, 5% siltstone/sandstone rock fragments, dry, medium stiff, no plasticity, hardness or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 8
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 3'0" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11-17-11 0906	Date/Time Total Depth Reached: 11-17-11 0933	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		40295 (0945)	
Geologist: Ian Stone Timothy Morse		Checked By / Date: <i>[Signature]</i> 1/11/12		

Radiological Background: 9 / 2262 / 69	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. to 5' 2637 (CPM)
			0.0	62	Surface: Soil + veg.		
0.5			0.0	86	Sandy Silt: Silty Sand: Brown (10YR 4/3), 20% fine grained Sand, 5% med. to coarse grained Sand, 75% silt, trace siltstone gravel fragments, trace rootlets, slightly moist, no odor, soft to medium firm, non-cohesive, low plasticity	ML	2882
1.0			0.0	67			2747
			0.9	72	1'6" —————		2854
2.0			0.0	54	Sandy silt w/gravel: Light Yellowish Brown (10YR 6/4), 20% fine grained Sand, 5% med. to coarse grained Sand, 65% silt, 10% mechanically weathered siltstone gravel, dry, no odor, firm to hard, non-cohesive, low plasticity	ML	2888
			0.0	83			2815
3.0			0.0	78	3'6" Sandy Silt: Light Yellowish Brown (10YR 6/4) 15% fine grained Sand, 85% silt, trace mechanically weathered siltstone gravel, dry, no odor, hard, noncohesive, low plasticity	ML	2887
					Refusal on bedrock at 3'0" bgs. NO BW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 8S	Group: 1	Location ID: 9	
Drilling Company: HGL		Driller: B. Harris		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-30-11/1020		Date/Time Total Depth Reached: 9-30-11/1027	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#40296) (1027)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>[Signature]</i> 11-22-11			
Radiological Background: 14		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	13	Clayey silt, (10YR, 6/3), beige, 60% silt, 35% clay, 5% fine sand, dry, medium stiff, low plasticity, low hardness, no odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 9
Drilling Company: HGL	Driller: Ian Stone Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 8' 2" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11-16-11 1115	Date/Time Total Depth Reached: 11-16-11 1209	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.) 40297 (12.30)			
Geologist: Ian Stone Timothy Morse	Checked By / Date: Jan [Signature] 1/13/12			

Radiological Background: 9 / 2200 / 73	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' 2248 (CPM)
			0.0	62	Surface: Soil + Veg.		2423
0.5			0.0	81	Silty Sandy Silt: Light olive Brown (2.5Y 5/4) 20% fine grained Sand, 80% silt, trace subangular siltstone gravel (~1/4"), trace rootlets, slightly moist, soft, low plasticity, non-cohesive, no odor	ML	2698
1.0			0.0	86	1'-2' same as above except, ↳ trace quartzite gravel, trace CaCO ₃ deposits		3639
2.0			0.0	62	2' 0" ————— Sandy silt w/ gravel: Light olive Brown (2.5Y 5/4) 20% fine grained Sand, 75% silt, 5% subangular siltstone gravel (1/4" to 5/8"), trace CaCO ₃ deposits, dry, no odor, low plasticity, non-cohesive, medium firm consistency	ML	3949
3.0			0.0	57			3936
			0.0	77			3951
4.0			0.0	58	3' 3" ————— sandy silt: Light Yellowish Brown (2.5Y 6/4) 20% fine grained Sand, 75% silt, 5% subangular siltstone gravel (1/4" - 1/2"), trace CaCO ₃ deposits, dry, no odor, low plasticity, non-cohesive, trace rootlets, medium firm consistency	ML	4211
			0.0	80			4426
			0.0	63			4370
5.0			0.0	65	5' 0" ————— Same as above, except color change ↳ Light Yellowish Brown (2.5Y 6/3)		4349
			0.0	98			4453
6.0			0.0	68			4389

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	85	1	9		
Radiological Background:		Radiological Equipment Used:		PID Used:			
		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	69	same as above...		4388
			0.0	67		ML	4057
7.0			0.0	56	7'0" -----		3845
			0.0	45	Sandy silt w/gravel: Light yellowish brown (2.54 6/4), 15% fine grained sand, 5% med. to coarse grained sand, 10% subangular siltstone gravel (1/2" to 1 1/2"), 70% silt, trace CaCO ₃ deposits, dry, no odor, low plasticity, non-cohesive	ML	3541
8.0			0.0	74	8'2" firm consistency		3212
					Refusal at 8'2" bgs. on bedrock NO BW 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: 8S		Group: 1		Location ID: 10	
Drilling Company: HGL		Driller: B. Harris		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-30-11/0945		Date/Time Total Depth Reached: 9-30-11/0953			
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#40298) (0953)					
Geologist: Chelsea Carmichael				Checked By / Date: <i>[Signature]</i> 11-22-11					
Radiological Background: 14			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	12	Sandy silt, (10YR, 4/3), pale brown, 65% silt, 35% fine to medium grained sand, dry, medium stiff, no plasticity, hardness or odor.	ML	1		
1.0							2		
2.0							3		
3.0							4		
4.0							5		
5.0							6		
6.0									

No GW reached

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 10
Drilling Company: HGL	Driller: <i>Jan Stone</i> Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 9'8" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11-16-11 1450	Date/Time Total Depth Reached: 11-16-11 1544	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		410299 (1615)	
Geologist: <i>Jan Stone</i> Timothy Moore	Checked By / Date: <i>Jan Stone</i> 1/13/12			

Radiological Background: 9 / 2330 / 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 (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' 2170 (CPM)
			0.0	55	Surface: soil + veg.			2543
0.5			0.0	58	Sandy silt: olive brown (2.5Y 4/3), 30% fine grained sand, 5% med to coarse grained sand, 65% silt, slightly moist, no odor, soft, low plasticity, non-cohesive, trace rootlets, trace siltstone gravel (1-2")	ML		3196
1.0		0.0	64					3541
		0.0	70					3622
2.0			0.0	60	2'0" -----		2	3752
			0.0	72	Sandy silt: light olive brown (2.5Y 5/4) 25% fine grained sand, 75% silt, dry, no odor, firm consistency, low plasticity, non-cohesive, trace siltstone gravel (1/2"), trace rootlets	ML		3796
3.0		0.0	73					4040
			0.0	63				4080
4.0			0.0	51	4'0" -----		4	4099
			0.0	56	same as above, except ↳ trace calcium carbonate deposits ↳ hard consistency	ML		4424
5.0			0.0	73				5
			0.0	53	5'6" -----			4827
6.0			0.0	72	Sandy silt w/ band: light yellowish brown (2.5Y 6/4) 20% fine grained sand, 70% silt, 10% subangular siltstone gravel, dry, no odor, hard, trace calcium carbonate deposits, non-cohesive, low plasticity	ML	6	4539

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	85	1	10		
Radiological Background:		Radiological Equipment Used:		PID Used:			
9 / 2330 / 51		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	72	Same as above...	ML	4539
			0.0	57			3801
7.0			0.0	75	Same as above...	ML	3603
			0.0	89			4143
8.0			0.0	80			4516
			0.0	65	9' 0" --- ↳ slightly more siltstone gravel (1/4" to 1/2")	ML	4425
9.0			0.0	54			4443
			0.0	64			4457
10.0					9' 8" Refusal on Bedrock at 9' 8" bgs. NO GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 8S	Group: 1	Location ID: 11
Drilling Company: HGL	Driller: B. Harris	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-30-11/0823-0815	Date/Time Total Depth Reached: 9-30-11/0823	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#40300) (0820)		Checked By / Date: <i>[Signature]</i> 11-22-11	
Geologist: Chelsea Carmichael				

Radiological Background: 14	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	14	Silt, (10 YR, 4/4), brown, 90% silt, 10% fine sand, dry, medium stiff, semi-cemented, very low hardness, no plasticity or odor.	ML		
1.0							1	
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: I	Location ID: 11
Drilling Company: HGL	Driller: Ian Stone Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 5'0" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11-17-11 10:10	Date/Time Total Depth Reached: 11-17-11 11:10	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		40301 (1130)	
Geologist: Ian Stone Timothy Morse		Checked By / Date: Jan Stone 1/11/12		

Radiological Background: 10 / 2238 / 68	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	75	Surface: soil + veg.			+0.5' 2389
0.5			0.0	64	Sandy silt: Yellowish Brown (10YR 5/4) 20% fine grained sand, 80% silt, trace quartzite gravel, trace rootlets, slightly moist, soft to medium firm, low plasticity, non-cohesive,	ML		2485
1.0			0.0	74	1'0" no odor		1	3134
			0.0	48	Sandy silt: Light olive Brown (2.5Y 5/4) 25% fine grained sand, 5% med. grained sand, 70% silt, trace rootlets, dry, no odor, medium firm to firm consistency, low plasticity, non-cohesive, trace calcium carbonate deposits	ML		3020
2.0			0.0	52			2	2865
			0.0	66				2926
3.0			0.0	88	3'0"		3	3067
			0.0	65	Sandy silt: same as above, except 20% sand, 80% silt, hard consistency	ML		3354
4.0			0.0	66	4'0"		4	3477
			0.0	69	Sandy silt: Light Yellowish Brown (2.5Y 6/4) Same as above except trace mechanically weathered siltstone gravel	ML		3407
5.0			0.0	60	5'0"		5	3584
					Refusal on bedrock at 5'0" bgs. no GW encountered		6	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 8S	Group: 1	Location ID: 12
Drilling Company: HGL	Driller: B. Harris	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-30-11/0754	Date/Time Total Depth Reached: 9-30-11/0803	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#40302) (0802)		Checked By / Date: <i>[Signature]</i> 11-22-11	
Geologist: Chelsea Carmichael				

Radiological Background: 14	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	14	Sandy silt with clay, (10 YR, 5/4), light brown, 50% silt, 30% fine sand, 20% clay, dry, medium stiff, semi-cemented, very low hardness, no plasticity, no odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 2	Location ID: 12
Drilling Company: HGL	Driller: Ian Stone Tim Morse / James Harris	Ground Elevation: NA	Total Depth Drilled: 6'2" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11-18-11 0848	Date/Time Total Depth Reached: 11-18-11 0935	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.) 40303 (1000)			
Geologist: Jan Stone Timothy Morse	Checked By / Date: Jan Stone 11/11/12			

Radiological Background: 10 / 2808 / 84	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: silt sticks			+0.5' 2588
			0.0	68	sandy silt silty sand: Dark Yellowish Brown (10YR 4/6)			2726
0.5			0.0	68	20% fine grained sand, 5% med. to coarse grained sand, 75% silt, trace calcium carbonate deposits, trace rootlets, moist, no odor, soft, low plasticity, slightly cohesive	ML		3147
1.0			0.0	71	1'0" sandy silt		1	3584
			0.0	77	silty sand : Light olive brown (2.5Y 5/5)			3672
			0.0	77	20% fine grained sand, 5% med. to coarse grained sand, 75% silt, trace calcium carbonate deposits, trace rootlets, slightly moist, no odor, firm consistency, low plasticity, non-cohesive	ML	2	3619
2.0			0.0	72				
			0.0	79				3598
3.0			0.0	84	3'0" -----		3	3716
			0.0	83	same as above, except ↳ light yellowish brown (2.5Y 6/4) ↳ medium firm to hard consistency			3423
4.0			0.0	77			4	3404
			0.0	84				3574
5.0			0.0	77	5'6" -----		5	3572
			0.0	91	sandy silt sandy silt: Light yellowish brown (2.5Y 6/4)			3522
			0.0	91	30% fine grained sand, 5% med. grained sand, 50% coarse grained sand, 55% silt, 5% subangular siltstone gravel fragments, dry, no odor, hard, trace calcium carbonate deposits, non-cohesive	ML	6	3878
6.0			0.0	94				

Project Name: SSFL Area IV Radiological Study		Project Number: BP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 12		
Radiological Background: 10/2805 / 84		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	24	6'2" same as above... Refusal on Bedrock at 6'2" bgs. NO GW encountered	MC Bedrock	3878
7.0							
8.0							
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: 88	Group: 1	Location ID: 13
Drilling Company: HGL	Driller: S. Lapeyre-Montrose	Ground Elevation: NA	Total Depth Drilled: 0.51 ft bgs.	
Drilling Equipment: stainless steel shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 9/29/11 1450	Date/Time Total Depth Reached: 9/29/11 1500	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		1500 40304 (4405) LRG	
Geologist: L. Robbins Goldmann	Checked By / Date: Chelsea Carmichael / 11-18-11			

Radiological Background: 14uR / 72 cpm	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)
0.5			0.0	74	silty sand: dark yellowish brown (10YR 4/4) loose, dry, no odor, 75% sand, 25% silt, cohesive, no plasticity, no hardness, trace rootlets, no groundwater encountered.	SM	
1.0			0.0				
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 8	Group: 1	Location ID: 13
Drilling Company: HGL	Driller: I. Stone Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 7' 6" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/14/11 1345	Date/Time Total Depth Reached: 11/14/11 1440	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		40305 (1515) 40330 (NT)	
Geologist: Ian Stone Timothy Morse	Checked By / Date: Dan [Signature] 1/13/12			

Radiological Background: 10 / 2623 / 56	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
			0.0	85	surface: soil + veg.		10.5 2652
0.5			0.0	98	Sandy silt: Dark Yellowish Brown (10YR 3/4) 35% fine grained sand, 5% med. grained sand, 5% coarse grained sand, 55% grained silt, slightly moist, no odor, soft, low plasticity, non-cohesive, trace rootlets	ML	2850
1.0			0.0	105			3794
			0.0	104	1'0" Silty sand: Dark Yellowish Brown (10YR 4/6) 35% silt, 55% fine grained sand, 5% medium grained, 5% coarse grained sand, slightly moist, no odor, loose soft, low plasticity, non-cohesive, trace roots and rootlets	SM	4312
2.0			0.0	92			4564
			0.0	71			4602
			0.0	83			4652
3.0			0.0	56			4836
			0.0	83	4'0" Same as above, except medium ^{dense} firm consistency and presence of trace calcium carbonate deposits		4861
4.0			0.0	80			4927
			0.0	69			4932
5.0			0.0	91		SM	4910
			0.0	74			4560
6.0			0.0	74			4628

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04.03		85	1	13	
Radiological Background:			Radiological Equipment Used:			PID Used:	
10 / 2623 / 56			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	74	6'0" - - - - -		4628
			0.0	104	Silty Sand: Yellowish Brown (10YR 5/6) 15% silt, 80% fine grained sand, 5% md. to coarse grained sand, dry, no odor, medium dense, no plasticity	SM	4749
7.0			0.0	66	7'0" - - - - -		5004
			0.0	92	Mechanically weathered sandstone to SP fine grained poorly graded sand, dry, no odor, very dense Yellowish Brown (10YR 5/6)	SP	5311
					7'6" - - - - -		
					Refusal on sandstone bedrock at 7'6" bgs. NO GW encountered	bedrock	
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: 8S	Group: 1	Location ID: 14
Drilling Company: HGL	Driller: S. Lapeyre-Montrose	Ground Elevation: NA	Total Depth Drilled: 0.5' ft bgs.	
Drilling Equipment: stainless steel shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 9/29/11 1515	Date/Time Total Depth Reached: 9/29/11 1515	
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		40306 (1515)	
Geologist: L. Robbins Goldman	Checked By / Date: Chelsea Carnichael / 11-18-11			
Radiological Background: 16 uR / 72	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.1 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			87		Surface: soil + twigs		
0.5			83		Silty clay: dark yellowish brown (10YR 4/4), loose, no odor, dry, 75% clay, 20% silt, 5% fine sand, cohesive, plastic, no dilatancy, low toughness, rootlets, pinhole pores	CL	
1.0							
2.0					no GW		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 14
Drilling Company: Beart 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: 10-21-11 1410	Date/Time Total Depth Reached: 10-21-11 1500	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 40307 (1415)			
Geologist: C. Knight	Checked By / Date: <i>[Signature]</i> 11/10/12			

Radiological Background: 13MR/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 (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	66	Surface: Soil and gravel		0.5	2732
			0.0	60	Sandy silt with gravel: light yellowish brown (10YR 6/4), dry, medium stiff, no odor, 10% fine angular gravel, 30% fine sand, 60% silt, non cohesive, slow dilatancy, low plasticity, low toughness, trace quartzite crystals ~4" diameter, mottled	AF ML	1	3329
			0.0	72				4246
			0.0	73				4657
			0.0	62			2	4911
			0.0	55				4975
			0.0	60	2'0" - Same as above with appearance of CaCO ₃ stringers	ML	3	4862
			0.0	66				4736
			0.0	59			4	4719
			0.0	51				4406
			0.0	63			5	4576
			0.0	55	Same as above: Sandy silt 70% silt, 30% fine sand no gravel	ML		4414
			0.0	52			6	4205
			0.0	52				4471

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 15
Drilling Company: Dart 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: 10-21-11 1510	Date/Time Total Depth Reached: 10-21-11 1605	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 40309 (1515)			
Geologist: C. Knight	Checked By / Date: Jan [Signature] 1/10/12			

Radiological Background: 11uR/2556/50	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs.)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	95	Surface: Soil and grass		6.5'	2600
			0.0	52	Sandy Silt: Brown (10YR 5/3), dry, medium stiff to soft, no odor, 25% fine sand, 75% silt, cohesive, low plasticity, low toughness, mottled, trace rootlets	ML		3079
0.5			0.0	56				4098
1.0			0.0	53				4358
			0.0	66				4436
			0.0	50				4437
2.0			0.0	55	3" Quartz crystals - 4mm diameter			4712
			0.0	77	3" Same as above: Sandy silt with CaCO ₃ stringers and nodules	ML		4800
			0.0	81				4823
			0.0	75				4772
			0.0	71				4887
4.0			0.0	62	Silt: Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 5% fine sand, 95% silt, cohesive, low plasticity, low toughness, abundant CaCO ₃ stringers	ML		4784
			0.0	59				4904
5.0			0.0					4828
6.0			0.0					

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 8S	Group: 1	Location ID: 16
Drilling Company: HGL	Driller: B. Harris	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-30-11/1414	Date/Time Total Depth Reached: 9-30-11/1421	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 40310) (1420)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>[Signature]</i> 11-22-11			

Radiological Background: 18	Radiological Equipment Used: Micro R Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	18	Clay with sand, (10YR, 4/3), pale brown, 80% clay, 20% fine sand, dry, semi-cemented, trace rootlets, medium stiff, low-medium plasticity and hardness, no odor.	CL	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: CL 17.16
Drilling Company: Becht Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 6'10" OK ft. bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/20/11 1455	Date/Time Total Depth Reached: 10/20/11 1555	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 40311 (1500)			
Geologist: C. Knight	Checked By / Date: [Signature] 1/5/12			

Radiological Background: 15mR/27mR/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 (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	59	Surface: Soil and grass		0.5	3138
			0.0	57	Clayey silt with sand: Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 20% clay, 15% fine sand, 65% silt, cohesive, low plasticity, low toughness, CaCO ₃ stringers, some pinhole pores	ML	1	3235
			0.0	58			4253	
			0.0	62			4991	
			0.0	58			5290	
			0.0	50	3' 11" Silty Clay: Brown (7.5YR 5/4), moist, medium stiff, no odor, 35% silt, 65% clay, cohesive, medium plasticity, medium toughness, abundant CaCO ₃ stringers	CL	2	5349
			0.0	54			5530	
			0.0	61			5321	
			0.0	65			5276	
			0.0	66			5370	
			0.0	68			5276	
			0.0	66	5' 4" CaCO ₃ nodules in silty clay	CL	5	5257
			0.0	66			5482	
			0.0	63	contact 6'0"		6	5454

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 8S	Group: 1	Location ID: 17
Drilling Company: HGL	Driller: B. Harris	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-30-11/1343	Date/Time Total Depth Reached: 9-30-11/1351	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#40312) (1350)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>[Signature]</i> 11-11-11			

Radiological Background: 18	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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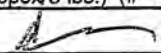
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	18	Clay with sand, (10YR, 3/3), dark brown, 80% clay, 20% fine to coarse grained sand, trace sandstone rock fragments, dry semi-moist, low plasticity, low-medium hardness, no odor.	CL	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 157
Drilling Company: Pant 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: 10-21-11 1050	Date/Time Total Depth Reached: 10-21-11 1150	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		40329 (CAT) Field DOP 40313 (1100)	
Geologist: C. Knight	Checked By / Date: [Signature] 1/10/12			

Radiological Background: BGR/3209/41	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	54	Surface Soil on ground		0.5	3057 (CPM)
0.5			0.0	74	Sandy silt: Olive brown (2.5 Y 4/3), dry, medium stiff, no odor, 20% fine sand, 80% silt, cohesive, low plasticity, low toughness, trace roots and rootlets	ML	1.0	3703
1.0			0.0	82			1.5	4677
			0.0	81			2.0	5144
2.0			0.0	72			2.5	5246
			0.0	77			3.0	5331
3.0			0.0	45	2'11" dashed Clayey silt: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 30% clay, 70% silt, cohesive, low plasticity, low toughness	ML	3.5	5613
			0.0	55			4.0	5486
4.0			0.0	54			4.5	5704
			0.0	78			5.0	5600
5.0			0.0	55	4'8" weathered sandstone bedrock: Pale yellow (2.5 Y 7/4) dry, dense, no odor, 5% medium sand, 95% fine sand, fine grained sandstone	Bedrock	5.5	5641
					Refusal on sandstone at 5.0' bgs NO GW encountered		6.0	5604

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 8S	Group: 1	Location ID: 18	
Drilling Company: HGL		Driller: B. Harris		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-30-11/1359		Date/Time Total Depth Reached: 9-30-11/1407	
Type of Sampling Device: stainless steel shovel/trowel				Samples Collected: One 1/2 Gallon Bag (Approx. 8 lbs.) (# 40314) (1405)			
Geologist: Chelsea Carmichael				Checked By / Date:  11-22-11			
Radiological Background: 19			Radiological Equipment Used: Micro R _x Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
0.5			0.0	18	Clay with sand, (10YR, 4/3), pale brown, 85% clay, 15% fine sand, dry, medium stiff, trace rootlets, low-medium plasticity and hardness, no odor.	CL	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 85	Group: 1	Location ID: 18	
Drilling Company: Best 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: 10-21-11 0915		Date/Time Total Depth Reached: 10-21-11 1020	
Type of Sampling Device: 1.75 inch Macrocore				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 40315 (0925)			
Geologist: C. Knight				Checked By / Date: I. Stone 1/10/12			
Radiological Background: MAR/3224/49			Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Feet bgs	(CPM)
					Surface: Soil and grab		10.5'	3172
0.5			0.0	52	Sandy Silt: Dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 15% fine sand, 5% clay, 80% silt, cohesive, low plasticity, low toughness, some pin hole pores and rootlets, abundant CaCO ₃ stringers	ML		3627
			0.0	56				4628
1.0			0.0	58				5135
			0.0	63				5294
2.0			0.0	68	2'3" ————— Clayey Silt: Strong brown (7.5YR 4/6), moist, medium stiff, no odor, 20% clay, 80% silt, cohesive, low plasticity, low toughness, abundant CaCO ₃ stringers	ML		5539
			0.0	65				5814
3.0			0.0	61				5808
			0.0	64				5783
4.0			0.0	77	Sand with Silt: Brownish yellow (10YR 6/6), moist, medium dense, no odor, 10% silt, 90% fine sand, some CaCO ₃ stringers, some iron oxide staining	SP		5820
			0.0	82				5819
5.0			0.0	85				5721
			0.0	51				5621
6.0			0.0	55			5561	

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04.03		BS	1	18	
Radiological Background:			Radiological Equipment Used:		PID Used:		
M/M/S/3224/44			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	55	Same as above: Sand with salt	SP	5561
			0.0	62			5636
7.0			0.0	64	70" absence of CaCO ₃ stringers		5765
			0.0	65			5937
8.0			0.0	67	8'0"		5708
			0.0	65	Weathered Sandstone: Pale yellow (2.5Y 8/3), moist, dense to very dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	5694
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: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 19
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 6 ft 2 in ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 12/2/11 0852	Date/Time Total Depth Reached: 12/2/11 0956	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx. 8 lbs.)		40317-1020	
Geologist: Ian Stone	Checked By / Date: <i>Jillian Robinson Feldman</i> 1/13/12			

Radiological Background: 11 / 3001 / 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 0.5' = 2948 (CPM)
0.0			0.0	73	Silty Sand, Yellowish Brown (5/6 104R) 80% fine sand, 20% silt, moist, low dens. no odor or staining	SM		3159
0.5			0.0	71			4320	
1.0			0.0	65	Sand, Brownish Yellow (6/6 104R) 95% ^{5%} fine sand, ^{5%} silt, dry, med dense, no odor or staining	SP		4688
			0.0	75			4861	
2.0			0.0	63				4845
			0.0	68			4991	
			0.0	86			5156	
3.0			0.0	96				5181
			0.0	102			5084	
4.0			0.0	81			Sand, Brownish Yellow (6/6 104R) 95% fine sand, 5% silt, trace gravel (sandstone/siltstone, max size = 0.75"), dry, med dense, no odor or staining weathered sandstone	SP Bed rock
			0.0	112	5463			
5.0			0.0	77				5581
			0.0	73			5931	

TD = 6 ft 2 in

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 8S	Group: 1	Location ID: 20			
Drilling Company: HGL		Driller: B. Harris	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-30-11/1109	Date/Time Total Depth Reached: 9-30-11/1116				
Type of Sampling Device: stainless steel shovel/trowel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#40318) (1115)						
Geologist: Chelsea Carmichael		Checked By / Date: <i>[Signature]</i> 11-22-11						
Radiological Background: 16		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	14	Sandy clay, (10 YR, 5/3), light brown, 60% clay, 40% fine to medium grained sand, dry, trace rootlets, medium stiff, low plasticity and hardness, no odor.	CL	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 20
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 10 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 12/2/11 1031	Date/Time Total Depth Reached: 12/2/11 1148	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.) 40319-1220			
Geologist: Ian Stone	Checked By / Date: Robbie Helman 4/13/12			

Radiological Background: 10 / 2502 / 81	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' = 2602 (CPM)
0.5			0.0	65	Silty Sand, Dark yellowish Brown (4/4 10YR) 55% fine sand, 45% silt, trace roots, moist, low dense, no odor or staining	SM	3239
1.0			0.0	61			3730
1.5			0.0	73	Sandy Silt w/clay, Yellowish Brown (5/4 10YR)	ML	3919
2.0			0.0	77	40% fine sand, 50% silt, 10% clay, moist, low toughness, low strength, low plasticity no odor or staining	ML	4260
2.5			0.0	71	Sandy Silt, Yellowish Brown (5/4 10YR)	ML	4185
3.0			0.0	72	40% fine sand, 60% silt, trace gravel (sandstone, max size=0.25"), dry, low strength, low toughness, low plasticity, no odor or staining	ML	4074
3.5			0.0	76			4081
4.0			0.0	82			4053
4.5			0.0	78	Silty Sand, light yellowish brown (6/4 10YR)	SM	4076
5.0			0.0	73	60% fine sand, 40% silt, trace roots, dry, med dense, no odor or staining	SM	4120
5.5			0.0	76			4256
6.0			0.0	66			4344
6.5			0.0	73			4502

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04.03		83	1	20	
Radiological Background:			Radiological Equipment Used:			PID Used:	
10 / 2502 / 81			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	73	Silty sand, same as above	SM	4502
			0.0	80	trace calcium carbonate		4575
7.0			0.0	113	Silty Sand, Brown (1/3 104R)	SM	4762
			0.0	108	65% fine sand, 35% silt, trace calcium carbonate, dry, med. dense, no odor or staining		4770
8.0			0.0	93	trace (25)		4970
			0.0	97			5001
9.0			0.0	79			4929
			0.0	84	trace gravel (siltstone/sandstone, max size = 1")		4672
10.0			0.0	89	TD = 10 ft bgs no gw. encountered no anomalies encountered		4597
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 8S	Group: 1	Location ID: 21	
Drilling Company: HGL		Driller: B. Harris		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-30-11/1127		Date/Time Total Depth Reached: 9-30-11/1135	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#40320) (1135)			
Geologist: Chelsea Carmichael				Checked By / Date: [Signature] 11-22-11			
Radiological Background: 16			Radiological Equipment Used: Micro R Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	16	Sandy clay, (10YR, 4/4), brown, 60% clay, 40% fine sand, dry, medium stiff, low plasticity, hardness, no odor.	CL	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 21
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 10 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 12/2/11 1346	Date/Time Total Depth Reached: 12/2/11 1441	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		40321 - 1510	
Geologist: Ian Stone	Checked By / Date: <i>J. Robbins</i> 1/13/12			

Radiological Background: 10 / 2742 / 63	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' = 2539 (GPM)
0.5			0.0	67	Silty Sand, Dark Yellowish Brown (3/6 10YR) 60% fine sand, 40% silt, trace gravel (sandstone, max size = 0.5"), moist, low dense, no odor or staining, trace roots	SM		3984
			0.0	55				4591
1.0			0.0	54				4531
			0.0	57	Silty Sand, Dark yellowish brown (4/4 10YR) 65% fine sand, 35% silt, trace gravel (sandstone/calcium carbonate, max size = 0.75"), dry, med dense, no odor or staining	SM		4552
2.0			0.0	66				4372
			0.0	94				4318
3.0			0.0	56			3	4146
			0.0	53				3947
4.0			0.0	63	Silty Sand Yellowish Brown (5/4 10YR) 70% fine sand, 30% silt, trace gravel & trace gravel (calcium carbonate/sandstone, max size = 1.5"), dry, med dense, no odor or staining	SM		3791
			0.0	57				3531
5.0			0.0	75				5
			0.0	95				4087
5.0			0.0	63			6	4576

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 8S	Group: 1	Location ID: 22	
Drilling Company: HGL		Driller: B. Harris		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-30-11/0858		Date/Time Total Depth Reached: 9-30-11/0906	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#40322) (0905)			
Geologist: Chelsea Carmichael				Checked By / Date: 11-22-11			
Radiological Background: 15			Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	14	Silt with rock fragments, (10YR, 5/4), light brown, 80% silt, 20% siltstone/sandstone rock fragments, dry, medium stiff, very low hardness, no plasticity, no odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: 1	Location ID: 22
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 8 ft 10.25 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 12/1/11 1425	Date/Time Total Depth Reached: 12/1/11 1533	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		40323 - 1610	
Geologist: Ian Stone	Checked By / Date: <u>Robbin Feldman</u> 1/13/12			

Radiological Background: 9 / 2305 / 50	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings 0.5' = 2382 (CPM)
0.0			0.0	86	Sandy Silt, Dark Brown (3/3 10YR)	ML		2442
0.5			0.0	47	40% fine sand, 60% silt, trace gravel, trace roots, dry, low toughness, low strength, low plasticity, no odor or staining			2875
1.0			0.0	92			1	3726
			0.0	63				3881
2.0			0.0	71	Silty Sand w/ gravel, Yellowish brown (5/4 10YR) 55% 60% fine sand, 30% silt, 15% fine gravel (siltstone/sandstone, max size = 0.3"), dry, med dense, no odor or staining	SM	2	3780
			0.0	62				3473
3.0			0.0	96	Silty Sand w/ gravel, Brownish Yellow (6/6 10YR) 60% fine sand, 30% silt, 10% fine gravel (siltstone/sandstone, max size = 0.25"), dry, med dense, no odor or staining	SM	3	3510
			0.0	78				3682
4.0			0.0	74			4	3765
			0.0	70				3701
5.0			0.0	63			5	3877
			0.0	60	Silty Sandy Silt, Brownish Yellow light yellowish brown (6/4 10YR), 70% 30% fine sand, 70% silt, trace gravel (siltstone, max size = 0.25"), dry, low tough, low strength, low plasticity, no odor or staining	ML		3730
5.0			0.0	63			6	3533

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 83	Group:	Location ID: 22		
Radiological Background: 9 / 23051 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, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	63	Sandy silt, tan as above	ML	3533
			0.0	73			3515
7.0			0.0	63	Silty sand, Brownish yellow (6/6 104R)		3801
			0.0	69	60% fine sand, 40% silt, trace gravel (siltstone, max size = 0.5"), dry, med dense, no odor or staining	SM	4000
8.0			0.0	67	Silty sand, Brownish yellow (6/6 104R)		4035
			0.0	73	55% fine sand, 40% silt, 5% gravel (siltstone, max size = 0.25"), dry med-high density, no odors or staining	SM	4468
9.0					TD = 8ft 10in bgs no gw encountered refusal on bedrock no anomalies detected		
10.0							
11.0							
12.0							
13.0							



Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 8S	Group: 1	Location ID: 23
Drilling Company: HGL		Driller: B. Harris	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-30-11/0841	Date/Time Total Depth Reached: 9-30-11/0850	
Type of Sampling Device: stainless steel shovel/ trowel			Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#40324) (0850)		
Geologist: Chelsea Carmichael			Checked By./ Date: <i>[Signature]</i> 11-22-11		
Radiological Background: 14		Radiological Equipment Used: Micro B / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	14	Clay with sand, (10YR, 4/4), brown, 80% clay, 20% fine sand, dry, medium stiff, ^(ae) very low plasticity, low-medium hardness, no odor.	CL		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 85	Group: i	Location ID: 23
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 9 ft 9 in ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 12/1/11 1048	Date/Time Total Depth Reached: 12/1/11 1208	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		40325 - 1245 1245	
Geologist: Ian Stone	Checked By / Date: JR Alderman 1/13/12			

Radiological Background: 9 / 2425 / 76	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.2 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' = 2506 (CPM)
0.0			0.0	58	Silty Sand, Brown (4/3 104R), 70% fine sand, 30% silt, trace roots, trace gravel, low dense, no odor or staining, dry (Fill)	SM		2688
0.5			0.0	39	Silty Sand w/ clay, Yellowish Brown (5/6 104R), 60% fine sand, 30% silt, 10% clay, low dense, no odor or staining, dry	SM		3512
1.0			0.0	67			1	3827
			0.0	71				3977
2.0			0.0	73	Sandy silt, Yellowish Brown (5/4 104R)	ML	2	4332
			0.0	77	35% fine sand, 60% silt, 5% fine gravel (siltstone, max size = 0.25"), low toughness, low strength, low plasticity, no odor or staining, dry			4404
3.0			0.0	100	Sandy silt, light brownish yellow (6/4 104R)	ML	3	4437
			0.0	104	35% fine sand, 60% silt, 5% fine gravel (siltstone, max size = 0.25"), low toughness, low strength, low plasticity, no odor or staining, dry			4481
4.0			0.0	90			4	4477
			0.0	72				4399
5.0			0.0	83			5	4448
			0.0	88				4313
6.0			0.0	94			6	4177

Project Name:		Project Number:		Subarea:	Group:	Location ID:	
SSFL Area IV Radiological Study		EP038.01.22.04.03		85	1	23	
Radiological Background:			Radiological Equipment Used:		PID Used:		
9 / 2425 / 76			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	94	Silty silt same as above	ML	4177
			0.0	75	Silty Sand, pale brown (7.5Y 2.5X) (S) light yellowish brown (6.4Y 10.4R) 80% fine sand, 20% silt, trace gravel (with clay) sandstone, max size = 1/16", mud dense, no clay or shelling, dry	SM	4007
7.0			0.0	81			3867
			0.0	78			3946
8.0			0.0	93			3913
			0.0	92			3620
9.0			0.0	94			4041
			0.0	101			4112
10.0					ID = 9 ft 9 in logs refused on sandstone no gw encountered no gamma anomalies		
11.0							
12.0							
13.0							



Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 8S	Group: 1	Location ID: 24	
Drilling Company: HGL		Driller:		Ground Elevation: NA		Total Depth Drilled: 0.5' ft bgs.	
Drilling Equipment: stainless steel shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 9/29/11 1410		Date/Time Total Depth Reached: 40326 9/29/11 1415 (1415)	
Type of Sampling Device: stainless steel shovel/trowel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		Checked By / Date: Chelsea Carnichael / 11-18-11			
Geologist: L. Robbins Goldman		Radiological Background: 2 µR / 75 pCi/m		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	50	Silty clay: olive brown (2.5Y 4/6), dry, loose, no odor, 85% clay, 15% silt, cohesive, med. plastic, no dilatancy, no toughness, trace rootlets and twigs, mica flecks.	cl	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

no GW encountered

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 95	Group: 1	Location ID: 24		
Radiological Background: 9 / 2.54 / 61		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		RID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radilogical	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
6.0			0.0	55	Same as above...		6 3464
			0.0	75		ML	3794
7.0			0.0	62	7'0" - - - - - Same as above, except color change Light olive brown (2.5Y 5/4)		7 4013
			0.0	67			4085
8.0			0.0	77	8'3" Refusal on bedrock at 8'3" bgs. NO GW encountered	Bedrock	8 4032
9.0							9
10.0							10
11.0							11
12.0							12
13.0							13