APPENDIX C

SUBSURFACE BORING LOGS

URS Corporation

WELL BORING LOG

		BORING NO:	MW-47
PROJECT:	SLDA	SHEET:	1 of 1
CLIENT:	USACE	JOB NO.:	11173233.00000
BORING CONTRACTOR:	SJB Services, Inc.	BORING LOCATION:	N 474769.62 E 1460063.55
GROUNDWATER:		GROUND ELEVATION:	922.2'
		DATE STARTED:	09/23/03
		DATE FINISHED:	09/23/03
		DRILLER:	Steve Wolkiewicz
		GEOLOGIST:	Scott McCabe
		REVIEWED BY:	R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	HSA	SS		
				WT.	4.25"	2"		
				FALL		140#		
				* FIELD SCREENING VIA PID (PPM)		30"		

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	BLOWS PER 6"		REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER	
1									Continous samples not collected due to proximity to MW-52. See MW-52 boring log for 0-8' soil descriptions.					
5														
		1	SS	5	8	50.0%	Gray-		8.0'-15.0' Silty CLAY/Clayey SILT	ML/CL	ND	ND	ND	Dry
10				12	17		Lt. Brown		-with reddish brown mottles					
		2	SS	14	15	50.0%								
				19	24									
		3	SS	21	19	NR								
				23	32									
15		4	SS	26	21	NR								
				61	50/2		Lt. Purple		15.0' Weathered SHALE (consistency of clay)					
									End of Boring at 17.8'.					
20														
25														
30														
35														

Comments: Boring Advanced w/ track mounted CME-850

ND - Not Detected Above Background NR - Not Recorded

Augered to 17.8' and installed 2" PVC well as per Bill Frederick (USACE) and workplan.

PROJECT NO.	11173233.00000
BORING NO.	MW-47

URS Corporation

WELL BORING LOG

BORING NO:	MW-50
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	N 475062.59 E 1460107.73
GROUND ELEVATION:	899.1'
DATE STARTED:	11/07/03
DATE FINISHED:	11/18/03
DRILLER:	Brian Fuller/ Steve Wolkiewicz
GEOLOGIST:	Sheldon Nozik/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

TYPE	CAS.	SAMPLER	CORE	TUBE
HSA	SS	HQ		
DIA.	4.25"	2"	2.5"	
WT.		140#		
FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
1		1	SS	1 / 1	1 / 3	41.7%	Dk. To Light Brown	Very Soft	0'-0.3': Clayey TOPSOIL, organic	CL	0.0	5.5	8440	Dry
		2	SS	3 / 12	5 / 12	16.7%	Brown	Very Stiff	0.3'-4.6': SILT, some clay Possible sandstone cobble in shoe	ML	0.0	NA	NA	
5		3	SS	8 / 50/4	39	100.0%		Hard to Medium Hard	4.6'-15': Weathered sandy SILTSTONE - platy, iron staining, weathered in place Mudstone/siltstone, some fine shale and sandstone gravel		0.0	4.0	8198	
		4	SS	50/4		100.0%					0.0	5.0	6844	
10		5	SS	39 / 50/2	78	100.0%					NA	4.0	8150	
		6	SS	28	50/2	100.0%					NA	4.0	7500	
15							Lt. Gray		Sandstone chips and Auger refusal @12', reamed w/ 7.875" roller bit to 15' BGS					
20		C1	HQ (15.3'-20.1')	2.4	4.8	50.0% / 33.0%	Medium Gray	Medium Hard	15.3'-27': SHALE, moderately weathered, with very thin (black) laminae	V. Broken	0.0	NA	9900 - 12300	
25		C2	HQ (20.1'-30.1')	9.8	10.0	98.0% / 32.0%			27'-30.1': Grades to very fine SANDSTONE with black shale laminae		0.0	NA	10700 - 11500	
30		C3	HQ (30.1'-35.1')	5.0	5.0	100.0% / 72.0%	Medium Dark Gray		30.1'-30.7': SHALE 30.7'-31.4': Very fine SANDSTONE 31.4'-35.1': SHALE, with very fine sandstone laminae	Broken	0.0	NA	10300 - 12000	
35									End of Boring at 35.1' BGS					

Comments: Boring Advanced w/ track mounted CME-850
NA - Not Obtained due to Malfunction of Meter
Overburden Backgrounds: uR = 3-6
6" Diameter Steel Casing Set at 15' BGS
FIDLER = 8050-9500
2" PVC Well Installed

PROJECT NO. 11173233.00000
BORING NO. MW-50

URS Corporation

WELL BORING LOG

BORING NO:	MW-51
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	N 474892.83 E 1460685.09
GROUND ELEVATION:	922.7'
DATE STARTED:	11/18/03
DATE FINISHED:	11/19/03
DRILLER:	Brian Fuller
GEOLOGIST:	Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:				CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	Steel	SS	HQ
				DIA.	6"	2"	2.5"
				WT.		140#	
				FALL		30"	

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER	
1		1	SS	WoH	WoH	56.3%	Dark Brown	Very Soft	0'-0.3': TOPSOIL, organic	CL	0.0	4.0	8680	Dry
				WoH	1				0.3'-4': Clayey SILT					
		2	SS	7	7	55.0%	Gray	Stiff	0.95': with mottling & fine gravel appears to be weathered siltstone	ML	0.0	3.5	8570	
				3	3									
5		3	SS	2	4	55.0%	Light Gray		4'-6': SILT, trace clay, platy		0.0	4.0	9240	
				9	11									
		4	SS	15	21	75.0%		Medium Hard	6'-10': Weathered SILTSTONE - some sandy shale partings, crumbly		0.0	3.5	8270	
				37	50/1									
		5	SS	42	50/1	100.0%					NA	3.5	8850	
10														
		6	SS	40	50/0	26.0%			10'-15.8': Fine SANDSTONE		NA	NA	NA	
		C1	HQ (13'-16')	2.9	3.0	98.0% / 63.0%				Broken	0.0	5 - 7.0	12020 - 13010	
15									15.8'-16': sandy SHALE					
									16'-20': Fine SANDSTONE					
20		C2	HQ (16'-26')	9.8	10.0	98.0% / 74.0%			20'-20.9': sandy SHALE		0.0	5 - 7.0	11700 - 13200	
									20.9'-23.8': Fine to medium SANDSTONE					
25									23.8'-25.8': sandy SHALE					
									25.8'-36': Fine to Medium SANDSTONE subangular fracture at 25.5', horizontal fractures between facies changes					
30		C3	HQ (26'-36')	10.0	10.0	100.0% / 73.0%					0.0	5 - 8.0	10300 - 13401	
35														
									End of Boring at 36' BGS					

Comments: Boring Advanced w/ track mounted CME-850
NA - Not Obtained due to Malfunction of Meter
6" Diameter Steel Casing Set at 13' BGS 2" PVC Well Installed
WoH = Weight of Hammer

PROJECT NO. 11173233.00000
BORING NO. MW-51

URS Corporation

WELL BORING LOG

BORING NO:	MW-52
SHEET:	1 of 2
JOB NO.:	11173233.00000
BORING LOCATION:	N 474767.91 E1460081.72
GROUND ELEVATION:	921.9'
DATE STARTED:	09/15/03
DATE FINISHED:	09/30/03
DRILLER:	Brian Fuller/ Steve Wolkiewicz
GEOLOGIST:	Sheldon Nozik/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
9/16/2003	8:15	2.58	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
1		1	SS	1 / 1	1 / 2	46.0%	Dk. Brown to Light Brown	Loose to Medium Dense	0'-0.75': Clayey TOPSOIL, organic		0.0	ND**	13900 to 15500	Dry
		2	SS	6 / 11	10 / 10	100.0%			0.75'-3.9': sandy SILT, grading to clayey sandy SILT	ML	0.0			
									3.9'-4.5': silty SAND, trace (f) rounded to sub rounded gravel	SM				
5		3	SS	3 / 7	5 / 10	75.0%	Gray		4.5'-5.3': SILT & CLAY	ML/CL	0.0			
		4	SS	15 / 13	14 / 8	54.0%			5.3'-6.2': sandy SILT, trace fine gravel w/ sand & gravel	ML	0.0			
		5	SS	5 / 14	10 / 21	37.5%			6.2'-8.5': SAND & SILT, w/ angular shale fragments	SM/ ML	0.0			
10		6	SS	5 / 13	9 / 14	45.8%	Reddish Gray & Black		8.5'-12.4': Weathered SHALE/ CLAYSTONE, iron staining, fine sandy silt		0.0			Wet
		7	SS	9 / 17	14 / 20	37.5%		Dense	12.4-19.5: Transitions to weathered CLAYSTONE, some shale partings highly weathered @ 16'-18'	ML/CL	0.0			
15		8	SS	30 / 50/4	34	68.8%		Very Dense			0.0			Dry
		9	SS	50	50/1	100.0%					0.0			
		10	SS	50/4		100.0%	Gray/Brown				0.0			
20		C1	HQ (19.5'-24.5')	4.6	5.0	92.0% / 39.0%	Reddish Brown to Blue Green	Very Soft to Soft	19.5'-24.5': Alternating CLAYSTONE & SILTSTONE w/ irregular sandstone veining from 23.5'-24.5'	V. Broken				
25		C2	HQ (24.5'-29.5')	5.0	5.0	100.0% / 50.0%	Blue Green	Medium Hard	24.5'-27': CLAYSTONE w/ trace fine sand & silt					
								Hard	27'-35': SILTSTONE w/ 0.25" faint banding, irregular "hackly" fractures @ 2"-4" intervals					
30		C3	HQ (29.5'-39.5')	9.7	10	97.0% / 90.0%	Medium Gray		33'-35': 2" fine sandstone beds	Broken				
35														

Comments: Boring Advanced w/ track mounted CME-850

** - ND: None Detected Above Background Levels

6" Diameter Steel Casing set @ 19.5' BGS 2" PVC Well Installed

PROJECT NO. 11173233.00000
BORING NO. MW-52

URS Corporation	WELL BORING LOG
	BORING NO: MW-52
PROJECT: SLDA	SHEET: 2 of 2
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 474767.91 E1460081.72
GROUNDWATER:	GROUND ELEVATION: 921.9'
	DATE STARTED: 09/15/03
	DATE FINISHED: 09/30/03
	DRILLER: Brian Fuller/ Steve Wolkiewicz
	GEOLOGIST: Sheldon Nozik/ Tim Burmeier
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
9/16/2003	8:15	2.58	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
		C3	HQ (29.5'-39.5')	9.7	10.0	97.0% / 90.0%	Medium Gray	Hard	35'-39.7': sandy SILTSTONE w/ fine sand laminae lenses	Broken				
40									39.7'-40': SANDSTONE - fine grained well cemented					
		C4	HQ (39.5'-44.5')	5.0	5.0	100.0% / 100.0%	Dark Gray / Medium Gray		40'-43': Grades to silty SHALE w/ planar partings; 43'-44.5': SILTSTONE w/ (f) sandstone laminae					Lost 200 gallons @ 40' BGS
45									End of Boring @ 44.5' BGS					
50														
55														
60														
65														
70														

Comments: Boring Advanced w/ track mounted CME-850

** - ND: None Detected Above Background Levels

6" Diameter Steel Casing set @ 19.5' BGS 2" PVC Well Installed

PROJECT NO. 11173233.00000

BORING NO. MW-52

URS Corporation

WELL BORING LOG

BORING NO:	MW-53
PROJECT: SLDA	SHEET: 1 of 2
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 474883.38 E 1460681.58
GROUNDWATER:	GROUND ELEVATION: 922.7'
	DATE STARTED: 11/09/03
	DATE FINISHED: 11/09/03
	DRILLER: Brian Fuller
	GEOLOGIST: Sheldon Nozik
	REVIEWED BY: R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
11/11/2003	14:00	47.8	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	REMARKS uR	REMARKS FIDLER
									0'-13': See Boring Log for MW-51				
5													
10													
		C1	HQ (13'-15.7')	2.7	2.7	100.0% / 52.0%	Light Gray	Hard	13'-39.8': Fine grained SANDSTONE 13.5'-14.5': vertical fractures and rubble with iron staining	Broken	0.0	6 - 11	10210 - 10608
15													
20		C2	HQ (15.7'-25.7')	9.9	10.0	98.5% / 62.0%			Frequent horizontal fractures Some evidence of weathering between fractures. Some Interbedded SILTSTONE. Iron Staining evident between fractures 24'-25': Shaly		0.0	7 - 8.0	9888 - 10250
25													
30		C3	HQ (25.7'-36')	10.3	10.3	100.0% / 62.0%			29.5': Vertical fracture with iron staining 30.5'-30.8': Rubble zone. Iron staining throughout. Transitions to and from silty sandy SHALE.		0.0	8.0	9980 - 10150
35													

Comments: Boring Advanced w/ track mounted CME-850

6" Diameter Steel Casing Set at 13' BGS | 2" PVC Well Installed

Borehole grouted from 62' to 71' BGS

PROJECT NO. 11173233.00000

BORING NO. MW-53

URS Corporation

WELL BORING LOG

BORING NO:	MW-53
PROJECT: SLDA	SHEET: 2 of 2
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 474883.38 E 1460681.58
GROUNDWATER:	GROUND ELEVATION: 922.7'
	DATE STARTED: 11/09/03
	DATE FINISHED: 11/09/03
	DRILLER: Brian Fuller
	GEOLOGIST: Sheldon Nozik
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
11/11/2003	14:00	47.8	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
		C3	HQ	10.3	10.3	100%/ 62%	Light Gray	Hard	13'-39.8': Fine grained SANDSTONE with shale Banding	Broken			
40		C4	HQ (36'-46')	10.1	10.1	100.0% / 73.0%	Dark Gray to Black	Medium Hard	39.8'-71': SHALE - silty, highly fractured along bedding, very fractured at 40.5' 41.9'-45.8': sandy SHALE Transitions to Predominantly SHALE @ 45.8'		0.0	6 - 11	10235 - 10445
45													
50		C5	HQ (46'-56')	9.9	10.0	99.0% / 92.0%		Hard			0.0	8 - 11	9630 - 9903
55							Black						
60		C6	HQ (56'-66')	9.9	10.0	99.0% / 73.0%					0.0	5 - 8.0	10010 - 10440
65													
70		C7	HQ (66'-71')	4.9	5.0	99.2% / 73.0%			Minor sandstone Layering		0.0	3 - 5.0	9985 - 10489
71									End of Boring at 71' BGS				

Comments: Boring Advanced w/ track mounted CME-850

6" Diameter Steel Casing Set at 13' BGS | 2" PVC Well Installed

Borehole grouted from 62' to 71' BGS

PROJECT NO. 11173233.00000

BORING NO. MW-53

URS Corporation

WELL BORING LOG

BORING NO:	MW-54
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 475381.64 E 1459132.10
GROUNDWATER:	GROUND ELEVATION: 858.6'
	DATE STARTED: 10/01/03
	DATE FINISHED: 10/01/03
	DRILLER: Brian Fuller
	GEOLOGIST: Sheldon Nozik
	REVIEWED BY: R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
10/1/2003		14.0	ft BGS	DIA.	4.25"	2"		
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
		1	SS	2	4	70.0%	Brown to Brown and Gray	Loose to Medium Dense	0'-0.3': Clayey TOPSOIL, organic		0.0	3 to 7	16500 to 26000	Moist
				4	4				0.3'-2': silty CLAY					
		2	SS	4	5	45.0%			2'-2.9': silt, sand & gravel shale gravel	Mine Fill	0.0			
				5	3									
5		3	SS	3	3	42.0%			2.9'-10.2': silt, sand, gravel shale & siltstone		0.0			
				3	4									
		4	SS	2	3	85.0%					0.0			
				3	4									
		5	SS	2	3	40.0%					0.0			
10				3	6									
		6	SS	2	7	84.0%			10.2'-14': silty clay, little fine gravel		0.0			
				9	9									
		7	SS	3	4	50.0%					0.0			
14				4	5									
15		8	SS	WoH	WoH	65.0%		Very Soft to Medium Stiff	14'-18.5': SILT & CLAY, medium plasticity, little fine gravel	CL/ ML	0.0			Wet
				WoH	1									
		9	SS	3	3	85.0%					0.0			
18				3	5									
19		10	SS	3	6	90.0%	Black		18.5'-18.75': COAL, black, shiny		0.0			
20				9	40		Gray	Hard	18.75'-20': CLAYSTONE					Moist
									End of boring @ 20' BGS					
25														
30														
35														

Comments: Boring Advanced w/ track mounted CME-850
WoH = Weight of Hammer
2" PVC Well Installed

PROJECT NO. 11173233.00000
BORING NO. MW-54

URS Corporation

WELL BORING LOG

BORING NO:	MW-56
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	N 475631.65 E 1459384.09
GROUND ELEVATION:	859.4'
DATE STARTED:	09/26/03
DATE FINISHED:	09/26/03
DRILLER:	Steve Wolkiewicz
GEOLOGIST:	Scott McCabe
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE
9/26/2003		16.0	ft BGS

TYPE	CAS.	SAMPLER	CORE	TUBE
HSA	SS			
DIA. 4.25"	2"			
WT.	140#			
FALL	30"			

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
		1	SS	6 5 / 4 10	50.0%	Brown	Loose to Very Loose	0'-18': Fine sandy SILT, trace clay & fine to coarse gravel - some weathered shale & sandstone fragments	Mine Fill	0.0	4.5	16361	Moist
		2	SS	5 3 / 2 2	50.0%					0.0	4.0	15207	
5		3	SS	5 3 / 2 2	50.0%					0.0	4.5	16917	
		4	SS	3 2 / 2 4	75.0%	Reddish Brown				0.0	5.0	13971	
10		5	SS	3 1 / 2 2	25.0%					0.0	4.5	17361	
		6	SS	5 3 / 2 1	50.0%					0.0	5.0	15924	
		7	SS	WoH 2 / 3 4	50.0%					0.0	4.0	19163	
15		8	SS	2 4 / 3 3	75.0%					0.0	4.5	16321	
18		9	SS	2 1 / 3 5	25.0%					0.0	4.0	15961	Wet @16'
19		10	SS	2 2 / 2 2	100.0%	Dark Gray to Brown		18'-25': Clayey SILT, some fine to medium sand, trace fine gravel & roots (possibly original ground surface)	ML	0.0	4.5	15321	Moist
		11	SS	2 3 / 3 5	100.0%					0.0	4.0	15342	
		12	SS	4 4 / 6 3	100.0%					0.0	5.0	13619	
25		13	SS	1 2 / 17 30	50.0%		Med. Dense to Very Dense			0.0	4.0	17061	Wet
27		14	SS	50 50/1	100.0%	Medium Gray		25'-27': Weathered SHALE		0.0	3.5	16341	
30								End of boring @ 27' BGS					
35													

Comments: Boring Advanced w/ track mounted CME-850
WoH = Weight of Hammer
Micro R Background = 4-5
2" dia SCH 40 PVC well installed
FIDLER Background = 13000-18000

PROJECT NO. 11173233.00000
BORING NO. MW-56

URS Corporation

WELL BORING LOG

BORING NO:	MW-57
PROJECT: SLDA	SHEET: 1 of 4
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 474430.33 E 1460856.37
GROUNDWATER:	GROUND ELEVATION: 945.6'
	DATE STARTED: 09/14/03
	DATE FINISHED: 11/08/03
	DRILLER: Brian Fuller/ Steve Wolkiewicz
	GEOLOGIST: Sheldon Nozik/ Tim Burmeier
	REVIEWED BY: R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
9/15/2003	9:00	17.75	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
1		1	SS	1 1 / 2 2	87.5%	Dk. Brown / Med. Brown	Very Loose to Loose	0'-1': TOPSOIL, organic		0.0			Dry
		2	SS	4 4 / 6 6	75.0%	Light Brown		1'-4.8': silty fine SAND, trace clay -increasing clay content	SM	0.0			
5		3	SS	4 7 / 9 9	100.0%		Medium Dense to Dense	4.8'-18': silty SAND & GRAVEL 6.2' - Sandstone cobbles throughout	SM/ GM	0.0			
		4	SS	10 15 / 27 50/4	100.0%	Medium to Dark Brown				0.0			
10		5	SS	5 6 / 12 14	41.7%					0.0	5.2 to 6.2	10004	
		6	SS	8 11 / 12 19	100.0%					0.0			
		7	SS	14 17 / 22 24	91.7%					0.0			
15		8	SS	11 19 / 20 19	45.8%					0.0			
		9	SS	9 16 / 37 22	39.6%		Very Dense	16'-18': same but more silt & clay		0.0			Moist to Wet @ 16'-18'
20		10	SS	44 6 / 9 11	62.5%	Light Brown to Gray	Very Stiff	18'-21.5': silty CLAY to Clayey SILT slightly plastic 18.75': Gray shale Lamination	ML/ CL	0.0			Moist
		11	SS	2 6 / 22 24	97.9%					0.0			
		12	SS	31 50/2	100.0%		Soft	21.5'-25': Weathered SHALE	Very Broken	0.0			
25		13	SS	31 50/4	100.0%					0.0			Dry
		C1	HQ (22'-27.3')	3.5 7.3	48.0% / 16.0%			25'-27.3': CLAYSTONE - Friable, weathered		0.0		12700 to 14000	
30		C2	HQ (27.3'-29.7')	2.4 2.4	100.0% / 17.0%	Blue Gray	Moderate Hard	27.3'-29.7': SILTSTONE - Very Broken				13700 to 16300	
35		C3	HQ (29.7'-34.7')	0.5 5.0	10.0% / 0.0%	Gray & Tan		29.7'-39.7': CLAYSTONE - Brecciated and cemented with tan calcite to 35.0'				12000 to 16000	

Comments: Boring Advanced w/ track mounted CME-850

WoH = Weight of Hammer Samples #12-#13 and Core C1 overlap (cored grout).

6" Diameter Steel Casing Set at 25' BGS 2" PVC Well Installed

FIDLER Background = 12700-15750 FIDLER & PID Affected by Rain

PROJECT NO. 11173233.00000

BORING NO. MW-57

URS Corporation

WELL BORING LOG

BORING NO:	MW-57
SHEET:	2 of 4
JOB NO.:	11173233.00000
BORING LOCATION:	N 474430.33 E 1460856.37
GROUND ELEVATION:	945.6'
DATE STARTED:	09/14/03
DATE FINISHED:	11/08/03
DRILLER:	Brian Fuller/ Steve Wolkiewicz
GEOLOGIST:	Sheldon Nozik/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
9/15/2003	9:00	17.75	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER
		C4	HQ (34.7'-39.7')	9.9 10.0	99.0% / 95.0%	Gray	Competent Hard	35': Becomes Competent Rock with uniform appearance and color	Broken	0.0		11200 to 13700
40		C5	HQ (39.7'-44.7')	5.0 5.0	100.0% / 90.0%			39.7'-50': MUDSTONE/SHALE with Planar Partings (4"-18")				
45		C6	HQ (44.7'-54.7')	7.8 10.0	78.0% / 88.0%			50'-61': SANDSTONE and SHALE - very fine grained, well cemented, alternating with shale, mostly 0.25" thick, has thin bands @ 54.7'-61.1'				
50												
55												13000 to 13600
60		C7	HQ (54.7'-64.7')	10.0 10.0	100.0% / 98.0%			61'-64.7': SHALE - has several thin silty sand lenses				
65		C8	HQ (64.7'-74.7')	9.8 10.0	98.0% / 91.0%			64.7'-69': SANDSTONE - very fine sandstone laminae with banded appearance				11800 to 13400
70								69'-70': SHALE 70'-71': SANDSTONE - fine, silty				

Comments: Boring Advanced w/ track mounted CME-850
WoH = Weight of Hammer
6" Diameter Steel Casing Set at 25' BGS 2" PVC Well Installed
FIDLER Background = 12700-15750 FIDLER & PID Affected by Rain

PROJECT NO. 11173233.00000
BORING NO. MW-57

URS Corporation

WELL BORING LOG

BORING NO:	MW-57
PROJECT: SLDA	SHEET: 3 of 4
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 474430.33 E 1460856.37
GROUNDWATER:	GROUND ELEVATION: 945.6'
	DATE STARTED: 09/14/03
	DATE FINISHED: 11/08/03
	DRILLER: Brian Fuller/ Steve Wolkiewicz
	GEOLOGIST: Sheldon Nozik/ Tim Burmeier
	REVIEWED BY: R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
9/15/2003	9:00	17.75	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY / HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
		C8	HQ (64.7'-74.7')	9.8	10.0	98.0% / 91.0%	Gray	Competent Hard	70'-71': SANDSTONE - fine, silty 71'-77.5': SHALE - contains thin very fine sandstone laminae with banded appearance	Broken	0.0		11400 to 13000
75		C9	HQ	2.0	2.0	100.0% / 100.0%							11700 to 12800
80		C10	HQ (76.7'-79.7')	3.0	3.0	100.0% / 77.0%			77.5'-78.5': SANDSTONE - very fine, silty 78.5'-112': SHALE - contains brown nodules at 80.4'. Contains light gray paper-thin very fine sandstone laminae				
		C11	HQ (79.7'-84.7')	5.0	5.0	100.0% / 94.0%							
85							Black						12500 to 13700
90		C12	HQ (84.7'-94.7')	10.0	10.0	100.0% / 96.0%							
95									-contains thin medium brown bands at 93.5'-94.7' and 97.7'-104.7'				12200 to 14200
100		C13	HQ (94.7'-104.7')	10.0	10.0	100.0% / 96.0%							
105													

Comments: Boring Advanced w/ track mounted CME-850

WoH = Weight of Hammer

6" Diameter Steel Casing Set at 25' BGS 2" PVC Well Installed

FIDLER Background = 12700-15750 FIDLER & PID Affected by Rain

PROJECT NO. 11173233.00000

BORING NO. MW-57

URS Corporation

WELL BORING LOG

BORING NO:	MW-57
SHEET:	4 of 4
JOB NO.:	11173233.00000
BORING LOCATION:	N 474430.33 E 1460856.37
GROUND ELEVATION:	945.6'
DATE STARTED:	09/14/03
DATE FINISHED:	11/08/03
DRILLER:	Brian Fuller/ Steve Wolkiewicz
GEOLOGIST:	Sheldon Nozik/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
9/15/2003	9:00	17.75	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	REMARKS uR	REMARKS FIDLER
		C14	HQ (107.7'-114.7')	10.0 10.0	100.0% / 83.0%	Black/ Gray Brown	Competent Hard	78.5'-112': SHALE	Broken	0.0		12500 to 13700
110												
						Black	Brittle	112'-112.8': SHALE - Bituminous				
								112.8'-116.1': COAL: Shiny				
115												
		C15	HQ	2.2 2.2	100.0% / 100.0%							12100 to 13200
		C16	HQ (116.9'-119.1')	2.2 2.2	100.0% / 100.0%	Light Brown	Medium Hard	116.1' - 121.1': CLAYSTONE - trace black mottles and contains trace pyrite.				
120												
								End of Boring at 121.1' Measured Depth Drilled Depth = 119.1'				
125												
130												
135												
140												

Comments: Boring Advanced w/ track mounted CME-850
WoH = Weight of Hammer
6" Diameter Steel Casing Set at 25' BGS 2" PVC Well Installed
FIDLER Background = 12700-15750 FIDLER & PID Affected by Rain

PROJECT NO. 11173233.00000
BORING NO. MW-57

URS Corporation

WELL BORING LOG

BORING NO:	MW-58
PROJECT: SLDA	SHEET: 1 of 3
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 475686.53 E 1459760.00
GROUNDWATER:	GROUND ELEVATION: 836.7'
	DATE STARTED: 09/24/03
	DATE FINISHED: 10/29/03
	DRILLER: Steve Wolkiewicz
	GEOLOGIST: Scott McCabe/ Tim Burmeier
	REVIEWED BY: R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
					HSA	SS	HQ	
				DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	NO.	TYPE	BLOWS PER 6"		REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
1		1	SS	WoH	3	50.0%	Brown	Loose	0'-5': Fine sandy SILT, some fine to coarse flat angular rocks fragments (sandstone & shale) -some gravel	ML/ SM	0.0	4.0	13897	Dry
				3	3									
		2	SS	6	3	10.0%					0.0	4.5	15368	
				2	2									
5		3	SS	3	4	50.0%					0.0	5.0	14369	
				13	5		Yellow	Stiff	5'-6': Clayey SILT	ML				
		4	SS	12	14	50.0%	Brown	Soft	6'-18': Weathered SHALE/MUDSTONE	Very Broken	0.0	5.5	15361	
				30	26		Lt. Tan							
		5	SS	20	28	50.0%	Light Gray				0.0	5.5	15197	
10				34	50/3									
		6	SS	50/3		100.0%					0.0	5.0	16308	
		7	SS	50/3		100.0%					0.0	6.0	1397	
15		8	SS	36	50/1	100.0%					0.0	5.8	14970	
		9	SS	50/4		100.0%					0.0	5.5	15361	
		10	SS	50/1		0.0%	Medium Gray	Medium Hard	18'-21': SILTSTONE - Clayey		0.0		11700 - 13200	
20		C1	HQ (18.2'-21.2')	1.7	3.0	56.0% / 23.0%								
		C2	HQ (21.2'-31.2')	8.0	10.0	80.0% / 36.0%			21'-26': SANDSTONE - Very Fine - Fine, tight, calcareous with alternating thin shale laminae		0.0		12800 - 12900	
25							Dark Gray		26'-33.3': SHALE - has several gray brown rounded nodules					
30		C3	HQ (31.2'-36.2')	4.6	5.0	92.0% / 30.0%	Gray Brown / Lt. Gray / Med. Gray		- with 1" green gray irregular bands; 33.3'-34.3': SANDSTONE - very fine -fine, silty; 34.3'-36.2': SHALE - vertical fractures		0.0		11800 - 13200	
35														

Comments: Boring Advanced w/ track mounted CME-850

WoH = Weight of Hammer — Micro R Background = 4-5

6" Diameter Steel Casing Set at 19' BGS — FIDLER Background = 14500-17000

Sample #10 and Core C1 overlap (cored grout). — 2" PVC Well Installed

PROJECT NO. 11173233.00000

BORING NO. MW-58

URS Corporation

WELL BORING LOG

BORING NO:	MW-58
SHEET:	2 of 3
JOB NO.:	11173233.00000
BORING LOCATION:	N 475686.53 E 1459760.00
GROUND ELEVATION:	836.7'
DATE STARTED:	09/24/03
DATE FINISHED:	10/29/03
DRILLER:	Steve Wolkiewicz
GEOLOGIST:	Scott McCabe/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
				DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
		C3	HQ	4.6 5.0	92%/30%	Med. Gray	Med. Hard	34.3'-36.2': SHALE - vertical fractures	Broken			
40		C4	HQ (36.2'-46.2')	10.0 10.0	100.0% 74.0%	Light Gray	Hard	36.2'-43.8': SANDSTONE - very fine to fine, silty, faint banding - with thin shale at base		0.0		10600 - 12000
45						Dk. Gray		43.8'-44.5': SHALE				
50		C5	HQ (46.2'-51.2')	4.8 5.0	96.0% 88.0%	Light Gray		44.5'-56.5': SANDSTONE - very fine to fine, trace shale, rip-ups at 44'-46', has thin dark bands spaced 0.25"-0.5" dips at 15º		0.0		10900 - 11200
55		C6	HQ (51.2'-56.2')	5.0 5.0	100.0% 94.0%			- has faint bands, dipping at 30º		0.0		11900 - 12200
						Black		56.5'-57': SHALE				
60		C7	HQ (56.2'-66.2')	9.9 10.0	99.0% 82.0%	Medium Gray Light Gray		57'-81.2': SANDSTONE - fine with numerous paper-thin shale laminae - shale spaced 0.25"-0.5" apart		0.0		11100 - 12100
65								- coaly shale laminae at 64' - fine SANDSTONE, trace medium with irregular black shale "veins"				
70		C8	HQ (66.2'-76.2')	10.0 10.0	100.0% 92.0%			- has two thin layers of coarse subangular white quartz at 66'-69' - shale rip-ups at 70'		0.0		11800 - 12200

Comments: Boring Advanced w/ track mounted CME-850

WoH = Weight of Hammer — Micro R Background = 4-5

6" Diameter Steel Casing Set at 19' BGS — FIDLER Background = 14500-17000

Sample #10 and Core C1 overlap (cored grout). — 2" PVC Well Installed

PROJECT NO.	11173233.00000
BORING NO.	MW-58

URS Corporation

WELL BORING LOG

BORING NO:	MW-58
SHEET:	3 of 3
JOB NO.:	11173233.00000
BORING LOCATION:	N 475686.53 E 1459760.00
GROUND ELEVATION:	836.7'
DATE STARTED:	09/24/03
DATE FINISHED:	10/29/03
DRILLER:	Steve Wolkiewicz
GEOLOGIST:	Scott McCabe/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
				DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		
				* FIELD SCREENING VIA PID (PPM)				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	Fiddler
		C8	HQ (66.2'-76.2')	10.0	10.0	100.0% / 92.0%	Light Gray	Hard	57'-81.2': SANDSTONE - fine to medium grained (72'-76': very fine to fine grained)	Broken	0.0		11800 - 12200
75													
		C9	HQ (76.2'-81.2')	3.5	5.0	70.0% / 97.0%			(76'-81.2': fine to medium grained)		0.0		10600 - 12000
80													
									End of Boring @ 81.2' BGS				
85													
90													
95													
100													
105													

Comments: Boring Advanced w/ track mounted CME-850
WoH = Weight of Hammer — Micro R Background = 4-5
6" Diameter Steel Casing Set at 19' BGS — Fiddler Background = 14500-17000
Sample #10 and Core C1 overlap (cored grout). — 2" PVC Well Installed

PROJECT NO. 11173233.00000
BORING NO. MW-58

URS Corporation

WELL BORING LOG

BORING NO:	MW-59
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	N 474494.87 E 1460031.85
GROUND ELEVATION:	929.4'
DATE STARTED:	11/06/03
DATE FINISHED:	11/06/03
DRILLER:	Brian Fuller
GEOLOGIST:	Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA

CLIENT: USACE

BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE
11/6/2003	13:45	5.4	ft BGS

TYPE	CAS.	SAMPLER	CORE	TUBE
	HSA	SS		
DIA.	4.25"	2"		
WT.		140#		
FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER	
		1	SS	7 2 / 2 4	100.0%	Dark Brown	Soft	0'-1.2': Clayey TOPSOIL, organic	OH	NA	5.0	9090	Dry
		2	SS	7 11 / 13 10	100.0%	Light Brown	Very Stiff to Medium Stiff	1.2'-4.7': silty CLAY	CL	NA	7.0	9060	
5		3	SS	4 6 / 10 11	83.3%	Gray to Brown Gray		4.7'-6': Clayey SILT	ML	NA	5.0	9583	
		4	SS	4 5 / 6 6	91.7%			6'-10.8': SILT, trace clay, mottled		NA	3.0	9050	
10		5	SS	2 3 / 3 3	77.1%			9'-10.8': some fine sand		NA	4.0	9127	Wet @ 9.0'
		6	SS	2 6 / 36 50/2	90.0%		Hard	10.8'-14': SILTSTONE - weathered, platy, some iron staining		NA	4.0	7986	Dry
		7	SS	50/4	100.0%					NA	5.0	8284	
15								End of Boring @ 14' BGS					
20													
25													
30													
35													

Comments: Boring Advanced w/ track mounted CME-850

NA - Not Analyzed Due to PID Malfunction

2" PVC Well Installed

Micro R Background = 3-6

FIDLER Background = 9030-10400

PROJECT NO. 11173233.00000

BORING NO. MW-59

URS Corporation	WELL BORING LOG
	BORING NO: MW-60
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 474446.87 E 1460062.14
GROUNDWATER:	GROUND ELEVATION: 929.13'
DATE started: 09/13/03	
DATE finished: 09/26/03	
DRILLER: Brian Fuller	
GEOLOGIST: Sheldon Nozik	
REVIEWED BY: Sheldon Nozik	

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	4.25"	2"		
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
								Detailed log is presented on log for NWS-01. See note below.				
10												
20												
30												
40												
50								Bottom of Well at 47' End of Boring at 150.0' See log for NWS-01 for detail				
60												
70												

Comments: Boring Advanced w/ track mounted CME-850

Boring NWS-01 was renamed MW-60 after a 2" PVC well was installed following grouting of hole from 50' to 150'. A plug was placed at 90' to allow mine void to remain.

PROJECT NO. 11173233.00000

BORING NO. MW-60

URS Corporation

WELL BORING LOG

		BORING NO:	MW-62
PROJECT:	SLDA	SHEET:	1 of 2
CLIENT:	USACE	JOB NO.:	11173233.00000
BORING CONTRACTOR:	SJB Services, Inc.	BORING LOCATION:	N 474975.92 E 1460626.67
GROUNDWATER:		GROUND ELEVATION:	923.30'
		DATE STARTED:	04/29/04
		DATE FINISHED:	05/06/04
		DRILLER:	Steve Wolkiewicz
		GEOLOGIST:	Sheldon Nozik
		REVIEWED BY:	Sheldon Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	8.25"			
				WT.				
				FALL				

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	REMARKS uR	REMARKS FIDLER
								No soil sampling performed. Detailed log is presented on log for NWS-04.				
10								Top of weathered rock @ ~10 ft bgs				
20												
								Augered to 21 ft bgs through weathered rock. 6" steel casing set to 21 ft bgs				
30												
								Interbedded Siltstone, shale and mudstone, some minor sandstone				
40												
50												
60												
								Lost some drilling water @ 69'				
70												

Comments: Boring Advanced w/ track mounted CME-850

Boring advanced with 8 1/4" ID HSA to 21'. Six-inch steel casing set to 21 ft bgs.

Remainder of borehole reamed with 7 7/8" roller bit to 88 ft bgs.

Two-inch PVC well installed

PROJECT NO.	11173233.00000
BORING NO.	MW-62

URS Corporation									WELL BORING LOG	
									BORING NO:	MW-62
PROJECT:	SLDA								SHEET:	2 of 2
CLIENT:	USACE								JOB NO.:	11173233.00000
BORING CONTRACTOR:	SJB Services, Inc.								BORING LOCATION:	N 474975.92 E 1460626.67
GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE	GROUND ELEVATION:	923.30'
DATE	TIME	LEVEL	TYPE	TYPE	HSA				DATE STARTED:	04/29/04
				DIA.	8.25"				DATE FINISHED:	05/06/04
				WT.					DRILLER:	Steve Wolkiewicz
				FALL					GEOLOGIST:	Sheldon Nozik
				* FIELD SCREENING VIA PID (PPM)					REVIEWED BY:	Sheldon Nozik

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
								black shale				
80												
								Top of coal @ 83' Bottm of coal @ 87'				
90								Bottom of boring at 88'				
100												

Comments: Boring Advanced w/ track mounted CME-850

Boring advanced with 8 1/4" ID HSA to 21'. Six-inch steel casing set to 21 ft bgs.

Remainder of borehole reamed with 7 7/8" roller bit to 88 ft bgs.

Two-inch PVC well installed

PROJECT NO.	11173233.00000
BORING NO.	MW-62

URS Corporation	WELL BORING LOG
	BORING NO: MW-64
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 473972.91 E 1461139.17
GROUNDWATER:	GROUND ELEVATION: 943.9'
	DATE STARTED: 09/22/03
	DATE FINISHED: 09/22/03
	DRILLER: Steve Wolkiewicz
	GEOLOGIST: Scott McCabe
	REVIEWED BY: R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	4.25"	2"		
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	Fidler
								Continous samples not collected due to proximity to NWS-02. See NWS-02 boring log for soil descriptions.				
5												
10												
15												
20												
								End of Boring at 20.0'				
25												
30												
35												

Comments: Boring Advanced w/ track mounted CME-850

Augered to 20.0' (target depth) and installed 2" PVC well. .

See NWS-02 log for overburden descriptions

PROJECT NO. 11173233.00000

BORING NO. MW-64

URS Corporation

WELL BORING LOG

		BORING NO:	MW-69
PROJECT:	SLDA	SHEET:	1 of 1
CLIENT:	USACE	JOB NO.:	11173233.00000
BORING CONTRACTOR:	SJB Services, Inc.	BORING LOCATION:	N 474413.33 E 1461122.42
GROUNDWATER:		GROUND ELEVATION:	944.5'
		DATE STARTED:	09/24/03
		DATE FINISHED:	09/24/03
		DRILLER:	Steve Wolkiewicz
		GEOLOGIST:	Scott McCabe
		REVIEWED BY:	R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	4.25"	2"		
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	BLOWS PER 6"		REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER	
									Continous samples not collected due to proximity to NWS-03. See NWS-03 boring log for 0-12' soil descriptions.					
5														
10														
		1	SS	5	12	75.0%	Yellow Brown	Very Stiff	12.0'-12.5': Clayey SILT	ML	ND	ND	ND	Moist
				12	12			Medium Dense	12.5'-19.7': Silty SAND, trace fine gravel	SM				Wet @ 12.5'
15		2	SS	5	13	100.0%								
				11	13									
		3	SS	11	12	50.0%								
				15	13									
		4	SS	4	8	100.0%								
20				12	21									
		5	SS	21	50/3	100.0%	M. Gray	Very Soft	19.7'-20.8': Weathered SHALE, some silt.	V. Broken				Dry
									End of Boring at 20.8'.					
									Sampled to 20.8', Augered to 20.0'.					
25														
30														
35														

Comments: Boring Advanced w/ track mounted CME-850

ND - Not Detected Above Background

Augered to 20.0' and installed 2" PVC well.

PROJECT NO. 11173233.00000

BORING NO. MW-69

URS Corporation	WELL BORING LOG
	BORING NO: MW-74
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 475034.11 E 1460563.70
GROUNDWATER:	GROUND ELEVATION: 923.0'
	DATE STARTED: 09/23/03
	DATE FINISHED: 09/23/03
	DRILLER: Steve Wolkiewicz
	GEOLOGIST: Scott McCabe
	REVIEWED BY: R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	4.25"	2"		
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
								Continous samples not collected due to proximity to NWS-04. See NWS-04 boring log for soil descriptions.				
5												
10												
15								End of Boring at 14' (refusal)				
20												
25												
30												
35												

Comments: Boring Advanced w/ track mounted CME-850

Augered to 14.0' and installed 2" PVC well.

PROJECT NO. 11173233.00000

BORING NO. MW-74

URS Corporation

WELL BORING LOG

BORING NO:	NWS-01
SHEET:	1 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 474446.87 E 1460062.14
GROUND ELEVATION:	929.13'
DATE STARTED:	09/13/03
DATE FINISHED:	09/26/03
DRILLER:	Brian Fuller
GEOLOGIST:	Sheldon Nozik
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:				CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	PQ
				DIA.	8.25"	2"	3.5"
				WT.		140#	
				FALL		30"	

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
1		1	SS	1 / 2	1 / 2	58.3%	Medium Brown	Soft	0'-0.4': TOPSOIL, organic	OH	0.0	ND**	ND**	Dry
		2	SS	3 / 10	6 / 15	100.0%	Light Brown	Very Stiff	0.4'-6.8': Clayey SILT, little (f) sand 2'-6.8': gray clay interbeds	ML	0.0			
5		3	SS	6 / 10	9 / 11	100.0%					0.0			
		4	SS	6 / 8	9 / 5	96.0%		Medium Dense to Loose	6.8'-9.6': Silty SAND, little clay	SM	0.0			
10		5	SS	1 / 3	3 / 12	90.0%					0.0			Wet
		6	SS	5 / 40	8 / 50/2	62.5%		Medium Hard	9.6'-10.3': Fine SAND, little silt, some mottling	ML	0.0			Dry
		7	SS	50/3		12.5%	Gray		10.3'-12.5': Clayey SILT, mottled, grades to silty shaly SANDSTONE		0.0			
15		8	SS	48	50/4	41.6%			12.5'-15.9': Silty Shaly SANDSTONE, some laminations, highly fractured/weathered		0.0			
20		C1	PQ (16'-23.5')	7.5	7.5	97.0% / 11.8%			15.9'-24': Very weathered SHALE, mixed with clay, Auger refusal at 15.9' BGS	Very Broken	ND**			
25							Reddish Purple		24'-48': SILTSTONE					
30		C2	PQ (23.5'-33')	10.0	10.0	100.0% / 65.0%	Gray		Clay Infilling between some Horizontal Fractures at 29.8' and 31.3' Frequent Horizontal Fractures Along Bedding Planes Between 34' and 47' BGS	Broken				
35		C3	PQ (33'-43')	9.9	10.0	99.0% / 95.0%								

Comments: Boring Advanced with truck mounted CME-85

** - ND: None Detected Above Background Levels

6" Steel Diameter Casing set at 16' BGS

Core Barrel and Rods Stuck in Hole; Hole Abandoned, see Log NWS-01A.

PROJECT NO.	11173233.00000
BORING NO.	NWS-01

URS Corporation

WELL BORING LOG

		BORING NO:	NWS-01
PROJECT:	SLDA	SHEET:	2 of 5
CLIENT:	USACE	JOB NO.:	11173233.00000
BORING CONTRACTOR:	SJB Services, Inc.	BORING LOCATION:	N 474446.87 E 1460062.14
GROUNDWATER:		GROUND ELEVATION:	929.13'
		DATE STARTED:	09/13/03
		DATE FINISHED:	09/26/03
		DRILLER:	Brian Fuller
		GEOLOGIST:	Sheldon Nozik
		REVIEWED BY:	

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	8.25"	2"	3.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	REMARKS uR	REMARKS FIDLER
		C3	PQ (33'-43')	9.9 10.0	99.0% / 95.0%	Gray	Competent Hard	24'-48': SILTSTONE Subangular fractures at 37.2', 37.3', 40' and 42' BGS	Broken	ND**	ND**	ND**
40												
45		C4	PQ (43'-53')	9.2 10.0	92.0% / 80.0%			48'-73': Grades to sandy SILTSTONE More sandy between 49.5' and 50.6' Subangular Fracture at 50.6' Interbedded sandy Zones from 55.6' to 59.3'				
50												
55		C5	PQ (53'-63')	8.6 10.0	86.0% / 78.6%							
60												
65		C6	PQ (63'-73')	7.8 10.0	78.0% / 72.9%			63.3': Interbedded siltstone with weathered fracturing Planar Fractures Show Weathering				
70								69.3': More Shaly				

Comments: Boring Advanced with truck mounted CME-85

** - ND: None Detected Above Background Levels

6" Steel Diameter Casing set at 16' BGS

Core Barrel and Rods Stuck in Hole; Hole Abandoned, see Log NWS-01A.

PROJECT NO. 11173233.00000

BORING NO. NWS-01

URS Corporation

WELL BORING LOG

BORING NO:	NWS-01
PROJECT: SLDA	SHEET: 3 of 5
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 474446.87 E 1460062.14
GROUNDWATER:	GROUND ELEVATION: 929.13'
	DATE STARTED: 09/13/03
	DATE FINISHED: 09/26/03
	DRILLER: Brian Fuller
	GEOLOGIST: Sheldon Nozik
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	8.25"	2"	3.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
		C6	PQ (63'-73')	7.8	10.0	78.0% / 72.9%	Gray to Dark Gray	Competent Hard	70.75': Clay Infilling Between some Horizontal Fractures	Broken	ND**	ND**	ND**
75		C7	PQ (73'-83')	9.4	10.0	93.7% / 64.4%			73'-85.7': Interbedded SHALE and SILTSTONE with frequent horizontal fractures 79.72'to 80': Vertical Fracture				
80													
85		C8	PQ (83'-94.3')	10.6	11.3	93.8% / 63.3%	Black		85.7'-99': SHALE with horizontal bedding 87.5': subangular fractures with weathering 89.4'-89.8': Highly fractured evidence of iron staining				
90													
95		C9	PQ (94.3'-103')	5.2	8.7	59.8% / 72.9%			94.4'-95.2': Clay infilling between Horizontal Fractures				
100							None		99'-102.5': VOID				
105		C10	PQ (103'-113')	9.2	10.0	92.0% / 62.5%	Gray	Competent Hard	102.5'-105.3': CLAYSTONE - very weathered, with silty clay, no structure				

Comments: Boring Advanced with truck mounted CME-85

** - ND: None Detected Above Background Levels

6" Steel Diameter Casing set at 16' BGS

Core Barrel and Rods Stuck in Hole; Hole Abandoned, see Log NWS-01A.

PROJECT NO. 11173233.00000

BORING NO. NWS-01

URS Corporation	WELL BORING LOG
	BORING NO: NWS-01
PROJECT: SLDA	SHEET: 4 of 5
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 474446.87 E 1460062.14
GROUNDWATER:	GROUND ELEVATION: 929.13'
	DATE STARTED: 09/13/03
	DATE FINISHED: 09/26/03
	DRILLER: Brian Fuller
	GEOLOGIST: Sheldon Nozik
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	8.25"	2"	3.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	REMARKS uR	REMARKS FIDLER
106		C10	PQ (103'-113')	9.2	10.0	92.0% / 62.5%	Gray	Hard	105.3'-113': SHALE	Broken	ND**	ND**	ND**
110													
115		C11	PQ (113'-123')	9.8	10.0	98.0% / 74.0%			113'-140': SILTSTONE with shale interbeds, horizontal fractures with interspersed clay infilling, up to 2" between fractures				
120													
125		C12	PQ (123'-133')	9.6	10.0	96.0% / 88.0%							
130													
135		C13	PQ (133'-143')	9.4	10.0	94.0% / 89.0%							
140									140'-148.5': SANDSTONE/SILTSTONE				

Comments: Boring Advanced with truck mounted CME-85

** - ND: None Detected Above Background Levels

6" Steel Diameter Casing set at 16' BGS

Core Barrel and Rods Stuck in Hole; Hole Abandoned, see Log NWS-01A.

PROJECT NO. 11173233.00000

BORING NO. NWS-01

URS Corporation	WELL BORING LOG
	BORING NO: NWS-01
PROJECT: SLDA	SHEET: 5 of 5
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 474446.87 E 1460062.14
GROUNDWATER:	GROUND ELEVATION: 929.13'
	DATE STARTED: 09/13/03
	DATE FINISHED: 09/26/03
	DRILLER: Brian Fuller
	GEOLOGIST: Sheldon Nozik
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	8.25"	2"	3.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	Fiddler
		C13	PQ (133'-143')	10.0	10.0	100.0% / 96.0%	Gray	Hard	140'-148.5': SANDSTONE/SILTSTONE	Broken	ND**	ND**	ND**
145		C14	PQ (143'-148.5')	5.95	6.0	100.0% / 53.0%							
150									End of Boring at 148.5' BGS Core Barrel and Rods Stuck in Hole Abandoned, See Log NWS-01A				
155													
160													
165													
170													
175													

Comments: Boring Advanced with truck mounted CME-85

** - ND: None Detected Above Background Levels

6" Steel Diameter Casing set at 16' BGS

Core Barrel and Rods Stuck in Hole; Hole Abandoned, see Log NWS-01A.

PROJECT NO. 11173233.00000

BORING NO. NWS-01

URS Corporation

WELL BORING LOG

BORING NO:	NWS-01A
SHEET:	1 of 3
JOB NO.:	11173233.00000
BORING LOCATION:	N 474480.76 E 1460019.96
GROUND ELEVATION:	929.1'
DATE STARTED:	10/25/03
DATE FINISHED:	11/03/03
DRILLER:	Brian Fuller
GEOLOGIST:	Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
				DIA.	8.25"	2"	2.5"	
				WT.		140		
				FALL		30"		
				* FIELD SCREENING VIA PID (PPM)				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER	
									0'-85': SEE LOG FOR NWS-01					
75														
80														
85														
		C1	HQ (85'-90.3')	3.5	5.3	66.0 / 0.0	Black	Soft to Medium	85'-97.4': SHALE - highly fractured along bedding - some rip-up clasts, subrounded gravel-sized rock, evidence of water movement - some iron staining	Very Broken	0.0	10	17693	
90									90.3'-90.8': Clay Infilling					
		C2	HQ (90.3'-95.3')	2.6	5.0	52.6 / 0.0					0.0	10	17693	Lost Water Return at 93'
95														
100		C3	HQ (95.3'-104.2')	1.9	8.9	21.2 / 0.0			97.4'-102.3': MINE VOID		0.0	4-6	17000	
105							Greenish Gray	Soft	102.3'-105': MUDSTONE/CLAYSTONE grading to siltstone					
		C4	HQ	1.8	4.0	38 /0			105'-136': SILTSTONE		0.0	4-6	12912	

Comments: Boring Advanced with track mounted CME-850
HQ Core from 85' to 104.2' then reamed w/ 4.875" bit to 105', set 4" temporary casing,
then HQ cored to 125.7', clay infilling caused rods to bind, advanced casing to 126'.
HQ cored to 176' Fidler Background - 11222 cpm

PROJECT NO. 11173233.00000
BORING NO. NWS-01A

URS Corporation

WELL BORING LOG

BORING NO:	NWS-01A
SHEET:	2 of 3
JOB NO.:	11173233.00000
BORING LOCATION:	N 474480.76 E 1460019.96
GROUND ELEVATION:	929.1'
DATE STARTED:	10/25/03
DATE FINISHED:	11/03/03
DRILLER:	Brian Fuller
GEOLOGIST:	Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:				CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ
				DIA.	8.25"	2"	2.5"
				WT.		140	
				FALL		30"	

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
		C4	HQ (104.2'-109')	1.8	4.0	38.0 / 0.0	Greenish Gray	Soft	105'-136': SILTSTONE - clay infilling between several horizontal fractures, some fractures subangular	Very Broken				
110		C5	HQ (109'-115.7')	5.6	6.7	83.6 / 54.0				Broken	0.0	4-6	12912	
115														
		C6	HQ (115.7'-125.7')	9.4	10.7	87.0 / 61.0	Gray	Medium Hard to Hard	- mudstone and sandy siltstone intervals		0.0	4-8	12178	No Water Return at 120'
120									119.7'-120.2': frequent horizontal bedding fractures, weathered between partings					
125									125.7'-126': Clay Infilling					
		C7	HQ (126'-136')	9.5	10.0	95.0 / 94.0		Hard	126'-136': Massive SILTSTONE, grading to sandy silty shale, interbeds of fine sandstone		0.0	4-8	13528	Casing Advanced to 126' BGS -Water Back Lost Water Between 132' 134'
130														
135														
		C8	HQ (136'-146')	8.9	10.0	89.1 / 93.0	Black		136'-156': SHALE, some fine sandstone bedding					Water Back at 137'
140														

Comments: Boring Advanced with track mounted CME-850
HQ Core from 85' to 104.2' then reamed w/ 4.875" bit to 105', set 4" temporary casing,
then HQ cored to 125.7', clay infilling caused rods to bind, advanced casing to 126'.
HQ cored to 176' Fidler Background - 11222 cpm

PROJECT NO.	11173233.00000
BORING NO.	NWS-01A

URS Corporation

WELL BORING LOG

BORING NO:	NWS-01A
SHEET:	3 of 3
JOB NO.:	11173233.00000
BORING LOCATION:	N 474480.76 E 1460019.96
GROUND ELEVATION:	929.1'
DATE STARTED:	10/25/03
DATE FINISHED:	11/03/03
DRILLER:	Brian Fuller
GEOLOGIST:	Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
				DIA.	8.25"	2"	2.5"	
				WT.		140		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
		C8	HQ (136'-146')	8.9	10.0	89.1 / 93.0	Black	Hard	136'-156': SHALE, some fine sandstone bedding		0.0	4-8	13528
145													
		C9	HQ (146'-151')	5.0	5.0	100.0							
150									- transitions to sandy shale				
		C10	HQ (151'-156')	4.5	5.0	90.0 / 94.0	Black to Gray	Medium Hard to Hard			0.0	4-6	9927
155													
							Gray w/ Black to Black		156'-157.8': sandy SILTSTONE 157.8'-161': Fine SANDSTONE				
160													
		C11	HQ (156'-166')	10.5	10.0	100.0 / 83.0		Hard	161'-163': silty-sandy SHALE				
165							Gray to Lt. Gray	Medium Soft to Medium Hard	163'-176': Medium grained SANDSTONE - horizontal fractures and shale partings				
170		C12	HQ (166'-176')	10.0	10.0	100.0 / 89.0			-fine to medium SANDSTONE moderated horizontal fractures showing some indication of weathering		0.0		8941
175									End of Boring 176' BGS				

Comments: Boring Advanced with track mounted CME-850
HQ Core from 85' to 104.2' then reamed w/ 4.875" bit to 105', set 4" temporary casing,
then HQ cored to 125.7', clay infilling caused rods to bind, advanced casing to 126'.
HQ cored to 176' Fidler Background - 11222 cpm

PROJECT NO. 11173233.00000
BORING NO. NWS-01A

URS Corporation

WELL BORING LOG

BORING NO:	NWS-02
PROJECT: SLDA	SHEET: 1 of 5
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: N 473976.39 E 1461147.31
GROUNDWATER:	GROUND ELEVATION: 943.3'
	DATE STARTED: 09/11/03
	DATE FINISHED: 10/24/03
	DRILLER: Tom Kilburne/ Steve W.
	GEOLOGIST: Scott McCabe/ Tim Burmeier
	REVIEWED BY: R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
9/11/2003	17:30	12.0	ft BGS	DIA.	8.25"	2"	2.5"	
9/12/2003	8:50	10.8	ft BGS	WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
		1	SS	1 1 / 1 1	50.0%	Brown to Yellow Brown	Loose/ Soft	0'-6': Clayey SILT, trace fine sand	ML/ CL	0.0	4.0	12795	Moist
		2	SS	2 3 / 5 5	75.0%	Reddish Brown to Brown	Medium Stiff to Stiff			0.0	4.0	11316	
5		3	SS	4 6 / 9 22	90.0%					0.0	3.5	12004	
		4	SS	24 14 / 20 21	55.0%			6'-13.5': silty CLAY, trace fine sand	CL	0.0	4.0	13261	Dry
10		5	SS	5 9 / 14 17	50.0%					0.0	3.5	12851	
		6	SS	10 9 / 10 12	75.0%	Yellow Brown				0.0	3.5	12529	
		7	SS	3 5 / 7 11	100.0%					0.0	3.5	12315	
15		8	SS	5 10 / 21 23	65.0%	Brown	Medium Dense	13.5'-19': Fine to medium SAND, trace to some silt, trace coarse sand and fine rounded gravel	SW/ SM	0.0	4.0	11852	Wet
		9	SS	12 23 / 34 37	5.0%					0.0	4.0	13012	
		10	SS	10 25 / 33 50/2	75.0%					0.0	3.5	12208	
20		11	SS	50/1 - / - -	100.0%	Gray	Very Dense	19'-26': SILT, trace clay	ML	0.0	3.5	13207	Moist
		12	SS	50/2 - / - -	100.0%					0.0	4.0	12121	
25		13	SS	50/1 - / - -	100.0%	Medium Gray		24'-26': trace shale fragments		0.0	3.5	11931	
		14	SS	50/2 - / - -	100.0%		Soft	26'-42': Very Weathered SHALE		0.0	4.0	12567	Dry
30		15	SS	100/1 - / - -	100.0%					0.0	3.5	12863	
		16	SS	41 50/1 / - -	10.0%					0.0	3.5	13181	
		17	SS	48 50/2 / - -	100.0%					0.0	4.0	12888	
35		18	SS	50/4 - / - -						0.0	3.5	11850	

Comments: Boring advanced with track mounted CME-850

6" Diameter steel casing set at 40' bgs, Temporary 4" casing set to 125.5'

PROJECT NO.	11173233.00000
BORING NO.	NWS-02

URS Corporation

WELL BORING LOG

		BORING NO:	NWS-02
PROJECT:	SLDA	SHEET:	2 of 5
CLIENT:	USACE	JOB NO.:	11173233.00000
BORING CONTRACTOR:	SJB Services, Inc.	BORING LOCATION:	N 473976.39 E 1461147.31
		GROUND ELEVATION:	943.3'
		DATE STARTED:	09/11/03
		DATE FINISHED:	10/24/03
		DRILLER:	Tom Kilburne/ Steve W.
		GEOLOGIST:	Scott McCabe/ Tim Burmeier
		REVIEWED BY:	R. Murphy/S. Nozik

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
9/11/2003	17:30	12.0	ft BGS	DIA.	8.25"	2"	2.5"	
9/12/2003	8:50	10.8	ft BGS	WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY / HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER	
		19	SS	50/1 / -	- / -	100.0%	Medium Gray	Soft	35'-42': Weathered SHALE		0.0	4.0	12385	Dry
40		20	SS	50/1 / -	- / -	100.0%					0.0	3.5	13314	
		C1	HQ (40'-42')	2.0	2.0	100.0% / 75.0%	Blue Gray	Medium Hard	40'-45': CLAYSTONE-silty, trace brown mottling	Broken				Partial Water Return at 40' BGS
45		C2	HQ (42'-52')	9.7	10.0	97.0% / 70.0%	Medium Gray		45'-52': SILTSTONE 47': 1" rubble zone 50.3'-50.4': rust coating fractures 51': faint bands					
50														
55		C3	HQ (52'-58')	6.0	6.0	100.0% / 60.0%	Light Gray	Hard	52'-60': SANDSTONE - very fine - fine well cemented quartz with black grains and thin dark gray shaly bands					
							Medium Gray		56': Becomes Shaly SANDSTONE with thin bands and planar breaks 15 degree dipping					
60		C4	HQ (58'-63')	2.4	5.0	48.0% / 79.0%			60'-63': SHALE - silty with thin very fine sand laminae					
65		C5	HQ (63'-68')	5.0	5.0	100.0% / 86.0%	Light Gray		63'-84': SANDSTONE - very fine - fine "salt and pepper" texture, uniform color 67.5'-68': silty SANDSTONE					Losing most of drill water to formation
70		C6	HQ (68'-78')	9.7	10.0	97.0% / 95%			72'-78': faint banding					
75							Medium Gray		-fine grained with black grains, some mica on partings					

Comments: Boring advanced with track mounted CME-850

6" Diameter steel casing set at 40' bgs, Temporary 4" casing set to 125.5'

PROJECT NO.	11173233.00000
BORING NO.	NWS-02

URS Corporation

WELL BORING LOG

BORING NO:	NWS-02
SHEET:	3 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 473976.39 E 1461147.31
GROUND ELEVATION:	943.3'
DATE STARTED:	09/11/03
DATE FINISHED:	10/24/03
DRILLER:	Tom Kilburne/ Steve W.
GEOLOGIST:	Scott McCabe/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE
9/11/2003	17:30	12.0	ft BGS
9/12/2003	8:50	10.8	ft BGS

TYPE	CAS.	SAMPLER	CORE	TUBE
DIA.	HSA	SS	HQ	
WT.	8.25"	2"	2.5"	
FALL		140#		
		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
		C6	HQ (68'-78')	9.7	10	97.0% / 95.0%	Medium Gray	Hard	63'-84': SANDSTONE - fine grained, trace medium, white calcite cement, faint numerous dark gray bands	Broken				
80		C7	HQ (78'-88')	9.9	10.0	99.0% / 93.0%	Light Gray		83.1': Broken Zone					
85							Medium Gray		84'-87': SILTSTONE with numerous light gray bands					
									87'-92': SANDSTONE - very fine with faint darker bands - becomes fine grained with trace medium grains					Used 2,000 gallons to core 40'-93' BGS
90		C8	HQ (88'-93')	4.4	5.0	88.0% / 99.0%								
									92'-118.6': SHALE - has numerous thin brown bands up to - 0.5" thick					
95		C9	HQ (93'-103')	10.0	10.0	100.0% / 70.0%	Black	Medium Hard	95': 2" zone of 0.25" rubble					
100														
105		C10	HQ (103'113')	10.0	10.0	100.0% / 76.0%								
110														

Comments: Boring advanced with track mounted CME-850
6" Diameter steel casing set at 40' bgs, Temporary 4" casing set to 125.5'

PROJECT NO.	11173233.00000
BORING NO.	NWS-02

URS Corporation

WELL BORING LOG

BORING NO:	NWS-02
SHEET:	4 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 473976.39 E 1461147.31
GROUND ELEVATION:	943.3'
DATE STARTED:	09/11/03
DATE FINISHED:	10/24/03
DRILLER:	Tom Kilburne/ Steve W.
GEOLOGIST:	Scott McCabe/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE
9/11/2003	17:30	12.0	ft BGS
9/12/2003	8:50	10.8	ft BGS

TYPE	CAS.	SAMPLER	CORE	TUBE
DIA.	HSA	SS	HQ	
WT.	8.25"	2"	2.5"	
FALL		140#		
		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
		C10	HQ (103'-113')	10	10	100.0% / 76.0%	Black	Medium Hard	92'-117.5': SHALE	Broken			
115		C11	HQ (113'-123')	8.0	10.0	80.0% / 52.0%			117.5'-118.6': Bituminous SHALE				
120									118.6'-123': COAL - shiny, broken into 0.5" - 3" pieces, (mine pillar or wall)				
125									- reamed from 123'-125.5' to set temporary casing				
130		C12	HQ (123'-133.5')	6.3	8.0	79.0% / 94.0%	Lt. Brown / Medium Gray		125.5'-133.5': CLAYSTONE - mottled black scratches easily - Interbedded CLAYSTONE and SILTSTONE laminae, massive (one piece = 4.9')	Massive			
135		C13	HQ (133.5'-143.5')	10.0	10.0	100.0% / 100.0%	Green Gray		133.5'-143.5': SILTSTONE - massive, has 3"-5" dark gray bands and 4 rounded black 2" large siltstone clasts with calcite veining				
140													
145		C14	HQ (143.5'-153.5')	10.0	10.0	100.0% / 76.0%		Hard	143.5'-150': SANDSTONE - very fine quartz with irregular silty laminae, low porosity, well cemented	Broken			

Comments: Boring advanced with track mounted CME-850
6" Diameter steel casing set at 40' bgs, Temporary 4" casing set to 125.5'

PROJECT NO. 11173233.00000
BORING NO. NWS-02

URS Corporation

WELL BORING LOG

BORING NO:	NWS-02
SHEET:	5 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 473976.39 E 1461147.31
GROUND ELEVATION:	943.3'
DATE STARTED:	09/11/03
DATE FINISHED:	10/24/03
DRILLER:	Tom Kilburne/ Steve W.
GEOLOGIST:	Scott McCabe/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE
9/11/2003	17:30	12.0	ft BGS
9/12/2003	8:50	10.8	ft BGS

TYPE	CAS.	SAMPLER	CORE	TUBE
DIA.	HSA	SS	HQ	
WT.	8.25"	2"	2.5"	
FALL		140#		
		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
150		C14	HQ (143.5'-153.5')	10	10	100.0% / 96.0%	Light Gray; Green Gray; Dark Gray	Hard	143.5'-150': SANDSTONE - very fine quartz with irregular silty laminae, low porosity, well cemented; 150'-152': SILTSTONE - Uniform color probable conductive fracture at 150.5'	Broken			
155		C15	HQ (153.5'-163.5')	10	10	98.0% / 97.0%	Light Gray; Green Gray; Lt. Gray		152'-159': SANDSTONE - very fine-fine with faint very fine layers, (thin) bands; - very fine and silty, with fine thin bands and 20 deg dip				
160							Black		159'-164': SHALE - uniform coloring planar fractures, horizontal bedding				
165		C16	HQ (163.5'-173.5')	6.3	8.0	100.0% / 76.0%			164'-174.5': SILTSTONE - contains 2"-3" gray brown claystone rounded or irregular clasts, probable soft sediment deformation; 172'-173': 1"-2" rubble zone with trace coal fragments				
170													
175		C17	HQ (173.5'-177')	10.0	10.0	100.0% / 100.0%	Lt. Gray		174.5'-177': SANDSTONE - very fine to fine trace medium, well cemented, black; 0.25"-1" rip-up clasts at 176'				
180									End of Boring at 177' BGS				

Comments: Boring advanced with track mounted CME-850
6" Diameter steel casing set at 40' bgs, Temporary 4" casing set to 125.5'

PROJECT NO. 11173233.00000
BORING NO. NWS-02

URS Corporation

WELL BORING LOG

BORING NO:	NWS-03
SHEET:	1 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 474409.70 E 1461130.00
GROUND ELEVATION:	944.9'
DATE STARTED:	09/10/03
DATE FINISHED:	10/11/03
DRILLER:	Brian Fuller/ Steve Wolkiewicz
GEOLOGIST:	Sheldon Nozik/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE
9/10/2003	16:00	19.00	ft BGS

TYPE	CAS.	SAMPLER	CORE	TUBE
TYPE	HSA	SS	HQ	
DIA.	8.25"	2"	2.5"	
WT.		140#		
FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
		1	SS	1 2 / 3 4	100.0%	Dk. Brown / Light Brown	Soft / Medium Dense	0'-0.3': TOPSOIL, organic / 0.3'-12.5': SILT with SAND, trace clay, lenses of gray clay mixed throughout, mottled appearance, slight plasticity	CL / SC/ ML	ND**	ND**	ND**	Dry
		2	SS	4 7 / 10 10	90.0%								
5		3	SS	7 12 / 10 11	100.0%								
		4	SS	13 16 / 19 15	90.0%								
10		5	SS	7 12 / 11 16	100.0%								
		6	SS	8 10 / 14 16	90.0%								
		7	SS	15 20 / 23 21	85.0%	Medium Brown	Dense to Medium Dense	12.5'-17.5': SAND with SILT & fine to medium subrounded gravel	SC				Wet at 14' BGS
15		8	SS	7 10 / 11 6	50.0%								
		9	SS	10 14 / 27 28	60.0%								Moist at 18' BGS
20		10	SS	7 27 / 17 15	50.0%	Gray		17.5'-21.5': SILT & CLAY	ML/ CL				
		11	SS	16 39 / 50/4	65.0%								Dry
25		12	SS	50/4	30.0%		Soft	21.5'-29': Weathered SHALE, in-place silt and clay, some plasticity 25.0': SHALE fragments	Very Broken		NR		
30		C1	HQ (26'-32')	4.0 6.0	66.0% / 13.0%	Light Gray	Moderately Hard	29'-32': CLAYSTONE - highly weathered, broken into 0.5"-4" fragments				16500 - 19000	
35		C2	HQ (32'-37')	5.0 5.0	100.0% / 82.0%	Blue Gray	Hard	32'-33.5': SILTSTONE, trace fine sand / 33.5'-35': CLAYSTONE w/ calcite vein, run C2 is broken into 10 pieces / 35'-37': SILTSTONE	Broken			16500 - 22900	

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 29' BGS 118.5'-124': Reamed w/ 4.875" Rollerbit
Discontinued drilling @ 177.7' after core barrel binding to clay/shale zone.
ND = None Detected Above Background Levels NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-03

URS Corporation

WELL BORING LOG

BORING NO:	NWS-03
SHEET:	2 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 474409.70 E 1461130.00
GROUND ELEVATION:	944.9'
DATE STARTED:	09/10/03
DATE FINISHED:	10/11/03
DRILLER:	Brian Fuller/ Steve Wolkiewicz
GEOLOGIST:	Sheldon Nozik/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
9/10/2003	16:00	19.00	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
		C2	HQ (32'-37')	5.0	5.0	100.0% 82.0%	Blue Gray	Hard	35'-37': SILTSTONE, trace scattered sand	Broken	ND**	NR	16500 - 22900
40		C3	HQ (37'-47')	10.0	10.0	100.0% 90.0%	Medium Gray		37'-47': CLAYSTONE, silty, uniform coloring, grades to medium gray at 40' 45'-47': has lighter siltier thin faint bands, grading to siltstone				17600 - 23300
50		C4	HQ (47'-57')	10.0	10.0	100.0% 93.0%	Gray Green		47'-60.2': SILTSTONE: with sandy black mineralized bands in 4 areas, general uniform coloring - core broken into 17 pieces mostly horizontal, 3-4 are 45º breaks				16000 - 22000
60		C5	HQ (57'-67')	10.0	10.0	100.0% 77.0%	Medium Gray		- hackly (uneven) fractures present with no iron staining				16500 - 21800
65							Light Gray		60.2'-64.6': SANDSTONE - very fine quartz with fine black grains (salt and pepper texture), well cemented, low porosity				
							Gray Brown		64.6'-67': SHALE with fine black organic rich laminae and fine banned appearance				
70		C6	HQ (67'-77')	10.0	10.0	100.0% 83.0%	Medium Gray		67'-70': SILTSTONE with light brown very fine sandstone stringer				14500 - 21600
							Lt. Gray		70'-72': SANDSTONE				

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 29' BGS 118.5'-124': Reamed w/ 4.875" Rollerbit
Discontinued drilling @ 177.7' after core barrel binding to clay/shale zone.
ND = None Detected Above Background Levels NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-03

URS Corporation

WELL BORING LOG

BORING NO:	NWS-03
SHEET:	3 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 474409.70 E 1461130.00
GROUND ELEVATION:	944.9'
DATE STARTED:	09/10/03
DATE FINISHED:	10/11/03
DRILLER:	Brian Fuller/ Steve Wolkiewicz
GEOLOGIST:	Sheldon Nozik/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
9/10/2003	16:00	19.00	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER
		C6	HQ (67'-77')	10.0	10.0	100.0% / 83.0%	Light Gray	Hard	70'-72': SANDSTONE - very fine to fine with a few 2" silty layers	Broken	ND**	NR	14500 - 21600
									72'-77': SANDSTONE - very fine with alternating 1" thick SHALE beds, with low angle bedding, some wavy				
75													
		C7	HQ (77'-87')	9.1	10.0	91.0% / 98.0%			77'-84.7': SANDSTONE - very fine to fine quartz, calcareous cement with faint banding up to 0.5" thick				14800 - 19800
80													
									83.5'-84.7': shale content increases				
85							Dark Gray to Black		84.7'-111.5': SHALE, non calcareous with planar breaks, thin light gray banding				
90		C8	HQ (87'-96')	9.7	9.0	97.0% / 96.0%							
95													
		C9	HQ	1.0	1.0	100%/100%							
													18606 - 22600
100		C10	HQ (97'-107')	9.8	10.0	98.0% / 96.0%			- core is broken into 15 pieces				
105													

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 29' BGS 118.5'-124': Reamed w/ 4.875" Rollerbit
Discontinued drilling @ 177.7' after core barrel binding to clay/shale zone.
ND = None Detected Above Background Levels NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-03

URS Corporation

WELL BORING LOG

BORING NO:	NWS-03
SHEET:	4 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 474409.70 E 1461130.00
GROUND ELEVATION:	944.9'
DATE STARTED:	09/10/03
DATE FINISHED:	10/11/03
DRILLER:	Brian Fuller/ Steve Wolkiewicz
GEOLOGIST:	Sheldon Nozik/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE
9/10/2003	16:00	19.00	ft BGS

TYPE	CAS.	SAMPLER	CORE	TUBE
TYPE	HSA	SS	HQ	
DIA.	8.25"	2"	2.5"	
WT.		140#		
FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
		C10	HQ (97'-107')	9.8 10.0	98.0% / 96.0%	Dark Gray to Black	Hard	84.7'-111.5': SHALE, non calcareous with planar breaks, thin light gray banding	Broken	ND**	NR	18600 - 22600	
110		C11	HQ (107'-111.5')	4.5 4.5	100.0% / 80.0%			- small piece of coal				18300 - 19100	
115								111.5'-116': MINE VOID - flowing water in mine, grooves on mine floor, cored 0.5' of rock, rubble and clay					Lost Drill Water at 111.5'
		C12	HQ	NR NR	NR	Gray Brown	Hard	116'-135': SILTSTONE - mottled black gouges at mine floor	Broken			17500 - 19300	C12 and C13 difficulty seating core barrel 118.5'-124': Reamed w/ 4.875" Rollerbit
		C13	HQ	NR NR	NR								
120			4.875" Roller-bit (118.5-124')										
125		C14	HQ (124'-130.5')	5.7 6.5	87.0% / 89.0%	Medium Gray	Moderately Hard	- trace very fine sandstone lamination					
130								- rounded dark brown claystone nodules					
135		C15	HQ (130.5'-135.5')	5.0 5.0	100.0% / 92.0%	Dark Gray		134.7'-135': Sandy SILT with shale "rafts"					Open Fracture at 134.5'
140		C16	HQ (135.5'-145.5')	9.7 10.0	97.0% / 80.0%	Medium Gray	Hard	135'-154.5': SANDSTONE fine quartz with dark brown argillaceous rounded nodules - has thin dark gray banding and wavy layering, some 1"X beds					

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 29' BGS 118.5'-124': Reamed w/ 4.875" Rollerbit
Discontinued drilling @ 177.7' after core barrel binding to clay/shale zone.
ND = None Detected Above Background Levels NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-03

URS Corporation

WELL BORING LOG

BORING NO:	NWS-03
SHEET:	5 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 474409.70 E 1461130.00
GROUND ELEVATION:	944.9'
DATE STARTED:	09/10/03
DATE FINISHED:	10/11/03
DRILLER:	Brian Fuller/ Steve Wolkiewicz
GEOLOGIST:	Sheldon Nozik/ Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
9/10/2003	16:00	19.00	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
145		C16	HQ (135.5'-145.5')	9.7	10.0	97.0% / 80.0%	Medium Gray	Hard	135'-154.5': SANDSTONE fine quartz with dark brown argillaceous rounded nodules	Broken	ND**	NR	NR	
150		C17	HQ (145.5'-155.5')	10.0	10.0	100.0% / 94.0%			- faint sparse dark gray banding coarser than overlying sandstone					
155							Dk. Gray /Black		154.5'-157': SHALE - with 0.5" thick very fine sandstone in thin layers					
							Light Gray		157'-160': SANDSTONE - very fine to fine with altering dark gray bands					
160		C18	HQ (155.5'-165.5')	9.3	10.0	93.0% / 88.0%	Medium Gray Brown		160'-177.7': SHALE - with black nodules grading to black shale at 161' with slightly wavy 30º dipping bedding					Lost Drill Water at 160'
165							Black	Moderately Hard						Difficult Drilling
170		C19	HQ (165.5'-170.5')	4.5	5.0	90.0% / 71.0%			- wet soft clay filling, shale is silty with planar parting, uniform color					
175		C20	HQ (170.5'-175')	4.5	4.5	100.0% / 55.0%			- planar to hackly partings, 15º dip with soft sticky clay filling					
		C21	HQ (175'-177.7')	2.7	2.7	100.0% / 100%			End of Boring @ 177.7' BGS					

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 29' BGS 118.5'-124': Reamed w/ 4.875" Rollerbit
Discontinued drilling @ 177.7' after core barrel binding to clay/shale zone.
ND = None Detected Above Background Levels NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-03

URS Corporation

WELL BORING LOG

BORING NO:	NWS-04
SHEET:	1 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 475030.00 E 1460581.27
GROUND ELEVATION:	922.4'
DATE STARTED:	09/17/03
DATE FINISHED:	10/15/03
DRILLER:	Tom Kilburne/Brian Fuller
GEOLOGIST:	Scott McCabe/Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
10/12/2003	8:30	22.50	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
		1	SS	1 / 4	1 / 6	50.0%	Brown to Red Brown	Loose to Medium Dense	0'-0.5': TOPSOIL, organic	CL	0.0	3.5	18868	Moist
		2	SS	7 / 11	9 / 10	75.0%			0.5'-4': Fine sandy SILT, trace clay and fine sand	ML/ SM	0.0	2.5	18931	
5		3	SS	5 / 14	8 / 22	75.0%	Light Gray	Very Stiff to Hard	4'-6.5': Clayey SILT	ML	0.0	3.0	18281	
		4	SS	13 / 35	31 / 50	50.0%	Yellow Brown		6.5'-10': SILT, some fine-coarse angular - subangular gravel	ML	0.0	3.5	16934	
10		5	SS	50/5		100.0%					0.0	4.0	17853	
		6	SS	50/3		100.0%	Lt. Gray to Green		10'-12': SILT & weathered SHALE		0.0	3.0	16132	Dry
		7	SS	50/2		100.0%	Light Gray	Soft	12'-19.5': Weathered SHALE fragments	Very Broken	0.0	2.5	17119	
15		8	SS	50/2		100.0%					0.0	3.5	18998	
		9	SS	50/4		100.0%					0.0	4.0	16579	
20		10	SS	50/2		100.0%			-rollerbit 19.5-21.2'		0.0	3.0	15432	
		C1	HQ (20.5-24')	4.5	3.5	80.0% / 53.0%	Gray	Moderately Hard	21.2'-34': Silty fine SANDSTONE, very fractured		ND	ND	ND	
25		C2	HQ (24'-34')	9.3	10.0	93.0% / 57.0%			23.7'-25.8': highly fractured with iron staining					
30									- rip-up clasts at 29' BGS					
									- horizontal bedding, transitioning to siltstone/mudstone					
35		C3	HQ (34'-44')	9.6	10.0	96.0% / 51.0%			34'-44': SILTSTONE/MUDSTONE					

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 21.2' BGS — Micro R Background = 3-4
HQ core to 90', reamed w/ 4.875" roller bit to 90' — FIDLER Background = 16000-25000
set temporary 4" steel casing at 90' BGS, HQ cored from 90'-185.6'
ND = None Detected Above Background Levels — NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-04

URS Corporation

WELL BORING LOG

BORING NO:	NWS-04
SHEET:	2 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 475030.00 E 1460581.27
GROUND ELEVATION:	922.4'
DATE STARTED:	09/17/03
DATE FINISHED:	10/15/03
DRILLER:	Tom Kilburne/Brian Fuller
GEOLOGIST:	Scott McCabe/Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
10/12/2003	8:30	22.50	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	REMARKS uR	REMARKS FIDLER
40		C3	HQ (34'-44')	9.6	10.0	96.0% / 51.0%	Gray	Medium Hard	34'-44': SILTSTONE/MUDSTONE, some clay infilling, mainly horizontal bedding fractures	Broken	ND	ND	ND
45, 50		C4	HQ (44'-55.6')	9.6	11.6	82.8% / 60.0%	Gray to Black Banding	Hard	44'-55.6': SHALE with siltstone interbeds transitioning to shale				
55, 60, 65		C5	HQ (55.6'-65.5')	8.2	9.9	82.8% / 27.0%	Black to Gray/ Black		55.6'-56.85': MUDSTONE turned into viscous clay and was not recovered 56.85'-81.2': SHALE, many mechanical breaks, some vertical fractures				
70		C6	HQ (65.5'-75.2')	9.7	9.7	100.0% / 71.0%	Black						

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 21.2' BGS — Micro R Background = 3-4
HQ core to 90', reamed w/ 4.875" roller bit to 90' — FIDLER Background = 16000-25000
set temporary 4" steel casing at 90' BGS, HQ cored from 90'-185.6'
ND = None Detected Above Background Levels — NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-04

URS Corporation

WELL BORING LOG

BORING NO:	NWS-04
SHEET:	3 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 475030.00 E 1460581.27
GROUND ELEVATION:	922.4'
DATE STARTED:	09/17/03
DATE FINISHED:	10/15/03
DRILLER:	Tom Kilburne/Brian Fuller
GEOLOGIST:	Scott McCabe/Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
10/12/2003	8:30	22.50	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
		C6	HQ (65.5'-75.2')	9.7	9.7	100.0% / 71.0%	Black	Hard	56.85'-81.2': SHALE, many mechanical breaks, some vertical fractures	Broken	ND	ND	ND
75													
80		C7	HQ (75.2'-85.2')	9.9	10.0	99.0%							
							Gray to Black		81.2'-85.15': COAL PILLAR				
85													
		C8	HQ (85.2'-89.6')	4.4	4.4	100.0%	Lt. Gray		85.15'-89': CLAYSTONE				
90									89'-96': SILTSTONE with horizontal fractures throughout				
		C9	HQ (89.6'-95')	4.8	5.4	87.9% / 98.0%	Gray						
95									- grading into shale				
								Medium Hard to Hard	96'-127': SHALE with subangular fractures				
100		C10	HQ (95'-104.5')	9.7	9.5	100.0% / 86.5%							
105									- grading into sandy shale				
		C11	HQ	9.8	11.0	89%/96%							

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 21.2' BGS — Micro R Background = 3-4
HQ core to 90', reamed w/ 4.875" roller bit to 90' — FIDLER Background = 16000-25000
set temporary 4" steel casing at 90' BGS, HQ cored from 90'-185.6'
ND = None Detected Above Background Levels — NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-04

URS Corporation

WELL BORING LOG

BORING NO:	NWS-04
SHEET:	4 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 475030.00 E 1460581.27
GROUND ELEVATION:	922.4'
DATE STARTED:	09/17/03
DATE FINISHED:	10/15/03
DRILLER:	Tom Kilburne/Brian Fuller
GEOLOGIST:	Scott McCabe/Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
10/12/2003	8:30	22.50	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
110		C11	HQ (104.5-115.5')	9.8	11.0	89.0% / 96.0%	Gray	Medium Hard to Hard	96'-127': Sandy SHALE with subangular fractures	Broken	ND	ND	ND	
115														
120		C12	HQ (115.5'-125.5')	9.9	10.0	99.5% / 98.9%	Medium Gray	Hard	- Silty SHALE with minor black shale banding 120.4' & 123.7': Angular fractures with shale bands					Easy Coring at 121'
125														
130		C13	HQ (125.5'-135.6')	9.2	10.1	91.1% / 93.7%			- Silty sandy SHALE 127'-143': SANDSTONE with siltstone banding - fine SANDSTONE with angular shale banding at 133' and again at 134.8'					
135														
140		C14	HQ (135.6'-145.5')	9.6	9.9	97.0% / 93.3%	Lt. Gray to Black		- fine grained SANDSTONE with black shale banding (0.02'-0.4' wide)					

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 21.2' BGS — Micro R Background = 3-4
HQ core to 90', reamed w/ 4.875" roller bit to 90' — FIDLER Background = 16000-25000
set temporary 4" steel casing at 90' BGS, HQ cored from 90'-185.6'
ND = None Detected Above Background Levels — NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-04

URS Corporation

WELL BORING LOG

BORING NO:	NWS-04
SHEET:	4 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 475030.00 E 1460581.27
GROUND ELEVATION:	922.4'
DATE STARTED:	09/17/03
DATE FINISHED:	10/15/03
DRILLER:	Tom Kilburne/Brian Fuller
GEOLOGIST:	Scott McCabe/Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
10/12/2003	8:30	22.50	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
		C14	HQ (135.6'-145.5')	9.6	9.9	97.0% / 93.3%	Lt. Gray to Black	Hard	127'-143': Fine grained SANDSTONE with black shale banding 143': Horizontal fracture contact 143'-155': Silty-sandy SHALE	Broken	ND	ND	ND
145													
150		C15	HQ (145.5'-155.5')	10.0	10.2	100.0% / 100.0%	Medium Gray		145.5'-155.5': Massive, full run of C15 recovered (10.2' solid)	Massive			
155													
160		C16	HQ (155.5'-165')	10.0	9.5	100.0% / 99.0%	Dark Gray		155.5'-165.5: SILTSTONE and fine SANDSTONE intermittent changes, some shale banding, horizontal bedding with minor fractures along bedding planes 161.7'-162.6': fine SANDSTONE interbedded SILTSTONE, generally horizontal	Broken			
165													
170		C17	HQ (165'-175')	9.6	10.0	95.6% / 89.5%	Light Gray	Medium Hard	165.5'-165.6': Fine SANDSTONE transitions to black SHALE with sandstone bands 165.6'-183': Medium to fine grained SANDSTONE, minor shale partings horizontal fractures at contacts				
175													
180		C18	HQ (175'-185.6')	10.2	10.6	96.2% / 92.3%		Brittle	- medium to coarse SANDSTONE banding of coarse grains 1"-2" wide				
185							Black	Hard	183'-185.6': SHALE End of Boring @ 185.6' BGS				

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 21.2' BGS — Micro R Background = 3-4
HQ core to 90', reamed w/ 4.875" roller bit to 90' — FIDLER Background = 16000-25000
set temporary 4" steel casing at 90' BGS, HQ cored from 90'-185.6'
ND = None Detected Above Background Levels — NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-04

URS Corporation

WELL BORING LOG

BORING NO:	NWS-05
SHEET:	1 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 475148.45 E 1460199.00
GROUND ELEVATION:	912.5'
DATE STARTED:	09/16/03
DATE FINISHED:	10/07/03
DRILLER:	Tom Kilburne/Brian Fuller
GEOLOGIST:	Scott McCabe/Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE
10/9/2003	10:30	115.00	ft BGS

TYPE	CAS.	SAMPLER	CORE	TUBE
TYPE	HSA	SS	HQ	
DIA.	8.25"	2"	2.5"	
WT.		140#		
FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER	
		1	SS	2 4 / 6 7	50.0%	Dk. Brown / Rd. Brown	Stiff	0'-0.5': SILT, trace clay and fine sand, some organics	ML	0.0	NR	10905	Moist
		2	SS	10 32 / 49 50/3	75.0%	to Lt. Gray	Hard	0.5-5.0': Clayey SILT w/ reddish mottling		0.0	NR	10817	
5		3	SS	31 42 / 50/4	100.0%	Yellow Gray		-Gray mottling 5.0'-6.0'		0.0	NR	10134	
		4	SS	50/5	100.0%	Lt. Yellow Brown		-some olive to brown 1-2" mudstonefragments		0.0	NR	11020	
10		5	SS	28 50/3	100.0%			- some gravel		0.0	NR	10034	
		6	SS	50/3	100.0%					0.0	NR	10834	Dry
		7	SS	50/4	100.0%	Light Gray		12'-18': Very weathered Shale fragments		0.0	NR	10746	
15		8	SS	50/1	100.0%					0.0	NR	10612	
		9	SS	50/2	100.0%	Gray				0.0	NR	10837	
20		10	SS	50/1	100.0%			18'-21': Weathered sandy SHALE Auger Refusal	Very Broken	0.0	NR	11028	
										ND	ND	ND	
25		C2	HQ (21'-25')	0.3 4.0	8.3% / 0.0%		Moderately Soft	21'-30' SILTSTONE - highly fractured little sand 22.2': some iron staining					
30		C3	HQ (25'-35')	7.2 10.0	72.0% / 0.0%			25'-26.2': Clay infilling, numerous horizontal fractures through bedding planes 29': Sub-vertical fractures 30'-41': SILTSTONE/MUDSTONE					
35													

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 21' BGS
FIDLER Background = 10017-12165

ND = None Detected Above Background Levels NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-05

URS Corporation

WELL BORING LOG

BORING NO:	NWS-05
SHEET:	2 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 475148.45 E 1460199.00
GROUND ELEVATION:	912.5'
DATE STARTED:	09/16/03
DATE FINISHED:	10/07/03
DRILLER:	Tom Kilburne/Brian Fuller
GEOLOGIST:	Scott McCabe/Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
10/9/2003	10:30	115.00	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
40		C4	HQ (35'-45')	8.8	10.0	87.5% / 48.0%	Gray to Dark Gray	Hard	30'-41': SILTSTONE/MUDSTONE	Broken	ND	ND	ND
45		C5	HQ (45'-50.2')	5.2	5.2	100.0% / 0.0%			41'-50.2': Sandy SILTSTONE 42.6'-43.1': Fractured and crumbly subangular pieces - highly fractured 45.5'-46.6': Some vertical fractures with iron staining also at 49.4'-50'				
50		C6	HQ (50.2'-55.7')	5.5	5.5	100.0% / 72.7%			50.2'-70': Sandy-silty SHALE				
55							Black						
60		C7	HQ (55.7'-65.6')	9.8	9.9	98.5% / 76.4%							
65													
70		C8	HQ (65.6'-70.5')	4.9	4.9	100.0% / 0.0%			70'-70.5': COAL				

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 21' BGS
FIDLER Background = 10017-12165

ND = None Detected Above Background Levels NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-05

URS Corporation

WELL BORING LOG

BORING NO:	NWS-05
SHEET:	3 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 475148.45 E 1460199.00
GROUND ELEVATION:	912.5'
DATE STARTED:	09/16/03
DATE FINISHED:	10/07/03
DRILLER:	Tom Kilburne/Brian Fuller
GEOLOGIST:	Scott McCabe/Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE
10/9/2003	10:30	115.00	ft BGS

TYPE	CAS.	SAMPLER	CORE	TUBE
HSA	SS	HQ		
DIA. 8.25"	2"	2.5"		
WT.	140#			
FALL	30"			

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	FIDLER	REMARKS
						Black	Hard	70'-70.5': COAL		ND	ND	ND	
								70.5'-72': VOID					
						Gray	Soft	72'-74': FILL - broken coal rubble	Broken				
75		C9	HQ (74'-76')	2.0 2.0	100.0% / 0.0%		Hard	74'-77.9': CLAYSTONE					
		C10	HQ (76'-81')	4.5 5.0	89.0% / 60.2%			77.9'-82.7': SILTSTONE - grades from sandy siltstone to shale					
80													
		C11	HQ (81'-86')	5.2 5.0	100.0% / 98.0%			82.7'-95': SHALE					
85													
90		C12	HQ (86'-96')	9.8 10.0	98.0% / 84.8%			92'-92.4': Vertical fractures - some dark gray shale interbeds					lost water return
95								95'-99.75': Silty fine SANDSTONE -vertical fracture 96'-96.13' - grading to sandy fine siltstone					
100		C13	HQ (96'-106')	9.9 10.0	98.8% / 81.6%			99.75'-127': Sandy SILTSTONE					
105								-vertical fracture 105.8'-106'					

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 21' BGS
FIDLER Background = 10017-12165

ND = None Detected Above Background Levels NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-05

URS Corporation

WELL BORING LOG

BORING NO:	NWS-05
SHEET:	4 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 475148.45 E 1460199.00
GROUND ELEVATION:	912.5'
DATE STARTED:	09/16/03
DATE FINISHED:	10/07/03
DRILLER:	Tom Kilburne/Brian Fuller
GEOLOGIST:	Scott McCabe/Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
10/9/2003	10:30	115.00	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"	REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	FIDLER
						Gray	Hard	99.75'-127': Sandy SILTSTONE	Broken	ND	ND	ND
110		C14	HQ (106'-116')	9.6 10.0	96.0% / 78.0%							
115												
120		C15	HQ (116'-126')	9.9 10.0	99.0% / 85.0%							
125								126.5'-127': Clay infilling				
		C16	HQ	1.0 1.0	100%/0%	Light Gray		127'-155.5': Silty fine SANDSTONE with shale interbeds				
130		C17	HQ (127'-131')	4.0 4.0	100.0% / 84.3%							
135		C18	HQ (131'-135.6')	5.2 4.6	100.0% / 90.0%							
		C19	HQ (135.6'-145.5')	10.0 9.9	100.0% / 80.4%			135.6'-136.2': Coarser SANDSTONE mixed with shale partitions				
140												

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 21' BGS
FIDLER Background = 10017-12165

ND = None Detected Above Background Levels NR = Not Recorded

PROJECT NO. 11173233.00000
BORING NO. NWS-05

URS Corporation

WELL BORING LOG

BORING NO:	NWS-05
SHEET:	5 of 5
JOB NO.:	11173233.00000
BORING LOCATION:	N 475148.45 E 1460199.00
GROUND ELEVATION:	912.5'
DATE STARTED:	09/16/03
DATE FINISHED:	10/07/03
DRILLER:	Tom Kilburne/Brian Fuller
GEOLOGIST:	Scott McCabe/Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:				TYPE	CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS	HQ	
10/9/2003	10:30	115.00	ft BGS	DIA.	8.25"	2"	2.5"	
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"		REC% / RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	REMARKS uR	REMARKS FIDLER
		C19	HQ (135.6'-145.5')	10.0	9.9	100.0% / 80.4%	Light Gray	Hard	127'-155.5': Silty fine SANDSTONE	Broken	ND	ND	ND
145									145'-155': Fine to medium grained SANDSTONE with shale and siltstone clasts and horizontal shale interbeds.				
150		C20	HQ (145.5'-155.5')	9.8	10.0	98.0% / 70.8%	Light Gray to Medium Gray		152': Appears to be a transition zone, bedding is subangular				
155													
									End of Boring @ 155.5' BGS				
160													
165													
170													
175													

Comments: Boring Advanced with track mounted CME-850
6" Diameter Steel Casing Set at 21' BGS
FIDLER Background = 10017-12165

ND = None Detected Above Background Levels NR = Not Recorded

PROJECT NO.	11173233.00000
BORING NO.	NWS-05

URS Corporation

TEST BORING LOG

BORING NO:	TB-01
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	N 475806.8 E 1459597.4
GROUND ELEVATION:	845.6'
DATE STARTED:	09/29/03
DATE FINISHED:	09/29/03
DRILLER:	S. Wolkiewicz
GEOLOGIST:	R. Murphy
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	Splitspoon		
				DIA.	4 1/4"	2"		
				WT.	-	140 #		
				FALL	-	30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	NO.	TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	Fiddler	REMARKS
		1	SS	4 5 / 5 6	65.0%	Brown	Loose	Fine sandy SILT, trace clay, organics (roots), fine to coarse gravel.	SM	0.0	4.0	16800	Moist
		2	SS	9 14 / 17 19	100.0%	Light Brown	Dense			0.0	4.0	13486	
5		3	SS	1 8 / 16 20	100.0%		Medium Dense	Clayey SILT, trace fine sand.	ML	0.0	4.5	12480	
		4	SS	3 4 / 5 12	100.0%	Red	Loose	-Black fine sand layer 7.9-8.0'		0.0	5.5	13186	
10		5	SS	7 11 / 10 20	100.0%	Brown to Light Brown	Medium Dense	sandy SILT with black mottling alternating with .5' -1' layers of subangular sandstone and shale gravel in same matrix.	SM (GM layers)	0.0	4.0	16444	
		6	SS	9 14 / 20 24	50.0%		Dense			0.0	4.0	16543	
15		7	SS	15 12 / 10 14	30.0%		Medium Dense			0.0	5.0	12993	
		8	SS	23 19 / 18 14	75.0%	Brown	Dense			0.0	4.5	13274	
20		9	SS	15 29 / 18 12	50.0%					0.0	5.0	16890	
		10	SS	17 30 / 50/4" -	80.0%	Gray		Weathered SHALE		0.0	5.0	14358	
								End of boring at 21.3'					
25													
30													
35													

Comments: Boring advanced utilizing a CME-850 track drill rig. 2" Splitspoons, and 4 1/4" ID HSAs. No water was detected in hole. Abandoned and grouted hole as per discussion with USACE. This was one of two attempted locations for MW-55. No PID, uR, or Fidler Readings were noted as above background.

PROJECT NO.	11173233.00000
BORING NO.	TB-01

URS Corporation

TEST BORING LOG

BORING NO:	TB-02 (MW-55)
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	Abandoned Location - Not surveyed
GROUND ELEVATION:	
DATE STARTED:	11/20/03
DATE FINISHED:	11/20/03
DRILLER:	Steve Wolkiewicz
GEOLOGIST:	Tim Burmeier
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

TYPE	CAS.	SAMPLER	CORE	TUBE
TYPE	HSA	SS		
DIA.	4.25"	2"		
WT.		140#		
FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID*	uR	Fiddler	
1		1	SS	WoH	1	30.0%	Medium Brown	Very Soft	0'-6.5': silty CLAY with fine gravel	CL	0.0	7.0	15400	Slightly Moist
				WoH	1									
		2	SS	4	8	45.0%		Very Stiff	4'-6.5': As Above with fine sand gravel increases	CL/ GM	0.0	7.0	13500	Moist
				10	11									
5		3	SS	5	15	50.0%					0.0	5.0	12200	Slightly Moist
				10	20									
		4	SS	20	20	70.0%					0.0	7.0	12500	
				27	22		Light Gray/ Rusty	Very Weathered	6.4'-10.4': CLAYSTONE	V. Broken				Dry
		5	SS	8	10	45.0%					0.0	5.0	12400	
10				17	27									
		6	SS	50/4		100.0%					0.0	5.0	12800	
									End of Boring @ 10.4' BGS					
15														
20														
25														
30														
35														

Comments: Boring Advanced w/ track mounted CME-850
Drilled about 10' west of Dry Run
No Water Evident. This was the second attempt to install MW-55. Boring abandoned, no well installed.
WoH = Weight of Hammer

PROJECT NO. 11173233.00000
BORING NO. TB-02

URS Corporation

TEST BORING LOG

		BORING NO:	TB-03 (MW-48)
PROJECT:	SLDA	SHEET:	1 of 1
CLIENT:	USACE	JOB NO.:	11173233.00000
BORING CONTRACTOR:	SJB Services, Inc.	BORING LOCATION:	Abandoned Location - Not surveyed
GROUNDWATER:		GROUND ELEVATION:	
		DATE STARTED:	11/21/03
		DATE FINISHED:	11/21/03
		DRILLER:	Brian Fuller
		GEOLOGIST:	Sheldon Nozik
		REVIEWED BY:	R. Murphy/S. Nozik

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	4.25"	2"		
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	BLOWS PER 6"		REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	Fiddler	REMARKS
1		1	SS	WoH	1	70.8%	Dk. To Light Brown	Soft	0'-0.75': TOPSOIL, organic	CL	0.0	5.0	10020	Moist
				2	2				0.75'-6.8': Clayey SILT, some iron staining and mottling, trace f gravel					
		2	SS	5	6	100.0%		Stiff to Very Stiff		ML/ CL	0.0	5.0	10700	Dry
				6	7									
5		3	SS	7	8	83.3%					0.0	5-7	9479	
				10	9									
		4	SS	18	19	71.0%	Purple Mottling	Hard	6.8'-9,2': SILT & CLAY, trace fine gravel, mottling evident		0.0	5-6	10785	
				19	21									
		5	SS	8	12			Very Stiff			0.0	5-8	11208	
10				16	19				9.2'-10.7': SILT w/ trace fine sand	ML				
		6	SS	5	18			Hard			0.0	5-6	11350	
				26	50/3				10.7'-12': Weathered sandy SHALE					
									Refusal @ 12' BGS, End of Boring					
15														
20														
25														
30														
35														

Comments: Boring Advanced w/ track mounted CME-850

Original location for MW-48. No water evident, boring abandoned.

WoH = Weight of Hammer

Fiddler Background = 11000-13750 Micro R Background = 5-9

PROJECT NO.	11173233.00000
BORING NO.	TB-03

URS Corporation

TEST BORING LOG

BORING NO:	TB-04 (MW-49)
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	Abandoned Location - Not surveyed
GROUND ELEVATION:	
DATE STARTED:	11/19/03
DATE FINISHED:	11/19/03
DRILLER:	Brian Fuller
GEOLOGIST:	Sheldon Nozik
REVIEWED BY:	R. Murphy/S. Nozik

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	HSA	SS		
				DIA.	4.25"	2"		
				WT.		140#		
				FALL		30"		

* FIELD SCREENING VIA PID (PPM)

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID*	uR	Fiddler	REMARKS
1						Brown	Stiff	0'-8': Clayey SILT	ML				Moist
5													Dry
		1	SS	16	50/2			8'-8.5': Weathered sandy SHALE					
10								Refusal @ 8.5' BGS, End of Boring					
15								Boring advanced with 4.25" ID HSAs, Continuous samples were not collected due to proximity to MW-51 and MW-53.					
20								Left boring open with augers in hole to evaluate the presence of water. No water evident.					
25								See MW-51 boring log for additional overburden description.					
30													
35													

Comments: Boring Advanced w/ track mounted CME-850

Original location for MW-49. No water evident, boring abandoned.

PROJECT NO.	11173233.00000
BORING NO.	TB-04

URS Corporation

GEOPROBE BORING LOG

BORING NO:	BK-001
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	9-20-03 1400
DATE FINISHED:	9-20-03
DRILLER:	JASON
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
		1	MC	100%			0-6" - Topsoil silt, some clay. Dk brown, moist		0	5	
							0.5-1.6 Brown moist clayey silt.				
							1.6-4.0 lt brown fine sand some silt, some gravel. Dry				
							2 macrocores (FD collected)				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

URS Corporation

GEOPROBE BORING LOG

BORING NO:	BL-002
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-20-03 1430
DATE FINISHED:	10-20-03
DRILLER:	
GEOLOGIST:	K. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1		100%			0-.5 Dk brown organic topsoil. ~~Silty~~				
							0.5-4.0 - lt brown moist to dry Clayey Silt ~~Silty fine sand~~ trace ~~clay~~ f. sand. Drier from 2'-4'. light grey 3'-4' ~~&~~ mottled Red + more clay herd. Denser -				
							2-4 sampled 1437				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-003
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-20-03 1450
	DATE FINISHED:
	DRILLER:
	GEOLOGIST:
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	DESCRIPTION USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
				100%			0-0.5 Topsoil organic silt				
							SAME AS BK-002				
							0.5-4.0				
							Lit brown moist to dry				
							reddish mottles throughout				
							denser below 2.5'				
							juicer below 2.5'				
							silty clay to clayey silt				
							gravel layer @ 2.8'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation

GEOPROBE BORING LOG

BORING NO:	BK-004
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-20-03
DATE FINISHED:	
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
				100%		very dense hard	0-0.5 Topsoil silt, organics trace gravel.				
							0.5-4.0 Reddish brown to Grey w/ red mottling Silty clay trace f. sand. gravel at 4.0'				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

URS Corporation

GEOPROBE BORING LOG

BORING NO:	BK-005
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	
DATE FINISHED:	
DRILLER:	
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
				100%			0-0.5 - Dk brown silty topsoil, organic Roots				
							0.5-4.0 - SAS BK004 Moist to 1.5' Denser/harder >1.5 brown to grey w/red mottling silty clay. No gravel.				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

URS Corporation

GEOPROBE BORING LOG

BORING NO:	BK-006
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	
DATE FINISHED:	
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
				100%			0-0.5 - Dk Brown silty topsoil 0.5-3.0 - lt brown moist silty clay gravel layer @ 3.0' 3.0-4.0 - Dry lt brown to red brown silty clay (more clay)				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-007
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-20-03
	DATE FINISHED: 10-20-03
	DRILLER:
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
				100%			0-0.5 - Dk brown organic silty topsoil.				
							0.5-4.0				
							SAME AS BK-006 lt brown silty clay gravel at 3'				
							2.5-4.0 - Hard/dense				
							2-4 sampled 16:09				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-008
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-20-03
	DATE FINISHED: 10-20-03
	DRILLER:
	GEOLOGIST: K. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC				0-0.5 Topsoil 5YR 8/2 gravel 0.5-4. lite brown silty clay to clayey silt Denser below 2.8' gravel layer @ 3.5'				
							2 macro cores for volume				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-009
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-20-03
	DATE FINISHED: 10-20-03
	DRILLER: JASON
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
				100%			0-0.5 - DK Br. Topsoil				
							0.5-4.0 -				
							H brn to Rd brown				
							silt to some clay				
							- no gravel.				
							damp to dry				
							Rd mottles @ 3.2'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-090
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-20-03
	DATE FINISHED: 10-20-03
	DRILLER:
	GEOLOGIST: T. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	Mc	100%			0-0.5- Topsoil 0.5-4.0 - Dk Brown Silty to some clay to 1.0' 1.0-4.0 lite brown silt w/ some clay Moist to 2.0' Dry @ 2.0 2 - macrocores For Field Dup 2nd spoon driver, moisture location dependent Some gravel 3-4'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-011
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-20-03
	DATE FINISHED: 10-20-03
	DRILLER: SASON
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
				100%			0-0.5 - Dk Brown organic silt topsoil				
							0.5-4.0 - litebrown silt w/ trace to some clay				
							moist to dry @ 1.5'				
							Red mottles @ 3.0'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-12
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-20-03
	DATE FINISHED: 10-20-03
	DRILLER:
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
				100%			0-0.5 DK brown silty topsoil .5-4.0 Ltc brown moist silt w/some clay gravel layer @ 3.5' Dry beneath gravel				
							2-macro core (QA Sample 2-4)				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-013
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-20-03
	DATE FINISHED:
	DRILLER: Jason.
	GEOLOGIST: K. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.5 - DK Br topsoil - silt organic				
							0.5-4.0 - ~~Lt brown~~ Brown w/ reddish brown mottling				
							— moist to 2.0'				
							Silt w/ some clay				
							red mottling 3.5-4.0'				
							Denser 2.0-4.0'				
							Very Fine Sand 3.5-4.0				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-014
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE TIME LEVEL TYPE	DATE STARTED: 10-21-03
	DATE FINISHED: 10-21-03
	DRILLER: Jason
	GEOLOGIST: R. Murphy
* POCKET PENETROMETER READING	REVIEWED BY:

GROUNDWATER:	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100			0.5 - Dk Brn topsoil silt organic				
							0.5-4.0 - Hbrn silt w/some clay				
							gravel layer @ 2.0'				
							drier beneath gravel, tr. fine sand 2-4.0'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation

GEOPROBE BORING LOG

BORING NO:	BK-015
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-21-03
DATE FINISHED:	10-21-03
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	MC				0-0.5 - Topsoil DK brn. organic silt					
							0.5-4.0 - H brn ~~silt w/some~~ Silt ~~w/clay~~ w/some clay moist throughout. more clay than other holes nearby					

Comments:

PROJECT NO. 11173233.00000
BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-016
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE started: 10-21-03	DATE STARTED: 10-21-03
DATE finished: 10-21-03	DATE FINISHED: 10-21-03
DRILLER: Jason	DRILLER: Jason
GEOLOGIST: R. Murphy	GEOLOGIST: R. Murphy
REVIEWED BY:	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	Me				0-0.5- Dk brn silt topsoil/organic				
							0.5-4.0- H Reddish Brown silt w/some clay				
							No gravel				
							moist throughout				
							Dense throughout				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-017
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-21-03
	DATE FINISHED: 10-21-03
	DRILLER: Jason
	GEOLOGIST: K. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler
		1	MC				0-0.5 - DK Brn Silty organic topsoil.				
							0.5-4.0 -				
							Rddish Brn to 2.8'				
							Silty w/ some clay				
							throughout				
							a 1' layer of very fine sand +				
							gravel at 2.0'				
							0.5' layer gravel @ 2.8'				
							2.8-4.0 - color Hbrn to Reddish Brn				
							Dry after 2.0', moist above.				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation	GEOPROBE BORING LOG
	BORING NO: BK-018
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-21-03
	DATE FINISHED: 10-21-03
	DRILLER: JASON
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC				0-0.5 - Dk BRN silty organic topsoil w/ Red mottles				
							0.5-4.0 - Moist to 2' then dry light brown silt some clay 0.1' gravel layers @ 3.0 and 3.5'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-001
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-21-03
DATE FINISHED:	10-21-03
DRILLER:	Jason
GEOLOGIST:	K Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-1.0' - DK Brn silty topsoil ~~concrete~~ sandstone gravel layer @ 1.0'		0	5	12752
4							1.0-4.0' - Dk brown Damp silty some clay 0.1' gravel layer @ 2.0'				
		2	MC	100%			- trace to some coarse sand - fine gravel throughout		0	5-6	13531
8							4.0-5.5 BRN - Damp silt Some clay trace coarse sand shale fragments.				
		3	MC	100% ~~100%~~			5.5-~~8.0~~ 11.9' - weathered Shale. More competent @ Refusal.		0	5	15374
11.5 12	— REFUSAL AT 11.9'										

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background - 10-21-03
14463 cpm
15743 cpm
14100 cpm

This location only

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-002
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	–
GROUND ELEVATION:	
DATE STARTED:	10-21-03
DATE FINISHED:	10-21-03
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
4		1	MC	100%			Brn to Rd Brn – Reworked silty clay to clayey silt, some gravel, shale mine spoils, more moist 2.5-3.0'	FILL	0	10	11562
8		2	MC	100%			4.85 AA GRAVEL larger 5.5-5.9' and 7.8-8.0'		0	11	11555
12		3	MC	2.7/4.0			8-10 - As above, mostly gravel fill to 10.0 -		0	10	11404
14		4	MC	1.4/2.0			10.0-12.0 - Brn - wet silt, some vf to fine sand, trace clay	10?	0	11	11520
							12-14 Brn wet silt, some fine to coarse sand, trace to some gravel, (may be reworked?)				
							End boring @ 14'				
							Collected samples 0-0.5, 4-6, 8-10, 12-14				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 11827, 11649, 11623 For 002, 009, 012, 003, 008

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-003
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-21-03
DATE FINISHED:	10-21-03
DRILLER:	Dawson
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	75%			FILL Silt, trace to some clay 0-4 some shale gravel, moist BROWN to grey	Fill	0	11	10804
4											
		2	MC	60%			silt, shale gravel, minespoil fill - U grey to black		0	11	10871
8							8-12 - grey - dk grey slate graivel minespoil's				
		3	MC	80%					0	10	11110
12							12-13.5 as above				
14		4	MC	100%			13.5-14.0 - lt brown silt some coarse sand to fine gravel very moist		0	10	10915

Sampled
0-0.5
4-6
8-10
12-14

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACKGROUND 11827
11649
11623

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-004
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE started: 10-22-03	DATE FINISHED: 10-22-03
DRILLER: Jason	GEOLOGIST: Rob Murphy
* POCKET PENETROMETER READING	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	90%			Moist brn silt, trace clay, Some shale gravel and coarse SAND.		0	10	10652
		2	MC	100%			4-4.5 As Above, coarse gravel on 4.5 [illegible] 5.0 -> 8.0 - weather shale in place		0	10	10710
		3	MC	100%			8-12 wx shale competent @ 12'		0	10	10696
		4	MC				[illegible]				

Sample 0-0.5
AND 4-6
wx shale @ 5.0'
No samples collected
from wx shale.

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACKGROUND
11023
11255
11574

Normal

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-005
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	
DATE FINISHED:	
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler	REMARKS
		1	PC	100% / 100%			FILL: silt, trace clay, some fine to coarse sand and gravel. BRN, GREY, moist to Dry		0	10	10681	10699
		2	MC	50% / 100%			~~0.0'~~ weathered shale 7.8' bedrock. EOB @ 8'		0	10	10597	10597

Ran twice for sample volume

~~SO~~ Sampled
SO-GB-0-0.5
SB-GB-4-6
AND
FD-001-0-0.5
FD-001-4-6.

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

- Blind Dup -

Background FOR ALL BORINGS ON 10-22-03

11023	
11235	
11574	

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-006
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED:
	DATE FINISHED:
	DRILLER:
	GEOLOGIST:
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	100%			0-1' - Dk Brn Silt moist tr to some clay, trace gravel		0	10	10719	
		2	MC	90%			1-4' - Lt brn fine sand, some f-coarse gravel, (sandstone + slate pieces) dry.		0	10	10575	
							4-6' as above.					
							Refusal @ 6.4' on assumed bedrock					
							SAMPLE - 0-0.5					
							4-6					
							Refusal					

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 11023
11235
11574

Normal

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-007
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 10-22-03	
DATE FINISHED: 10-22-03	
DRILLER: Jason	
GEOLOGIST: R. Murphy	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	20% / 50%			0-2 - 3cm Silt, trace to some clay, some f-c gravel, shale fragments	Fill	0	10	10609
4							2.0-4.0 Shale + Sand & some gravel				
		2	MC	50%			4-8 - Mine spoil Fill moist to dry silt to clay, some shale and coal gravel.		0	10	10508
8											
		3	MC	90%			8-12 SA SABOVE - More Fine SAND		0	10	10802
12											
		4	MC	70%			12-16 - AS ABOVE Dk brn Dry		0	10	10546
~~15~~ 16											
							EOB 16'				

Samples - 0-0.5
4-6
8-10
12-14

No MS/MSDs collected due to poor recovery in shallow 2'-6' range will collect MS/MSD on other holes.

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
11023
11255
11574

~~MS/MSD~~

URS Corporation	WELL BORING LOG
	BORING NO: GB-008
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE started: 10-21-03	DATE FINISHED: 10-21-03
DRILLER: JASON	GEOLOGIST: R. MURPHY
REVIEWED BY: —	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	REMARKS PID	uR	Fiddler	
		1	MC	90%			0-2.0 - Brown silt, some clay trace gravel.	0	10	11035	~~11026~~
4							2.0-4.0 Red Brn moist silt, some clay, some coarse gravel,				
		2	MC	75%				0	10	11089	
8							4.0-9.0 - As Above More shale gravel				
		3	MC	35%			8-12 - Minespoil 9-9.5 Reddish Sandstone gravel	0	10	10849	
12							11.5-12.0 - silt tr. clay.				
14		4	MC	100%			12.0-13.0 - c gravel grey weathered shale dry	0	10	10702	
							13-14 - Reddish Brn - silt, some fine sand trace gravel, moist, loose				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

BACKGROUND 11827
11649
11623

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-009
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-21-03
DATE FINISHED:	10-21-03
DRILLER:	Jason
GEOLOGIST:	R Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.5 - Dk brn moist silt & some clay	FILL	0	11	11459
4							0.5-4.0 - Brn silt tr-some clay shale gravel layers throughout. (mine spoil)				
		2	MC	100%					0	11	11109
8							4.0-7.0 - Brn moist SAME as Above				
		3	MC	75%					0	10.5	11080
12							7.0-8.0 - Very Moist lt brown silt tr to some fine S and fine gravel.				
14		4	MC	90%					0	10	11039
							8-12 - Fine shale Gravel, so IN silt, brown, trace clay matrix - mostly gravel, mine spoil.				
							12-14 - moist brown silt tr-some fine shale Gravel reworked mine spoils (grey to brown)	14			
							EOB @ 14'				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACKGROUND 11827
11649
11623

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-010
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED:
	DATE FINISHED:
	DRILLER:
	GEOLOGIST:
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	MC	25% / 75%			0-4 - Dk Brn moist, silty fr to some clay, some f-C gravel, (push slag-like porous gravel.		0	10	10653 / 10921	
4												
5.9		2	MC	75% / 75%	75% Recovery 5.9' Refusal		4-5.9 - Dk Brn grades to lt brn silty w/ some clay,		0	10	11085 / 10912	
8												

0.1' Medium sand + gravel layer @ 4.5'-4.6'
v. moist below 4.6' - lt brn silt.
refusal on possible sandstone bedrock @ 6.0'

2 RUNS - 1st to 5.9 Refusal
2nd to 6.0' Refusal

Sample - 0 - 0.5 + QA SPLIT
4-6 + QA SPLIT

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
11023
11255
11579

QA SPLIT

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-011-
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED:
	DATE FINISHED:
	DRILLER:
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
		1	MC	50% / 75%			BROWN - SILT; some gravel, cs sand, st. slag pieces, possible asphalt underlain by concrete from 3-4'	FILL	0 / 0	10 / 10	10882 / 11021
4		2	MC	~~25%~~ 30%			~~V. loose rubble material?~~ 4-8 BRN silt; some clay; some slate gravel.		0	10	10593
8		4	MC	~~0~~ 2%			8-12 V. loose c sand to course slate gravel. wet fibrous mtl + metal		0	10	10821
12		5	MC	25%			12-16 - V. loose as above some silt trace clay		0	10	10557
16											

Sample - 0-0.5
4-6
12-14

8-12 retained for TCLP only

Initial refusal @ 1.9
offset + reattempted

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background
11023
11255
11574

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-012
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-21-03
DATE FINISHED:	10-21-03
DRILLER:	JASON
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	μC	80%			-BRN moist silt some gravel, 0-4' coarse sand. trace sandstone gravel.		0	11	11191
4											
		2	μC	75%			4-8- SAA → silt, trace clay, some gravel, trace coal gravel - Moist @ 7.5-8.0'		0	10	11249
8											
		3	μC	50%			8-12- Same as Above (Fill) Minespoil, Very moist @ 11.5'		0	10	11192
12											
		4	μC	100%			12-13- SAS ABOVE		0	11	10970
14							13-14 - very moist brown, silt, some f-c sand (Shale pieces).				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACK GROUND - 11827 cpm
11649 cpm
11623 cpm

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-013-
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-22-03
	DATE FINISHED: 10-22-03
	DRILLER:
	GEOLOGIST: R. Murph
* POCKET PENETROMETER READING	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler
		1	MC	75%			0-0.8 Brown silt, some to trace clay, some f gravel (moist)		0	10	10885
4							0.8→4.0 - Grey + Brown shale gravel interlayered with silt, some clay. (DRY)				
		2	MC	60%					0	10	10929
8							4-8 - SAA.				
		3	MC	60%			8-11 - SAA				
							11-12 - BRN - very hard, silt, tr clay damp some f-c gravel.		0	10	10812
12											
14		4	MC	100%			12-14 - Dk gry shale f-c gravel and f-c sand.		0	10	10760
							EOB 14				
							Sampled 0-0.5				
							4-6				
							8-10				
							12-14				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 11025
11235
11374

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-014-
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED:
	DATE FINISHED:
	DRILLER:
	GEOLOGIST: R. Murphy
* POCKET PENETROMETER READING	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	73%			0-0.5 - Lt brn - silt some clay + f-c gravel 0.5-1.0 - Lt brn dry fine sand.		0	10	10548	
		2	MC	80%			1.0-4.0 - Dk Brn/Dk gray dry shale gravel and silt. 4.0-8.0 - Dk BRN to Lt brn silt shale gravel throughout		0	10	10574	
		3	MC	60%			8-12 Lt brown as above wet @ 10.5' more clay @ 10.5		0	10	10726	
		4	MC	75%			12-13.5 - Dk BRN moist silt, tr clay, some shale f-c gravel 13.5-16 - appears to be weathered shale grey dry bedrock		0	10	10764	

Sample 0-0.5 ✓
4-6 ✓
8-10 ✓
12-14 ✓

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
11003
11255
11574

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-015
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-23-03 · 815
	DATE FINISHED: 10-23-03
	DRILLER: Jason
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
4		1	MC	90%			Brown moist silt, trace clay some f-c shale gravel. dry - 3-4'		0	12	12656
8		2	MC	60%			4-8 - SAA, moist throughout		0	12	12614
12		3	MC	60%			8-12 - GRY Dry - shale f-c sand, and f-c shale gravel. - little 0.05 silty layers (moist)		0	12	12622
14		4	MC	100%			12-14 SAA		0	12	12633

Possible weathered bedrock surface @ 9', very weathered, hard to tell if in place or not, shale layers well laminated, layered

Sampled - 0-0.5
4-6
8-10
12-14

Not wx bedrock based on GB-017-

Comments:

PROJECT NO. 11173233.00000
BORING NO.

10-23-03 - Background All locations in lower trench done on 10-23-03
12983 12689
12630

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-016
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-23-03 845
DATE FINISHED:	
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	95%			0-2' - ~~BRN~~ - Silt, trace ~~some~~ clay moist, little f gravel	FILL	0	12	12450
4							2-4 - SAA - ~~no~~ some f-c gravel				
		2	MC	75%			4-8 - SAA (2-4') stole gravel layers are dry		0	12	12455
8							8-12 - SAA ~~m~~ very moist 10-12' to wet 14				
		3	MC	50%					0	12	12410
12							12-14 - SAA, silty layers very moist to wet				
14		4	MC	75%					0	12	12400

Sampled 0-0.5
4-6
8-10
12-14

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Back ground
12983
12630
12689

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GO-017
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-
DATE FINISHED:	
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	90%			0-10' - Dk Brn moist, silt, tr clay, some f-c shale gravel some f-c sand - gravel layers dry -	FILL	0	12	12496
		2	MC	90%			10-12 - Grey shale f-c sand and gravel - dry		0	12	12593
		3	MC	90%			12-14 - wet Brn grey to silt f to c sand and black gravel.		0	12	12181
		4	MC	75%					0	12	12999

Sampled 0-0.5
4-6
8-10
12-14

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
12953
12630
12689

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-018
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	GB 018
GROUND ELEVATION:	
DATE STARTED:	11-4-03
DATE FINISHED:	11-4-03
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.5 - DK BRN Silty clay (organic topsoil)		0	12	12197
							0.5-2.0 - BRN - Stiff Silty Clay trace to some very fine Sand.				
							2.0-3.5 - Lt brown Stiff Silty clay some Fine Coarse gravel ~~(clay)~~				
							3.5-4.0 - very weathered Lt brn to gray dry clay stone				
							EOB @ 4.0 weathered rock				
							Sampled - 0-0.5' 2-4'				
							(Looks all natural)				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 12282
11888
12002

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-019
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-4-03
DATE FINISHED:	11-4-03
DRILLER:	Jason
GEOLOGIST:	RoB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	90%			0-0.5 - DK Brown Silty clay organic topsoil.		0	12	1203
4							0.5-4.0 Gray Brown silty clay more clay 2.5-4.0 Damp. Stiff.				
		2	MC	100%					0	12	1208
7.8							4.0-5.5 grades into Purple/DK Red Silty clay interbedded w/ stiff damp brown gray silty clay				
							5.5-7.8 - Reddish-DK Purple claystone very weathered.				
							EOB @ 7.8' Refusal				
							Sampled - 0.0-.5 4-6				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
12282
11988
12032

URS Corporation	GEOPROBE BORING LOG
	BORING NO: 022-020
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-4-03
	DATE FINISHED: 11-4-03
	DRILLER: Jason
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler
		1	MC	75%			0-0.5- DK BRN silty organic clay topsoil. 0.5-5.0- BROWN silty clay stiff, trace fine gravel		0	12	12323
3		2	MC	100%			5.0-6.9 Grey, stiff, silty clay (more clay) Some Red Brown mottling 5.5- 6.9 - Grey weathered clayshale, dry	damp	0	12	12391

EOB @ 6.9'

Sampled - 0-0.5 + 0-0.5 SPLIT
4-6

(Looks more natural)

Comments:	PROJECT NO. 11173233.00000
	BORING NO.

Background | 13361
13380
13393

URS Corporation	GEOPROBE BORING LOG
	BORING NO: SB-021
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-26-03
	DATE FINISHED: 10-26-03
	DRILLER: Jason
	GEOLOGIST: R Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-1.2- DK Brown silty Clay, trace coarse sand,		0	17	18063
		2	MC	90%			1.2-5.0 Rd Brn stiff silty CLAY, trace C-Sand		0	17	18127
		3	MC	100%			5.0 fine grained sandstone gravel coarse				
	11.1						5.1-7.0- Lt brown silty stiff clay		0	17	18457
							7.0-11.1- Grey weathered Siltstone/claystone -Some purple colors (clasts) all purple @ 11.1'				
							Sampled 0-0.5 4-6				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 18062

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-022
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: OFFSET 10' S From GPS Due to Access
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-4-03
	DATE FINISHED: 11-4-03
	DRILLER: Jason
	GEOLOGIST: [illegible]
	REVIEWED BY: [illegible]

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-1.0- DK BRN Silty Clay Soil, organic moist		0	10	11241
		2	MC	75%			1.0-3.5- Lt brn-gray silty clay stiff damp				
							3.5-6.0 Silty Clay Lt brown Stiff, damp, some coarse fine grained Sandstone gravel.				
							5-6- Hgray-brn Refusal on assumed Bedrock based on topography + GB-018				
							Sampled - 0-0.5 4-6				
							Appears Natural				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 11748

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-023
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE / TIME / LEVEL / TYPE	DATE STARTED:
	DATE FINISHED:
	DRILLER: Sasan
	GEOLOGIST: Rob
	REVIEWED BY:

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	90%			0-1.0 - Dk Brown Silty Organic ~~Clay~~ topsoil		0	11	11002	
4							1.0-3.2 - Soft to medium Silty clay, brown, moist					
		2	MC	100%					0	11	11653	
7.5							3.2-7.5 - Brown Silty Clay, Fine to coarse sand, some Sandstone gravel (fine grained) Refusal @ 7.5 on Sandstone Boulder.					
						Some f-vf Sand						
							Sampled 0-0.5 4-6 6-7.5					

Comments:

PROJECT NO. 11173233.00000

BORING NO.

2 Refusals @ 3.5' from 7.5' Refusal on Sandstone Boulder

Background 11122

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-024
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 11/23/03	
DATE FINISHED: 11/23/03	
DRILLER: JASON	
GEOLOGIST: KOZ	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	85%			0-1 - Dark Brown organic silty clay topsoil.		0	11	12545
		2	MC	100%			1-4 Brown silty clay. very moist medium soft		0	10	12611
		3	MC	100%			3.5 Wet fine sandy silt. Brown		0	10	12232
	@ 3 Refusal						4-8 Grey-Brown very stiff silty clay moist trace f gravel fine grained C-Sandstone gravel @ 6.0'				
							8-8.3 - SAA.				
							8.3-9.3 - Grey weathered claystone dry/damp				
							Ends 9.3'				
							Sampled 0-0.5 4-6 6-8.3				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background

12378
11935
12234

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-025
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE started: 11-4-03	DATE FINISHED: 11-4-03
DRILLER: Jason	GEOLOGIST: Rob
* POCKET PENETROMETER READING	REVIEWED BY:

GROUNDWATER					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	100%			0-0.5 - DK BRN very organic silty ~~clay~~ soft moist		0	11	11472	
		2	MC	100%			0.5-2.5 - Light Brown silty clay, some vf sand trace fine gravel.		0	11	11300	
							2.5-3.9 weathered Brown claystone.					
							3.9-4.0 weathered Brown Fingerprinted Sandstone.					
							4.0-4.9 - weathered Brown Claystone					
							4.9-5.0 weathered Brown sandstone					
							Refusal @ 5.0'					
							Sampled - 0-0.5 1.0-3.0					

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background

11132

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-026
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-04-03
	DATE FINISHED: 11-04-03
	DRILLER: SJB
	GEOLOGIST: RDB
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	90%			0-5.0 Brown silty clay, some fine gravel some rounded. (coarse gravel layer @ 0.5') Very stiff Damp.		0	11	11411
7.1		2	MC	100%			5.0-6.0- Fine sandy silt wet - trace coarse sand.		0	11	11569
							6.0-7.1 - Damp, very stiff grey-Brown silty clay				
							Presumed weathered bedrock Refusal @ 7.1' based on surrounding borings				
							EOB @ 7.1				
							Sampled - 0-0.5 4-6 6-7				
							Appears to be all Fill (IN ROADWAY) (for well access)				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 11132

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-027
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-4-03
DATE FINISHED:	11-4-03
DRILLER:	Jason
GEOLOGIST:	ROB
REVIEWED BY:	—

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPL	CORE TUBE
DATE	TIME	LEVEL	TYPE	TYPE			
				DIA.			
				WT.			
				FALL			
				* POCKET PENETROMETER READING			

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-2.0- Lt Brn ~~stif~~ medium stiff silty clay damp. to moist.		0	11	11366
							2.0-3.6- Brown silty clay trace fine gravel (sandstone)				
							Two- Refusals on possible bedrock or ~~Sandstone~~ Boulder				
		Sampled			0-0.5						
					2-3.5'						
							2- Refusals @ 3.6'				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 11132

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-028
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-23-03
	DATE FINISHED:
	DRILLER: JASON
	GEOLOGIST: ROB
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	mc	95%	90%		0-1.2 Dk Brown silty sand organic soil moist		0	11	12636	1171
		2	mc	60%	60%		1.2-4.0 Lt Brown silty clay. Fine Aregrained medium stiff, V. moist (2.5-2.7')		0	10	11880	10954
							4-6.5 SAA - Some Fine K - H Red and Brown sandstone gravel Refusal at 6.5 Run #1 Refusal at 6.5' Run #2 probable - sandstone cobbles and Boulders.					
							EOB @ 6.5'					
							Sampled - 0-0.5 4-6.5 and 4-6 QA split					

Comments:

PROJECT NO. 11173233.00000

BORING NO.

BACKGROUND 12376
11935
12234

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-029
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11/23/03
DATE FINISHED:	11/23/03
DRILLER:	~~[illegible]~~ JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler		
				1	2	3	0-0.5 DK BROWN V-organic topsoil silty clay, moist					2	3
		1	MC	100%	100%	100%	0.5-2.5 - LT Brown silty clay medium soft/very stiff		0	11	12105	12897	12522
		2	MC	80%	90%	80%	2.5-4.0 - Brown Gray silty clay, tr f. gravel, moist (Some c-gravel @ 3.8')		0	11	12558	12944	12500
7.5	Refusal						4.0 - 7.0 - SAA (some c-gravel @ 4.2') (and 6.0') (no c-sand 6-7.0')						
							7.0-7.5 - RED Gray silty clay - v. stiff (very weathered Red claystone, moist)						
							EOB @ 7.5 all 3 Refusals						
							Sampled - 0-0.5	0-0.5	MS/MSD				
							4-6 AND	4-6	MS/MSD				
							6-7.5	6-7.5	MS/MSD				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACKGROUND
12378
11935
12234

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-030.
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-23-03
DATE FINISHED:	11-23-03.
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	mc	100%	100%		0-0.5 - Very Dk Brown Very organic topsoil, moist		0	12	12288	12228
							0.5-2.5 Brown med soft silty clay moist tr c sand					
		2	mc	100%	95%				0	12	12639	12231
							2.5-7.5 Gray Brown silty clay moist, stiff tr f-gravel, Coarse Fine grained grain at 6.5' more clay 6.5-7.5, more plastic.					
							7.5-8.0 Reddish w. Weathered Claystone					
							EOB 8.0'					
							Sampled - 0-0.5 4-6 6-7.5 and FD-010				0-0.5 4-6 6-7.5	

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACKGROUND 12378 11935 12234

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-031
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-23-03
DATE FINISHED:	11-23-03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
		1	MC	90%			0-0.5 DK BROWN ORGANIC Silty clay/Topsoil		0	10	12508
		2	MC	100%			0.5-7.8' BROWN silty clay trace fine gravel moist very stiff		0	10	12509
7.9'							Some fine gravel at 5.8 and 7.0				
							7.8-7.9' - weathered grey claystone				
							EOB @ 7.9				
							Sampled 0-0.5' 4-6' 6-7.8'				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACKGROUND
11928
12586
12412
12079
11923

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GO-032
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-23-03
DATE FINISHED:	11-23-03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	Mc	100%	100%		0-0.3- DK BROWN silty clay very organic topsoil		0	10	[illegible]	12360
							0.3-2.5' - Medium stiff Brown silty clay trace fine gravel					
							2.5-2.6 - Sandstone gravel					
							2.6-3.5 - [illegible] Brown silty clay					
							3.5-4.0 - Light Brown-gray weathered claystone.					
							EOB @ 4.0'					
							Sampled - 0-0.5 1.5-2.5 and @ Asphalt 1.5-2.5'					

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACKGROUND
11928
12586
12110
12079
11923

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-073
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-28-03
DATE FINISHED:	11-28-03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0 0.5 - Dk Brown organic Silty clay topsoil		0	9.5	12383
							0.5-2.5 Grey Brown silty clay. stiff, moist + trace fine gravel.				
							2.5-3.8 - Light Brown weathered claystone (dry)				
							3.8-4.0 - Grey claystone weathered.				
							EOB 4.0'				
							Sampled - 0-0.5 1-2.5				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background
11928 11923
12586
12112
12071

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-034
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-23-03
DATE FINISHED:	11-23-03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler 1	Fiddler 2	Fiddler 3
				1	2	3							
		1	MC	100%	100%	100%	0-2 - BROWN to DK BROWN Silty Clay medium Soft trace c-sand, moist		0	10	11730	12100	11714
6.5'		2	MC	Not Recovered	100%	100%	2-5 - Gray Brown Silty clay trace organics medium soft, moist		0	10	Not Recovered	12028	12432
							5-6.5 - Lit Brown weathered claystone Dry (crumbly)						
							EOB @ 6.5						

Sampled
0-0.5 AND MS/MSD
3-5 MS/MSD

Comments: Initial Refusal @ 3.5'
2nd Refusal @ 6.5'
3rd Refusal @ 6.5'

PROJECT NO. 11173233.00000
BORING NO.

Background
11928
12586
12112
12074
11923

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-035
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-23-03
DATE FINISHED:	11-23-03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	mc	100%	100%		0-0.2' Dk Brown Silty clay organic topsoil. soft		0	10	12[illegible]	12009
		2	mc	90%	70%		0.2-1.0- Lt brown silty clay trace fine gravel, stiff		0	10	11751	12051
7.7' 9.7'		3	mc	100%			1.0-1.5- Dk Brown silty clay medium soft, moist		0	10	12495	
							1.5-3.0- Gray Brown silty clay (trace organics roots) moist, medium stiff					
							3.0-3.8 Dk Brown Silty Clay tr C-Sand. Some fine Sand, moist, stiff					
		Sampled			0-0.5 4-6 + MS/MSD 6-8 + QA split		3.8-8.0- Gray Brn silty clay medium soft, trace organics, moist some C-Sandstone gravel @ 5.5, 6.0, 7.0'					
							8-9.7 Gray weathered clay/stone Dry					
							EOB @ 9.7'					

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

BACKGROUND
11928
11923
12586
12110
12074

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-036
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-4-03
DATE FINISHED:	11-4-03
DRILLER:	Jason
GEOLOGIST:	RDB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			DK-BRN - Silty clay stiff, trace Fine gravel, moist 0-1.5 1.5' - Coarse sandstone gravel.		0	12	12520
		2	MC	100%			1.5 - 4 - Grey-Brown silty clay stiff 1.5-2.0 medium 2.0-2.5 stiff 2.5-4.0		0	12	12686
		3	MC	75%			Some Fine rounded gravel		0	12	12435
							4-7 - Stiff Brown - silty clay Some F-C sandstone gravel layers				
							7.0-7.8 - Brown silty clay some very fine sand.				
							7.8-8.0 Grey stiff silty clay - damp - some Red Brown Mottling.				
		sampled		0-0.5 + DUP							
				4-6							
				8-10							
							8-9.5 SAA (vertical "Fracture" - Dessication crack w/some organic very small roots within.				
							9.5-12 - DK Purple, to grey Very weathered claystone. Some F-M Reddish glasts (weathered. dry - damp.				
							* Took Field DUP SO-FD-014-0-0.5				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 13361
13380
13393

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-057
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-04-03
	DATE FINISHED: 11-04-03
	DRILLER: Jackson
	GEOLOGIST: RGB
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
					2nd			FILL				2nd
		1	pc	100%	90%		0-4 Stiff, damp Silty Clay, Grey-Brown with purple and red clays		0	12	13054	13012
		2	mc	90%	90%		4-6 - SAA - medium stiff		0	12	12906	13013
		3	mc	100%	50		6-6.3' - Light grey dry gravel Shale.		0	12	13129	12690
							6.3'-8.5 - Soft silty clay, moist Brown grey, trace fine Rounded gravel (fill)					
							8-9 - SAA					
							9-11 - Grey Brown Silty Clay very stiff, Damp.					
							11-12 Purplish to grey weathered claystone, damp -					
							40x2'2'					
							sampled 0-0.5 4-6 8-10 PLUS QA SPLITS					

FILL to at least 9' then probably natural

Comments:	PROJECT NO. 11173233.00000
	BORING NO.

Background: 13361, 13380, 13393

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-038
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-29-03
DATE FINISHED:	10-29-03
DRILLER:	Jason Todowski
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.2 Dk Brn silty clay soft - organic		0	10	12285
		2	MC	100%			0.2-2.0 Gray Brown silty clay trace fine gravel, stiff		0	10	12405
							2.0-2.2 Coarse gravel (fine gravel sandstone)				
							2.2-3.0 gray brown stiff silty clay, some course gravel (rounded)				
							3.0-3.4 Dk grey moist soft silty clay, organic odor				
							3.4-5.5 Brown Grey Silty clay				
							5.5-8.0 Lt Brown weathered Siltstone Dry-damp, some very stiff red brown stiff plastic silty clay layers				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 1523
1491
1494

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-039
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-29-03
	DATE FINISHED: ~~10-29-03~~ 11-03-03
	DRILLER: Jason
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	
							0.0-0.1 Thin DK Brn Silty organic clay topsoil.					
		1	MC	75%			0.1-6.0 Grey Brown Silty clay ~~Light Brown~~ coarse angular sand		0	10	12416	
4												
		2	MC	75%					0	10	12412	Rig broke on 10/29/03
8							(No sand 4-8.)					← 11-03-03
		3	MC	100%			very stiff		0	11	12059	
12							Rig broke down (chain snapped @ 7.10 retrieving 8-12 sample)					
							8-9.5 - Grey Brown Silty clay, stiff, damp. Some coarse gravel (Angular) (sandstone) Some rounded fine gravel.					
				Sample - 0-0.5			9.5-11.5 - Very weathered Dk Red to Red Brown Siltstone/claystone.		Dry to Damp			
				4-6								
				8-10								
							11.5-12. - Light Brown weathered claystone					

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 10/29/03

11523
11491
11494

Background 11-3-03

12329
12314
12344

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-040
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-24-03
DATE FINISHED:	11-24-03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
							Thin layer organic topsoil.				
		1	MC	95%			0-0.5 - Lt. Brown, medium stiff silty clay, moist		0	10	13003
		3	MC	100%			0.5-2.0 - Brown medium silty clay, moist trace glass		0	10	12688
7.0'							2-3 - Lt Brown silty clay, med soft.				
							3-4 - Grey-Brown mottled silty clay, stiff, damp trace organics				
							4-6.0 - Brown silt clay and thin black, some sandstone gravel.				
			Sampled	0-0.5, 4-6			6-7 - gray silty clay very stiff, grades into weathered gray claystone.				
							EOB @ 7.0'				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background | 12283, 12621, 12653, 12579

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-041
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-28-03
	DATE FINISHED: 10-28-03
	DRILLER: Jason
	GEOLOGIST: R. Murphy
* POCKET PENETROMETER READING	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	0			0-6.0 - Reworked wet soft Brown/grey silty clay, some gravel some sandstone cobbles		-	-	-
		2	MC	50%			Grey Brown weathered Claystone. (grey) damp dry		0	11	11883
							EOB @ 8'				
							Sampled 0-0.5 4-6				

Comments: 0-4 sample too soft/wet - not recovered,

PROJECT NO. 11173233.00000

BORING NO.

Background 11853 11982

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-042
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE / TIME / LEVEL / TYPE	DATE STARTED: 10-28-02
	DATE FINISHED: 10-28-02
	DRILLER: Jason
	GEOLOGIST: R. [illegible]
	REVIEWED BY:

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION (Gray Sandy wet)	USCS	PID	uR	Fiddler
		1	ME	95%			0-5.0 BROWN grey silty clay stiff, damp, some coarse sandstone gravel		0	10.5	11922
		2	ME	95%			5.0-7.0- green Dark grey soft silt clay, trace organics trace coarse rounded sand	moist	0	10.5	11810
							7.0-8.0 - Light grey weathered dry claystone.				

EOB @ 8.0'

Sampled ~~3-5~~ 4-5.5

5.5-7.0

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background | 11857
11982

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GP-043
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-28-03
	DATE FINISHED: 10-28-03
	DRILLER: Jensen
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	95%			0-0.5 - Gray Brown Silty clay stiff, damp.		0	11	10799
		2	MC	90%			0.5-1.0 - Damp Grey very plastic clay.		0	11	12191
							1.0-5.0 - Dark Grey Brown silty clay trace coarse sandstone gravel.				
							5.0-6.0 - Moist gray brown very tacky clay.				
							6.0-8.0 weathered gray brown claystone bedrock, some purple "clasts"				
							EOB @ 8.0				
							Sampled 0-0.5 4-6				

Comments:	
	PROJECT NO. 11173233.00000
	BORING NO.

Background
11647
12027
11779

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	GB-01M
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-12-03
DATE FINISHED:	11-12-03
DRILLER:	JASON
GEOLOGIST:	ROB-MURPHY
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	Me	100%			0-1 Brown silty clay Sand gravel moist, soft,		0	89	10128
5.7		2	Me	100%			1-4. Gray. Reddish Brown V. stiff silty clay moist. c-sand		0	09	133X3
							4-5.3' SAA				
							5.3-5.7 dry grey weathered shale/claystone.				
							EOB @ 5.7				
							Sampled				
							0-0.5				
							4-5.7				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background

8868 9116
8750
9586

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-045
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-12-03
DATE FINISHED:	11-12-03
DRILLER:	DASCO
GEOLOGIST:	Rob
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	PT	60%			0-3 - Brown silty clay stiff moist some sandstone gravel (fine grained)		0	10	1011
		2	MC	80%			3-4 Brown silty clay soft moist trace fine gravel		0	10	1056
6.9							4-4.5 SAT				
							4.5 - 6.9 - Brown-grey silty clay some fine gravel (fine grained sandstone) stiff, moist				
							Refusal @ 6.9 on probable Sandstone Boulder -				
							Sampled: 0-0.5', 4-6.9'				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background

8868
8780
9586

9116

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-046
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: 10' NE of planned location to move away from trench
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-28-03
	DATE FINISHED: 10-28-03
	DRILLER: JASON TOJDOWSKI
	GEOLOGIST: R. Murphy
* POCKET PENETROMETER READING	REVIEWED BY:

GROUNDWATER				CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE			
				DIA.			
				WT.			
				FALL			

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
4		1	Me	75%			0 - 0.5 - Brown very moist silty clay, sandy clay gravel @ 0.5'		0	10	12767
8		2	Me	90%			0.5-6.5 - Brown silty clay stiff - medium soft some f-c gravel, trace fine sand.		0	10	12598
12		3	Me	75%			6.5-7.5 light brown grey weathered claystone		0	10	12277
							7.5 - 10.5 - Red Brown + Grey varved silty clay, (mostly red brown) mostly clay.				
							10.5-12.0 Grey Brown weathered claystone bedrock almost dk green @ bottom				
							EOB @ 12'				
							sampled - 0-0.5, 4-6, 8-10				
							No sample 10-12 due to unstable rock				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 12700 ppm

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-47
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-12-03
DATE FINISHED:	11-12-03
DRILLER:	OASON
GEOLOGIST:	ROD
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	mc	90%			0-4' Brown silty clay stiff, soft 2-4' tr fine gravel, moist		0	10	10441
		2	mc	90%			4-5' SAA		0	10	10499
							5-7.9' - Brown silty clay stiff, some sandstone gravel and cobbles moist				
							Refusal on possible sandstone cobble or boulder, numerous boulders visible in back fill on hillside.				
							Sampled 0-0.5				
							4-6				
							6-7.9'				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

See background or TA-47 log
Background 8868 8750 9586 9116

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB - 048
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 10-28-03	
DATE FINISHED: 10-28-03	
DRILLER: Jason TOJDOWSKI	
GEOLOGIST: R. Murphy	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	95%	Brown		0-8.0- Very stiff moist-silty clay, some coarse sandstone gravel. Some coarse sand.		0	10	12581	
		2	MC	90%			8-10.5- Brown Silty fine sand. Some medium-coarse sandstone gravel.		0	10	12495	
		3	MC	50%			10.5-12.0 red/grey varved clay transition to very hard weathered claystone in end of spoon		0	10	12195	
							EOB@12'					
							Sampled - 0-0.5 4-6 8-10					
							Did not sample 10-12 due to low recovery. in 8-12 liner. Although seems to be transitioning to wx Rock any more					

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 13042 12851 13009

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-049
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	—
GROUND ELEVATION:	—
DATE STARTED:	10-28-03
DATE FINISHED:	10-28-03
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS	
					2	3	0-0.3 - DK BROWN silty clay organic topsoil					RUN-2 Refusal @4	RUN 2
		1	MC	90%	100%	100%	0.3-7.5 BROWN MEDIUM STIFF (soft to 1.0'). moist silty clay. Some sandstone gravel		0	10	12916	12742	12739
		2	MC	75%		75%			0	10	12783	—	
							7.5-12.0 BROWN - Fine Sandy SILT Some Sandstone gravel, trace to some rounded fine gravel. (wet 10-10.5)						12745
		3	MC	75%		75%			0	10	12611	—	12810
		4	MC	75%		100%			0	10	12634	—	13046
							~~12-12.5 - BROWN Fine SAND, wet loose~~						
							12.0-14 - Grey and red brown mottled silt/clay, very stiff						
							14-15 - As above. start getting 0.05' hard Rock like layers						
							turns to weathered claystone?						
							Sample - 0-0.5 4-6 8-10 12-14						

Comments:

PROJECT NO. 11173233.00000
BORING NO.

FD-007 - 0-0.5
4-6
8-10
12-14

Background | 13042
12851
13074

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-050
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 10-27-03	
DATE FINISHED: 10-27-03	
DRILLER: Jason	
GEOLOGIST: R. Murphy	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	nc	90%			0-0.5 Dk Brown silty clay organic		0	11	12001
		2	nc	95%			5.0 BROWN silty clay very stiff, some sandstone gravel (Soil (2.0-3.0))		0	11	11834
		3	nc	90%			3.0-5.3 Sandstone cobbles. 5.3-8.0 BROWN silty clay very stiff some Sandstone gravel.		0	11	12309
		4	nc	75%			8.0-11.5 wet Brown (wet 5-9 only) Fine Sand and silt, some ~~12.0~~ Coarse gravel, then moist		0	11	12189
							11.5-12.0 BROWN very stiff silty clay				
		Sampled	0-0.5				12.0-13. Wet Brown Fine Sand, trace silt,				
			4-6				13-16' - Dk Red/Grey/Brown very stiff damp silty clay (15-16 - Reddish Brown + grey ferrous)				
			8-10								
			12-14								
							EOB @ 16'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 12721

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-051
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 10-28-03	
DATE FINISHED: 10-28-03	
DRILLER: Jason	
GEOLOGIST: R. Murphy	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	80%			0-4. BROWN - Very stiff silty clay, some coarse gravel coarse, sand, Roots.		0	10	12665
		2	MC	75%			4-9 - LI Brown silty clay medium stiff to stiff some coarse gravel. (sandstone)		0	10	12686
		3	MC	75%			9-13 Brown silty fine Sand some fine gravel, (dense) (wet 10-12)		0	10	12316
		4	MC	90%			13.0-13.3: very wet silty fine ~~Sandy~~ ~~silt~~. Brown, loose,		0	10	12872
							13.3-14 - medium stiff. Brown grey fine sandy silt. trace to some clay, moist				
							EOB @ 14'				
							Sample 0-0.5 4-6 8-10 12-14				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background

13042
12851
13074

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	GB-052
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-27-03
DATE FINISHED:	10-27-03
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler
		1	MC	95%			0-0.5 - DK Brown, soft silty organic topsoil		0	11	12227
							0.5 - moist, LT Brown silty clay trace coarse sand.				
		2	MC	95%					0	11	12232
							3.0 - 7.0 - Very stiff Brown silty clay, some coarse sandstone gravel.				
		3	MC	60%					0	11	12226
4.8							7.0 - 7.4 - Sandstone cobble/Boulder				
							7.4 - 8.0 - Very stiff Brown silty clay, some sandstone gravel.				
							8.0 - ~~8.5~~ - As above				
							~~8.5~~ - 9.0 - ~~Sandstone Boulder.~~				
		Sample		0-0.5			9.0 - 11.0 - Very stiff silty clay, damp, brown. Some very fine sand. Some coarse sandstone gravel.				
				4-6							
				8-10							
				~~8-11~~							
				10-12							
							11.0 - 11.8 - Sandstone Boulder				
							Refusal @ 11.8				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background - 12608
12696
12349

Background 15237 @ 955
15918 @ 938
15227

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	GB-053-
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-27-03
DATE FINISHED:	10-27-03
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.5 - Dk Brn moist silty clay trace-some coarse gravel, soft		0	14	15716
		2	MC	90%			0.5-3.0 - Lt brown silty clay trace coarse sand. very stiff		0	14	15500
		3	MC	95%			3.0-5.0 Brown-grey very stiff silty clay, moist-damp drier (4-5.0')		0	14	15500
12											
14		4	MC	100%			5.0-8.0' - Silty clay brown-grey damp, some f-c gravel trace fine sand.		0	14	14710
							8.0-12.5 very stiff silty clay damp-grey-brown (more clayey 8-9.0')				
							12.5-14 - Lt Brown dry crumbly silty clay (very weathered brown siltstone/claystone) some gray silty clay zones (0-0.2')				
							FORB @ 14'				
							Sampled - 0-0.5 4-6.5 8-10' 12-14'				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 14006 @ 1053

URS Corporation

GEOPROBE BORING LOG

BORING NO: GB-059
SHEET: 1 of 1
JOB NO.: 11173233.00000
BORING LOCATION:
GROUND ELEVATION:
DATE STARTED: 10-27-03
DATE FINISHED: 10-27-03
DRILLER: Tyson
GEOLOGIST: [illegible]
REVIEWED BY:

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler
		1	mc	85%	60%		Grey Brown Silty clay medium stiff, moist. 0-4 trace fine coarse gravel.	Fill	0	12.5	11305
		2	mc	40%	60%		4.0-16' Brown gray silty clay, very soft, moist, some fine & coarse gravel.		0	12.5	13051
		3	mc	50%	60%				0	12.5	13713
		4	mc	50%	60%				0	12.5	13511
16'							EOB @ 16'				

3' RUNS - FOR VOLUME

Did not have to hammer clay material very soft / reworked, where was pushed right in.

Comments:

PROJECT NO. 11173233.00000
BORING NO.

MS + MSD @ 0.5
4-6
8-10
10-12

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
GROUNDWATER:	
BORING NO:	GB-055
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	12-27-03
DATE FINISHED:	12-27-03
DRILLER:	Jason
GEOLOGIST:	[illegible]
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
4		1	MC	100%			0-2.2 - Grey Silty clay mod. to stiff, damp, trace coarse sand.		0	11	12517
8		2	MC	60%			2.2 - 8.0 - Brown ~~clay~~ mod. stiff, silty clay.		0	11	12006
12		3	MC	80%			8.0 - 10.0 Red silty silty clay, dry,		0	11	12786
16		4	MC	90%			10-12 - Light Brown - grey silty clay		0	11	12382
							12-14 - Fine sand, some silt and fine gravel (wet)				
							14-15.0 - Grey silty clay damp very stiff.				
							15.0-16.0 - grey stiff silty clay varved Red (Clay) and grey damp.				
			Sampled		0-0.5						
					4-6						
					8-10						
					10-12		EOB @ 16'				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background
12608
12696
12349

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-056
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-24-03
DATE FINISHED:	10-24-03
DRILLER:	
GEOLOGIST:	R Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	110%			0-0.8- DK BRN MOIST silty organic topsoil,		0	10	11476
4							0.8-3.5- LT Brn moist medium-hard silty clay trace coarse sand.		0	10	11171
		2	MC	95%			3.5-3.8 ~~Fine brown~~ (white fine Sand				
8							3.8-8.0- Brown Silty Clay, some f-c gravel and Fine Sand Layers		0	10	11463
		3	MC	100%							
14							8.0-12- BROWN WET ~~Fine~~ Silty Fine SAND, Thickly interbedded with very fine sandy silts (0.8' thick)		0	10	11020
		4	MC	100%							
16							12-15.5' - wet Fine SAND ~~Some silt~~ Brown Silty				
							15.5-16.0- Brown Silty clay, some fine gravel.				
						Sampled	- 0-0.5 4-6 8-10 12-14				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Collected QA splits
0-0.5'
4-6'

Background [illegible] only - cpm
12178
11913
12185

URS Corporation

GEOPROBE BORING LOG

BORING NO: GD-057
SHEET: 1 of 1
JOB NO.: 11173233.00000
BORING LOCATION:
GROUND ELEVATION:
DATE STARTED: 10-23-03
DATE FINISHED: 10-23-03
DRILLER:
GEOLOGIST: R. Murphy
REVIEWED BY:

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
		1	MC	100	DK BRN / Lt Brn		0-0.5 - DK BRN moist silt. tr clay		0	10	10720
							0.5-4.0 - Lt brn silty clay c. sandstone gravel @ 4.0'				
		2	MC	100%	BROWN		4.0-8.0 - BRN moist silty clay, f-m SAND, 7.5'-7.6', Sandstone gravel layer		0	10	10603
		3	MC	75%			8.0-9.5 fine BROWN SAND, wet		0	10	10710
		4	MC	50%			9.5 - moist at 10.0' grades to silt some clay medium-grained Some sandstone gravel to 12'		0	10	10746
							12-14 - Brown Medium Sand wet to 13'; Moist 13-14'	wet 12-13'			
							first Very Fine Sand and fine sandstone gravel. (weathered Sandstone?)				
							Sampled - 0-0.5 4-6 8-10 12-14				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background "New Area" 10-23-03

10784
10622
10823

URS Corporation

GEOPROBE BORING LOG

BORING NO: BB-058
SHEET: 1 of 1
JOB NO.: 11173233.00000
BORING LOCATION:
GROUND ELEVATION:
DATE STARTED: 10-23-07
DATE FINISHED: 10-23-07
DRILLER:
GEOLOGIST: R. Murph
REVIEWED BY:

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
		1	MC	100%			0-0.5 - Dk BRN SILTY ORGANIC TOPSOIL, MOIST		0	10	10808
4							0.5-4.0 - MOIST, lt brn silty clay, trace gravel				
		2	MC	100%			3.8' f Sandstone gravel, in matrix.		0	10	10666
8							3.8'-9.5' Moist brn silt, tr, clay, some f-m sand layers and coarse gravel.				
		3	MC	75%					0	10	10501
12		4	MC	100%			9.5-10 ~~FINE SAND~~ wet starts to grade to wet Fine Sand @ 10 - wet fine Sand silty clay @ 11-11.3, Fine wet sand f. trace silt. 14'-		0	10	10684
14											

Sampled - 0-0.5
4-6
8-10
12-14

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 10754
10822
10823

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-059
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-23-03
DATE FINISHED:	10-23-03
DRILLER:	
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
							0-0.5 Dk BRN Organic Moist silty clay		0	10	10774
		1	MC	100%			0.5-3.5 - lite brown silty clay trace fine gravel.				
4							3.5-11.8 Light brown silty clay some coarse sandstone gravel.		0	10	10706
		2	MC	100%			Mostly coarse gravel 4.5-5.0' (white sandstone)				
8							5.5'-0.1' Brn medium sand layer -		0	10	11034
		3	MC	100%							
12		4	MC	100%			9.2-9.4' white sandstone gravel layer.		0	10	11428
16							11.8 - Fine SAND - v. moist 12 - WET Fine Brown Sand				
							15.8 - White Sand ~~stone~~ -16.0 ~~Gravel~~ (gravel?) breaks apart easily				
							Samples 0-0.5 4-6 8-10 12-14				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 10789
10822
10823

11173232.00000

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-060
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-24-03
DATE FINISHED:	10-24-03
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-1 - DK BRN, moist, organic silty topsoil.		0	12	11592
4							1-3.5 Light Brn moist Silty clay trace course sand		0	12	11379
		2	MC	100%			3.5-3.6 coarse light brown sandstone gravel layer				
8							3.6-6.0 Silty Clay, moist light brown with some sandstone gravel layers		0	12	11643
		3	MC	75%							
12									0	12	12209
12.7		4	MC	100%							
14											
		Refusal @ 12.7'									
							6.0-6.5 - Fine Sand + gravel, moist - lt brown				
							6.5-7.0 - Silty Clay, moist Brown, some sandstone gravel layers.				
							7.0-8.0 - BROWN, Moist, Hard - Clay, trace to some silt, ~~some~~ trace fine sand Some Fine gravel				
	Sampled - GB-060				0-0.5						
					4-6						
					8-10						
					10-12						
							8-10' FINE SAND, moist, Brown, some silt, trace clay				
							10-10.2 - lite brown FINE Sand. trace gravel.				
							10.2-12 - BROWN, WET Silty Fine SAND, some (silt, trace Fine Sand) layers.				
							Refusal @ 12.7				
							12-12.7, wet fine brown sand And Sandstone gravel Refusal on possible sandstone boulder				

16.0
3.5
12.7

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 10-24-03 AM SAMPLES
12174
12203
12147

Ground SURFACE
12360

FD-004. 0-0.5
4-6
8-10
10-12

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-061
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: ~~0~~ 10-23-03 1750	
DATE FINISHED: 10-23-03	
DRILLER: [illegible]	
GEOLOGIST: R. MURPHY	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler
		1	NC	100%			0-1.0. DK BRN - SILTY ORGANIC TOPSOIL, trace c. sand.	Mast	0	10	10786
4							1.0-4.0 MOIST Lt brn silty clay - very moist 2-3' more plastic 2-3' more clay 2-3'				
		2	Mc	100%					0	10	10694
8							3-4' - trace Coarse SAND				
		3	Mc	100%			4-4.8' - (As 3-4)		0	10	10791
12							4.8 - 7.5' - white SANDSTONE GRAVEL INTERLAYERED w/ brown SILT trace to some clay, Dry to moist				
		4	Mc	100%					0	10	11151
16							7.5-8.0 - silty clay grades to silt and fine sand, brown + moist,				
							8.0-10 very wet very fine brown sand and silt.				
							10-12 ~~Grad~~ FINE SAND very moist BROWN Interlayered Silty fine Sands 0.1' thick				
			Sampled		0-0.5		@10.5 → 0.1' thick white sandstone gravel layer				
					4-6						
					8-10		12-16 - BROWN - wet fine - very fine sand trace silt.				
					10-12						

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background
10784
10622
10823

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-062
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-24-03
DATE FINISHED:	10-24-03
DRILLER:	
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.5 - DK BRN moist silty organic topsoil		0	12	11615
4		2	MC	100%			0.5-4.0 - LITE BROWN HARD SILTY CLAY, trace coarse SAND		0	11	11795
6		3	MC	95%			4-6 - SAA 6-8 - ~~SILTY~~ MOIST BROWN SILTY CLAY some coarse sandstone gravel.		0	11	11992
12		~~4~~	~~MC~~				8-9.5 - SAA 9.5-11.5 - WET BROWN FINE SAND - trace gravel - some (silty fine sand layers) 11.5-12 - Silty very fine SAND moist, Brown, some SANDSTONE GRAVEL Refusal @ 12' SAMPLE - 0-0.5 4-6 8-10 10-12				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
12174
12203
12147

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-063-
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-24-03
DATE FINISHED:	10-24-03
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.8 - DK BRN moist SILTY ORGANIC Topsoil		0	11	11677
4		2	MC	100%			0.8-6.0 LIT BROWN moist SILTY CLAY (soft) trace medium SAND HARD (3.0-6.0')		0	11	11627
8		3	MC	100%			6.0-8.0 - Hard, moist silty clay Brown, some f-c sandstone gravel,		0	11	11694
12	12'	4	MC	100%			8.0-8.2 - white Fine Sand moist 8.2-12.5 - INTERBEDDED (0.8' thick) Silty clay and Fine Sandy silt, very moist to wet (in sand) 12.5-13.0 - weathered shale bedrock Refusal @ 13' on weathered shale		0	11	11763

Sample 0-0.5
4-6
8-10
10-12

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
12174
12203
12147

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-064
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-24-03
	DATE FINISHED: 10-24-03
	DRILLER:
	GEOLOGIST: Rob murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	mc	100%			0-0.5 Dk Brn moist silty organic topsoil, trace coal		0	11	12040	11610
4							0.5-3.0 - Lt Brn Silty Clay trace course sand.					
		2	mc	100%			3.0-3.3 - white sandstone gravel. Dry, and fine sand.		0	11	11486	11598
8							3.3-8.0 - HARD moist silty Clay, Brown Some gravel.					
		3	mc	100%	Refusal 10.7				0	11	11668	
							Lt brn - MED SAND - @ (7.8-8.0)					
							Sandstone gravel layer @ ~5.0'					
							8.0-9.5 - Alternating Brown wet Fine Sandy silt, and silt fine SAND					
							9.5-10.5 - Hard moist silty clay and course sandstone gravel.					
							10.5-10.7 weathered Slate Bedrock					
			Sampled -		0-0.5		1st Refusal @ 8.0'					
					4-6		2nd Refusal @ 10.7'					
					8-10							
			Split		0-0.5							
					4-6							
					(Not enough volume for 8-10)							

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background
12174
12203
12147

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-065
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-24-03
DATE FINISHED:	10-24-03
DRILLER:	Dawson
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100			0-0.5 DK. BRN. silty organic topsoil, moist,		0	11	11758
4							0.5-4.0 - Lt Brown moist silty clay soft to 2.0' Hard 2.0-4.0 trace Coarse SAND		0	11	11584
		2	MC	90%							
8							4.0-8.0 - BROWN moist silty Clay, Some (Sandstone gravel, and fine sand)		0	11.5	11956
		3	MC	100%			8.0-9.0 - SAA				
12							9.0-9.5 F GRAVEL - DRY GREY F- Medium SAND -				
							9.5-10.5 - Fine Sand and silt Some gravel moist Lite Brown				
							10.5-12 BROWN FINE SAND (WET), Trace to Some silt,				
							Refusal at 12'				
							Sample 0-0.5 4-6 8-10 10-12				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
12174
12203
12147

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-066
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-25-07
DATE FINISHED:	10-25-05
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.5 Red Brown Silty Clay soft/moist.		0	11	12182
											11965
							0.5-3.0- Light Grey Brown mottled Red. Gravelly Silty Clay stiff, damp to dry				
							3.0-3.9 Light Brown Dry weathered claystone.				
							3.9-4.0 weathered Red Brown Silty ~~Shale~~ fine sandy Shale				
							EOB@4.0'				
							Sampled 0-0.5				
							FD-003 0-0.5				
							1-3				
							FD-003 1-3				

2 RUNS FOR VOLUME

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background | 12201 12153 11702 11711 12000

URS Corporation

GEOPROBE BORING LOG

BORING NO: GB-067

SHEET: 1 of 1

JOB NO.: 11173233.00000

BORING LOCATION:

GROUND ELEVATION:

DATE STARTED: 10-25-03

DATE FINISHED: 10-25-03

DRILLER: Dason

GEOLOGIST: R. Murphy

REVIEWED BY:

PROJECT: SLDA

CLIENT: USACE

BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.5 DK BROWN silty clay organic topsoil		0	11	11484
							0.5-2.5 BROWN moist silty Clay, ~~some~~ trace fine gravel				
							2.5 - 4.0 - Weathered Light Brown dry siltstone some clay layers -				
							EOB @ 4.0				
							Sampled - 0-0.5 1-3				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background

12201
12153
11702
11741
12000

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GD-068.
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-25-03
	DATE FINISHED: 10-25-03
	DRILLER:
	GEOLOGIST: R. Murphy
* POCKET PENETROMETER READING	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	mc	100%			0-0.8- DK BRN SILTY CLAY ORGANIC TOPSOIL, some fine gravel, moist		0	11	11422	
		2	mc	90%			0.8-4.5' BROWN SILTY CLAY moist fine gravel layer 0.1' @ 2.0' and 3.5' 3.0-4.5 - some ~~coarse~~ fine sand		0	11	11864	
							4.5'-8.0' - weathered siltstone/claystone, light brown more competent @ 8.0'		dry			
							Sampled 0-0.5 2-4					

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background | 12201 12153 11702 11741 12000

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-069
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-25-03
	DATE FINISHED: 10-25-03
	DRILLER:
	GEOLOGIST:
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	Mc	90%			0-0.5- DK BRN SILTY organic topsoil,		0	11	11525
							0.5-0.6 COARSE GRAVEL				
							0.6-2.0'- BROWN SILTY clay Some fine gravel moist				
							2.0'-4.0- Dry weathered Light Brown Siltstone to very fine sand.				
							EOB @ 4'				
							SAMPLED 0-0.5 1-3'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 12201
12153
11702
11741
12000

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-070
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 10-25-03	
DATE FINISHED: 10-25-03	
DRILLER: Jason	
GEOLOGIST: R. Murphy	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	ML	100%			0-1.5 - Brown moist silty clay - medium stiff		0	11	11792
							1.5-3.0 - Brown fine sandy silt, some fine coarse gravel				
							3.0-4.0 weathered silt ~~some fine~~ some very fine sand				
							EOB @ 4.0'				
							Sampled 0-0.5 1-3				
							Very hard @ 4.0'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background

12201
12153
11702
11741
12000

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-071
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 11-23-03	
DATE FINISHED: 11-23-03	
DRILLER: JASON	
GEOLOGIST: DOB	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	MC	90%	2 10YR		0-0.5 - DK BROWN ORGANIC silty clay topsoil.		0	11	12323	12530 —
		2	MC	100%	10YR		0.5 - 3.0 - Brown red soft very moist silty clay + fine gravel, F-m sand lore gravel layer @ 3.0'		0	11	12498	12861 —
7.7'							3.0-7.6 Grey brown silty clay medium stiff, moist tr f-gravel (wet .04' interval @ 5.0' trace sand)					
							7.6' - 7.7 Weathered gray brown clayshale, damp in shoe.					
							2nd Refusal 7.9'					
							EOB 7.9'					
							Sampled 0-0.5 FD-008-4-6 4-6 FD-009 6-7.9 6-7.9					
							Also QA split 4-6 and 6-7.9					

Comments:

PROJECT NO. 11173233.00000

BORING NO.

BACKGROUND 12378
11935
12234

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-072
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11/23/03
DATE FINISHED:	11/23/03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	MC	100%	90%		0-0.5-DK BRN very organic silty clay, soft		0	10	1/902	11252
					—		0.5-3.0- Lt Brn med stiff silty clay tr Fgravel, moist					—
	7.3'	2	MC	100%	0%		3.0-6.8-Brown-gray silty clay stiff, moist tr fine gravel and coal. moist (White Sandstone gravel. 6-7-6.8)		0	10	11460	NR
							6.8-7.3-Red (Very weathered silty claystone) silty clay V. stiff moist					
							EOB @ 7.3'					
							Sampled - 0-0.5' 4-6' + QA split 6-7.3' + QA split					
							2nd run to get Additional QA split volume. pushed gravel 4-7.3 No Recovery Still had enough volume from 100% Run to fill 4 containers					

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACKGROUND 12378 11935 12234

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-073.
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-23-03
DATE FINISHED:	11-23-03
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	MC	100%	100%		0-0.5- Very DK Brown very organic silty clay topsoil, moist		0	10	11829	11466
		2	MC	100%	100%		0.5-2.0- Lt Brown silty clay trace m-sand very moist		0	10	11664	11867
7.5'							2.0-6.5- Gray Brown silty clay very stiff moist Reddish @ 5.5' C-sandstone gravel @ 5.0-5.2'					
							6.5-7.5'- Very weathered grey Brown and Red claystone, dry to damp					
							EOB @ 7.5'					
							Sampled 0-0.5 4-6.5					
							AND FD-009- 0-0.5 4-6.5					

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACKGROUND 12378 11935 12234

URS Corporation

GEOPROBE BORING LOG

BORING NO: GB-074
SHEET: 1 of 1
JOB NO.: 11173233.00000
BORING LOCATION: OFFSET 15' due to ACCESS
GROUND ELEVATION:
DATE STARTED: 11-24-03
DATE FINISHED: 11-24-03
DRILLER: JASON
GEOLOGIST: ROB
REVIEWED BY:

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-1.0 Lt Brown - silty clay (soft) some organics (roots.) tr c-sand.	moist	0	10	12627
		2	MC	100%			1.0-1.2 - DK Brown silty clay moist w organic layer soft		0	10	12575
							1.2-3.0 - Lt Brown silty clay Medium Stiff moist				
							3.0-4.0 Red Brown + Gray silty clay, medium stiff moist				
							4-7.3 - SAA, v. stiff				
							7.3-7.5 - Brown v. weathered claystone and f gravel.				
							EOB @ 7.5'				
							Sampled - 0-0.5' 4-6' 6-7.3'				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background | 12283 12621 12653 12579

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-075
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-26-03
	DATE FINISHED: 10-26-03
	DRILLER: Jason.
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler
		1	MC	65%			0-2.0 Dk Red-Lt Brown silty Clay trace coarse Sand. Reworked	Fill	0	17	17292
		2	MC	90%			2.0-2.4 - Dk Brown silty clay (former topsoil) Organic (loam)		0	17	17612
		3	MC	90%			2.4-4.0 - Lt Brown silty Clay, trace coarse sand, very stiff		0	17	17638
							4.0-11.5 As Above some black mottling				
							11.5-11.6 (Refusal on weathered grey claystone				
							EOB @ 11.6				
							Sample - 0-0.5 4-6 8-10 10-12				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 17956

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-076
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	
DATE FINISHED:	
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-4.5 silty clay very stiff brown grey, trace coarse sand, damp		0	14	15317
		2	MC	100%			4.5-8.0 As Above with coarse gravel @ 4.5+6.0' medium stiff 6.5-8.0'		0	14	15086
		3	MC	100%					0	14	15198
							8.0-9.0 Reddish Brown-Grey silty clay medium-soft moist				
							9.0-11.6 very weathered claystone grey some iron staining				
							Sample- 0-0.5 4.6 8-10				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

New Background 15958

Background Area 15[illegible]

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-077
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-27-03
DATE FINISHED:	10-27-03
DRILLER:	Dean
GEOLOGIST:	[illegible]
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
4		1	MC	90%			0-1.0 DK. Brown silty clay some Reddish fill surface moist. very stiff		0	14	15855
4		2	MC	[illegible]			1.0-3.0 Lt brown medium stiff silty clay trace coarse sand.		0	14	15902
14		3	MC	0%			3.0-5.0 Grey brown silty clay very stiff, moist		—	—	—
		4	MC	90%			5.0-7.0 Grey brown silty clay very stiff trace to some very fine sand. Sand to coarse gravel @ 6.0'		moist in very 0	14	15361
							7.0-14' grey brown silty clay very stiff. trace red-purple gravel, moist,				
							8-12 Sample destroyed from attempting to collect 3 times				
							Collected - Samples 0-0.5, 4-6, 6-8, 12-14				

Comments:
Difficulty retrieving 8-12 so [illegible] due to wet rain conditions causing [illegible] pb to slide out of sampling tube
Crammed sample [illegible]
[illegible] to [illegible]

PROJECT NO. 11173233.00000
BORING NO.

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-078
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-26-03
DATE FINISHED:	10-26-03
DRILLER:	Dawson Geo
GEOLOGIST:	[illegible]
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-1.5 - Brown silty clay very stiff, trace c. sand		0	12	14286
		2	MC	100%			1.5-7.0 - Brown grey silty clay, very stiff		0	12	14301
		3 (11)	MC	100%			7.0-9.0 - Brown-Grey silty clay trace coarse sand medium stiff		0	12	14560
							9.0/11.0 - weathered gray siltstone some dark red mottles.				
							EOB @ 11.0'				
							0-0.5 4-6 8-10				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 14134
14374
14656

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-079
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION: —
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 10-26-08 10:40	
DATE FINISHED: 10-26-08	
DRILLER: Jason	
GEOLOGIST:	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler 1st	Fiddler 2nd
		1	MC	90%			0-2.5 - Very stiff moist silty clay		0	12	12881	12863
		2	MC	100%			2.5-5.5 - Gry Brn Damp medium stiff silty clay trace c. sand.		0	12	12871	12965
		3	MC	100%			5.5-5.6 - Red stained [illegible] Sandstone gravel					
							5.5-9.0 - Gray Brown very stiff silty clay damp (f sandstone gravel @ 8.5')		0	12	13173	13362
							9.0-10.5 - Very very weathered lithic [illegible]					
							10.5-17 - Weathered gray clay silt shale very weathered [illegible]					
							Sampled - 0.0-4					
							4-6					
							8-10					

Comments:

PROJECT NO. 11173233.00000

BORING NO.

FD-006 - 0-0.5
4-6
8-10

Background | 12539
12475
12678
12684

Background Piping due to Rain

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-080
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-26-03
	DATE FINISHED: 10-26-03
	DRILLER: JASON - TOSDOWSKI
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	mc	100			0-3.0 - Light brown Silty CLAY trace coarse SAND, stiff Damp		0	12	13917
		2	mc	90%			3.0-8.0 - grey brown stiff silty clay,		0	12	13409
		3	mc	100%			@8' fr-m grained coarse Sandstone gravel.		0	12	14393
							8-10 SAA				
							10-12 light brown dry weathered claystone				
							Sampled - 0-0.5 4-6 8-10				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 80 14134
78 14374
14856

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-081
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 10-26-03	
DATE FINISHED: 10-26-03	
DRILLER: Jason	
GEOLOGIST: R. Murphy	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler 1st	Fiddler 2nd
		1	mc	1st 100%	2nd 100%		0-0.5 - Lt brown moist silty clay, medium stiff.		0	12	~~12209~~ 12229	12209
		2	Mc	100%	100%		0.5-5.0 - Very stiff gray-Brown silty clay moist, trace coarse sand.		0	12	12365	12138
		3	Mc	100%	100%		~~5.0-5.2~~ f-M grained Sandstone gravel Dry		0	12	12309	12253
							5.0-6.0 - Gray Brown very stiff silty clay, damp (some sandstone gravel)					
							6.0-7.0 - Gray very stiff silty clay damp trace coarse Rounded Sand.					
							7.0-8.0 - Gray - w/ Red Brown mottles, Silty clay very stiff. Damp					
							8.0-9.5 - Grey Brown Silty clay dry crumbly like weathered claystone					
							9.5-11.- Lt Brown weathered claystone					
							11.0-12 - Grey weathered claystone/or shale w/ Red iron staining					

Sampled - 0-0.5
4-6
8-10

Plus QA Splits
0-0.5
4-6
8-10

Unweathered

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background
12539
12475
12678
12684

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-082
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10/26/03
DATE FINISHED:	10/26/03
DRILLER:	Jason
GEOLOGIST:	R Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.3 - DK Brown silty organic.		0	12	12326
		2	MC	95%			0.3-10.0 Brown-Grey moist silty clay Very stiff, coarse gravel @ 2.0', 2.2', 6.0'		0	12	12449
		3	MC	100%			changes to Reddish grey from 8-10'		0	12	12362
							10.0-11.0 - Lt brown weathered siltstone/claystone,				
							11.0-12.0 Very weathered grey claystone ~~shale~~, some reddish colors (iron staining.				
							Sampled 0-0.5 4-6 8-10				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
12539
12475
12678
12684

URS Corporation

GEOPROBE BORING LOG

BORING NO: GB-083
SHEET: 1 of 1
JOB NO.: 11173233.00000
BORING LOCATION:
GROUND ELEVATION:
DATE STARTED: 10-26-03
DATE FINISHED: 10-26-03
DRILLER: Sayon
GEOLOGIST: R. Murphy
REVIEWED BY:

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-0.5- Dk Brown silty organic topsoil, underlain by shale pieces.		0	12	12581
4		2	MC	85%			0.5-4.0- moist grey Brown silty clay, trace fine gravel. medium stiff 0.5-1.5 very stiff 1.5-4.0		0	12	12699
8		3	MC	75%					0	12	12678
10.3							~~4.0-4.4 very wet brown silty~~ soft clay,				
							4.0-8.0- very stiff moist silty clay, Grey Brown, Some Dk Red + grey/ [illegible] (Red 5-5.5) (Grey 7.0-8.0) Coarse fine Sandstone gravel @ 4.4-4.5'				
	Sampled				0-0.5 4-6 8-10		8-10.3- (8-8.5- Grey-Dk Red moist very stiff silty clay 8.5-9.5 grey w/ Rusty Red Mottling silty Clay very stiff, moist. 9.5-10.3. Very stiff very hydrated ~~grey~~ claystone grey to Rusty Red.				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Water table @ 0.5' bgs when finished. (from surface water)

Background for 83

	cpm
82	12539
79	12475
81	12678
[illegible]	12681

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-084
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-24-03
	DATE FINISHED: 10-24-03
	DRILLER:
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100			0-0.5- DK BRN silty/organic ~~brown~~ topsoil. Moist ~~trace course sand~~		0	11.5	11900
4		2	MC	90%			0.5-2.0- Brown moist silty Clay trace course SAND,		0	11	11811
8		3	MC	75%			2.0- gray brown Silty Clay, medium stiff		0	11	11694
12							6.0- 7.0- Very stiff - Dry 8-10- Grades to fine sandy clay and 10.0-12.0 ~~Fine S. Silty~~ Fine Sandy Clay - stiff - weathered shale in bottom of shoe,				

Sample
0-0.5
4-6
8-10
10-12

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background for 84 11968
85 11863
86 12055
12044

URS Corporation	GEOPROBE BORING LOG
	BORING NO: SB-085
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-24-07
	DATE FINISHED: 10-24-07
	DRILLER:
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
		1	MC	100%			0-1.0 Brown silty clay moist trace fine gravel, coarse sand, stiff		0	12	11330
		2	MC	100%			1.0 - 10.0 Brown (few gray/green) silty clay very stiff, trace sandstone gravel, trace very fine sand		0	12	11625
		3	MC	100%					0	12	11498
		4	MC	75%			Medium stiff 8-10 - More silty moist		0	12	11824
							10.0 - 12.0 - Transition to brown fine sand. Brown fine silty sand, trace to some clay ~~to clayey sand~~, interbedded with silty clay layers				
							12.0 - 14.0 - Very wet Brown ~~fine~~ clayey fine sand				
							EOB @ 14.				
							Sampled. 0-0.5, 4-6, 8-10, 12-14				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 11968
11883
12055
12044

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	GB-086
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-24-03
DATE FINISHED:	10-24-03
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	60%			0-5.5 Gray Brown Moist silty clay, trace fine angular gravel. Medium stiff, (softer - 4-5.5'		0	11	11483
		2	MC	100%			5.5'-6.5 ~~Hard~~ Very stiff gray brown Damp silty clay, very plastic Some black ~~[illegible]~~ mottles. (possibly organic.		0	11	11648
		3	MC	100%					0	11	12225
							6.5 - 7.0 - Alternating bands of lignite coal or charcoal (trace organics				
							7.0-9.5 Gray Brown silty clay, plastic, stiff moist, Black - vertical seam From 8'-8.5'				
							9.5 - 12 clay stone light brown weathered Dry, crumbly. more shaly @ 12' in bottom of spoon				
							EOB @ 12'				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Fill?

Background 11968
11883
12055
12044

URS Corporation

GEOPROBE BORING LOG

BORING NO: GB-087
SHEET: 1 of 1
JOB NO.: 11173233.00000
BORING LOCATION:
GROUND ELEVATION:
DATE STARTED: 10-25-03
DATE FINISHED: 10-25-03
DRILLER:
GEOLOGIST:
REVIEWED BY:

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	DESCRIPTION: MATERIAL DESCRIPTION	USCS	REMARKS: PID	uR	Fiddler
		1	MC	100%			~~Lt Brown~~ ~~Brown~~ moist stiff silty clay, ~~to~~ some F-C gravel.	FILL	0	11	12286
		2	MC	100%			2-4 - Lt Brown weathered claystone. Dry to Damp some f gravel,		0	11	12157
		3	MC	50%			4-6 - SAA. (Breaks apart to mostly coarse sand size pieces)		0	11	12482
							6-8 - Silty clay stiff Brown-Grey trace to ~~some~~ fine gravel.				
							8-10 - Very wet silty sand.				
							10-11.8 Very stiff silty clay Brown Moist				
							11.8-12.0 very weathered grey shale				
							EOB 12'				
							0-0.5 4-6 8-10 10-12				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background for 87 + 88 | 12836 ppm
12493
12737

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-088
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-25-03
DATE FINISHED:	10-25-03
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	50%			0-0.5 - GREY BROWN silty clay. Some f. c gravel.	FILL	0	11.5	12350
		2	MC	100%			0.5-4.0 weathered shale gravel / silt. loose		0	11.5	12448
		3	MC	100%			4.0-8.0 Light Brown Silty Clay very stiff - moist. ~~today~~ damp some fine gravel. (crumbly)		0	11.5	12436
							8.0-9.5 - F-medium sandy well silt/~~clay~~ BROWN, some clay				
							9.5-12.0 - Light Brown silty clay, ~~very~~ medium stiff. Damp some fine gravel.				
							weathered shale in end of spoon.				
							Sample 0-0.5 4-6 8-10 10-12				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 12836
12493
12737

URS Corporation

GEOPROBE BORING LOG

BORING NO:	CB-89
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	OFFSET 10' N due to Access w/Track Rig
GROUND ELEVATION:	
DATE STARTED:	11-24-03
DATE FINISHED:	11-24-03
DRILLER:	BRIAN FULLER
GEOLOGIST:	RDB
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	SS	30%			0-1 - Dk Brown silty [illegible] very Moist		0	10	12936
		2	SS	75%					0	10	12826
		3	SS	75%					0	10	11505
	6.5 Refusal	4	SS	100%			1-4 - Grey w/ Reddish Brown silty [illegible]		0	10	12338
							Csa debris gravel @ 2' moist				
							4-5.0 SAA Moist				
							5.0-6.2 Grey silty [illegible] dirier and less plastic				
		Sampled 0-0.5 4-6.2					6.2-6.5 Lt Brown very weathered silty clay to claystone Bedrock hard Refusal @ 6.5				

Comments: ADVANCED WITH 8.0 CME TRACK RIG AND 2" SS.
1st Attempt to 6' w/ [illegible] of 4" recovery [illegible]

PROJECT NO.	11173233.00000
BORING NO.	

Standard Background 12716
12689
12642

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	GB-090
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11/24/03
DATE FINISHED:	11/24/03
DRILLER:	BRIAN FULLER
GEOLOGIST:	ROB MURPHY
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	SS	75%			0-0.2 Dk Brn silty clay wet		0	10	12941
		2	SS	90%			0.2-3.0 Dk gray w/Red Brown mottling/streaking. moist silty clay. trace c-gravel.		0	10	13045
		3	SS	75%					0	10	12883
		4	SS	100%			3.0-5.0 Lite gray very plastic w/ red & mottling medium soft, silty clay v moist		0	10	13300
							5.0-5.1 - Dk Red silty clay moist				
							5.1-6.0 - Medium stiff silty clay, grey				
							6.0-6.7 weathered grey claystone. damp.				
							EOB@6.7				
							Sampled - 0-0.5 4-6				

Comments: Advanced with CME 850 TRACK RIG AND 2" split spoons

PROJECT NO. 11173233.00000

BORING NO.

BACKGROUND | 12283
12621
12653
12579

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-091
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-4-03
DATE FINISHED:	11-4-03
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-4 Stiff, Damp Brown-Grey Silty Clay (Some very		0	12	11784
4											
		2	MC	100%			fine sand 2.5-3.0')		0	12	12219
7.2							Sandstone cobble (2.5-2.8)				
							4-6.0' - Brown gray v. stiff silty clay, damp (More clay 4.8-6.0')				
							6.0-7.2 - Very weathered gray claystone, damp				
							EOB@7.2'				
							Sampled - 0-0.5 4-6				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 12641
12553
12616

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-092
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-25-03
DATE FINISHED:	10-25-03
DRILLER:	Jason
GEOLOGIST:	Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-1.5 - DK Brown Silty Clay, moist, Some gravel. (medium stiff) Some coal and shale pieces (wet 1.2-1.5)		0	11	13285
		2	MC	90%			1.5 - Dry to damp light brown Silty Clay, very stiff. greyish @ 4.0'		0	11	13100
		3	MC	90%					0	11	13025
		4	MC	100%			4.0-8.0 - Gray Brown Silty clay - very stiff, Dry Reddish Colors @ 8.0		0	11	13245
							8-11.5 - Reddish grey Silty clay, trace fine gravel, possibly very weathered shale.		Purplish (almost)		
							11.5-13.8 - Reddish Brown very stiff Damp Silty Clay				
							13.8-14 - Very weathered siltstone - light gray brown				
							SAMPLED - 0-0-5				
							4-6				
							8-10				
							12-14				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background | 13319
13478
13439

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-093
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-25-03
DATE FINISHED:	10-25-03
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
					2 Volume		0-0.4 - Dk Brn moist silty organic topsoil.		0	11	13089	2nd 13293
		1	mc	100%	100%	4	0.4 - 4.0 Lt Brown grey silty clay moist stiff, (medium stiff 2.5-3.0) trace fine gravel.		0	11	12815	13240
		2	mc	90%	90%	8			0	11	13521	13264
		3	mc	100%	90%				0	11	13390	13232
		4	mc	100%	12' 100%	14'	4.0-4.1 white medium sand layer.					
							4.1 - 6.0 Stiff moist brown silty clay.					
							6.0 - 7.0 - Medium Stiff Brown moist silty clay					
							7.0 - 8.0 - ~~Fine~~ Sandy silty clay moist Some coarse sandstone gravel. ~~Stiff~~ - medium stiff					
							8-10 - AS ABOVE - except GREY BROWN moist					
		Sampled			0-0.5 4-6 8-10 12-14		10-11.8 - Brown Dry Silt trace clay, trace coarse sand					
							11.8 - 13.0 Very Stiff Dry, grey-Brown silty clay					
							13.0-14 - AS ABOVE But ~~some~~ Dark Red color.					

Comments: 2 Reps For Volume for F.D.

PROJECT NO. 11173233.00000
BORING NO.

2

FD-0035 - 0-0.5
4-6
8-10
12-14

Background for 93 | Cpm
92 | 13319
85 | 13478
13439

URS Corporation

GEOPROBE BORING LOG

BORING NO: GB-094
SHEET: 1 of 1
JOB NO.: 11173233.00000
BORING LOCATION:
GROUND ELEVATION:
DATE STARTED: 10-23-03
DATE FINISHED: 10-23-03
DRILLER: Jason
GEOLOGIST: R. Murphy
REVIEWED BY:

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	70%			0-4- BRN MOIST SILT - trace clay Some f-c shale gravel		0	12	12201
4		2	MC	95%			4-8.0- Reddish Brown moist Silty clay Some fine ~~gravel~~ med sand trace ~~coarse~~ fine gravel		0	12	12350
8		3	MC	60%			10-14- Grey moist to dry shale f-c gravel and sand, loose fill pieces,		0	12	12541
12		4	MC	20%					0	12	12805
14											

Appears to be reworked.

Sampled 0-0.5
4-6
8-10
12-14

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background 12983
12630
12689

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-095
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 10-23-03 955
	DATE FINISHED: 10-23-03
	DRILLER: Jason
	GEOLOGIST: R. Murphy
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	95%			0-3 DK Brn moist mine spoil fill - silt tr clay, some f-c shale gravel.	Fill	0	12	12311
4											
		2	MC	75%			3-~~8~~ - lt Reddish Brown moist silt some clay trace to some ~~of~~ coarse shale gravel		0	12	12335
8											
		3	MC	75%			9-11.5 - Grey Brown Silty clay trace fine gravel		0	12	12442
12		4	MC	100%			11.5 - ~~12~~ 14 Red Brown ~~silt~~ silty clay ~~some clay~~, some fine sand and fine gravel, trace coarse gravel		0	12	12341
14											
			Sampled		0-0.5		Reworked Fill throughout				
					4-6		moist throughout.				
					8-10						
					12-14		Possibly natural @ ~~11.5~~ 9, unlikely due to amount of sand mixed with clay				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 12983
12689
12630

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-096
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-23-03
DATE FINISHED:	10-23-03
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	mc	100%			0-0.5 Dk Brn - organic silty topsoil, tr. clay		0	10	10925
		2	mc	100%			0.5-~~4.0~~ 5.5 Lt Brn silty clay moist, trace fine gravel (clayey silt)		0	10	10744
		3	mc	90%			5.5-7.5 - Lt Brn silt, trace clay some ~~very~~ fine sand ~~trace~~ sandstone gravel @ 5.5, 6.0 and 7.0.		0	10	10683
		4	mc	75%			7.5-8.0 BROWN - silty moist clay, some sandstone gravel, brown		0	10	10770
							8.0 - 9.5 - WET - F-M SAND AND SILT.				
							9.5 - 12 - MOIST ~~LT BRN~~ SILTY CLAY, SOME ~~COARSE~~ SANDSTONE GRAVEL				
							12-12.5 - Wet BRN f-m SAND				
							12.5-14 - Moist Silty clay Some ~~coarse~~ medium SAND → to ~~40~~%				
							SAMPLED	0-0.5			
								4-6			
								8-10			
								12-14			
							- All Natural -				

Comments: Twice over background surface hit could not be replicated, location suspect?

PROJECT NO. 11173233.00000
BORING NO.

Background
12983
12689
12630

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB - 097
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 10-25-03	
DATE FINISHED: 10-25-03	
DRILLER: Dodson	
GEOLOGIST: R. Murphy	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-1.0- Brown silty clay Some coarse gravel		0	11	11868
							1.0-3.8.- Dry crumbly Lt Brown Silt trace clay Some fine gravel (weathered Siltstone)				
							3.8-4.0 Sandy Shale, weathered dry.				
							EOB @ 4.0				
							Sampled - 0-0.5 2-4				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background | 12201 12133 11702 11741 12000

URS Corporation	GEOPROBE BORING LOG
	BORING NO: GB-098
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE / TIME / LEVEL / TYPE	DATE STARTED: 10-25-03
	DATE FINISHED: 10-25-03
	DRILLER: Jason
	GEOLOGIST: R. Murphy
* POCKET PENETROMETER READING	REVIEWED BY:

CAS.	SAMPLER	CORE	TUBE
TYPE			
DIA.			
WT.			
FALL			

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	mc	10%			0-0.5 GRAVELLY SILTY Clay, DK BROWN-MOIST		0	11	11997
							0.5-1.5' - DK Brown MOIST STIFF silty clay trace coarse gravel.				
							1.5-3.0 - Lt Brown silty Clay, some f-c gravel, Moist.				
							3.0-4.0 - weathered Red/Lt Brown ~~clay~~ siltstone/ claystone,				
							EOB @ 4.0'				
							Sampled 0-0.5 1-3'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background | 12201 12153 11702 11741 12000

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-099
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	
DATE FINISHED:	
DRILLER:	
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	90%			0-2.0- Miscellaneous Backfill Coarse-Fine Sandstone gravel. Some clay, some silt Dry. Loose, Shale Pieces		0	10	11935
							2.0-3.9'- Silty Claystone weathered. dry, crumbly				
							3.9-4.0 - Fine Sandy Siltstone				
				0-2	Fill from Road Building?						
							Sampled 0-0.5 1-3.				
							0.0-5 MS, + MSD 1-3 MS + MSD				

2 Runs FOR volume

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background | 12201 12153 11702 11741 12000

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	GB-100
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-23-03
DATE FINISHED:	10-23-03
DRILLER:	Jason
GEOLOGIST:	R. Murphy
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	Mc.	100%			0-1.0 - Dk Brown Very moist Sandy silt, some gravel,		0	11	12351
							1.0-3.0 Lite Brown very Stiff silty clay some f-c siltstone gravel,				
							3.0-4.0 - weathered light Brown Dry ~~Clayey~~ silt~~stone~~ Shale				
							EOB 4.0				
							Sampled 0-0.5				
							1.0-3.0				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background Nearby 100 99 | 12201 12153 11702 11741 12060 cpm

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
GROUNDWATER:	
BORING NO:	GB-101
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-22-03
DATE FINISHED:	10-22-03
DRILLER:	
GEOLOGIST:	R. Murphy
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	60%			0-0.5 - DK Brn silt, trace clay, some coarse gravel (slaglike - pitted)		0	10	12385	RUNS - 2 + 3 on back → while core 0-2- 14786 2-4- 11070
4							0.5-1.5 - as above w/ some C-sand (blue?) and coal.					
		2	MC	90%			1.5' light brown sand (0.1' layer) (markers break in observable rod.					
8							1.6-4.0 - silt trace clay, brown, moist, some shale gravel and coarse sand throughout		0	10	10909	
		3	MC	90%								
12							4.0-8.0 - DK Brn - H Brn moist silt tr. clay some gravel + coarse sand shale pieces. FILL		0	10	10734	
14		4	MC	100								
16									0	10	11340	
							8-12 - As above. thick silt trace clay unit @ 10.5'-12' more moisture 10.5-12'					
							12-15 As above - moist v. moist 14.5-15'					
							SAMPLES COLLECTED:					
							SO-GB-101-0-0.5				11201	
							SO-GB-101-0-0.5 MS				23709	
							SO-GB-101-0-0.5 MSD				21921	
							SO-FP-002-0-0.5				22933	
							0-2, MS, MSD, DUP					
							4-6, " " "					
							8-10 " " "					
							12-14 " " "					

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background
11023
11235
11574

BLIND DUP
MS/MSD

(See back)

URS Corporation

GEOPROBE BORING LOG

BORING NO:	GB-102
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	
DATE FINISHED:	
DRILLER:	
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	90%	Rd Brown		Moist - Rd Brown silt, some clay		0	10	10809
4					DK BRN		0-4 Some gravel (shale + coal) 4-7.5 SAA (moist)				
		2	MC	90%	Lt brn		7.5-8.0 DK grey shale gravel dry		0	10	10885
8							8-10 - As above DK grey shale				
10		3	MC	75%	DK-grey		10-11 As above		0	10	10769
		4	mc	100%	DK grey Hbrn		11-12 - Hbrn silt tr clay some coarse sand and fine gravel shale pieces		0	10	10498
12											
14.7		5	mc	90%	DK grey Hbrn		12-13 - DK grey Shale gravel + sand (dry) 13-14.7 - Hbrn silt, trace clay some shale gravel moist		0	10	10662

Sampled - 0-0.5
4-6
8-10
12-14

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
11023
11255
11374

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	GB-102R
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	10-23-03
DATE FINISHED:	10-23-03
DRILLER:	
GEOLOGIST:	R. Murphy
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
4		1	MC	60%			0-0.5 DK BRN SILT, trace clay, some coarse slag like, pourous gravel	moist FILL	0	12	12562	12624 12603
8		2	MC	90%			0.5-3.0 - BRN silt, trace clay trace f-gravel, trace coal gravel, moist	moist	0	12	12601	
12		3	MC	60%			3.0'-3.2' Light Brown sandlike gravel and fine-medium sand		0	12	1260	
16		4	MC	85%			3.2'-6.0 BROWN moist silt, trace to some f-coarse slate sand. and fine slate gravel.		0	12	12601	
							6-~~12~~ 16 - Light Brown ~~very~~ moist silt, trace to some clay, intermixed f-gravel, trace coarse gravel.					
							~~Possibly natural~~ Reworked - throughout					
							Sampled - 0-0.5, 4-6, 8-10, 12-14 → 18570					
							GROUND SURFACE ~ 3X Background ON FIDDLER 34,000 vs 12,000					

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background.
12983
12630
12689

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	GB-103
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	
DATE FINISHED:	
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

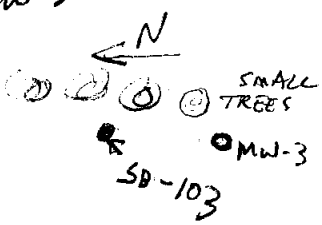
GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY RQD	DESCRIPTION COLOR	DESCRIPTION CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
							Collected 0-6" SAMPLE: SEVERAL FLAT V. FINE GRAINED SILTY SANDSTONE PIECES 2"-10" in max length				
							Soil is Red Brown Silty Clay. (Scans ⓑⓐ background)				
							Elevated Readings in sandstone Rock pieces only!				
							Collected - 0-0.5 Sample				
							FIFTEEN FEET NORTH OF MW-3.				

28822 cpm (2-3x above background)



Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background | 12201 12153 11704 11741 12000

URS Corpor

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	TR-10-001
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11/8/03
DATE FINISHED:	11/8/03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE
				DIA.
				WT.
				FALL
				* POC

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
		1	MC	100%		0-3' - Brown Stiff silty clay Some fine gravel (coal+shale)		0	8	12739
		2	MC	75%		3.0-3.5' - Lt Brown fine sand wet (wet sand)		0	8	12573
		3	MC	60%		3.5-4.0 very stiff brn silty clay some fine-coarse shale gravel		0	8	12674
		4	MC	60%		4-8.0- Stiff BRN SILTY CLAY and med-sand to Coarse gravel sized shale pieces		0	8	12529
		5	MC	60%		8-12- Stiff some wet zone 8.5-9.5' yellow silty clay		0	8	12591
						12-16- Stiff, silty clay and med-f gravel trace c-gravel				
						16-18- f-sand - fine gravel sized shale pieces				
						18-20 - Possible weathered shale bedrock surface grey ver/weathered.				
			Sampled As Soil			0-0.5 4-6 8-10 12-14				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 13188
13088
13034

URS Corpo

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, In
GROUNDWATER:	

DATE	TIME	LEVEL	TYPE	TYPE
				DIA.
				WT.
				FALL
				* PO

SAMP

RO

RING NO:	TR-90-002
EET:	1 of 1
B NO.:	11173233.00000
RING LOCATION:	
OUND ELEVATION:	
TE STARTED:	11-8-03
E FINISHED:	11-8-03
LLER:	JASON
OLOGIST:	ROB
IEWED BY:	

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR 2nd	COLOR 3rd	DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	2nd	3rd
							0-0.3 DK BRN Topsoil silty organic						
		1	MC	85%	95%		0.3-3.8' - BROWN silt/clay stiff to medium, moist some fine shale + coal gravel - trace slag gravel		0	8	12634	12856	13778
		2	MC	60%	100%		3.8-4.1' - Fine lite brn sand very moist.		0	8	12491	12856	13728
		3	MC	60%			4.1'-5.5' - BROWN silty clay stiff moist AND shale c sand + f gravel		0	8	12802		
		4	MC	70%			5.5'-8.0 - shale - silt + c-gravel dry		0	8	12636		
							8.0-12. BRN stiff silty clay some f-shale gravel some c-shale gravel layers						
	Sampled - 0-0.5 4-6 8-10 12-14 For RCRA's Also 4-6 for Full TCLP RCRA PCBs						12-16 - Moist, grey dry shale f-Sand to f gravel, little BRN moist silty clay pockets.						
							16-19 = SAA						
							19-20 - Sandstone f-c gravel.						

Comments:

OJECT NO.	11173233.00000
RING NO.	

2nd Run to 8' for volume

Background
13188
13088
13034

URS Corpor

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
GROUNDWATER:	

DATE	TIME	LEVEL	TYPE	TYPE
				DIA.
				WT.
				FALL
				* PO

BORING NO:	T.. -10-003
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	
DATE FINISHED:	
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	60%	2nd 60%	0-4 Brown silty clay, little fine-medium shale gravel moist, trace coal, medium stiff. trace shale gravel	FILL	0	12	12304	2nd 12584
		2	MC	10%	60%	4-8 - SAA above pushed gravel poor recovery, trace glass - trace scrap metal (tin) + Brick - 2nd run		0	12	12489	12632
		3	MC	20%		8-12 SAA Soil only - No metal/brick/glass		0	12	12283	
		4	MC	60%		12-16 - 12-14 mostly dry loose gr/shale gravel + sand 14-16 - Brown silty clay matrix, with medium sand to coarse shale gravel		0	12	12151	
		5	MC	75%		16-20 - ~~Brown~~ silty clay and fine sand + fine shale gravel. trace coal.		0	12	12719	

Sampled - 0-0.5
4-6
8-12 - Due to low recovery
12-14

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 12711
13064

URS Corpora

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE
				DIA.
				WT.
				FALL
				* POCK

GEOPROBE BORING LOG

ORING NO:	TR-010-004
HEET:	1 of 1
OB NO.:	11173233.00000
ORING LOCATION:	
ROUND ELEVATION:	
ATE STARTED:	11-7-03
ATE FINISHED:	11-7-03
RILLER:	Jason
OLOGIST:	ROB
IEWED BY:	

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	ON	USCS	PID	uR	Fiddler
		1	mc	30%		0-4 Brown - moist silty clay stiff, ~~some~~ little f-c gravel (Shale + Sandstone)		0	12	12103
		2	mc	75%		4-6 - SAA ~~w/ Some Fragment~~		0	12	12571
		3	mc	75%		6-8 - Brown - stiff silty clay moist, Some f-c shale gravel		0	12	12369
		4	mc	50%		Some medium-coarse shale sand.		0	12	12368
		5	mc	60%		8-12 - SAA. mostly c-gravel 11-12 12-16 SAA		0	12	12436
						16-20 - Mostly shale gravel f-c sand (shale - gray)				
						EOB @ 20'				
						Sampled - 0-0.5, 4-6, 8-10, 12-14				

REMARKS

Comments:

OJECT NO. 11173233.00000

RING NO.

Background

12324 12537
12540 12548
12559

URS Corporat

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
GROUNDWATER:	

DATE	TIME	LEVEL	TYPE	TYPE
				DIA.
				WT.
				FALL
				* POCK

BORING NO:	TR-10-005
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-6-03 + 11/7/03
DATE FINISHED:	11-6-03 + 11/7/03
DRILLER:	Jason
GEOLOGIST:	Rob
REVIEWED BY:	

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR			REMARKS	PID	uR	Fiddler	2nd 11/7/03	3rd 11/7/03
		1	MS	95-80%		0-50%		0-4 Brown silty clay + shale f-c gravel to cobble, moist	0	11	12723	12485	12561
		2	MC	90%	70%	60%		4-7.5 - SAA plus trace sandstone gravel, moist	0	11	12653	12102	12280
		3	MC	75%	60%	40%		7.5-8.0 - Dry gray shale gravel and sandy silt.	0	11	12558	12553	12404
								8-12 - SAA					
		4	MC	60%	50%	40%		12-13 - SAA	0	11	12264	12343	12498
		5	MC	60%				13-16 - Lt brown silty clay, some fine sand. Stiff, moist, little shale sandstone and coal. 2% gravel to coarse sand pieces	0	11	12642		
	Sampled			0-0.5				16-18 - Dry gray shale, silt sand + fine gravel.					
				4-6									
				8-10									
				12-14				18-20 - Lt brown medium stiff very moist, silty clay, some f-coarse shale gravel, trace coarse sandstone gravel					

Comments: MS/MSD 0-0.5
MS/MSD 4-6
QA SPLIT 8-10
QA SPLIT ~~8-~~ 12-14

PROJECT NO.	11173233.00000
BORING NO.	

Came back to hole 11-7-03. Ran adjacent borings to collect QA splits + MS/MSDs

Background [illegible] see earlier [illegible] Background 11/7/03 12782 12442 12811

URS Corporati

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
GROUNDWATER:	

DATE	TIME	LEVEL	TYPE	TYPE
				DIA.
				WT.
				FALL
				* POCKE

BORING NO:	TR-010-006
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-6-03 / 11/7/03
DATE FINISHED:	11-7-03 / 11/7/03
DRILLER:	DA SMI
GEOLOGIST:	R OD
REVIEWED BY:	

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CON HA	IAL TION	USCS	PID	uR	Fiddler	2nd
		1	MC	85%	60%		0-4 Brown silty sand, some gravel, some cobbles, trace concrete & sandstone		0	11	12648	12602
		2	MC	20%	50%		4.0' Concrete & sandstone (grey) 4.8' poor recovery concrete, wood (roots) Rotting mine spoils - MOIST		0	11	12581	12083
		3	MC	80%	60%		8-12 - DKBROWN - BROWN - GREY mine spoils ~~sand~~ gravel (slag) lapilli, ANDSTONE + clay matrix - MOIST		0	11	12584	12343
		4	MC	100%	100%		12-13.7 DRY GREY SHALE AND Hematite SANDSTONE GRAVEL, some Brown silty		0	11	12445	12637

Creosote odor inwood @ ~6'

Refusal @ 13.7 + 13.5

will sample as soil borings

Sampled - 0-0.5
4-6
8-10
12-14

Comments: 2nd Run on 11/7/03 to grab dup sample.

PROJECT NO.	11173233.00000
BORING NO.	

TR-FD-001 - 0-0.5
4-6
8-10
12-14

See 11/7/03 background on 005 boring log

Background

12782
12442
12511

URS Corporatio

GEOPROBE BORING LOG

BORING NO:	TR-10-007
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-6-03
DATE FINISHED:	11-6-03
DRILLER:	JASON
GEOLOGIST:	Rob
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE	
				DIA.	
				WT.	
				FALL	
				* POCKET	

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	90%			BROWN- silty clay and Fine-Coarse gravel (shale) - mine spoils		0	11	12862
							Lt Blue slaglike gravel (pitted) at surface.				13208
							trace coal.				12797
							3 attempts, 3 refusals @ 3'				
							Jarred 0-0.5				
							1-3				
							to hold pending decision about hole				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

1st Refusal @ 3Ft
2nd Refusal @ 3Ft

Background 13165
12952

Attempt 1 of 2nd try

URS Corpora

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
GROUNDWATER:	

DATE	TIME	LEVEL	TYPE	TYPE
				DIA.
				WT.
				FALL
				* POC

BORING NO:	TR-010-00[illegible] OFFSET 10'
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-7-03
DATE FINISHED:	11-7-03
DRILLER:	R Murphy
GEOLOGIST:	Jason S
REVIEWED BY:	

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
0-2.0		1	MC	100%		Brown, medium stiff silty clay moist, some fine gravel & coarse sand. Former ground surface dark grass @ 2.0' Dk brown silty clay Refusal @ 2.3		0	12	B197

see try 2

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

1st Refusal @ 2.3'

URS Corpora

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
GROUNDWATER:	

DATE	TIME	LEVEL	TYPE	TYPE
				DIA.
				WT.
				FALL
				* POC

BORING NO:	TR-010-007R OFFSET 10' Try 2
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-7-03
DATE FINISHED:	11-7-03
DRILLER:	JASON
GEOLOGIST:	Ross
REVIEWED BY:	

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY	DESCRIPTION	USCS	PID	uR	Fiddler	2nd	3rd
		1	MC	90%			0-4 Brown silty clay, some shale gravel (f-c), stiff to medium stiff moist trace coal pieces		0	12	13578	12788	13400
		2	MC	100%			4-8 SAA with Sandstone c-gravel at 7.5'.		0	12	12364	12056	12216
		3	MC	75%			8-11 SAA		0	12	12370	12463	12135
		4	MC	50%			11-12 SANDSTONE GRAVEL DRY light bro, fine grained						
		5	MC	35%			12-16 Reddish Brown silty clay stiff moist some shale and fine grained sandstone gravel (f-c)		0	12	12316		
							16-19.5 - Dry moist, fine grained Brown gravel Sandstone some silty clay, brown moist medium soft		0	12	12444		
							19.5-20. - Dark gray wet, weathered shale + silt, + trace coal dust, f sand sized						

Sampled - Ropcs 0-0.5 chemical
4-6
8-10
12-14

Comments:

PROJECT NO. 11173233.00000
BORING NO.

~~not~~ sampled 3 times to get volume

Background
12324 12537
12540 12548
12559

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-10-008
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-6-03
DATE FINISHED:	11-6-03
DRILLER:	Sager
GEOLOGIST:	R. Murphy
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER: CAS. MI UBE

DATE	TIME	LEVEL	TYPE	TYPE	
				DIA.	
				WT.	
				FALL	
				* POCKET	

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	90%			0-3.5 BROWN silty clay, Moist to very moist, some ~~med coarse~~ sand to ~~coarse~~ fine gravel size shale and coal pieces, yellow painted sheet metal, thin guage @ 3.5' 3.5-4.0 more of a sand fill		0	11	12895	
		2	MC	95%					0	11	12552	
		3	MC	90%			4.0-8.0 Moist to Dry Medium grained sand black semi metallic looking shale pellets grade @ 5.5'		0	11	12765	
		4	MC	80%			8-12 Brown silty clay ~~med coarse~~ Moist to ~~Dry~~ gravel, red and gray shale		0	11	12519	
		5	MC	75%			12-16 - As Above - Moist to wet 14.5-15.0 Thick section of ~~slag~~ slag		0	11	12406	
							16-19. Weathered shale thin coal layer @ 16.5' (0.05' thick) Brown to gray weathered shale coal @ 18.0' wet 17-19'					
							Sampled like soil Boring 0-0.5 4-6 8-10 12-14					
							Refusal @ 19.0'					

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 12875 12874 12605

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-010-009
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-6-03
DATE FINISHED:	11-6-03
DRILLER:	Jaron
GEOLOGIST:	Rod
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER: CAS. AMPL UBE

DATE	TIME	LEVEL	TYPE	TYPE	
				DIA.	
				WT.	
				FALL	
				* POCKET PENE	

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	40%			Mine spoils - brown silty clay and shale f-c gravel (black), trace sandstone c-gravel.		0	13	12960	
		2	MC	50%			possible piece of slag @ 4.2' (pitted) slight yellow color) Hot top asphalt.		0	12	13104	
		3	MC	90%			Concrete gravel. One piece @ 4.2' Ran under edge of hole		0	12	12962	
	Rar to 17'	4	MC	100%			Mine spoil Brown silty clay and f-c gravel c-sand		0	12	13182	
17							15.5-17 - Grey to black weathered shale bedrock					
							Wet 16.5-17.0'					
							Very moist 15.-15.5					
							Sampled as Soil boring					
							0-0.5					
							4-6					
							8-10					
							12-14					

No VOCs
No PAD
No [illegible]
Tested [illegible]

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
13383
13285
13223

See background on 010

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-010-010
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-06-03
DATE FINISHED:	11-06-03
DRILLER:	Jason
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE			
				DIA.			
				WT.			
				FALL			
				* POCKET PENE	ROM		IG

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	MC	75%			0-7.5' Brown silty clay medium stiff, some fine to coarse shale gravel + coal dust. trace sandstone gravel. wet (4.5-5.5')		0	12	13314	/ 13030
		2	MC	90%			7.5'-8.0 Grey shale gravel. trace of sand (4.5-5.5)		0	12	13107	
		3	MC	90%			8.0-12 - Brown silty clay moist, stiff, and shale gravel (f-c), some c-sand.		0	12	13287	
		4	MC	60%			12-15' - SAA. Very moist coal dust.		0	12	13179	
17.1		5	MC	90%			15-16 - Weathered Shale mat		0	12	13018	
							16-17.1' - Weathered Shale Bedrock					
							Sampled like Soil boring all mine spoil. No sign of waste.					
							Final Refusal @ 17.1'					

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

18' Refusal @ 5.0' scarred + offset boring

Background
13385
13285
13203

[redacted]

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	TR-010-011
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-5-03
DATE FINISHED:	11-5-03
DRILLER:	JASON-TOJDOWSKI
GEOLOGIST:	ROB MURPHY
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	30%			0-4 BROWN Silty clay stiff moist some shale gravel		0	13	13584
4							4-5 - SAA				
		2	MC	60%			5-8 - Mostly weathered shale mine spoils (grey) dry		0	13	13582
8		3	MC	35%			8-12 BROWN silty clay and weathered shale (gray) some iron staining mine spoils (apparently)		0	13	13623
12		4	MC	75%			12-16 SAA wet 11-12 then Shale (layered in spoon) Fine coal gravel 11-12'		0	13	13684
16.5 Refusal							16-16.5 - Layered Shale bedrock wet - grey, hard, black coal-like layer @ 16.5 Refusal				
							EOB 16.5				
							sampled 0-2.5				
							4-6				
							8-10				
							12-14				
							NO [illegible]				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

1st Refusal @ 2.3' - Screened @ background/offset Background

13778
13500
13027

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	TR-010-012
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-5-03
DATE FINISHED:	11-5-03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPL	TUBE
				DIA.			
				WT.			
				FALL			
				* POCKET PENETR			G

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	50%			0-4 - DK BRN Silty clay Some Shale f-c gravel f-c Sand - mine spoil fill Loose, moist to very moist		0	12	14464
		2	MC	75%					0	13	14281
		3	MC	60%			4-8 - Same As Above IRON stained shale trace C-sand sized coal ~~beer bottle~~ glass @ 8'		0	13	14538
		4	MC	60%			8-12 SAA coarse sandstone @ ~11'		0	13	14558
15.8							12-15.8 As Above Thin clear glass @ 13' - some yellow plastic. Possible Wx Shale 14.5-15.8 But coal dust @ Bottom seems to indicate still in FILL could be Refusal on Possible Bedrock				
		Sampled		0-0.5							
				4-6							
				8-10							
				12-14							
							Refusal @ 15.8				
							will sample like soil boring as per plan				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

14286
14471
14820

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR-01-013
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 11-21-03	
DATE FINISHED: 11-21-03	
DRILLER: JASON	
GEOLOGIST: ROB	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler		
					2	3						2	3
		1	mc	95%	95%	95%	0-4 BROWN Silty Clay VDX / stiff - trace f-gravel (moist) (softer 3-4')		0	9	12255	12255	12044
		2	mc	100%	100%	100%			0	9	11536	12197	11838
	8.8'	3	mc	100%			4-8 BROWN-GREY silty Clay some black flecks, Very stiff, trace fine gravel. Slightly Reddish purple 4.5-5.0' More Grey 7-8 (moist)		0	10	11951		
							8-8.5 - SAA (ie more grey possibly very weathered gray claystone)						
							8.5-8.8 - Shale Bedrock Lite Brown/Grey						
							EOB @ 8.8'						
							Sampled - 0-0.5 4-6 6-8.5'						

RAN 3 times for volume.

4-6 DUP FD-003
4-6 MS/MSD
6-8.5 Full TCLP
RCRA
PCBS

Also FD-0035 6-8.5

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
12414
11704
11897
11711

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR-01-014
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: * SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 11-21-03	
DATE FINISHED: 11-21-03	
DRILLER: JASON	
GEOLOGIST: RAB	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	MC	100%			0-4 BROWN Silty Clay very stiff. Some fine grained coarse sandstone gravel, trace fine gravel.	very stiff	0	9	12357	
		2	MC	100%			4-8 SAA trace shale gravel. (moist to damp 0-8) No cobbles after 6'		0	9	12371	6.9
9.0		3	MC	100%			Some		0	9	12487	9.0
9.5		4	MC	100%			8-9 - ~~TRACE~~ Shale gravel in matrix @ Bottom		0	9	12192	
							9.0-9.5 - Dry Shale Bedrock hard.					
							Sampled 0-0.5 4-6 7-9	Soil				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Back ground | 12414 11704 11897 | 11711

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR-01-015
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-20-03 + 11/20/03
	DATE FINISHED: 11-20-03 + 11/21/03
	DRILLER: JASON
	GEOLOGIST: ROB
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
					2	3						2 3
		1	MC	75%	30%	90%	0.35 Brown-Grey stiff silty clay trace f gravel. ~~(soft ... very moist)~~	FILL	0	10	12238	11762 11705
		2	MC	75%	30%	90%	3.5-8.0 - soft-medium very moist silty clay Brown, trace grey + dark grey layers -		0	10	12625	11893 11550
	11.3	3	MC	100%	100%	100%	8.0-9.5 - Grey Brown Silty clay Soft to stiff (9-9.5) wet to very moist (8-9.0) trace organics trace f. gravel (shale) 9.5-11.3 - Grey to Red Brown weathered claystone		0	10	12295	11426 11957

Soil Sampled - 0-0.5, 4-6, 8-9.5

2 more Runs on 11/21/03 for MS/MSDs 4-6, 8-9.5

EOB @ 11.3'

2nd Refusal 9.9'
3rd Refusal 9.9'

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background

11/20/03	11/21/03
12316	11747
12135	11524
12174	

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-01-016
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-20-03
DATE FINISHED:	11-20-03
DRILLER:	JASON
GEOLOGIST:	ROB MURPHY / JEFF DAY
REVIEWED BY:	

HP ASSIST ER

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
		1	mc	90%			0-4 BROWN-Gray Silty clay, trace gravel stiff to 3' then medium soft moist		0	10	12649
		2	mc	100%					0	10	12039
		3	mc	100%			4-8 BROWN + DARK GREY Silty clay, trace f gravel, trace organics decayed grass @ 6.3' Soft to medium moist		0	10	12673
11.1							8-9.5 Gray Brown soft to medium silty clay, plastic tr f gravel, moist to wet				
		Sampled Assoil 0-0.5, 4-6, 8-9.5					9.5-11.1 weathered Gray claystone w/ reddish purple flecks (lt brown weathered claystone (10-10.5')				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background: 11950, 11619, 11397

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-01-017
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-20-03
DATE FINISHED:	11-20-03
DRILLER:	JASON.
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:				CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE			
				DIA.			
				WT.			
				FALL			
				* POCKET PENETROMETER READING			

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler		
				1	2	3							
		1	mc	95%	100%	80%	0-4- Gray-Brown, Silty clay, trace f. gravel moist very stiff		0	10	12043	12485	12203
		2	mc	95%	0%	100%	4-7.5 SAA more moist soft 4-6. medium stiff 6-7.5 very plastic. 7.5-8.0 - Gray w/reddish weathered claystone		0	10	12209	12090	12461

EOB @ 8.0'

Sampled as Soil.

RAN 3 Times for volume

SAMPLED 0-0.5
4-6
6-8

Plus 4-6 MS
4-6 MSD
6-8 BLIND DUP (FD-002)

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

BACKGROUND

11950
11619
11397

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-01-018
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-20-03 + 11/21/03
DATE FINISHED:	11-20-03 + 11/21/03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
					2		Surface - C-gravel ROAD BASE					
		1	MC	100%	95%		BROWN - w/ pieces of H grey and dark grey silty clay 0-5		0	10	12057	11869
		2	MC	95%	100%		trace fine + coarse gravel trace grey clay more plastic	sandstone	0	10	12129	12025
		3	MC	90%					0	10	12335	
							5-6 - Dk grey silty clay, some organics Decayed wood, plants, pinyl to moist, med soft					
							6-6.1 - DK Blue w/ white flecks - pastelike? grease like.					
							6.1-6.5 - Brown moist red rootsoil silty clay					
							6.5-6.8 - Dk grey silty clay med soft wet.					
							6.8-7.8 BROWN moist silty clay med soft					
							7.8-10.0 Gray w/ Red flecks purple weathered claystone					
							EOB @ 10.0'					
							Sampled as soil 0-0.5 4-6 6-8					

Note only 5-6.1 had any indication of non-soil materials No elevated PID or RAD - so sampled as soil

Collected FD-005 4-6 6-8

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

11/20/03 use bg from TR-01-019 11950, 11669, 11397

11/20/03

SEE Background 11747 from TR-01-018 11524 ON 11/20/03

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-01 - 019
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-20-03
DATE FINISHED:	11-20-03
DRILLER:	JASON
GEOLOGIST:	BOB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
		1	MC	100%			0-2 Dark grey + Brown silty clay medium stiff ⊥. f gravel. Moist		0	10	12476
		2	MC	40%			2-4 Brown med. soft silty clay + Harey f. fig core. moist to very moist		0	10	12365
		3	MC	80%			4-8 Harey + Red Brown very silty clay ⊥ fine sand. Moist medium stiff		0	10	11772
							8-8.5' SAA				
							8.5-9.0 weathered grey clay core.				
							COB 9.0				
							Sampled No Soil				
							0-0.5				
							4-6				
							8-9.0				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

BACKGROUND
11619
11397

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR-02-020
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-19-03
	DATE FINISHED: 11-19-03
	DRILLER: JASON
	GEOLOGIST: [illegible]
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	60%			0-4 - BROWN GRAY stiff silty clay trace fine gravel MOIST		0	12	14861
		2	MC	60%			4-5 SAA 5-6 - DK BRN F. SANDY SILT AND C-gravel		0	12	14863
		3	MC	100%			6-8 Red Brown F Sandy silt and c-gravel grades to silty clay 8-10.2 ~~F~~ Lt Brown silt clay grades into greyish very weathered claystone 10.2-10.7		0	12	15254
							EOB 10.7 Sampled as soil 0-0.5 4-6 8-10.2'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background

14618
14880
14913

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-02-021
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-19-03
DATE FINISHED:	11-19-03
DRILLER:	JASON
GEOLOGIST:	KOB
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	MC	95%	2nd 95%		0-3.5 - Grey-Brown silty clay moist stiff tr. fine gravel		0	12	15722	3rd 14812
		2	MC	50%	50%		3.5-5.1 Grey silty clay v-moist wet to tr. f-gravel. Some organics roots tr. wood tr blue colors		0	12	14776	13[illegible]
		3	MC	—	75%				0	12	—	13571
	12.5'	4	MC	70% →			3rd Run 4.0-8.0 - SAA, 3" piece of ½" dia. wood.		0	14	→	17790
							8-12 SAA, Blue grey wet to v. moist. tr wood.					
							12-12.5 - Multiple layers of thin mil plastic in above matrix (200 cpm w/ Pancake prob)					
							Sampled @ 11-12.5' WASTE					

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 14618 14880 14943 / Pre Lunch

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-2-22
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-19-03
DATE FINISHED:	11-19-03
DRILLER:	SASDI
GEOLOGIST:	RDB
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	Run 2	3
					2nd	3rd	0-3.5 Brown silty clay tr f-gravel stiff c-gravel 1.5'-1.7'						
		1	MC	100%	100%	95%				B	16139	16179	16125
		2	MC	100% (.5')	50%	50%	3.5-4.0 - medgray silty clay soft-medium, moist trace wood.			B	16500	15991	15766
							4.0-4.5 Refusal Run @ 4.5'						
							2nd Refusal 5.8'						
							4-5.8 - SA trace wood metal, gray PVC.						
							3rd Refusal 5.9'						
							4-5.9 SA Previous Runs tr wood						
							(3) Refusal probably due to compact fill material associated with 12"ϕ Corrugated metal drain pipe ~10' N of location						

Sampled as soil 0-3.5 4-5.9 ALSO 4-5.9 MS 4-5.9 MSD

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background

14803
14924
14727

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-02-23
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11/18/03 } Redo 11/19/03 for more volume
DATE FINISHED:	11/18/03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler		
		1	mc	100%/60%		100%	0-5.0- Lite Brown silty clay, trace f. gravel. Moist, stiff. tr c gravel		0	12	14270	15994	15350
		2	mc	60%	100%	75%	5-8- Dk grey (brown and Lite and Blue Red 7-8') silty clay, trace c. sand and f gravel. trace glass		0	12	15725	16679	17021
		3	mc	25%	40%	40%	8-12 glass and white dry Fiber-like material/fibers similar to insulation material Pulls apart in interconnected strands		0	22	41983	17587	17518
	12.9'	4	mc	100%					0	14	16812		
					only 1st run 2 and 3 gray silty clay and some sandstone gravel (very moist) (some plastic)		12-12.9' Dk grey silty clay moist (wet 12.5-12.9) Some organics (roots) trace styrofoam. 400cpm around it. EOB @ 12.9 Sampled - 8-12						
		2nd Run 6" away 3rd Run 6" away from 2nd											
		Runs 2 and 3 For chemical Analysis (Full TCL PCB, RCRA)					2nd hint of elevated readings @ 6' 2nd Run elevated Readings appear in wood (200 cpm on pancake) @ ~10' packed and less recovery 3rd Run - Hint of elevated Readings @ 60' (150 cpm w/ Pancake)						

Comments: Refusal @ 11.5

2nd and 3RD Fiddler readings are throughout soil / possible radon daughter products from waste found in Run #1

PROJECT NO.	11173233.00000
BORING NO.	

Background 11/19/03: 14803, 14924, 14727 Runs-2 and 3

Sampled 8-12 - 49269 cpm (Fiddler) on jar

Background 11/18/03: 14991, 14500, 14365

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-02-024
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-18-03
DATE FINISHED:	11-18-03
DRILLER:	JASON
GEOLOGIST:	ROB MURPHY
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			BROWN-GREY silty clay stiff-ox, medium 2-4, trace f gravel and purplish clasts more grey in color 3-4'		0	12	14133
		2	MC	100%			SAA to 7', trace c-gravel		0	12	14191
		3	MC	60%			7-8.0 - med gray to blue gray silty clay, ~~some~~ trace sand and f gravel. trace wood and wood fibers, possibly very slightly elevated.		0	12	26204
		4	MC	80%					0	12	16512
		Sampled 8-10'					8-12' - Elevated readings on Brown Paper @ 8.0' (~60,000 cpm on Fiddler) Dk grey silty clay wet to 10' (300 cpm on pancake) tr f gravel. One one inch ~~size~~ pebble @ 12'				
							12-14.0 - Dk gray green silty clay medium, moist - very moist trace wood. 14-14.2 - Blue green stained weathered claystone Bedrock. EOB @ 14.2				

wet @ 8'-10'

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 14991, 14900, 14365

Sample jar - 133,447 cpm on fiddler one minute count. 200 cpm on pancake

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR-02-025
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-18-03
	DATE FINISHED: 11-18-03
	DRILLER: JASON
	GEOLOGIST: ROB
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	me	95%			0 Brown stiff, moist Silty clay tr fine gravel		0	12	13987
		2	me	50%			~~3.8~~ DK grey silty clay, tr c-sand 3.8-4.3 tr wood, nail, cinder black rubber tubing and thin mil plastic		0	12	13595
9.5		3	me	100%			4.3-8.0 - Lt Reddish Brown (orangish) Silt clay, stiff, moist Some f grained Sandstone c-gravel. moist		0	12	14073
							8-9.0 - SAA, no c-gravel. Some f gravel. more stiff				
							9.0-9.5 - Lt gray brown very stiff, damp silty clay, very weathered claystone. Pretty compact though, not loose like elsewhere on site.				
							Sampled - 4-6 waste type characteristics - Moderated readings				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 14991 14500 14365

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR-009-26-
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-18-03
	DATE FINISHED: 11-18-03
	DRILLER: JASON
	GEOLOGIST: ROB
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	95%			0-2.0 Gray-red-Brown stiff damp - silty, trace gravel. 2.0-3.5 [illegible] gravel.		0	12	14186
		2	MC	30%			Some silty clay brown stiff moist layers.		0	12	14180
		3	MC	100%			3.5-4.0 reddish BROWN stiff silty clay. 4.0 c. shale gravel.		0	12	14326
	11.4.						4.0-8.0 Dk Grey, Brown ~~stiff~~ medium silty clay, some c. gravel				
							8-10 - Dk gray to gray silty clay soft to medium, slightly wet, trace wood.				
							10-11.4 - Red gray weathered claystone bedrock.				
							8-10. due to wood and color similar to other waste site collected QA split sample for 2nd Rpcs 8-10, Also,				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 14991 14500 14365

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-09-027
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-18-03
DATE FINISHED:	
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler		
					2nd	3rd							
		1	MC	100%	50%	100%	0-1 grey, stiff silty clay moist, tr f-gravel		0	11	14433	14470	14193
		2	MC	100%	50%	100%	1-3.5 Brown stiff silty clay trace f-gravel, moist (reddish 1.0-1.5) tr c. gravel		0	11	14827	14869	149[illegible]
		3	MC	100%	50%	100%	3.5-7.5 grey silty clay tr f gravel, moist soft to medium trace wood fragments (slightly wet 6.5-7.5)		0	High 14 AM 12	15418	15437	152[illegible]
							7.5-8.0 - Lt Brown Silty clay						
							8.0-9.5 grey silty clay trace f gravel. Brown @ 8.5' filter paper exhibits 600 cpm on porcelain probe [illegible]						
							9.5-11.5 - Red gray weathered claystone [illegible] brittle.						
							2nd Run possible, other flat pieces only slightly elevated @ 9.5'						

Sampled 8-9.5 for RCRA Full TCLP RCRA PCBS

Comments:

PROJECT NO. 11173233.00000
BORING NO.

1st Refusal 11.5'
2nd Refusal 11.5' No Recovery after 1.5' packed gravel
3rd Refusal 12.0

Back ground

14991
14527
14365

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-009-028
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-17-03
DATE FINISHED:	11-17-03
DRILLER:	
GEOLOGIST:	
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
		1	MC	100%	100%		0-2.0 - Brown silty clay stiff moist, t. f. gravel		0	11	12915	12993
		2	MC	100%	75%		2.0 - 4.0 - Brown-gray silty clay medium soft, moist, some purplish weathered claystone chips t. f. gravel.		0	11	13064	12921
							4-6.0' Refusal on unknown 1st attempt					
							4 - 4.5 EAA					
							4.5 - 5.5 - Brown dry w/ claystone.					
							5.5 - 6.0 - Dk gray silty clay (Soft) Very plastic, moist, some black fibers. (wood) only a hint of elevated readings, nothing noteworthy					
							went down second time in attempt to recover more usable material.					
							2nd attempt 6.0 - 7.8' (PID 5.5-6.0) - Refusal on unknown.					
							Sampled 5.5 - 7.8'					
							2nd Refusal 7.8'					

Comments:
35 LEL directly over hole, 0 in BZ 0 over core, probable methane soil gas.

PROJECT NO.	11173233.00000
BORING NO.	

Background
12210
12261
12292

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-03-029
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-17-03
DATE FINISHED:	11-17-03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	
		1	MC	95%	100%		0-4 Stiff, moist, Red Brown, silty clay trace organics (roots), trace f-gravel (sandstone) (slightly grey 3-3.5') (c-sandstone gravel 1-1.1')		0	11	13036	12962
		2	MC	10%			4-8 poor recovery SAA, 1st Run Pushing c-gravel? 2nd Run SAA, trace glass @ 9.0'		0	11	12825	12696
		3	MC	75%	~ plus 1-Foot Stuff from (4-7')		8-9 SAA - trace organics	soft	0	11	12641	
							9-10 - DK Red to light grey weathered claystone bedrock					
							2nd Run to 8' for additional recovery					
							Sampled 0-0.5 4-6 7-9'					

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background

12210
12261
1-292

URS Corpo ic

GEOPROBE BORING LOG

PROJECT:	SLDA	BORING NO:	TR-08-030
CLIENT:	USACE	SHEET:	1 of 1
BORING CONTRACTOR:	SJB Services, In	JOB NO.:	11173233.00000
GROUNDWATER:		BORING LOCATION:	
		GROUND ELEVATION:	
		DATE STARTED:	11/8/03
		DATE FINISHED:	11/8/03
		DRILLER:	JASON
		GEOLOGIST:	ROB
		REVIEWED BY:	

DATE	TIME	LEVEL	TYPE	TYPE
				DIA.
				WT.
				FALL
				* PO

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	DESCRIPTION	USCS	REMARKS PID	REMARKS uR	REMARKS Fiddler
		1	MC	80%		0.1' topsoil - 0.1 → 4.0 - BRN silty clay, stiff, moist, dark, medium plasticity trace c-sand and c-gravel (shale)		0	10	11167
		2	MC	90%		4.0 - 6.5 - SAA very moist 6.0-6.5		0	10	11127
		3	MC	100%		6.5 - 8.0 - BRN silty clay very moist trace f-gravel (shale) soft		0	10	11257
		4	MC	100%		8-12 - silty clay, brown, soft to medium stiff, little gray @ 11-11.2, slightly more plastic, trace fine-medium gravel.		0	10	11352
		5	MC	? unknown 100%?		12-16 - SAA - very soft @ 15-15.3' light pink, some greyish mottling - slightly more silty @ 15.5-16.0		0	10	11447
	? Methane pocket?					16-16.7 (Refusal) Hard @ 16.0' hand dipped to 16.7', refusal SN unknown. Pressure built up in hole. blowout sorbent sock. Macrocore pulled. Peak Readings over hole 126ppm CO, 100 LEL, 1.2 VOC (moisture?), 3 H_2S, 9.1 oxy %				

Macro core full of stiff clay. Same material as before a little bit of coal in shoe. went down for additional sample came up wet and 100% LEL and 2 instances (2.4 VOC's) discharges following cutting of macrocore. } methane?

Comments:

PROJECT NO. 11173233.00000

BORING NO.

16-16.7 - clay is very tacky! sticky

WATER BUBBLED UP OUT OF HOLE WHE PULLING UP 2ND TIME (Plunger effect)

Although No Rad evident and not apparently waste, sampled for Tuesday, RQPC's 14-16 and chemical analyses 16-16.7'

TBA 130034

URS Corpo.

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, In
GROUNDWATER:	

DATE	TIME	LEVEL	TYPE	TYPE
				DIA.
				WT.
				FALL
				* P

RING NO:	TR-007-031
EET:	1 of 1
B NO.:	11173233.00000
RING LOCATION:	
ROUND ELEVATION:	
TE STARTED:	11-9-03
E FINISHED:	11-9-03
LER:	JASON
LOGIST:	RDB
IEWED BY:	

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	N	USCS	PID	uR	Fiddler	REMARKS
		1	MC	75%				0	11	11754	
5.3'		2	MC	50%				0 ppm	11	11698	

0-4- BRN stiff, moist silty clay some gravel (f-m)

4-5 SAA WET
5->5.3 Black fibrous material/waste. rank odor

Refusal @ 5.3'
2nd Attempt Refusal @ 3.7
3rd Attempt Refusal 5.6'

Soil VOCs checked in ziplock bag
19729 WAS 75

2nd attempt SAA 1st boring w/ little 1/4" wood @ 2'. 11951 cpm on fiddler, 100% recovery. } 0 VOC

3rd attempt
0-4 SAA - 90% recovery, 11697 cpm on Fiddler
4-5.6' - 30% Recovery, 12521 cpm on Fiddler. } 0 VOC
Fine grained Sandstone gravel/wet underlain by Brown-grey wet Silty Clay. no visible waste, some c-SAND - Fine gravel. } 0 VOCs

Sampled representive 3.5 - 5.5 from 3 macro cores along with waste material to achieve sample volume requirements from lab.
ONLY ONE JAR DUE TO LOW recovery of waste.
No DUPS Done HERE

Comments:

OJECT NO.	11173233.00000
RING NO.	

Sample-JAR- 20420 cpm from bottom
11311 cpm from top.

Background 11665
11482
11364

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR007-032-
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-09-03
	DATE FINISHED: 11-09-03
	DRILLER: JASON
	GEOLOGIST: Doz
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	50%			0-5.0 BROWN - damp very stiff silty clay, some f-c gravel.		0	11	11378
		2	MC	60%			5.0-7.8 BROWN medium stiff silty clay, tr-some f gravel		0	11	11352
		3	MC	25%			8.0-13.0' BROWN silty clay tr c-sand to f-gravel, moist, soft-medium		0	11	105885
14.8'	refusal	4	MC	10%			13.0' - black hair-like fibers and possible cigarette wrapper red "W" on white background (Winston?) trace wood @ 13.5'		0	11	11600
							13'-14.8' - grey-brown wet silty clay, slight blue green (13-14.0') tr f-gravel.				
		Sample -		0-0.5			Refusal on unknown —				
				4-6							
				8-10							
				12-14			Appears mostly [illegible] trench waste sampled as Soil Boring. waste item's probably from backfilling activities				

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 11600 11482 11364

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-007-033
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-9-03
DATE FINISHED:	11-9-03
DRILLER:	JASON
GEOLOGIST:	Rob
REVIEWED BY:	

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.

GROUNDWATER:				CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE			
				DIA.			
				WT.			
				FALL			
				* POCKET PENETROMETER READING			

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
					2nd							2nd Run
		1	mc	85%	100%		0-2.0 - Red Brn Silty clay stiff - damp. trace c-gravel.		0	11	11107	11365
					—							—
		2	mc	60%	50%		2.0-4.0 - Brown Silty clay, soft-medium some sandstone c-gravel some f. rounded gravel,		0	11	11305	11196 By w/ pancake
		3	mc	33%	25%							—
					—				0	11	17500	11360
							4-7.5 - wet silty clay Soft some m-c sand.					
							7.5-8.0 - Black [illegible] on top of wood Fiber board possible roofing material. (NON RAD)					particleboard
							8-9.7 - Brn silty clay wet (NON RAD) and wood fiberboard (RAD)					
							2nd Refusal @ 11.8' 8-11.8 - Lbrown silty clay wet, some f-m sand. (No wood) (No RAD)					
							Sampled 8-11.8' [illegible] of 2nd Run (one jar)					
							Following pulling 9.7' screen surface @ hole w/ quadgas 11.5 VOCs, 34 CO, 100 LEL 3 H_2S					
							Following other run, 6 inches away 129 ppm VOCs					

Comments: No elevated PID readings for cores themselves

PROJECT NO.	11173233.00000
BORING NO.	

Wood @ 8-9.7' reads 1600 cpm with pancake probe

Rad traceled in water

Background 11665
11482
11364

Revisit hole for chem samples

URS Corporation

GEOPROBE BORING LOG

		BORING NO:	TR-007-033
PROJECT:	SLDA	SHEET:	1 of 1
CLIENT:	USACE	JOB NO.:	11173233.00000
BORING CONTRACTOR:	SJB Services, Inc.	BORING LOCATION:	
GROUNDWATER:		GROUND ELEVATION:	
		DATE STARTED:	11-22-03
		DATE FINISHED:	11-22-03
		DRILLER:	JASON
		GEOLOGIST:	ROB
		REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler		
				1	2	3							
		1	mc	100%		60%	SEE ORIG LOG FOR Description.		0	12	14867	11900	14764
		2	mc	60%		20%	0-4 SA 1st log 4-8 Brown sandy clay mod. stiff [illegible] trace f-gravel and c-gravel		0	12	14700		14783
		3	mc	2%		10%			0	13	17164		20577
		4	mc	4"/46" ~10%		20%	8-12. only Recovered one 2.5" piece of ~~pressed~~ fiberboard possible roofing material (1100 ppm on probe) wet		0	16	61560		
							12-15.8 Additional [illegible] drilling, wet with [illegible] Clay. 10,000 ppm w/ [illegible]						

3rd [illegible] 8.12ft recovered [illegible] paper fiberboard, wood, paper and very wet [illegible] sand silt. 2 wet [illegible] pieces plastic thick

2nd refusal @ 2.0'
3rd Refusal @ 12.5'

Due to higher Rad readings took bottles Rad waste and jarred for

slightly elevated 7-10 LEL readings throughout hole @ 8.0' and beyond could be methane gas

Comments: Possible analysis - 8-15.8' put in jar
Also jarred 8-12 for Full TCLP
and 6-8 for PCBs + RCRA

PROJECT NO. 11173233.00000
BORING NO.

BACK GROUND
14794
12915
13995

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR-07-034
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE TIME LEVEL TYPE	DATE STARTED: 11-9-03
	DATE FINISHED: 11-9-03
	DRILLER: JASON
	GEOLOGIST: ROB MURPHY
* POCKET PENETROMETER READING	REVIEWED BY:

TYPE	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler
		1	ML	100%			0-4 BRN SILTY CLAY very stiff trace fine gravel. Coarse shale gravel layer @ 2.0'	damp	0	11	11566
		2	MC	20%			4-8 BRN silty clay, some coarse gravel. (sandstone + shale) stiff,	damp	0	11	11240
10.9		3	MC	33%			8-10.9 wet Brn silty clay - BROWN gray - some red sand to fine gravel. apparent weathered shale in shoe.		0	11	11363
							EOB @ 10.9				
							Sampled - 0-0.5' 4-6' 8-10.9'				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 11665 11482 11361

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR-006-035
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED: 11-10-03
	DATE FINISHED: 11-10-03
	DRILLER: JASON
	GEOLOGIST: ROJ
	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	mc	100%			0-4 Brown stiff - very stiff silty clay, some fine grained sand, some gravel (fill)		0	11	12682
		2	mc	50%			4-8 SAA, some gravel. wet 7-8'		0	11	12658
		3	mc	50%			8-10 - SAA 10-12 [illegible] clay stone bedrock		0	11	12467
							EOB @ 12.0'				
							No elevated VOC/uR/LO measured at TS Observed [illegible] and 10C				
							Sample [illegible] soil boring				
							0-0.5				
							4-6				
							8-10				

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 12537
12404
12516

URS Corporation	GEOPROBE BORING LOG
	BORING NO: ~~SB~~-TR-006-36
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE / TIME / LEVEL / TYPE	DATE STARTED: 11-10-03
	DATE FINISHED: 11-10-03
	DRILLER: JASON
	GEOLOGIST: ROB
* POCKET PENETROMETER READING	REVIEWED BY:

TYPE	CAS.	SAMPLER	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	100%	100%		0-4- ~~BROWN~~ Brownish Grey stiff silty clay trace fine gravel. moist.		0	11	12644	12392
		2	MC	60%	50%		4-8- wet brown medium to SOFT tacky silty clay Some fine gravel to sand.		0	11	12538	12298
8.7 Refusal		3	MC	100%	60%		8-8.7 SAA / Coarse Sand & fine gravel In Shoe capped Refusal @ 8.7'		0	11	12497	12086
							EOB @ 8.7					
							8-11.2 - wet brown soft silty clay tacky Some fine gravel to medium sand.					
				2nd attempt Refusal @ 11.2'			Sampled as Soil Boring					
							0-0.5					
							4-6					
							8-~~8.7~~ 11.2'					
							Also collected SO-FD-TR-004-0-0.5					
							SB-FD-TR-004-4-6					
							SB-FD-TR-004-8-~~8.7~~ 11.2'					

Comments:

PROJECT NO. 11173233.00000

BORING NO.

Background 12537 12404 12316

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR-006-37
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE started: 11-10-03	DATE STARTED: 11-10-03
DATE finished: 11-10-03	DATE FINISHED: 11-10-03
DRILLER: JASON	DRILLER: JASON
GEOLOGIST: Ramnuva Ahly	GEOLOGIST: Ramnuva Ahly
REVIEWED BY:	REVIEWED BY:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler
		1	MC	100%			0-4 Brown silty clay + trace Coarse-fine sandstone gravel. (Slightly soft, 30-45%)		0	11	12146
		2	MC	60%			4-8 Brown-Grey silty clay soft, moist trace sand.		0	11	12036
		3	MC	90%			8-12 SAA - medium stiff - moist		0	11	12207
		4	MC	20%			12-15.7 SAA - moist + soft.		0	11 soil	23247
		5	MC	100%			15.7-16.0 - Brown + white multilayered paper, possible filter or laminated cardboard. ~~Lamin Board~~ Wood Fiberboard 10,000 cpm on paper		0	17 paper	13208
18							16-17.8 Blue Green-Grey silty clay, wet.				
							17.8-18 IN Shoe appears like weathered brown dacstone.				
							Refusal at 18'				
							2 "hotspots" in stuff in 16-18 core - in Blue green wet silty clay and fine sand. (400 cpm on paper				

(Sampled 15-16)

Comments: Noticed methane gas coming out of hole after 16' - LEL 100%. Logs 0, indicating a possible methane gas. Not observed in Breathing Zone

PROJECT NO. 11173233.00000

BORING NO.

Background 11383 11202

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-06-037 FOR Chem
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11/22/03
DATE FINISHED:	11/22/03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	100%			0-3.5 Brown silty clay trace f-c gravel. stiff		0	12	14178	
		2	MC	90%			3.5-8.0 Dk gray-brown silty clay - moist, medium soft		0	12	13948	
		3	MC	75%			8-11.8' - SAA		0	12	14164	waste 17000 - 18000
		4	MC	60%			11.8'-12.0 WASTE Plywood like Fiber board. 800cpm on pancake black greaselike material with wood.		0	1	15788	waste 22->23000
		Sampled Representative 11.8-16' For Chemical Full TCLP PCBs RCRA					12-13 WASTE thin Plastic and wood wet some f-M sand	800cpm pancake				
							13-15 Lt Brn silty clay stiff, moist					
							15-16 Green "Stained?" weathered claystone Bedrock					

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background

13297

URS Corporation	GEOPROBE BORING LOG
	BORING NO: TR-06-038
PROJECT: SLDA	SHEET: 1 of 1
CLIENT: USACE	JOB NO.: 11173233.00000
BORING CONTRACTOR: SJB Services, Inc.	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
DATE STARTED: 11-10-03	
DATE FINISHED: 11-10-03	
DRILLER: JASON	
GEOLOGIST: ROB	
REVIEWED BY:	

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	mc	100%			0-4- BRN-GREY STIFF SILTY clay - damp. trace fine gravel.		0	11	11743
		2	mc	75%			4-5' SAA 5'-5.5' Black staining and trace glass fragments.		0	11	11817
		3	mc	70%			5.5'-8.0' greybrown silty clay trace coarse sand and fine gravel.		0	11	11811
		4	mc	60%			8.0'-12' wet BROWN GREY SILTY clay - Soft, slightly more silt, trace fine gravel + c-sand		0	11	11922
		5	mc	100%			12-15- wet Brown-grey Soft silty clay. trace fine gravel + c-sand 15' (Some f-C-gravel 15-16' IN silty clay as above) moist		0	11	12563
							16-17. SAA wet. sandstone c-gravel, 17.-17.6- Blue green Dry silt and wet black feltlike fibers. 150 cpm on pancake probe one piece ~1" sized very thin tin/metal ~ clear trace wood chips				

Sampled TR-006-038-16-17.6' ONLY

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background 11383
11202

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR-04-39
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11/11/03
DATE FINISHED:	11/11/03
DRILLER:	CASON
GEOLOGIST:	DOB
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler
		1	MC	100%			0-4 Brown silt, some sandy clay, trace gravel (Geyadsoller 3-3.5')		0	10	11113
		2	MC	30%			4-8 SAA Moist/very moist @7.5' some reddish colors.		0	10	11456
	9.3 refusal	3	MC	75%			8-8.5 SAA, wet. 8.5-9.3 Blue green silty clay, trace fine sand, trace gravel		0	10	11577
							EOB @ 9.3				
							Similar color as matrix of waste in TR-04-40. So sampled as Tr waste (8-9.3')				
							No elevated readings observed.				

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Backgrounds
10230
10360
10651

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	TR-4-040
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-11-03
DATE FINISHED:	11-11-03 / 11/12/03
DRILLER:	CASON
GEOLOGIST:	[illegible]
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler		
					2nd	3rd						2nd	3rd
		1	mc	90%	30%	75%	0-3.5 Brown silty clay, stiff to f. some c - sandstone gravel (fine grained)		0	10	11087	10093	10571
		2	mc	100%	10%	60%	3.5-9.0 Tan green to grey brown silty clay, stiff, damp trace some f-m sand.		0	10	11083	10207	10273
		3	mc	30%	30%	30%							
	Refusal	4	mc	90%	60%	50%	9.0-11.8' - Brown silty clay wet soft.		0	10	12069	10920	11012
11.4	Refusal						Fine white and red paint chips and white paint chips, fine flakes flat, egg shell like.		0	10	13358	11112	10665
		2nd Run - 12-11-03 - SA Run #1					11.8-13.0 - Black green silty soft clay. Some paint chips and black fibers (wet)						
							13-14.4 - Grey brown moist, weathered clay stone bedrock.						
		Black fibers + Plastic and Purple wood, wet. Purple wood (250cpm on porous 450cpm bg)											
							EOB 14.4'						
							Sampled - 11-13.0'						
		3rd Run Plastic wood + [illegible] Refusal @ 12' Not [illegible] on [illegible] lake					2nd Refusal 14.8' 3rd Refusal 13.2'						

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

11/11/03 Background 10230 10360 10651

Came back to hole 11-12-03, 2 more runs for chemical analysis

Background for Runs 2 + 3 Monitor Probe 11 10938 0/12000

8868 9116 8750 9586

URS Corporation

GEOPROBE BORING LOG

BORING NO:	TR 05-41
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-11-03
DATE FINISHED:	11-11-03
DRILLER:	JASON
GEOLOGIST:	Rob Murphy
REVIEWED BY:	

PROJECT: SLDA
CLIENT: USACE
BORING CONTRACTOR: SJB Services, Inc.

GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE				
				DIA.				
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	SAMPLE STRATA	NO.	TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler		
		1	MC	100%	2nd 100%	3rd 75% 4th 100%	BROWN silty clay some f-c sandstone gravel Stiff		0	10	11036	10120	3rd 10587
7.7 Refusal		2	MC	55%	40%	30%	3-4 - DLUE green grey silty CLAY stiff, damp trace medium sand some coarse sand, 4-7.7 SAA wetter and softer @ 6.5' — 7.7' EOB @ 7.7' 2nd Refusal @ 7.5' 3rd Refusal @ 8.0' 4th Refusal @ 8.0'		0	10	11184	10123	10586

Sampled as soil boring
0-0.5
4-6
6-7.7

Sampled For Full TCLP/RCRA/PCBS 6-8.

applied water during drilling of hole (LEL on 4 gas meter)

Comments:

PROJECT NO. 11173233.00000
BORING NO.

Background
10674
10825
10809

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	TR-05-42
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-11-03
DATE FINISHED:	11-11-03
DRILLER:	Fraser
GEOLOGIST:	POD
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	PID	uR	Fiddler	REMARKS
		1	MC	60%			0-4 BROWN silty clay, stiff, Some fine grained Sandstone gravel and cobbles, trace -c- sand		0	10	11520	
		2	MC	40%			4-7 DK Grey silty clay moist stiff		0	10	11559	
		3	MC	75%			7-8 Sandstone gravel and gray brown silty clay		0	10	11615	
			10.6	refusal			8-9.5 Brownish gray silty moist Some fine grained sandstone & gravel.					
							9.5-10.6 Blue green silty clay moist, soft.					
							Refuse on something hard.					
							Sampled as Soil 0-0.5, 4-6, 8-10.6					

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

Background
10674
10825
10809

URS Corporation

GEOPROBE BORING LOG

PROJECT:	SLDA
CLIENT:	USACE
BORING CONTRACTOR:	SJB Services, Inc.
BORING NO:	TR-05-043
SHEET:	1 of 1
JOB NO.:	11173233.00000
BORING LOCATION:	
GROUND ELEVATION:	
DATE STARTED:	11-11-03
DATE FINISHED:	11-11-03
DRILLER:	JASON
GEOLOGIST:	ROB
REVIEWED BY:	

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE				
				DIA.				
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	RECOVERY RQD	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS PID	uR	Fiddler	
					2nd		0-0.2 - Dx 2RH topsoil/organic Moist					2nd
		1	MC	60%	60%		0.2-4.0 - Brown silty clay		0	10	10858	
							layering Some c-sandstone					11188
		2	MC	90%			Damp gravel. tr-f gravel.					
									0	10	11215	
							4-4.9 - Brown silty clay/clay					
							medium to fine gravel.					
							(Wet)					
							grey/blue @ 4.8-4.9'					
							Refusal @ 4.9'					
							2nd Run Refusal @ 3.9'					
							Moist brown silty clay					
							and [illegible]					
							[illegible] wet @ 3.5'					
							Offset [illegible]					
							[illegible]					
							Sample [illegible] 1-3.9'					

Comments:

PROJECT NO.	11173233.00000
BORING NO.	

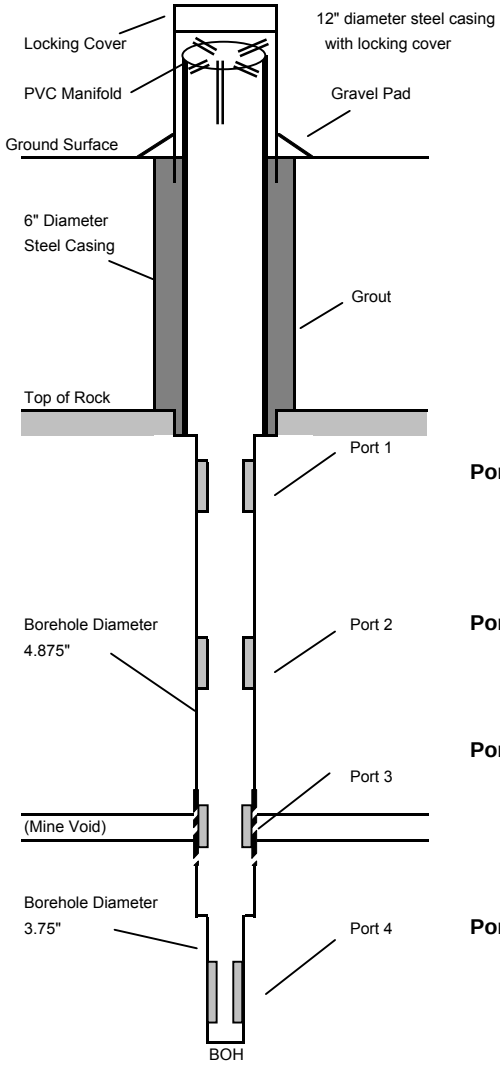
Background [illegible]

APPENDIX D

MONITORING WELL CONSTRUCTION DIAGRAMS

AS BUILT MONITORING WELL RECORD

HOLE NUMBER:	**NWS-01A**	**LOCATION:**	**N 474446.87**	**DRILLER: SJB Services, Inc.**
PROJECT: Shallow Land Disposal Area			**E 1460062.14**	**DRILL METHOD: 8.25" ID HSA**
DATE WELL COMPLETED:	**11/21/03**	**ELEVATIONS (FT AMSL)**		**and HQ Rock Core Barrels**
DATE DEVELOPMENT COMPLETED	**12/03/03**	**GROUND SURFACE:**	**929.1 ft**	**TYPE OF WELL:**
URS INSPECTOR:	**S. Nozik**	**TOP OF MANIFOLD:**	**931.57 ft**	**FLUTe Flexible Liner Well**



NOT TO SCALE

	TYPE OF MANIFOLD:	PVC Cap
	I.D. OF SAMPLE TUBE:	3/16"
	TYPE OF SAMPLE TUBE:	PVDF
	I.D. OF GAS TUBE:	1/2"
	TYPE OF GAS TUBE:	PVDF
	TYPE OF PORT:	Single Port
	TYPE OF GROUT:	Cement/Bentonite
	TYPE OF OVERBURDEN CASING:	Steel
	I.D. OF OVERBURDEN CASING:	6"
	DEPTH TO BOTTOM OF CASING:	21.5'
	DEPTH TO BOTTOM OF TEMPORARY 4" CASING:	126'
Port 1	SCREENED PORT INTERVAL:	38' to 48'
	PORT OPENING:	43'
Port 2	SCREENED PORT INTERVAL:	54' to 64 '
	PORT OPENING:	59'
Port 3	MINE VOID	97.4' to 102.3'
	SCREENED PORT INTERVAL:	97' to 104'
	REINFORCED INTERVAL:	92' to 109'
	PORT OPENING:	103'
Port 4	SCREENED PORT INTERVAL:	155' to 170'
	PORT OPENING:	162.5'
	BOREHOLE DIAMETER:	4.875" and 3.75"
	BOTTOM OF HOLE:	176'

Measuring Point Elevations
(Top of Tube Ports above PVC Manifold)

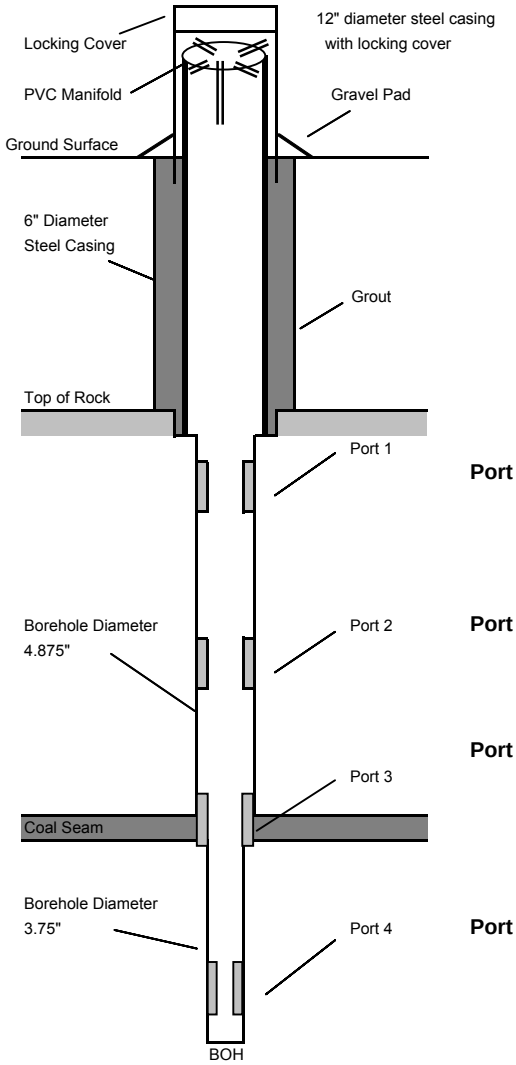
Port	Elevation
1	932.02
2	931.92
3	931.90
4	931.97

USACE - Buffalo District

PROJECT: **Shallow Land Disposal Area (SLDA)**	**HOLE NO.:** **NWS-01A**

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: NWS-02	**LOCATION:** N 473976.39	**DRILLER:** SJB Services, Inc.
PROJECT: Shallow Land Disposal Area	E 1461147.31	**DRILL METHOD:** 8.25" ID HSA
DATE WELL COMPLETED: 11/23/03	**ELEVATIONS (FT AMSL)**	and HQ Rock Core Barrels
DATE DEVELOPMENT COMPLETED 12/19/03	**GROUND SURFACE:** 943.3 ft	**TYPE OF WELL:**
URS INSPECTOR: S. Nozik	**TOP OF MANIFOLD:** 946.35 ft	FLUTe Flexible Liner Well



NOT TO SCALE

	TYPE OF MANIFOLD:	PVC Cap
	I.D. OF SAMPLE TUBE:	3/16"
	TYPE OF SAMPLE TUBE:	PVDF
	I.D. OF GAS TUBE:	1/2"
	TYPE OF GAS TUBE:	PVDF
	TYPE OF PORT:	Single Port
	TYPE OF GROUT:	Cement/Bentonite
	TYPE OF OVERBURDEN CASING:	Steel
	I.D. OF OVERBURDEN CASING:	6"
	DEPTH TO BOTTOM OF CASING:	40.0'
	DEPTH TO BOTTOM OF TEMPORARY 4" CASING:	125.5'
Port 1	SCREENED PORT INTERVAL:	45' to 55'
	PORT OPENING:	50'
Port 2	SCREENED PORT INTERVAL:	75' to 85'
	PORT OPENING:	80'
Port 3	COAL SEAM	118.6' to 123'
	SCREENED PORT INTERVAL:	118' to 125'
	REINFORCED INTERVAL:	none
	PORT OPENING:	124'
Port 4	SCREENED PORT INTERVAL:	145' to 155'
	PORT OPENING:	150'
	BOREHOLE DIAMETER:	4.875" and 3.75"
	BOTTOM OF HOLE:	177'

Measuring Point Elevations
(Top of Tube Ports above PVC Manifold)

Port	Elevation
1	946.53
2	946.50
3	946.49
4	946.75

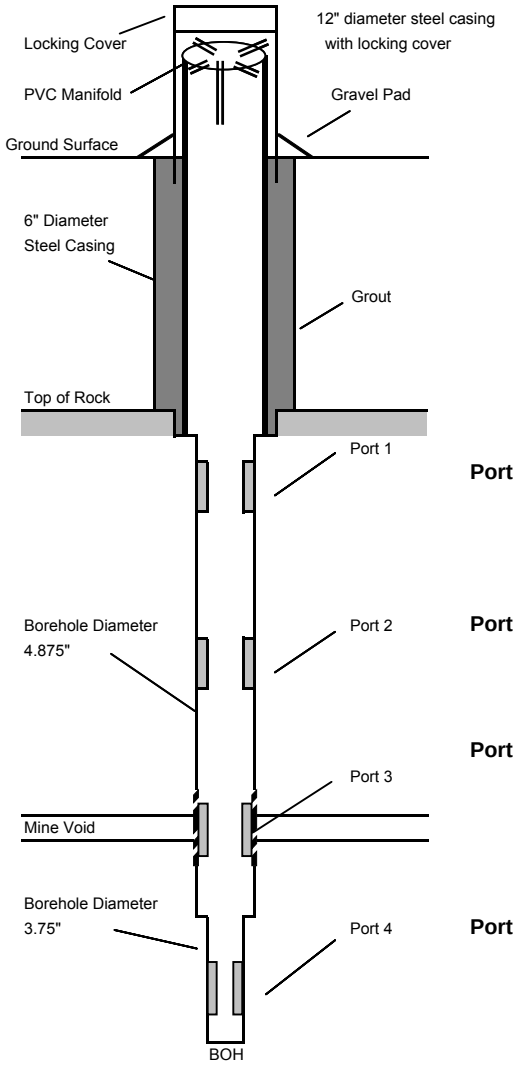
USACE - Buffalo District

PROJECT: **Shallow Land Disposal Area (SLDA)**

HOLE NO.: **NWS-02**

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: NWS-03	**LOCATION:** N 474409.70	**DRILLER:** SJB Services, Inc.
PROJECT: Shallow Land Disposal Area	E 1461130.00	**DRILL METHOD:** 8.25" ID HSA
DATE WELL COMPLETED: 12/15/03	**ELEVATIONS (FT AMSL)**	and HQ Rock Core Barrels
DATE DEVELOPMENT COMPLETED 12/19/03	**GROUND SURFACE:** 944.9 ft	**TYPE OF WELL:**
URS INSPECTOR: S. Nozik	**TOP OF MANIFOLD:** 946.87 ft	FLUTe Flexible Liner Well



NOT TO SCALE

	TYPE OF MANIFOLD:	PVC Cap
	I.D. OF SAMPLE TUBE:	3/16"
	TYPE OF SAMPLE TUBE:	PVDF
	I.D. OF GAS TUBE:	1/2"
	TYPE OF GAS TUBE:	PVDF
	TYPE OF PORT:	Single Port
	TYPE OF GROUT:	Cement/Bentonite
	TYPE OF OVERBURDEN CASING:	Steel
	I.D. OF OVERBURDEN CASING:	6"
	DEPTH TO BOTTOM OF CASING:	29.0'
	DEPTH TO BOTTOM OF TEMPORARY 4" CASING:	124'
Port 1	SCREENED PORT INTERVAL:	53' to 63'
	PORT OPENING:	58'
Port 2	SCREENED PORT INTERVAL:	70' to 80 '
	PORT OPENING:	75'
Port 3	MINE VOID	111.5' to 116'
	SCREENED PORT INTERVAL:	110' to 118'
	REINFORCED INTERVAL:	106.5' to 119'
	PORT OPENING:	117'
Port 4	SCREENED PORT INTERVAL:	154' to 164'
	PORT OPENING:	159'
	BOREHOLE DIAMETER:	4.875" and 3.75"
	BOTTOM OF HOLE:	177.7'

Measuring Point Elevations
(Top of Tube Ports above PVC Manifold)

Port	Elevation
1	947.20
2	947.16
3	947.19
4	947.21

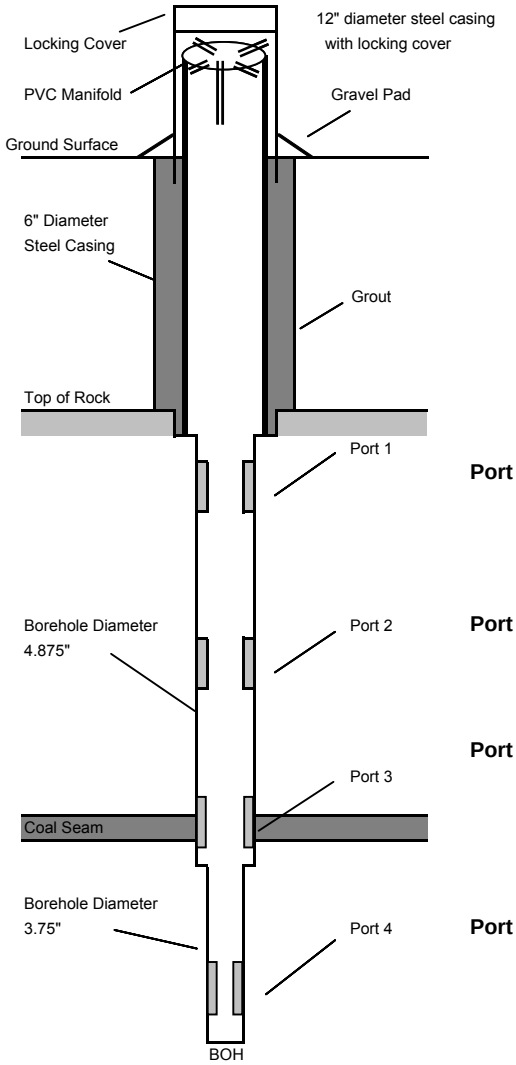
USACE - Buffalo District

PROJECT: **Shallow Land Disposal Area (SLDA)**

HOLE NO.: **NWS-03**

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: NWS-04	**LOCATION:** N 475030.00	**DRILLER:** SJB Services, Inc.
PROJECT: Shallow Land Disposal Area	E 1460581.27	**DRILL METHOD:** 8.25" ID HSA
DATE WELL COMPLETED: 11/23/03	**ELEVATIONS (FT AMSL)**	and HQ Rock Core Barrels
DATE DEVELOPMENT COMPLETED 12/02/03	**GROUND SURFACE:** 922.4 ft	**TYPE OF WELL:**
URS INSPECTOR: S. Nozik	**TOP OF MANIFOLD:** 925.25 ft	FLUTe Flexible Liner Well



NOT TO SCALE

	TYPE OF MANIFOLD:	PVC Cap
	I.D. OF SAMPLE TUBE:	3/16"
	TYPE OF SAMPLE TUBE:	PVDF
	I.D. OF GAS TUBE:	1/2"
	TYPE OF GAS TUBE:	PVDF
	TYPE OF PORT:	Single Port
	TYPE OF GROUT:	Cement/Bentonite
	TYPE OF OVERBURDEN CASING:	Steel
	I.D. OF OVERBURDEN CASING:	6"
	DEPTH TO BOTTOM OF CASING:	21.2'
	DEPTH TO BOTTOM OF TEMPORARY 4" CASING:	90'
Port 1	SCREENED PORT INTERVAL:	32' to 42'
	PORT OPENING:	37'
Port 2	SCREENED PORT INTERVAL:	50' to 60 '
	PORT OPENING:	55'
Port 3	COAL SEAM	81.2' to 85.15'
	SCREENED PORT INTERVAL:	79' to 87'
	REINFORCED INTERVAL:	none
	PORT OPENING:	86'
Port 4	SCREENED PORT INTERVAL:	135' to 150'
	PORT OPENING:	142'
	BOREHOLE DIAMETER:	4.875" and 3.75"
	BOTTOM OF HOLE:	185.6'

Measuring Point Elevations
(Top of Tube Ports above PVC Manifold)

Port	Elevation
1	925.73
2	925.72
3	925.85
4	925.77

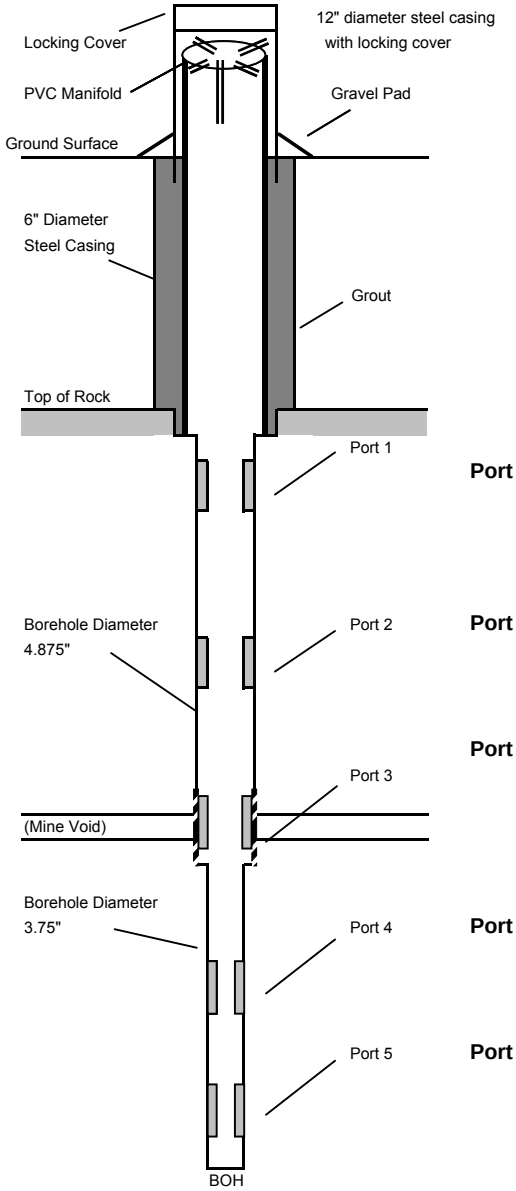
USACE - Buffalo District

PROJECT: **Shallow Land Disposal Area (SLDA)**

HOLE NO.: **NWS-04**

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: NWS-05	**LOCATION:** N 475148.45	**DRILLER:** SJB Services, Inc.
PROJECT: Shallow Land Disposal Area	E 1460199.00	**DRILL METHOD:** 8.25" ID HSA
DATE WELL COMPLETED: 12/16/03	**ELEVATIONS (FT AMSL)**	and HQ Rock Core Barrels
DATE DEVELOPMENT COMPLETED 01/06/04	**GROUND SURFACE:** 912.5 ft	**TYPE OF WELL:**
URS INSPECTOR: S. Nozik	**TOP OF MANIFOLD:** 914.28 ft	FLUTe Flexible Liner Well



	TYPE OF MANIFOLD:	PVC Cap
	I.D. OF SAMPLE TUBE:	3/16"
	TYPE OF SAMPLE TUBE:	PVDF
	I.D. OF GAS TUBE:	1/2"
	TYPE OF GAS TUBE:	PVDF
	TYPE OF PORT:	Single Port
	TYPE OF GROUT:	Cement/Bentonite
	TYPE OF OVERBURDEN CASING:	Steel
	I.D. OF OVERBURDEN CASING:	6"
	DEPTH TO BOTTOM OF CASING:	21.0'
	DEPTH TO BOTTOM OF TEMPORARY 4" CASING:	75'
Port 1	SCREENED PORT INTERVAL:	25' to 35'
	PORT OPENING:	30'
Port 2	SCREENED PORT INTERVAL:	42' to 52'
	PORT OPENING:	47'
Port 3	MINE VOID	70.5' to 74'
	SCREENED PORT INTERVAL:	68.5' to 75.5'
	REINFORCED INTERVAL:	65.5' to 76'
	PORT OPENING:	74.5'
Port 4	SCREENED PORT INTERVAL:	112' to 122'
	PORT OPENING:	117'
Port 5	SCREENED PORT INTERVAL:	145' to 155'
	PORT OPENING:	150'
	BOREHOLE DIAMETER:	4.875" and 3.75"
	BOTTOM OF HOLE:	155.5'

Measuring Point Elevations
(Top of Tube Ports above PVC Manifold)

Port	Elevation
1	914.79
2	914.87
3	914.28
4	914.28
5	914.89

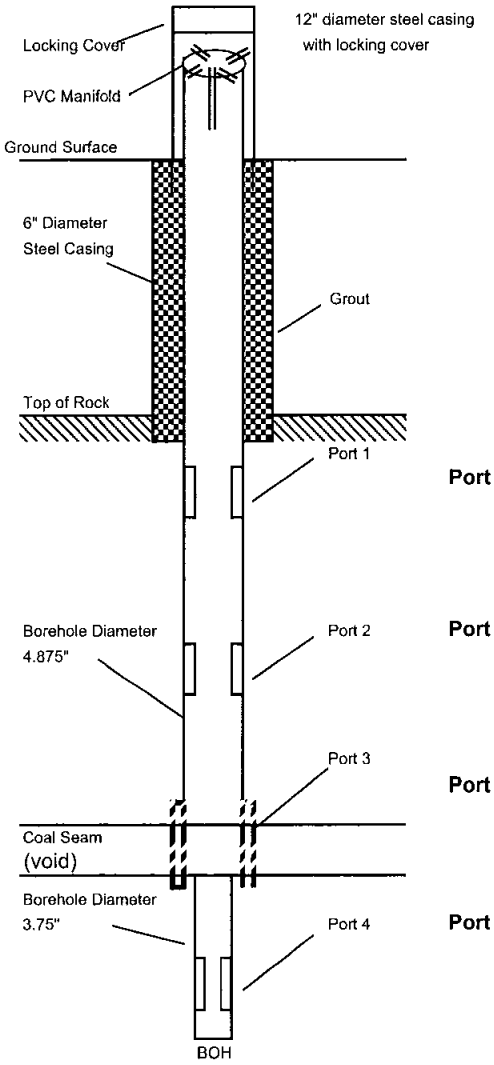
USACE - Buffalo District

PROJECT: **Shallow Land Disposal Area (SLDA)**

HOLE NO.: **NWS-05**

AS BUILT MONITORING WELL RECORD

HOLE NUMBER: NWS-01A	LOCATION:		DRILLER: SJB Services, Inc.
PROJECT: Shallow Land Disposal Area	ELEVATIONS (FT MSL)		DRILL METHOD: 8.25" ID HSA
DATE WELL COMPLETED: 11/21/03	SURFACE:	ft	and HQ Rock Core Barrels
DATE DEVELOPMENT COMPLETED:	TOP OF MANIFOLD:	ft	TYPE OF WELL:
INSPECTOR: S. Nozik	TOP OF OUTER CASING:	ft	FLUTe Flexible Liner Well



NOT TO SCALE

	COORDINATES: NORTH:	474516.52
	EAST:	1460130.00
	TYPE OF MANIFOLD:	PVC Cap
	I.D. OF SAMPLE TUBE:	3/16"
	TYPE OF SAMPLE TUBE:	PVDF
	I.D. OF GAS TUBE:	1/2"
	TYPE OF GAS TUBE:	PVDF
	TYPE OF PORT:	Single Port
	TYPE OF GROUT:	Cement/Bentonite
	TYPE OF OVERBURDEN CASING:	Steel
	I.D. OF OVERBURDEN CASING:	6 in.
	DEPTH TO BOTTOM OF CASING:	21.5 ft.
Port 1	SCREENED PORT INTERVAL:	38' to 48'
	PORT OPENING:	43'
Port 2	SCREENED PORT INTERVAL:	54' to 64 '
	PORT OPENING:	59'
Port 3	SCREENED PORT INTERVAL:	97' to 104'
	REINFORCED INTERVAL:	92' to 109'
	PORT OPENING:	103'
Port 4	SCREENED PORT INTERVAL:	155' to 170'
	PORT OPENING:	162.5'
	BOREHOLE DIAMETER:	4.875" and 3.75"
	BOTTOM OF HOLE:	176

USACE - Buffalo District

PROJECT: Shallow Land Disposal Area (SLDA)	HOLE NO.: NWS-01A

DRILLING SUMMARY

Geologist: Scott McCabe

Contractor: SJB Services, Inc.

Operator: Steve Wolkiewicz

Model: CME-850

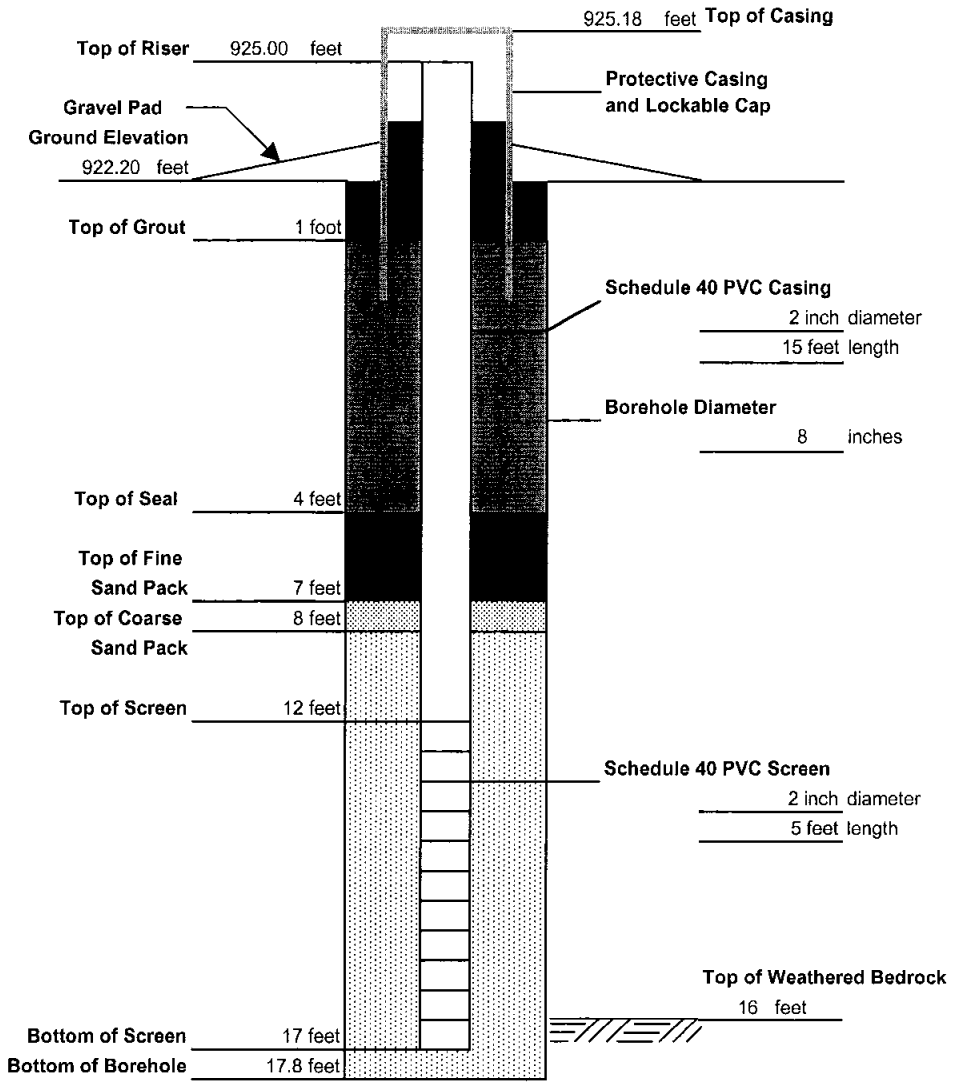
Date: 9/23/03

GEOLOGIC LOG*

Depth (ft.)	Description
0-3.9	sandy SILT grades to clayey sandy silt
3.9-4.5	silty SAND
4.5-5.3	SILT & CLAY
5.3-6.2	sandy SILT
6.2-8.5	SAND & SILT
8.5-17.8	silty CLAY (Highly Weathered CLAYSTONE/SHALE) - more competent below 16'.

DEPTH

WELL DESIGN



CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface: 4" Steel protective cover (Stick Up)	**Type:** 2" Schedule 40 PVC	**Type:** #1 well sand **Setting:** 8' - 17.8'
Monitor: 2" Schedule 40 PVC	**Slot Size:** 0.010"	**SEAL MATERIAL** **Type 1:** Bentonite Chips **Setting:** 4' - 7' **Type 1:** Bentonite Chips **Setting:** 0' - 1'

COMMENTS:

Surface bentonite extends one foot above grade inside protective casing.

* - Detailed Geologic Description in adjacent MW-52 Well Boring Log

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Fine Sand Pack (00)
- Coarse Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**OVERBURDEN WELL CONSTRUCTION DETAILS**	**Well Number: MW-47**

DRILLING SUMMARY

Geologist: Tim Burmeier

Drilling Co. SJB Services, Inc.

Operator: Steve Wolkiewicz

Model: Track Mounted CME-850

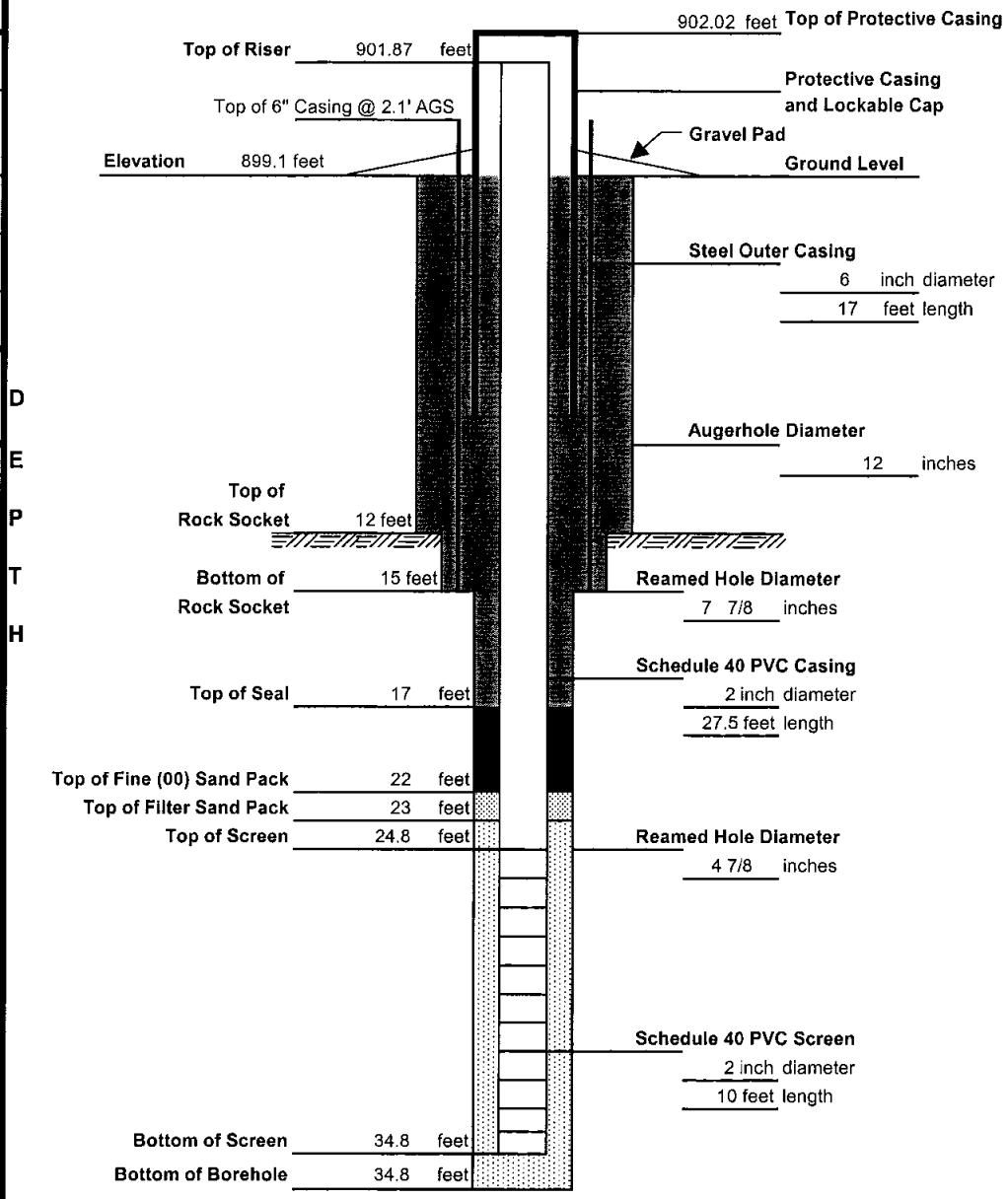
Date: 11/18/03

GEOLOGIC LOG*

Depth (ft.)	Description
0 - 0.3	Clayey TOPSOIL
0.3 - 4.6	SILT
4.6 - 15	SILTSTONE
15 - 27	SHALE
27 - 30.1	SANDSTONE
30.1 - 30.7	SHALE
30.7 - 31.4	SANDSTONE
31.4 - 35.1	SHALE

DEPTH

WELL DESIGN



CASING MATERIAL		SCREEN MATERIAL		FILTER MATERIAL	
Surface:	4" Steel protective cover (Stick Up)	Type:	2" Schedule 40 PVC	Type:	#1 Filter Pro Sand
				Setting:	23'-34.8'
Monitor:	2" Schedule 40 PVC	Slot Size:	0.010"	**SEAL MATERIAL**	
				Type 1:	Bentonite Chips
				Setting:	17'-22'
				Type 1:	
				Setting:	

COMMENTS:

* - Detailed Geologic Description in Corresponding Well Boring Log

ROCK CORING

Cored Interval: 15'-34.8'

Core Diameter: HQ

Reamed Diameter: 4.875"

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Fine Sand Pack
- Coarse (Filter) Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**	**Well No.:** MW-50

DRILLING SUMMARY

Geologist: Sheldon Nozik

Drilling Co. SJB Services, Inc.

Operator: Brian Fuller

Model: Track Mounted CME-850

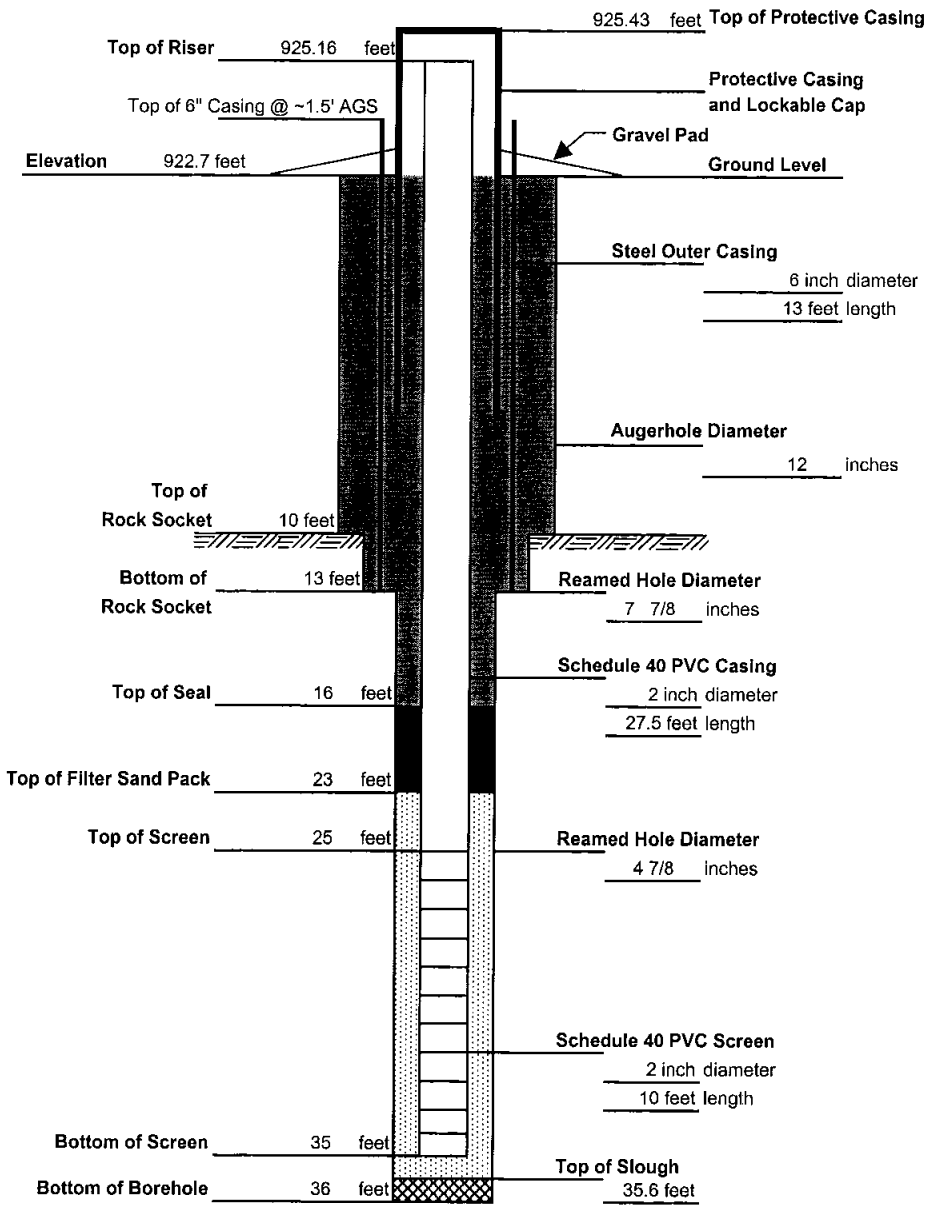
Date: 11/19/03

GEOLOGIC LOG*

Depth (ft.)	Description
0 - 6	Clayey SILT
6 - 8	Weathered SILTSTONE
8 - 10	Sandy SILTSTONE
10 - 15.8	Fine grained SANDSTONE
15.8 - 36	Fine SANDSTONE interbedded with sandy SHALE facies changes horizontal fracturing throughout

D E P T H

WELL DESIGN



CASING MATERIAL		SCREEN MATERIAL		FILTER MATERIAL	
Surface:	4" Steel protective cover (Stick Up)	**Type:**	2" Schedule 40 PVC	**Type:**	#0 Filter Pro Sand
				Setting:	23'-35.6'
Monitor:	2" Schedule 40 PVC	**Slot Size:**	0.010"	**SEAL MATERIAL**	
				Type 1:	Bentonite Chips
				Setting:	16'-23'
				Type 1:	
				Setting:	

COMMENTS:

* - Detailed Geologic Description in Corresponding Well Boring Log

ROCK CORING

Cored Interval: 13'-36'

Core Diameter: HQ

Reamed Diameter: 4.875"

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Slough
- Coarse (Filter) Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**	**Well No.:** MW-51

DRILLING SUMMARY

Geologist: Sheldon Nozik

Drilling Co. SJB Services, Inc.

Operator: Brian Fuller

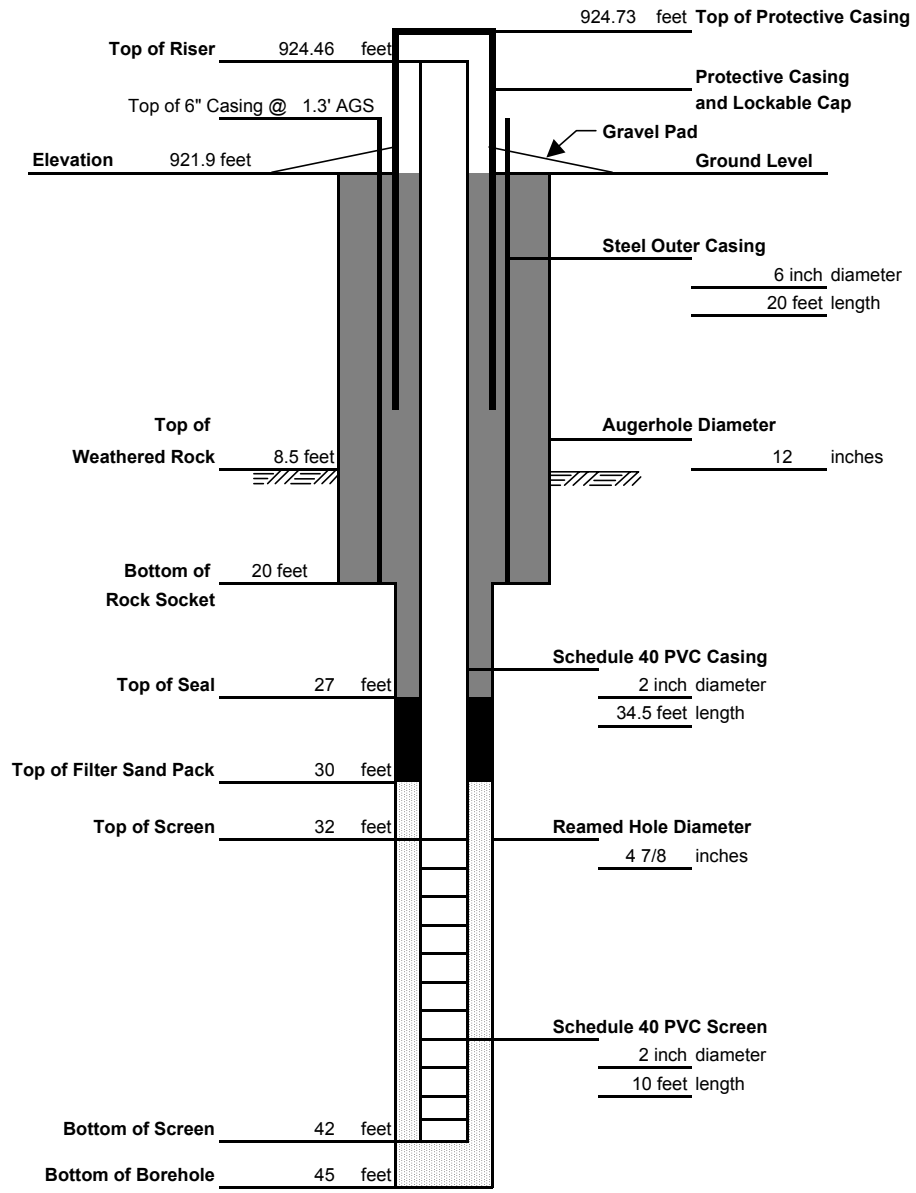
Model: Track Mounted CME-850

Date: 10/24/2003

GEOLOGIC LOG*

Depth (ft.)	Description
0-3.9	sandy SILT grades to clayey sandy silt
3.9-4.5	silty SAND
4.5-5.3	SILT & CLAY
5.3-6.2	sandy SILT
6.2-8.5	SAND & SILT
8.5-12.4	Weathered SHALE/ CLAYSTONE
12.4-19.5	Highly Weathered CLAYSTONE/SHALE
19.5'-24.5'	Red/Brown Blue/Green CLAYSTONE & SILTSTONE, changes to blue/grey @ 22.5'
24.5'-27'	Blue-green CLAYSTONE w/ trace v fine sand
27'-33'	Changes to SILTSTONE irregular fractures gradational color change to med.-grey
33'-35'	Grades to m-grey SILTSTONE
35'-39.7'	sandy SILTSTONE
39.7'-45'	alternating layers of fine SANDSTONE, SHALE and SILTSTONE

DEPTH



WELL DESIGN

CASING MATERIAL		SCREEN MATERIAL		FILTER MATERIAL	
Surface:	4" Steel protective cover (Stick Up)	**Type:**	2" Schedule 40 PVC	**Type:**	#1 Filter Pro Sand
				Setting:	30'-45'
Monitor:	2" Schedule 40 PVC	**Slot Size:**	0.010"	**SEAL MATERIAL**	
				Type 1:	Bentonite Pellets
				Setting:	27'-30'
				Type 1:	
				Setting:	

COMMENTS:

* - Detailed Geologic Description in Corresponding Well Boring Log

ROCK CORING

Cored Interval: 20'-45'

Core Diameter: HQ

Reamed Diameter: 4.875"

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**	**Well No.:** MW-52

DRILLING SUMMARY

Geologist: Sheldon Nozik

Drilling Co. SJB Services, Inc.

Operator: Brian Fuller

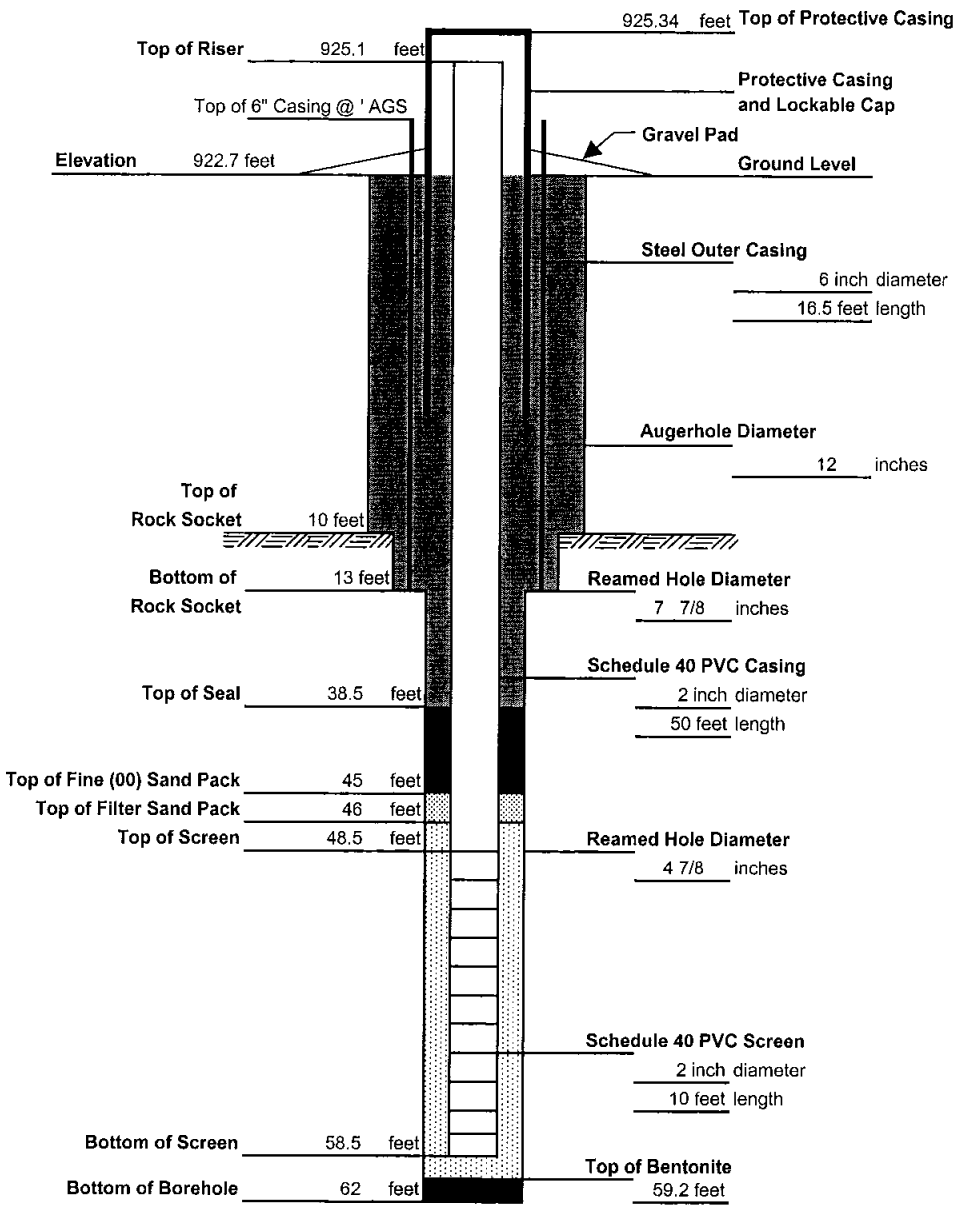
Model: Track Mounted CME-850

Date: 11/17/03

GEOLOGIC LOG*

Depth (ft.)	Description
0 - 6	Clayey SILT
6 - 8	Weathered SILTSTONE
8 - 39.8	Fine grained SANDSTONE
39.8 - 71	Black SHALE, some siltstone and sandstone interbedding horizontal fracturing throughout

DEPTH



WELL DESIGN

CASING MATERIAL		SCREEN MATERIAL		FILTER MATERIAL	
Surface:	4" Steel protective cover (Stick Up)	Type:	2" Schedule 40 PVC	Type:	#1 Well Sand
				Setting:	46'-59.2'
Monitor:	2" Schedule 40 PVC	Slot Size:	0.010"	**SEAL MATERIAL**	
				Type 1:	Bentonite Chips
				Setting:	38.5'-45'
				Type 1:	
				Setting:	

COMMENTS:

* - Detailed Geologic Description in Corresponding Well Boring Log

ROCK CORING

Cored Interval: 15'-71'

Core Diameter: HQ

Reamed Diameter: 4.875"

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Fine Sand Pack
- Coarse (Filter) Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**	**Well No.:** MW-53

DRILLING SUMMARY

Geologist: Sheldon Nozik

Contractor: SJB Services, Inc.

Operator: Brian Fuller

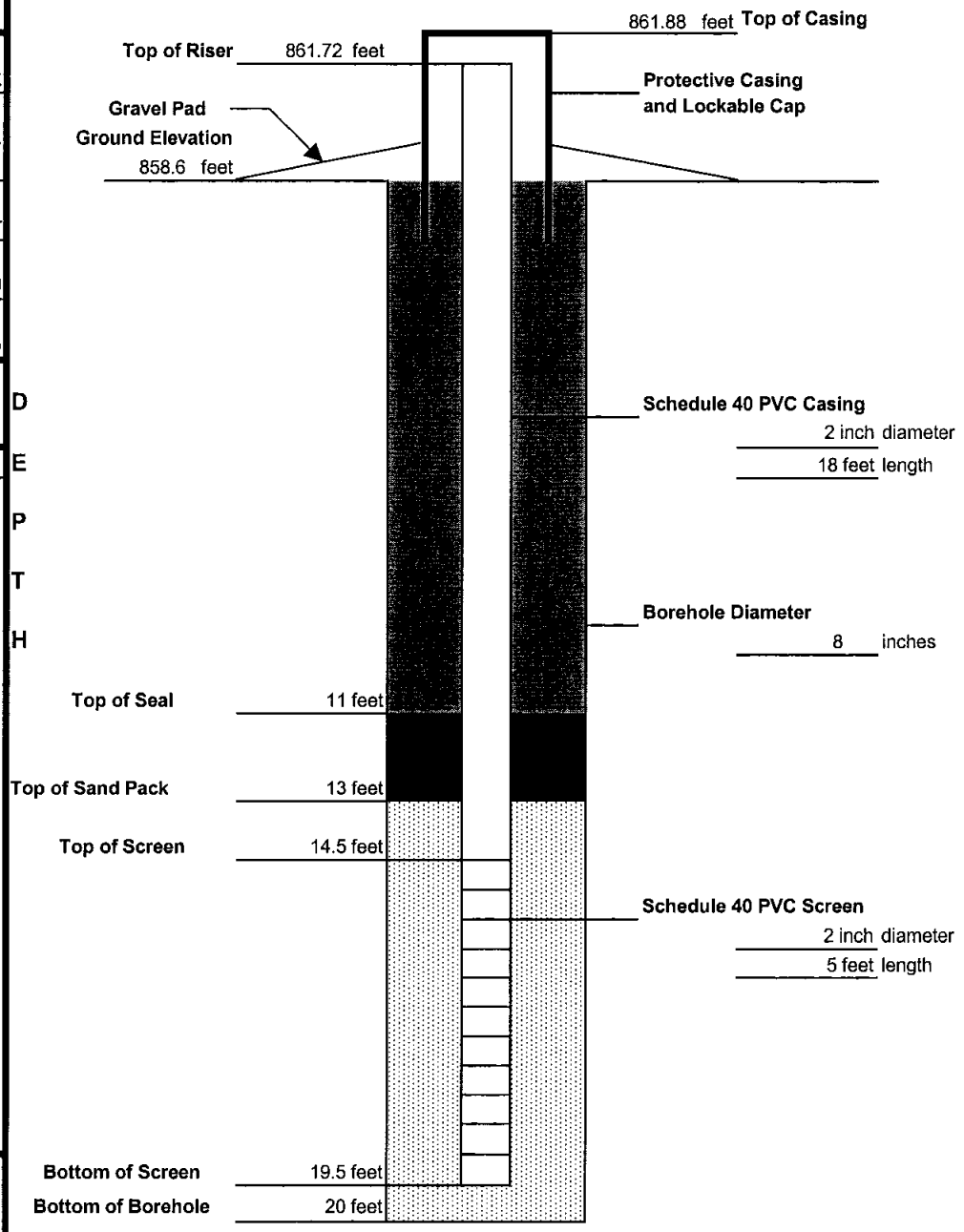
Model: CME-850

Date: 10/1/03

GEOLOGIC LOG*

Depth (ft.)	Description
0 - 0.3	Organic TOPSOIL
0.3 - 2	Silty CLAY
2 - 10.2	MINE FILL (Silt & Gravel)
10.2 - 14	Silty CLAY, little fine gravel
14 - 18.5	SILT & CLAY, little gravel med. plasticity
18.5 - 18.75	Wet COAL
18.75 - 20	Dry CLAYSTONE

WELL DESIGN



CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface: 4" Steel protective cover (Stick Up)	**Type:** 2" Schedule 40 PVC	**Type:** #1 well sand **Setting:** 13' - 20'
Monitor: 2" Schedule 40 PVC	**Slot Size:** 0.010"	**SEAL MATERIAL** **Type 1:** Bentonite Pellets **Setting:** 11' - 13'

COMMENTS:

* - Detailed Geologic Description in Corresponding Well Boring Log

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Coarse Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**OVERBURDEN WELL CONSTRUCTION DETAILS**	**Well Number: MW-54**

DRILLING SUMMARY

Geologist: Scott McCabe

Contractor: SJB Services, Inc.

Operator: Steve Wolkiewicz

Model: CME-850

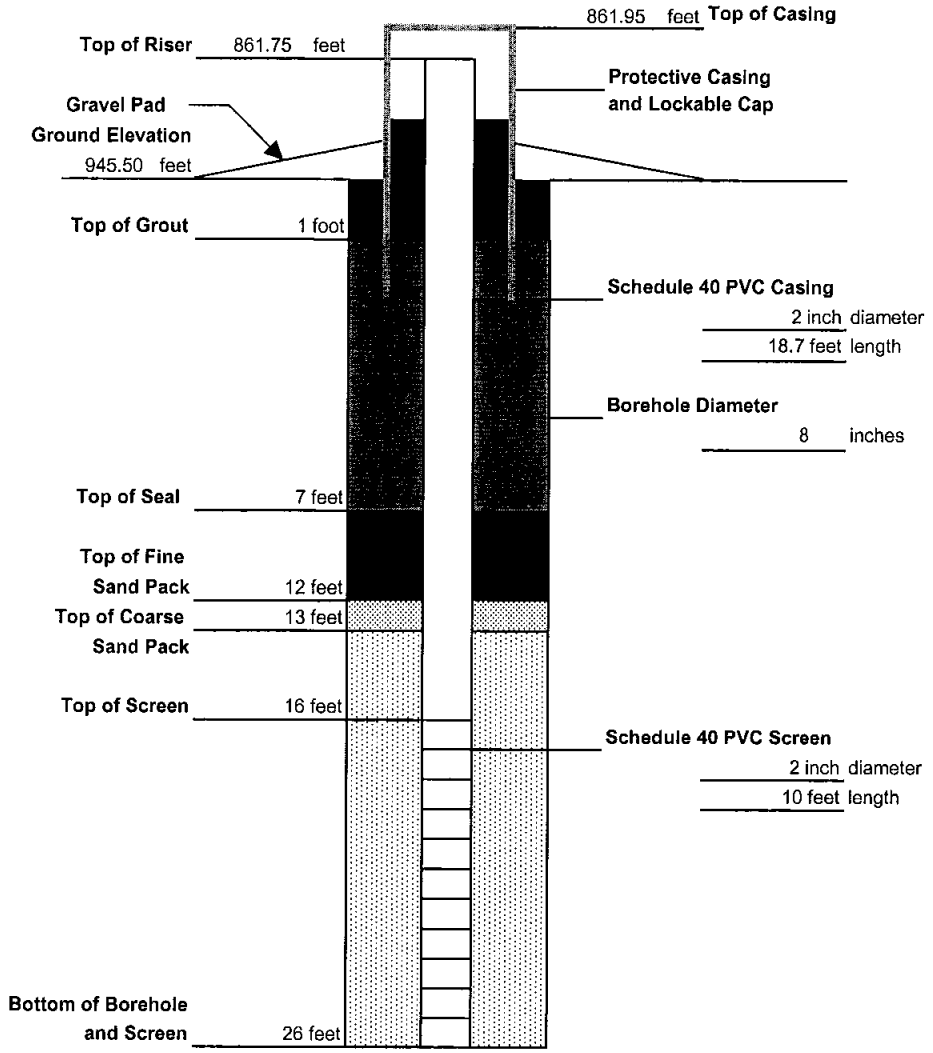
Date: 9/29/03

GEOLOGIC LOG*

Depth (ft.)	Description
0 - 18	Fine sandy SILT
18 - 25	Clayey SILT
25 - 26	Weathered SHALE

DEPTH

WELL DESIGN



CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface: 4" Steel protective cover (Stick Up)	**Type:** 2" Schedule 40 PVC	**Type:** #1 well sand **Setting:** 13' - 26'
Monitor: 2" Schedule 40 PVC	**Slot Size:** 0.010"	**SEAL MATERIAL** **Type 1:** Bentonite Chips **Setting:** 7' - 12' **Type 1:** Bentonite Chips **Setting:** 0' - 1'

COMMENTS:

Surface bentonite extends one foot above grade inside protective casing.

* - Detailed Geologic Description in Corresponding Well Boring Log

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Fine Sand Pack (00)
- Coarse Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**OVERBURDEN WELL CONSTRUCTION DETAILS**	**Well Number: MW-56**

DRILLING SUMMARY

Geologist: Tim Burmeier

Drilling Co. SJB Services, Inc.

Operator: Steve Wolkiewicz

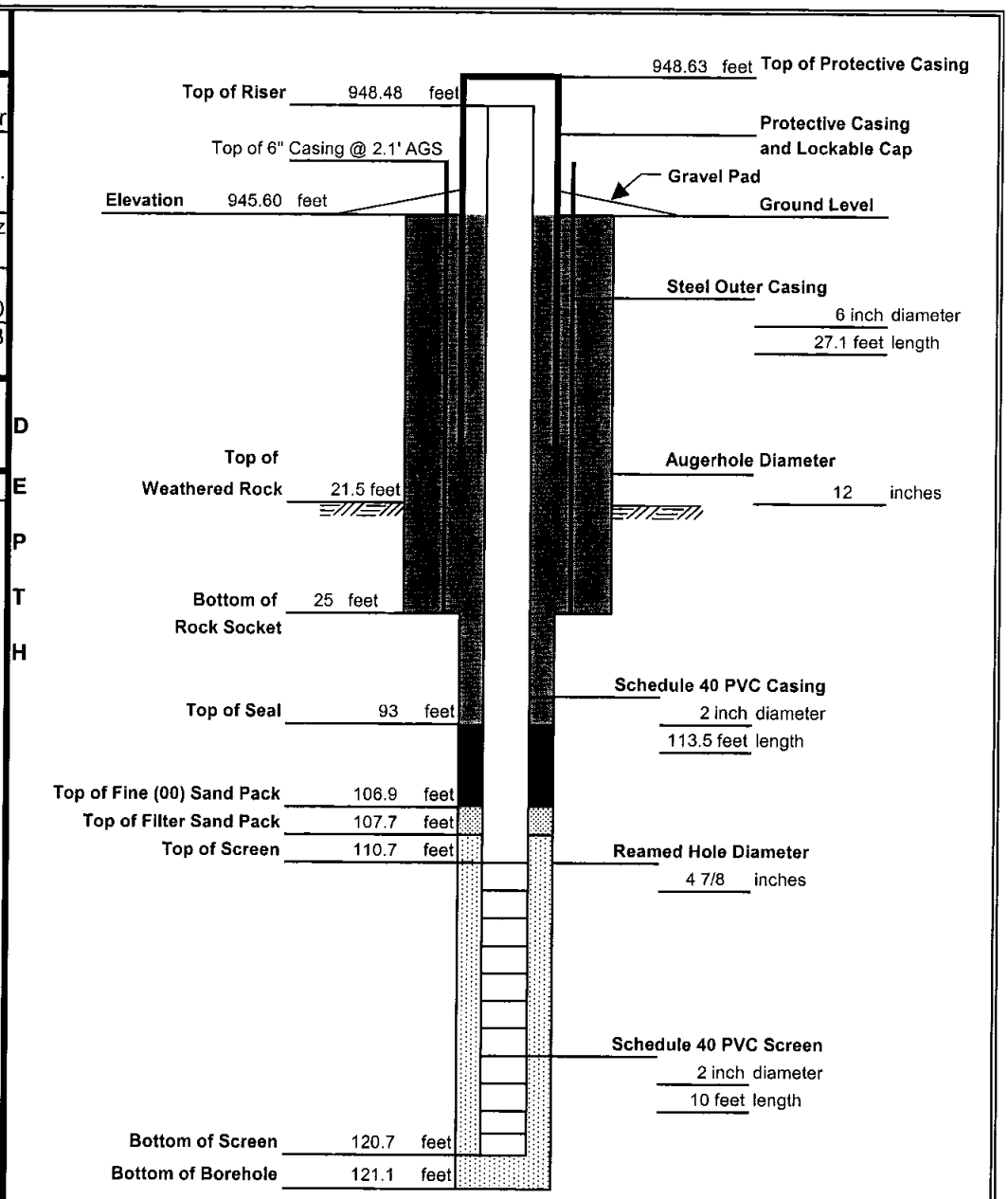
Model: Track Mounted CME-850

Date: 11/10/03

GEOLOGIC LOG*

Depth (ft.)	Description
0 - 6	Clayey SILT
6 - 13.5	Silty CLAY
13.5 - 19	Fine to medium SAND
19 - 22	SILT
22 - 27	CLAYSTONE
27 - 29	SILTSTONE
29 - 39	CLAYSTONE
39 - 50	SILTSTONE
50 - 70	Very fine SANDSTONE alternating with SHALE
70 - 75	Silty fine SANDSTONE
75 - 85	Gray SHALE
85 - 122.8	Black SHALE
112.8 - 116.1	COAL
116.1 - 121.1	CLAYSTONE

DEPTH



WELL DESIGN

CASING MATERIAL		SCREEN MATERIAL		FILTER MATERIAL	
Surface:	4" Steel protective cover (Stick Up)	**Type:**	2" Schedule 40 PVC	**Type:**	#1 Filter Pro Sand
				Setting:	107.7'-121.1'
Monitor:	2" Schedule 40 PVC	**Slot Size:**	0.010"	**SEAL MATERIAL**	
				Type 1:	Bentonite Chips
				Setting:	93'-106.9'
				Type 1:	
				Setting:	

COMMENTS:

Well screened in coal bed

* - Detailed Geologic Description in Corresponding Well Boring Log

ROCK CORING

Cored Interval: 22.1'-121.1'

Core Diameter: HQ

Reamed Diameter: 4.875"

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Fine Sand Pack
- Coarse (Filter) Sand Pack

Client:	USACE	**Location:**	SLDA	**Project No.:**	11173233.00000
URS Corporation		**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**		**Well No.:**	MW-57

DRILLING SUMMARY

Geologist: Tim Burmeier

Drilling Co. SJB Services, Inc.

Operator: Steve Wolkiewicz

Model: Track Mounted CME-850

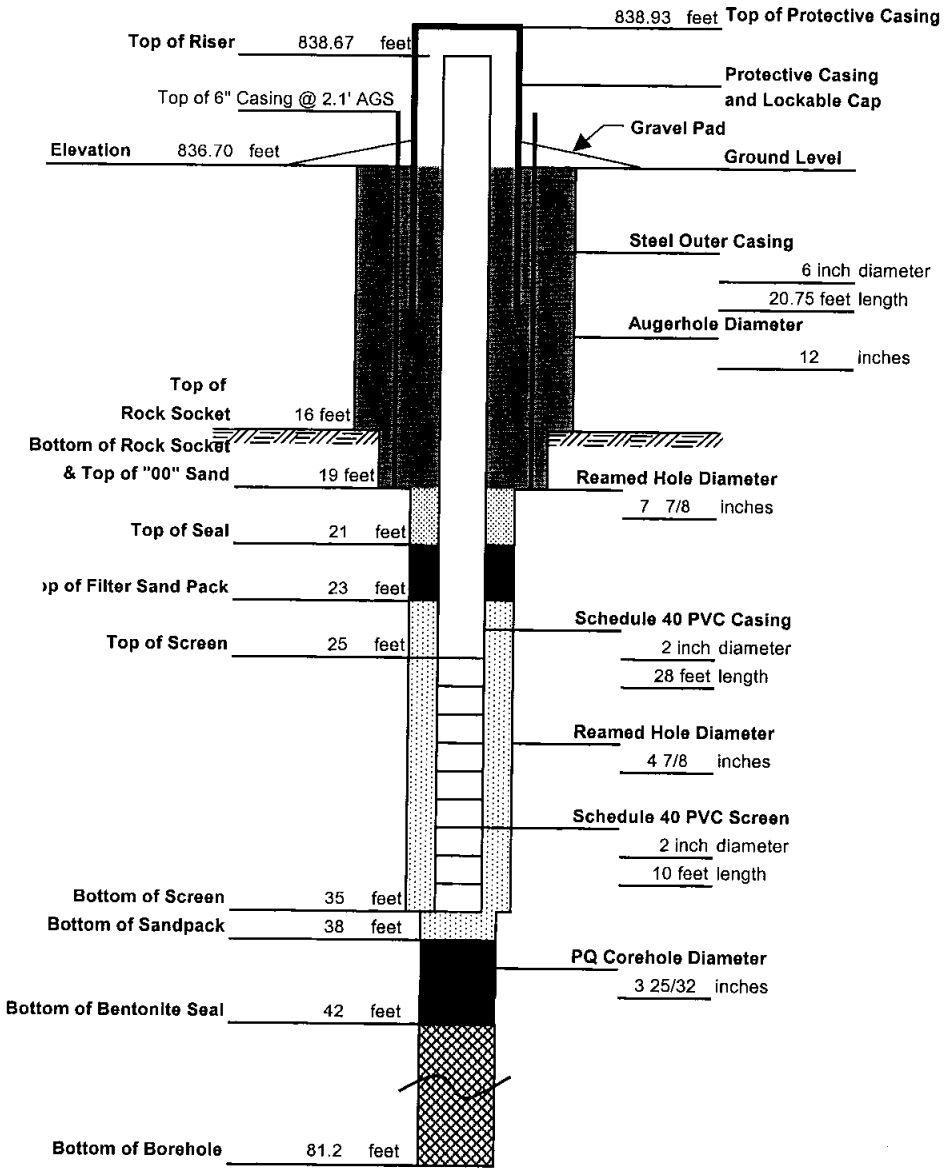
Date: 11/4/03

GEOLOGIC LOG*

Depth (ft.)	Description
0 - 5	Fine Sandy SILT
5 - 6	Clayey SILT
6 - 18	Weathered SHALE
18 - 21	SILTSTONE
21 - 26	SANDSTONE
26 - 33.3	SHALE
33.3 - 34.3	SANDSTONE
34.3 - 36.2	SHALE
36.2 - 43.8'	SANDSTONE
43.8 - 44.5	SHALE
44.5 - 56.5	SANDSTONE
56.5 - 57	SHALE
57 - 81.2	SANDSTONE

DEPTH

WELL DESIGN



CASING MATERIAL

Surface: 4" Steel protective cover (Stick Up)

Monitor: 2" Schedule 40 PVC

SCREEN MATERIAL

Type: 2" Schedule 40 PVC

Slot Size: 0.010"

FILTER MATERIAL

Type: #1 Filter Pro Sand
Setting: 23' - 38'

SEAL MATERIAL

Type 1: Bentonite Chips
Setting: 21' - 23'
Type 1: Bentonite Chips
Setting: 38' - 42'

COMMENTS:

Hole not Reamed from 35' to 81.2'.
HQ sized (approximately 3-25/32" OD) hole (35'-81.2'), was filled with rock cuttings and bentonite chips .

Choker sand was inadvertently installed incorrectly at this location.

* - Detailed Geologic Description in Corresponding Well Boring Log

ROCK CORING

Cored Interval: 19' - 81.2'

Core Diameter: HQ

Reamed Diameter: 4.875"

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Cuttings from Reaming
- Fine (Choker) Sand
- Coarse (Filter) Sand Pack

Client: USACE

URS Corporation

Location: SLDA

BEDROCK MONITORING WELL CONSTRUCTION DETAILS

Project No.: 11173233.00000

Well No.: MW-58

DRILLING SUMMARY

Geologist: Sheldon Nozik

Contractor: SJB Services, Inc.

Operator: Brian Fuller

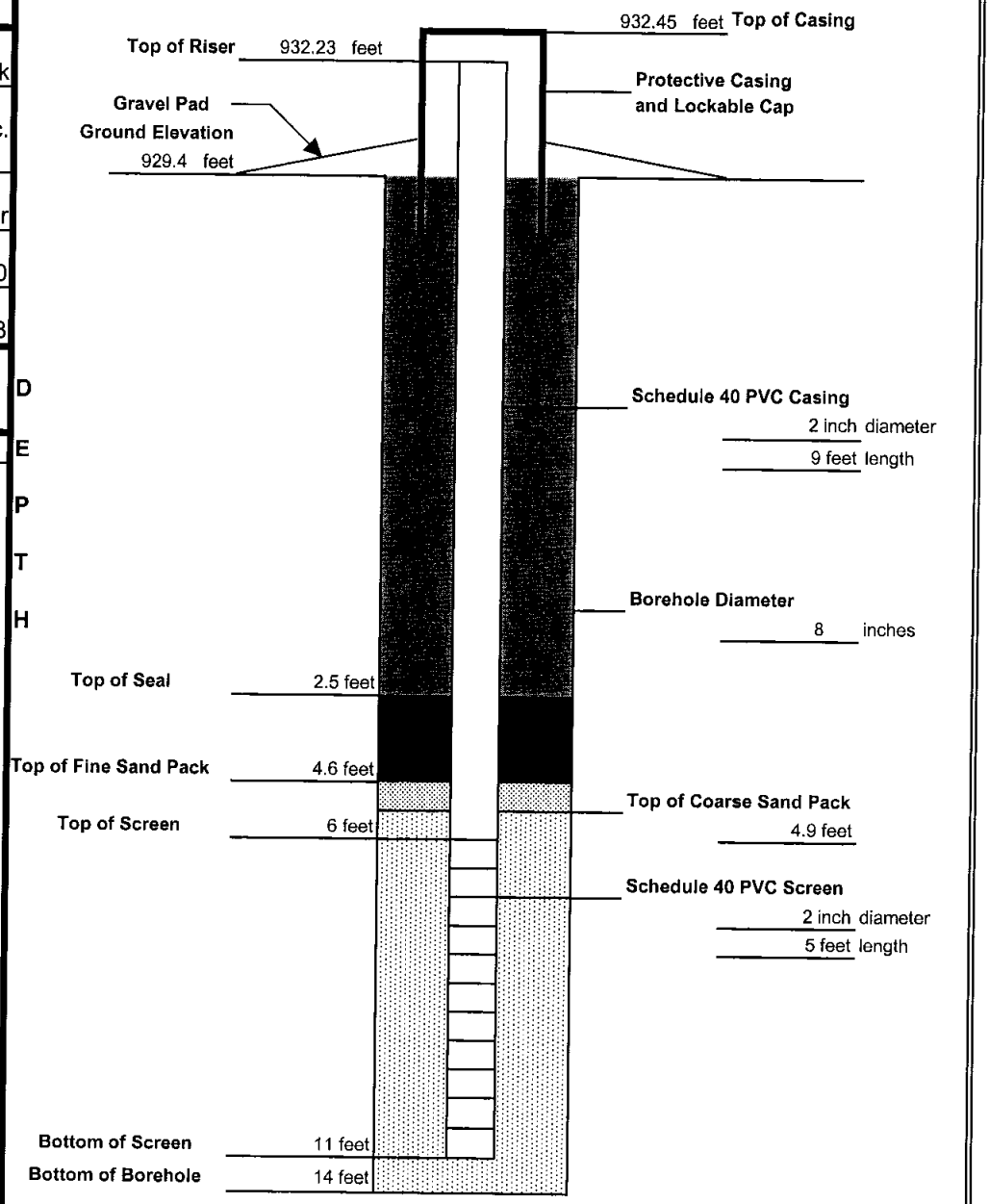
Model: CME-850

Date: 11/6/03

GEOLOGIC LOG*

Depth (ft.)	Description
0-10.8	Silty CLAY, intermixed w/ silty zones
10.8-14	Weathered SILTSTONE

DEPTH



WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface: 4" Steel protective cover (Stick Up)	**Type:** 2" Schedule 40 PVC	**Type:** #1 well sand **Setting:** 4.6' - 14'
Monitor: 2" Schedule 40 PVC	**Slot Size:** 0.010"	**SEAL MATERIAL** **Type 1:** Bentonite Pellets **Setting:** 2.5' - 4.6' **Type 1:** **Setting:**

COMMENTS:

* - Detailed Geologic Description in Corresponding Well Boring Log

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Fine Sand Pack
- Coarse Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**OVERBURDEN WELL CONSTRUCTION DETAILS**	**Well Number: MW-59**

DRILLING SUMMARY

Geologist: Sheldon Nozik

Drilling Co. SJB Services, Inc.

Operator: Brian Fuller

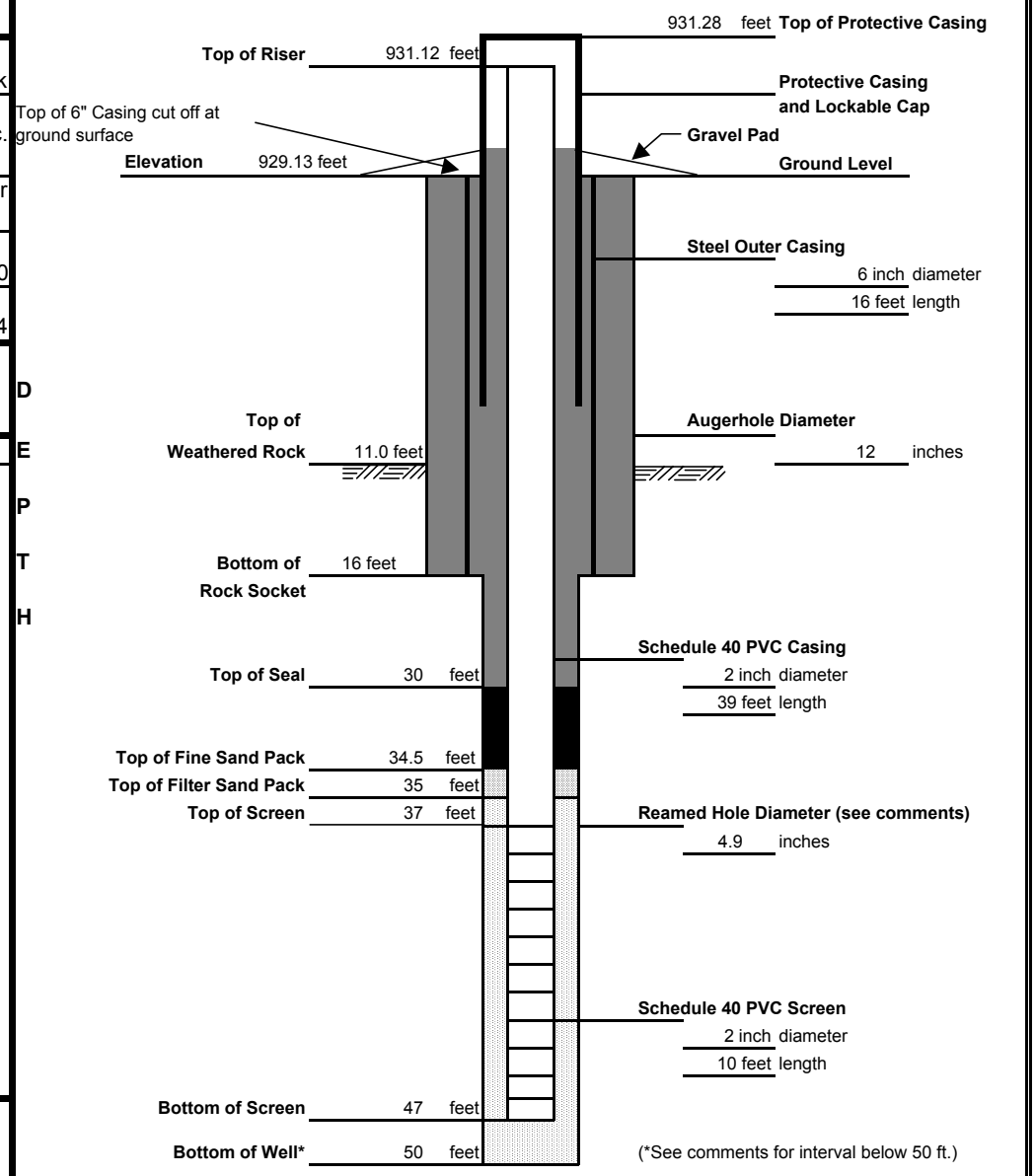
Model: Track Mounted CME-850

Date: 1/12/2004

GEOLOGIC LOG*

Depth (ft.)	Description
0-6.8	clayey SILT
6.8-9.6	silty SAND, little clay
9.6-10.3	Fine SAND, little silt, some mottling
10.3-12.5	clayey SILT, mottled, grades to silty/shaly SANDSTONE
12.5-15.9	sily/shaly SANDSTONE some laminations, highly fractured/weathered
15.9-24	Gray SHALE, very weathered mixed with clay
24-48	Gray SILTSTONE, frequent horizontal fractures along bedding, some clay infilling
48-73	Grades to sandy SILTSTONE

WELL DESIGN



CASING MATERIAL		SCREEN MATERIAL		FILTER MATERIAL	
Surface:	4" Steel protective cover (Stick Up)	**Type:**	2" Schedule 40 PVC	**Type:**	#1 Filter Pro Sand
				Setting:	35'-50'
Monitor:	2" Schedule 40 PVC	**Slot Size:**	0.010"	**SEAL MATERIAL**	
				Type 1:	Bentonite Pellets
				Setting:	30'-34.5'
				Type 1:	
				Setting:	

COMMENTS:

Borehole originally cored with PQ-sized core bit (3.345")

Due to PQ-string lodged in borehole, borehole was later over-drilled with 5-inch casing to remove tools.

*Boring was grouted from 150 ft bgs to bottom of mine void (101 ft bgs). A plug was placed at 90 ft bgs. Borehole was then grouted from 90 to 50 ft bgs.

* - Detailed Geologic Description in boring log for NWS-01 boring log

ROCK CORING

Cored Interval: 16'-148.5'

Core Diameter: PQ (3.345")

Reamed Diameter: 4.9"

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Fine Sand Pack
- Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**	**Well No.:** MW-60

DRILLING SUMMARY

Geologist: Scott McCabe

Contractor: SJB Services, Inc.

Operator: Steve Wolkiewicz

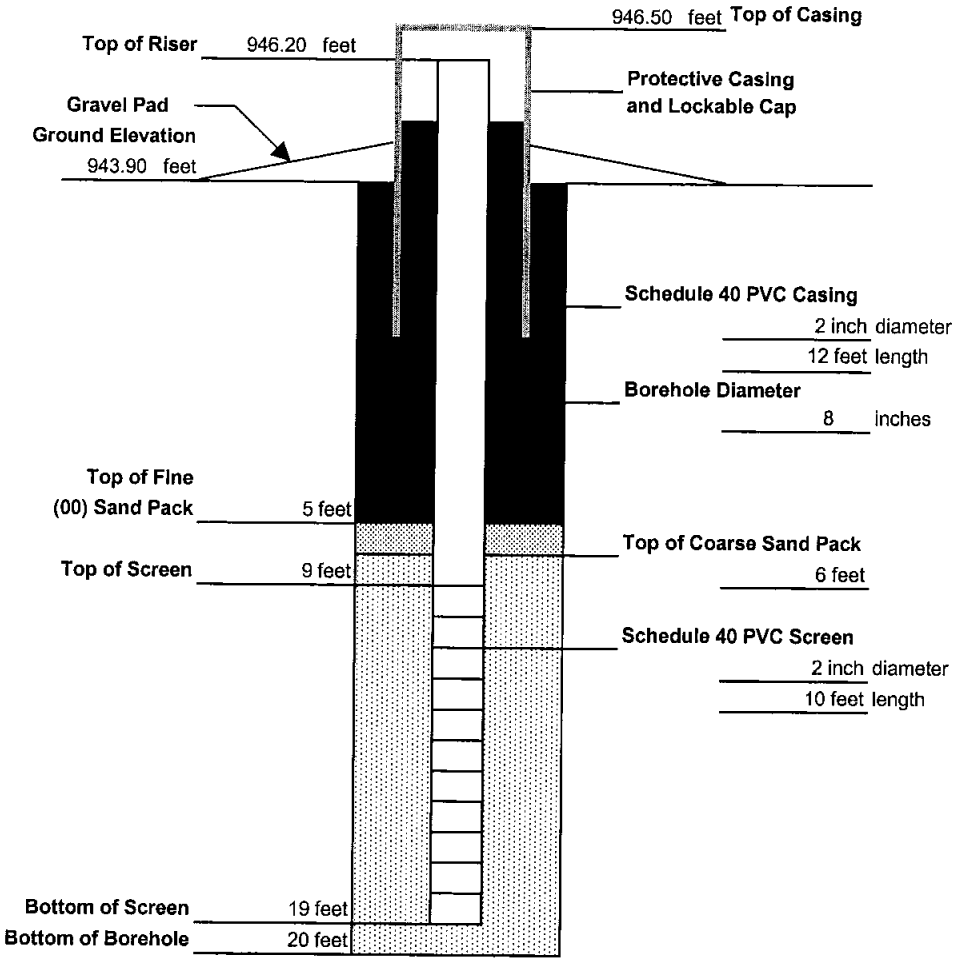
Model: CME-850

Date: 9/22/03

GEOLOGIC LOG*

Depth (ft.)	Description
0 - 6	Clayey SILT
6 - 13.5	Silty CLAY
13.5 - 19	Medium to fine SAND
19 - 20	SILT, trace clay

DEPTH



WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface: 4" Steel protective cover (Stick Up)	**Type:** 2" Schedule 40 PVC	**Type:** #1 well sand **Setting:** 6' - 20'
Monitor: 2" Schedule 40 PVC	**Slot Size:** 0.010"	**SEAL MATERIAL** **Type 1:** Bentonite Chips **Setting:** 0' - 5' **Type 1:** **Setting:**

COMMENTS:

Well was completed with bentonite to grade in lieu of cement/bentonite grout due to insufficient room to allow for both. Bentonite filled to one foot above ground surface inside protective casing.

* - Detailed Geologic Description in NWS-02 Well Boring Log

LEGEND

- Bentonite Seal
- Fine Sand Pack
- Coarse Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**OVERBURDEN WELL CONSTRUCTION DETAILS**	**Well Number: MW-64**

DRILLING SUMMARY

Geologist: Scott McCabe

Contractor: SJB Services, Inc.

Operator: Steve Wolkiewicz

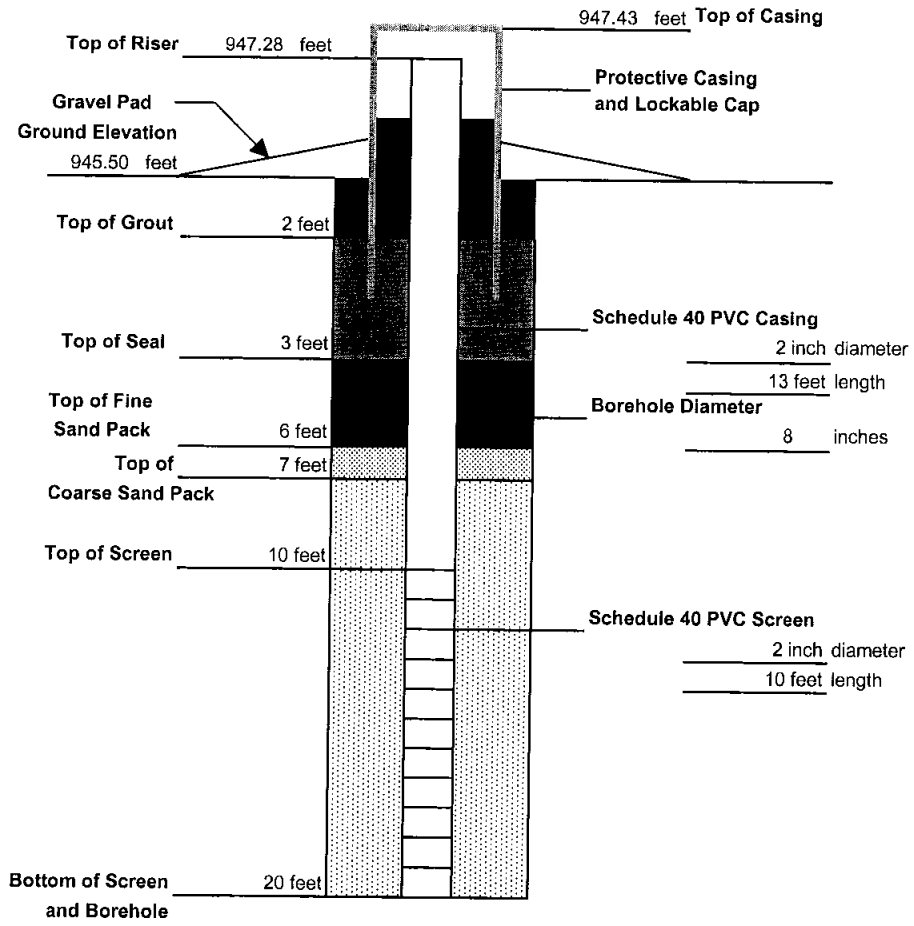
Model: CME-850

Date: 9/24/03

GEOLOGIC LOG*

Depth (ft.)	Description
0 - 0.3	Organic TOPSOIL
0.3 - 12.5	SILT with SAND
12.5 - 17.5	SAND with SILT
17.5 - 20	SILT & CLAY

DEPTH



WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface: 4" Steel protective cover (Stick Up)	**Type:** 2" Schedule 40 PVC	**Type:** #1 well sand **Setting:** 7' - 20'
Monitor: 2" Schedule 40 PVC	**Slot Size:** 0.010"	**SEAL MATERIAL** **Type 1:** Bentonite Chips **Setting:** 3' - 6' **Type 1:** Bentonite Chips **Setting:** 0' - 2'

COMMENTS:

Surface bentonite extends one foot above grade inside protective casing.

* - Detailed Geologic Description in NWS-03 Well Boring Log

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Fine Sand Pack (00)
- Coarse Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**OVERBURDEN WELL CONSTRUCTION DETAILS**	**Well Number: MW-69**

DRILLING SUMMARY

Geologist: Scott McCabe

Contractor: SJB Services, Inc.

Operator: Steve Wolkiewicz

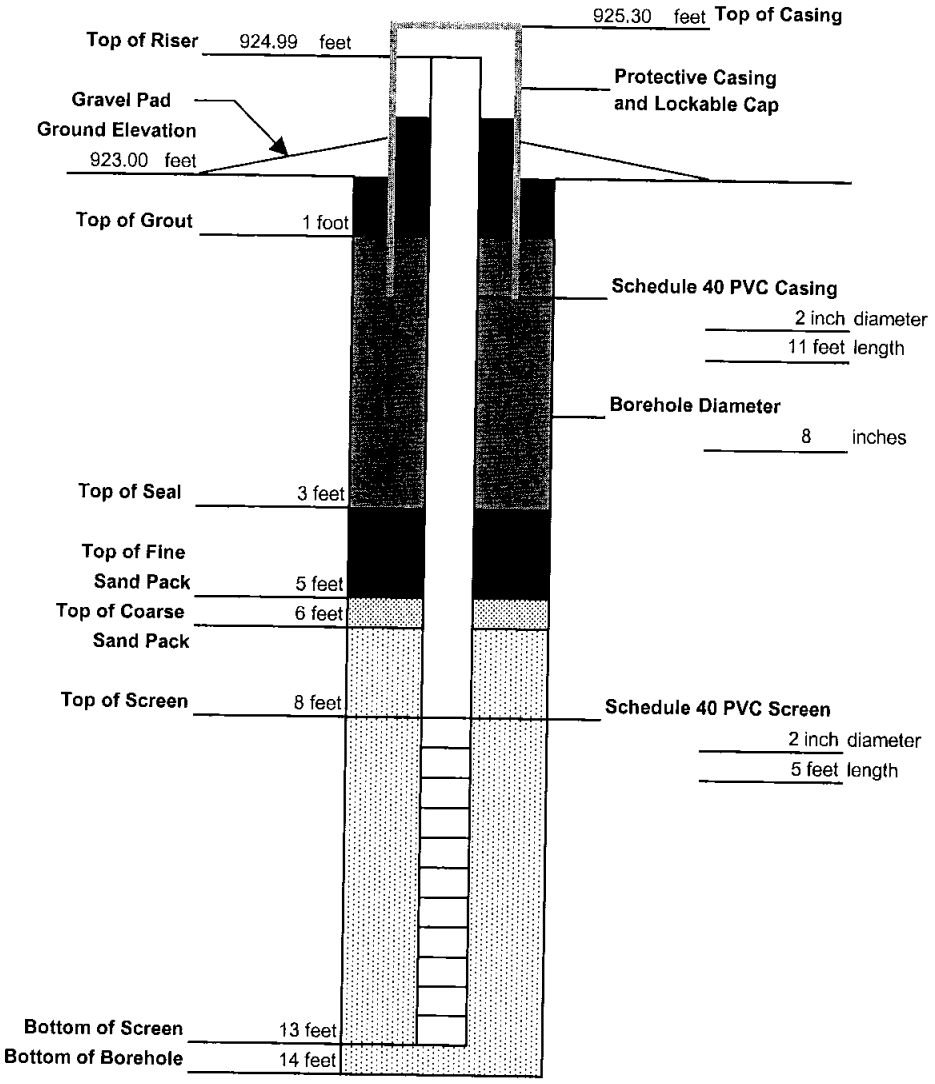
Model: CME-850

Date: 9/23/03

GEOLOGIC LOG*

Depth (ft.)	Description
0-0.5'	TOPSOIL, organic
0.5-4.0'	Fine Sandy SILT
4.0-6.5'	Clayey SILT
6.5'-10.0'	SILT some fine-coarse gravel
10.0-12.0'	SILT and Weathered SHALE
12.0-14.0'	Weathered SHALE

DEPTH



WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface: 4" Steel protective cover (Stick Up)	**Type:** 2" Schedule 40 PVC	**Type:** #1 well sand **Setting:** 6' - 14'
Monitor: 2" Schedule 40 PVC	**Slot Size:** 0.010"	**SEAL MATERIAL** **Type 1:** Bentonite Chips **Setting:** 3' - 5' **Type 1:** Bentonite Chips **Setting:** 0' - 1'

COMMENTS:

Surface bentonite extends one foot above grade inside protective casing.

* - Detailed Geologic Description in NWS-04 Well Boring Log

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Fine Sand Pack (00)
- Coarse Sand Pack

Client: USACE	**Location:** SLDA	**Project No.:** 11173233.00000
URS Corporation	**OVERBURDEN WELL CONSTRUCTION DETAILS**	**Well Number: MW-74**

APPENDIX E

GEOTECHNICAL ANALYTICAL LABORATORY REPORT

CASE NARRATIVE
for
URS Corporation
Shallow Land Disposal Area
Parks Township, Armstrong County, Pennsylvania
Purchase Order No. BU-01-G10208
SDG# 106330

February 19, 2004

Laboratory Identification:

General Engineering Laboratories, LLC

Mailing Address:

P.O. Box 30712
Charleston, South Carolina 29417

Express Mail Delivery and Shipping Address:

2040 Savage Road
Charleston, South Carolina 29414

Telephone Number:

(843) 556-8171

Summary:

Sample receipt

The samples arrived at General Engineering Laboratories, LLC. (GEL) Charleston, South Carolina on February 3, 2004 for Environmental Analyses. All sample containers arrived without any visible signs of tampering or breakage. The samples were delivered with chain of custody documentation and signatures.

The laboratory received the following samples:

Laboratory Identification	Sample Description
106330001	MW-52 (2'-10')
106330002	MW-54 (2'-12')
106330003	MW-57 (6'-16')
106330004	NWS-01 (2'-12')

106330005	NWS-02 (12'-20')
106330006	NWS-03 (10'-18')

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

Internal Chain of Custody:

Custody was maintained for the samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Qualifier Flag Definitions, Chain of Custody, Cooler Receipt Checklist, and Geotechnical Analysis.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Laura Sluss
Project Manager

Subject: Re: Geotech samples received today
Date: Tue, 03 Feb 2004 11:46:27 -0500
From: Peter_Fairbanks@URSCorp.com
To: Laura Sluss <laura.sluss@mail.gel.com>

Laura,

- All 6 samples should be analyzed for ALL parameters.

- The method for moisture content is ASTM D2216.

- Ideally, we would like grain size with and without hydrometer. But if there is insufficient volume to run both, then we would prefer with hydrometer.

Peter R. Fairbanks
Senior Chemist
URS Corporation
640 Ellicott Street, 3rd Floor
Buffalo, New York 14203
Tel: 716.856.5636, ext. 1121
Fax: 716.856.2545

Laura Sluss <Laura.Sluss@gel.com>
02/03/2004 10:53 AM

To: Peter Fairbanks <Peter_Fairbanks@URSCorp.com>
cc:
Subject: Geotech samples received today

Peter:

In regards to the Geotechnical samples received at GEL today, please note the following:

-Please verify that Moisture Content, Grain Size, Attenberg Limits, Specific Gravity are needed on each of the 6 samples. There is a commetn at the bottom right of the chain 0863, but not all samples are marked for all tests.
-Please verify the method needed to report Moisture Content. I don't see a specific method in Table 1, #11 which lists Geotech sample numbers and prices.
-Do you need Grain size reported with or without Hydrometer? Typically, it depends on how much sand is in the sample. For example, if the sample contains more silt and clay, Grain size with Hydrometer should be used.

Please advise when you can. Thanks,

Laura
--
Laura Sluss
Federal Project Manager
General Engineering Laboratories, LLC.
2040 Savage Road
Charleston, SC 29407
(843)-556-8171 ext. 4707

CHAIN OF CUSTODY RECORD

URS

PROJECT NO. 11173233.00000

SITE NAME SLDA

SAMPLERS (PRINT/SIGNATURE) ROBERT J. MURPHY / Robert J. Murphy

106330%

DELIVERY SERVICE: UPS GROUND AIRBILL NO.:

LAB GEL

~~BOX~~ COOLER 1 of 1

PAGE 1 of 1

TESTS: MOISTURE CONTENT; GRAIN SIZE; ATTERBERG LIMITS; SPECIFIC GRAVITY; USCS Classification

BOTTLE TYPE AND PRESERVATIVE: 16oz Plastic; 16oz Glass

	LOCATION IDENTIFIER	DATE	TIME	COMP/ GRAB	SAMPLE ID	MATRIX	TOTAL NO.# OF CONTAINERS	16oz Plastic	16oz Glass	REMARKS	SAMPLE TYPE	BEGINNING DEPTH (IN FEET)	ENDING DEPTH (IN FEET)	FIELD LOT NO. # (ERPIMS)
001	MW-52	1/27/04	1210	Comp	MW-52 (2'-10')	SO	2	2			N1	2	10	
002	MW-54	↓	1220	↓	MW-54 (2'-12')	↓	2	2			↓	2	12	
003	MW-57	↓	1230	↓	MW-57 (6'-16')	↓	2	2			↓	6	16	
004	NWS-01	↓	1240	↓	NWS-01 (2'-12')	↓	2	1	1		↓	2	12	
005	NWS-02	↓	1250	↓	NWS-02 (12'-20')	↓	2	2			↓	12	20	
006	NWS-03	↓	1300	↓	NWS-03 (10'-18')	↓	2	2			↓	10	18	

MATRIX CODES
AA - AMBIENT AIR; SE - SEDIMENT; SH - HAZARDOUS SOLID WASTE; SL - SLUDGE; WP - DRINKING WATER; WW - WASTE WATER; WG - GROUND WATER; SO - SOIL; DC - DRILL CUTTINGS; WL - LEACHATE; GS - SOIL GAS; WC - DRILLING WATER; WO - OCEAN WATER; WS - SURFACE WATER; WQ - WATER FIELD QC; LH - HAZARDOUS LIQUID WASTE; LF - FLOATING/FREE PRODUCT ON GW TABLE

SAMPLE TYPE CODES
TB# - TRIP BLANK; SD# - MATRIX SPIKE DUPLICATE; RB# - RINSE BLANK; FR# - FIELD REPLICATE; N# - NORMAL ENVIRONMENTAL SAMPLE; MS# - MATRIX SPIKE; (# - SEQUENTIAL NUMBER (FROM 1 TO 9) TO ACCOMMODATE MULTIPLE SAMPLES IN A SINGLE DAY)

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
Robert J. Murphy	1/28/04	1500			
RELINQUISHED BY (SIGNATURE)	**DATE**	**TIME**	**RECEIVED FOR LAB BY (SIGNATURE)**	**DATE**	**TIME**
			Mike Kanlow	2-3-04	0900

SPECIAL INSTRUCTIONS: MOISTURE CONTENT, GRAIN SIZE, ATTERBERG LIMITS, SPECIFIC GRAVITY, USCS classification, to be performed on ALL SAMPLES.

Distribution: Original accompanies shipment, copy to coordinator field files

URSF-075C/1 OF 1/CofCR/GCM

GEOTECHNICAL TESTING ORDER/RECORD FORM

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: SLDA
CLIENT: USACE
URS GREINER REP.: ROBERT J. MURPHY
SIGNATURE: Robert J. Murphy DATE: 1/27/04

JOB NO.: 11173233.000002
SHEET: 1 OF 1
LAB NAME AND REP: GEL
SIGNATURE: DATE:

LOCATION	BORING OR TEST PIT NO.		MW-52	MW-54	MW-57	NWS-01	NWS-02	NWS-03				
	SAMPLE NO.											
	SAMPLE DATE		1/27/04	1/27/04	1/27/04	1/27/04	1/27/04	1/27/04				
	SAMPLE DEPTH	FROM	2	2	6	2	12	10				
		TO	10	12	16	12	20	18				
SAMPLE TYPE	SHELBY TUBE	DIAMETER										
	SPLIT-SPOON	JAR	BAG									
	GRAB	JAR	BAG									
	HNU READING (PPM)											
		TEST METHOD										
CLASS. TESTS	VISUAL CLASS	USCS	✓	✓	✓	✓	✓	✓				
	WATER CONTENT	D2216	✓	✓	✓	✓	✓	✓				
	ATTERBERG LIMITS	D4318	✓	✓	✓	✓	✓	✓				
	HYDROMETER ANALYSIS	D421/422	✓	✓	✓	✓	✓	✓				
	SIEVE ANALYSIS	D421/422	✓	✓	✓	✓	✓	✓				
	SPECIFIC GRAVITY		✓	✓	✓	✓	✓	✓				
PROPERTY TESTS	UNIT WEIGHT											
	RELATIVE DENSITY											
	PERMEABILITY	1 2										
	PROCTOR (STANDARD)											
	PROCTOR (MODIFIED)											
STRENGTH TESTS	UNCONFINED COMP.	1 2										
	DIRECT SHEAR	1 2										
	TRIAXIAL SHEAR	1 2										
	CONSOLIDATION	1 2										
OTHER												
ADMIN.	DATE TESTING REQUESTED											
	DATE TESTING COMPLETED											
	AMOUNT SAVED											

STATUS: TO BE TESTED ☐ TEST INITIATED ☒ TEST COMPLETED ☒ UNABLE TO RUN ■

NOTE: UNDISTURBED [1] REMOLDED (SEE REMARKS) [2]

REMARKS:

URSF-035/1 OF 1/GTORF

4

COOLER RECEIPT CHECKLIST

SAMPLE RECEIPT & REVIEW FORM

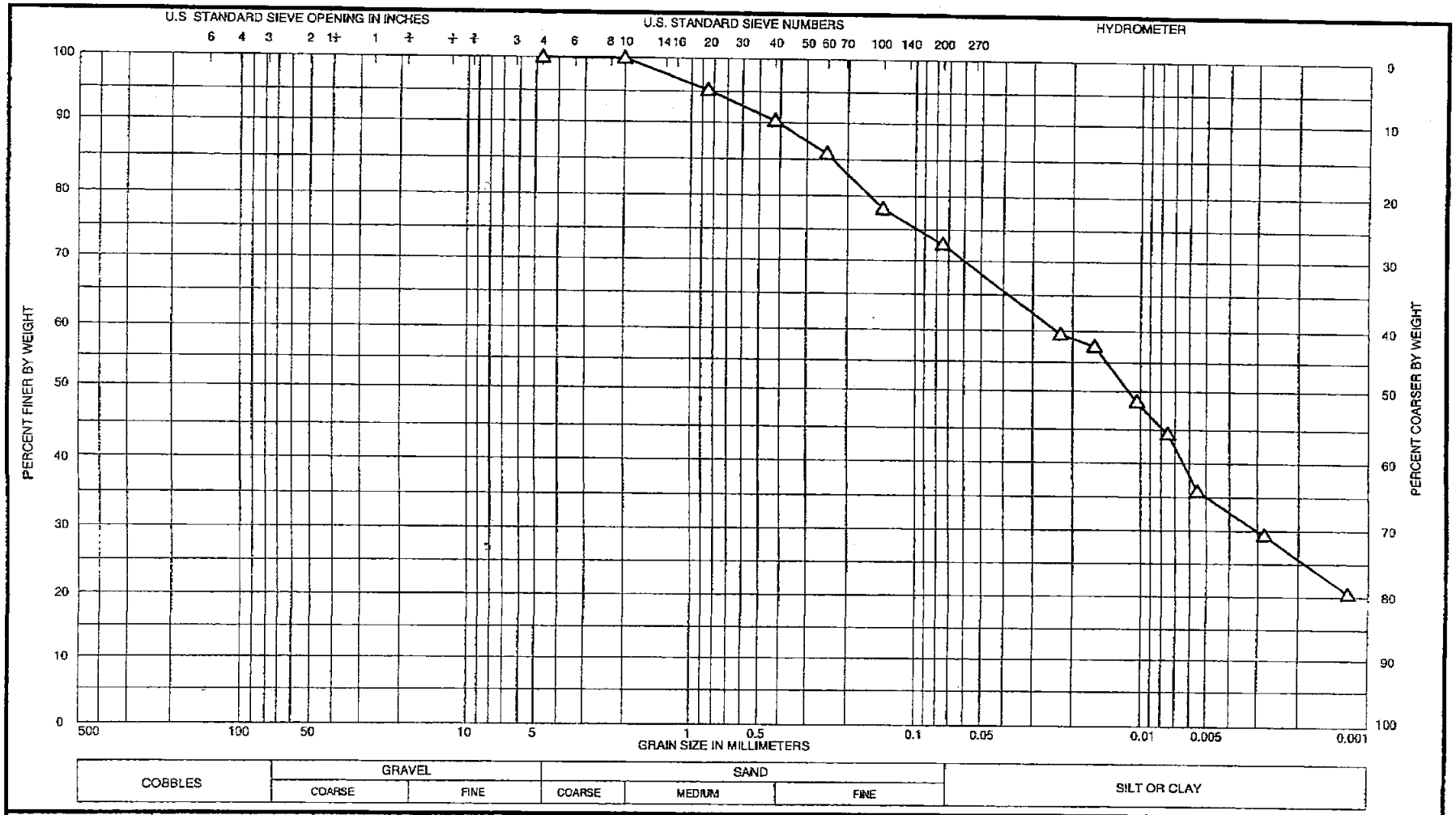
GENERAL ENGINEERING LABORATORIES, LLC

		PM use only
Client:	WRS	SDG/ARCOC/Work Order:
Date Received:	2-3-04	PM(A) Review (ensure non-conforming items are resolved prior to signing): Laura Sluz
Received By:	MK	

	Sample Receipt Criteria	Conforming	NA	Non-Conforming	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within (4 +/- 2 C)? Record preservation method.		✓		Circle Temp device serial # 221113011 221113026 109479 109480 ice bags blue ice dry ice none other(describe) 14c
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?		✓		Sample ID's, containers affected and observed pH: Soils
6	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
7	Samples received within holding time?	✓			Id's and tests affected:
8	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
9	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
10	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
11	COC form is properly signed in relinquished/received sections?	✓			
12	Air Bill ,Tracking #'s, & Additional Comments	UPS # 1Z X14 907 03 1023 1414			

Radiological Information	Non-RAD	RAD	RADII	RSO RAD Receipt #
What is the radiological classification of the samples?	✓			Comments:
Radioactivity Screening Results (maximum observed CPM)				*If > x2 area background is observed on a non-radioactive sample, contact the RSO to investigate.

GEOTECHNICAL PARAMETERS

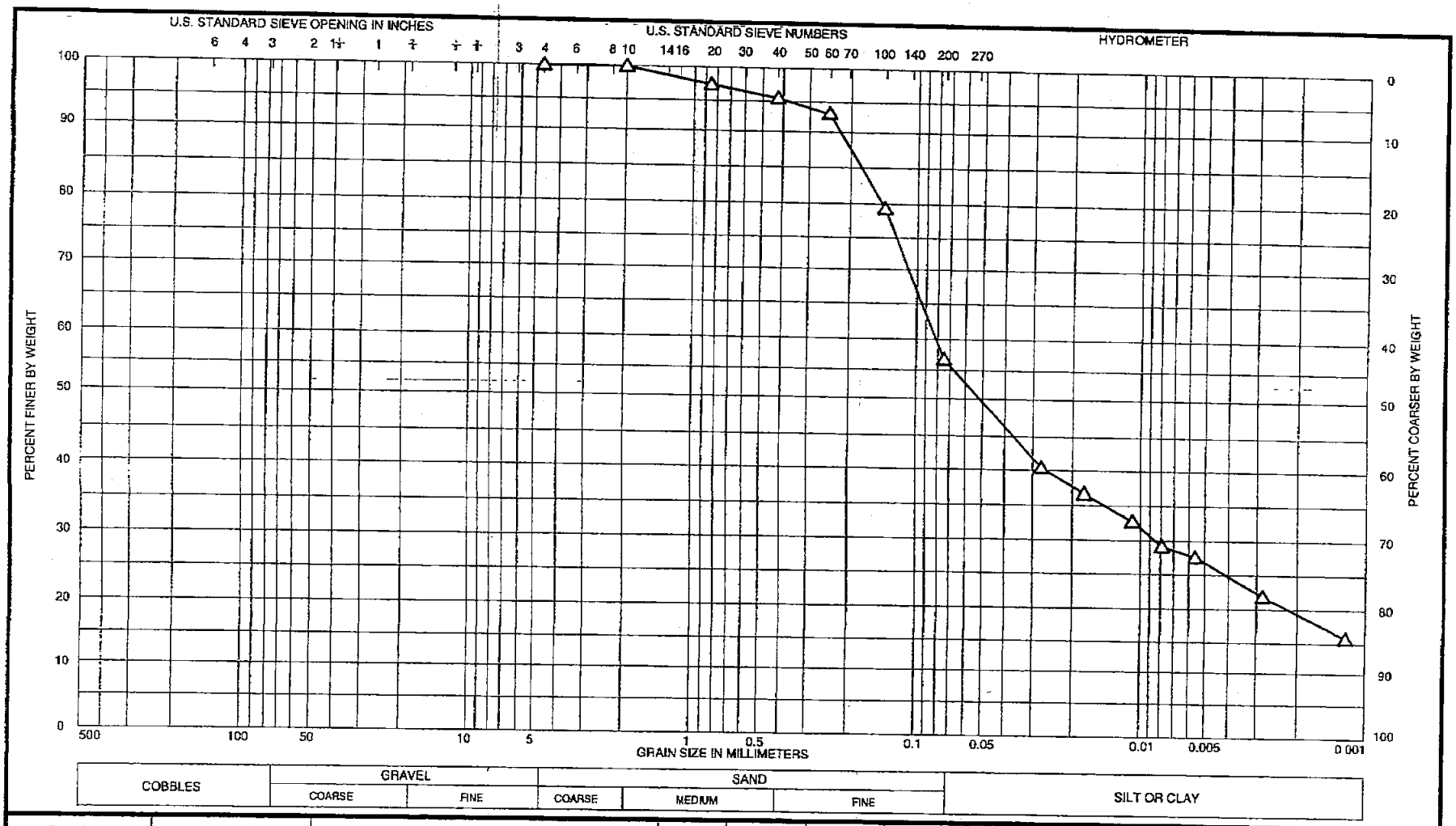


Sample No.	Specific Gravity	Classification	Nat w %	LL %	PL %	PI %
106330-001	2.70	CL with sand	15.6	35.0	20.1	14.9
		% SAND = 27.3				
		% SILT = 37.7				
		% CLAY = 35.0				

GRADATION CURVES

GENERAL ENGINEERING
A Division of General Engineering Laboratories, Inc.

Project Code URSC00403C
Project Name Shallow Land Disposal Area
Parks Township, Pennsylvania
Boring No. MW -52 (2-10)
Date February 24, 2004



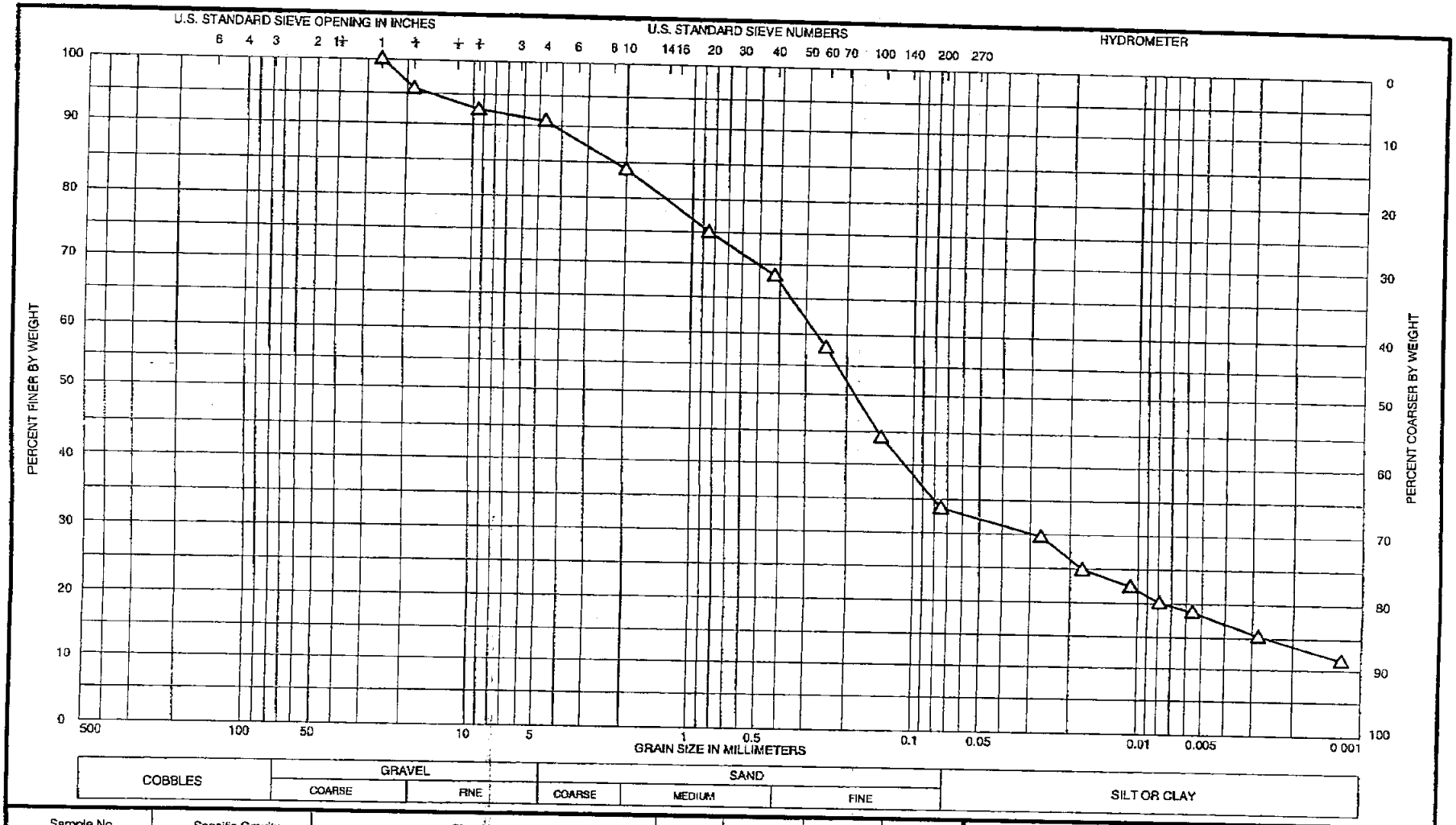
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Specific Gravity	Classification	Nat w %	LL %	PL %	PI %
106330-002	2.75	sandy CL-ML	11.5	22.8	15.7	7.1
		% SAND = 43.4				
		% SILT = 29.8				
		% CLAY = 26.8				

GRADATION CURVES

GENERAL ENGINEERING
A Division of General Engineering Laboratories, Inc.

Project Code URSC00403C
Project Name Shallow Land Disposal Area
Parks Township, Pennsylvania
Boring No. MW -54 (2-10)
Date February 24, 2004



Sample No	Specific Gravity	Classification	Nat w %	LL %	PL %	PI %
106330-003	2.71	SC-SM	6.1	28.0	21.6	6.5
		% GRAVEL = 9.2				
		% SAND = 56.9				
		% SILT = 15.6				
		% CLAY = 18.3				

GRADATION CURVES

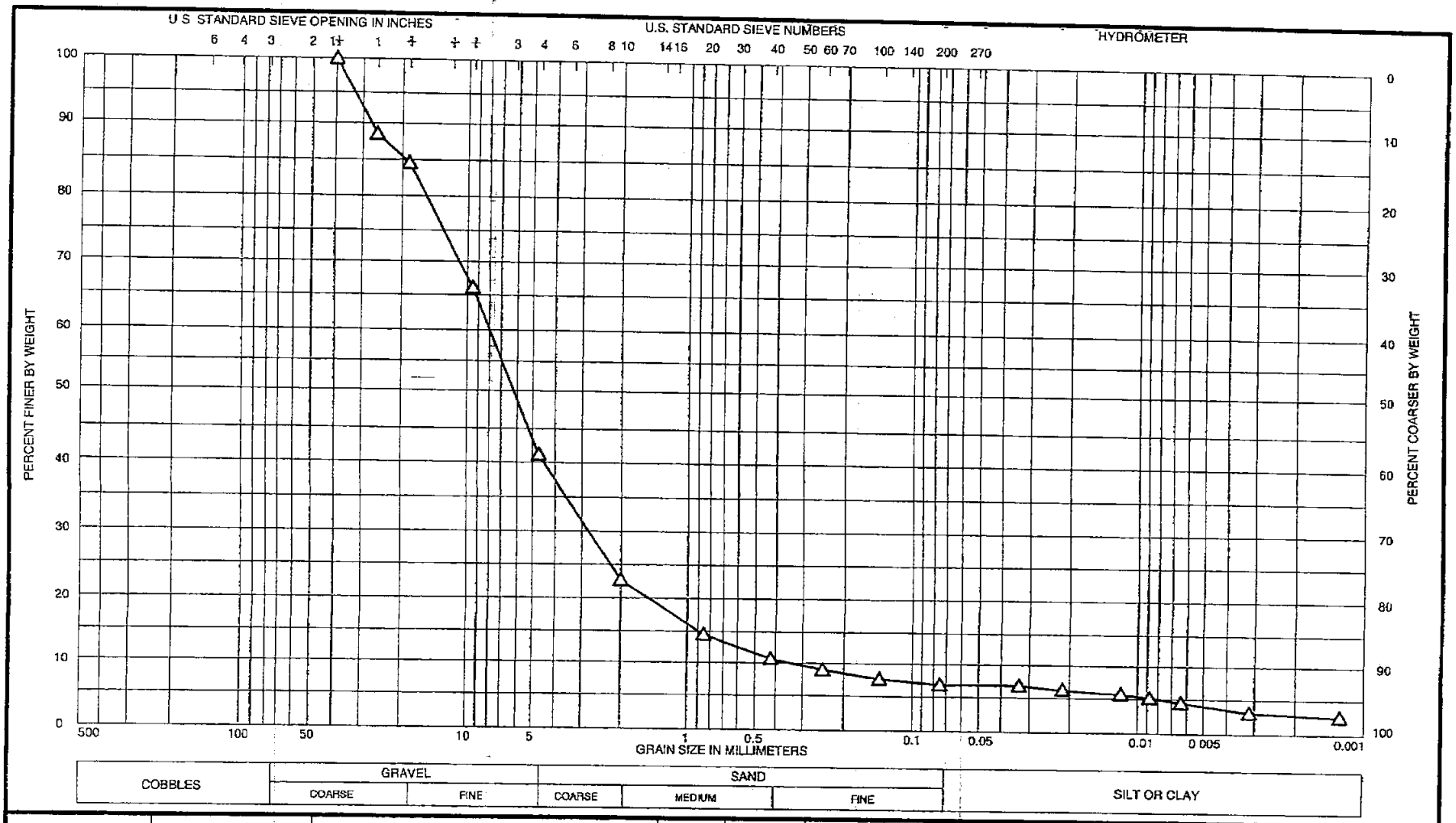
GENERAL ENGINEERING
A Division of General Engineering Laboratories, Inc

Project Code URSC00403C

Project Name Shallow Land Disposal Area
Parks Township, Pennsylvania

Boring No. MW -57 (6-16)

Date February 24, 2004

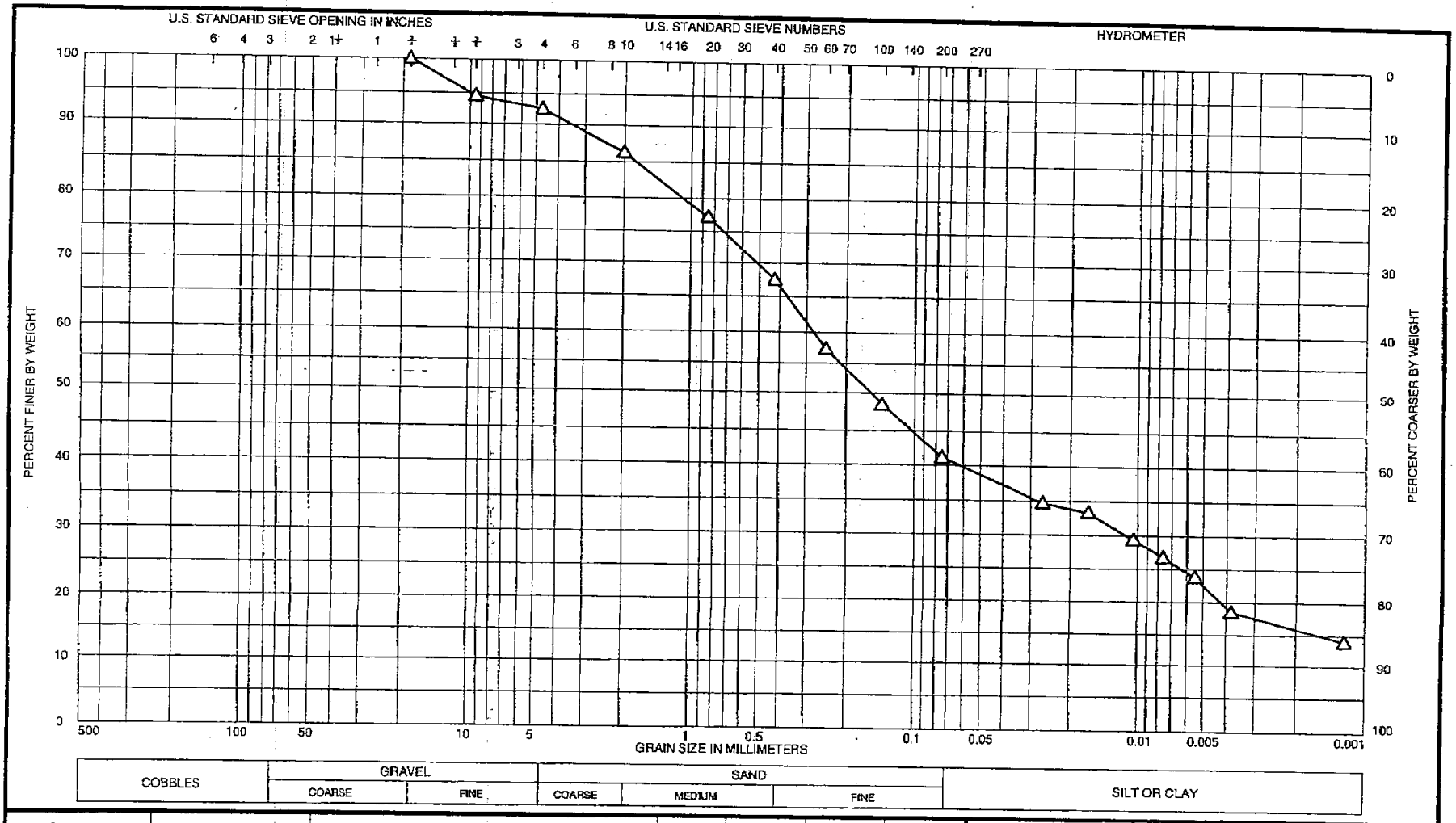


Sample No.	Specific Gravity	Classification	Nat w %	LL %	PL %	PI %
106330-004	2.65	sandy GP-GC	4.8	32.3	23.9	8.4
		% GRAVEL = 58.7				
		% SAND = 34.6				
		% SILT = 2.6				
		% CLAY = 4.1				

GENERAL ENGINEERING
A Division of General Engineering Laboratories, Inc

Project Code URSC00403C
Project Name Shallow Land Disposal Area
Parks Township, Pennsylvania
Boring No. MWS-01 (2-12)
Date February 24, 2004

GRADATION CURVES

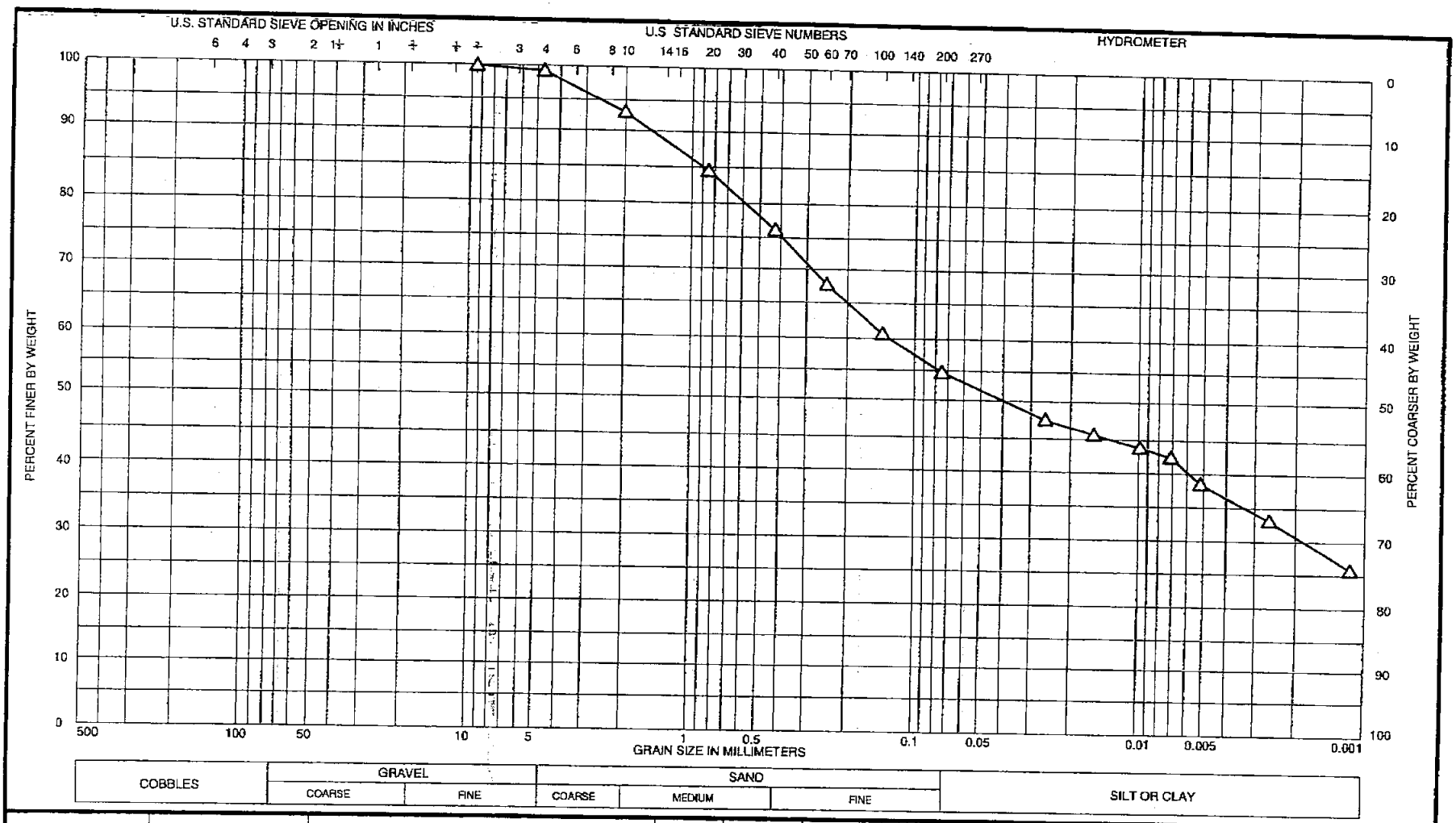


Sample No.	Specific Gravity	Classification	Nat w %	LL %	PL %	PI %
106330-005	2.71	SC	18.0	35.8	21.8	14.0
		% GRAVEL = 7.5				
		% SAND = 51.2				
		% SILT = 19.2				
		% CLAY = 22.1				

GRADATION CURVES

GENERAL ENGINEERING
A Division of General Engineering Laboratories, Inc.

Project Code URSC00403C
Project Name Shallow Land Disposal Area
Parks Township, Pennsylvania
Boring No. MWS-02 (12-20)
Date February 24, 2004



Sample No.	Specific Gravity	Classification	Nat w %	LL %	PL %	PI %
106330-006	2.78	sandy CL	26.9	28.6	20.0	8.6
		% SAND = 45.2				
		% SILT = 16.5				
		% CLAY = 38.3				

GRADATION CURVES

GENERAL ENGINEERING
A Division of General Engineering Laboratories, Inc.

Project Code URSC00403C
Project Name Shallow Land Disposal Area
Parks Township, Pennsylvania
Boring No. MWS-03 (10-18)
Date February 24, 2004

APPENDIX F

PACKER TEST DATA AND CALCULATIONS

MADE BY: DRL DATE: 12/19/03
CHECKED BY: SSN DATE: 04/13/04

1. PURPOSE

The purpose of this calculation is to determine an approximate value of hydraulic conductivity (permeability) for bedrock at the USACE SLDA site near the Town of Leechburg in Armstrong County, Pennsylvania. The conductivity estimates are based on the results of pressure (i.e. packer) tests performed at five (5) perimeter nested well borehole locations (NWS-01A through NWS-05) and other single boreholes drilled between September and November 2003. The nested well borings are located around the 'Upper Trench Area' and were drilled for the installation of FLUTe multi-port sampling systems to monitor the water-bearing units at the site.

2. SITE DESCRIPTION

The SLDA site is situated in the central part of the Appalachian Plateau, which is characterized by, rounded hills and steep-sided valleys. The ground surface ranges from approximately 760 feet (AMSL) to more than 950 feet (AMSL) in the site vicinity. The majority of the region is drained by the Allegheny River and its tributaries including the Kiskiminetas River to which the site drains.

2.1 Site Stratigraphy

The uppermost bedrock consists of sandstone and interbedded shale of the Glenshaw formation, which exhibits facies changes across the site. In the upper part of the section, claystone and calcareous units appear at some locations. Underlying the Glenshaw, the upper units of the Freeport formation include the Upper Freeport Shale, the Upper Freeport Coal and associated underclay. Below the Upper Freeport Coal is a 20 to 30 foot thick interval of shale followed by sandy units consisting of siltstone, shale, and sandstone (Butler sandstone) 10 to 30 feet thick. The lower portion of the Freeport consists of approximately 30 feet of interbedded shales and sandstone with coal stringers (Lower Freeport Coal) and includes the Freeport Sandstone, which lies approximately 60 feet below the upper Freeport coal seam.

Boring logs for the monitored FLUTe locations and other borings where packer testing was completed are provided in the RI report Appendices.

2.2 Water Bearing Zones

Four (4) hydrogeologic units have been identified and are currently monitored at the site. These include the following water bearing zones:

- Unconsolidated Overburden
- Shallow Bedrock Zone (above the mine)
- Upper Freeport Coal (including the mine)
- Deep Bedrock Zone (below the mine)

Beneath the unconsolidated overburden at the site, weathered bedrock with a clayey matrix act to plug the rock fractures and forms a confining unit that limits the downward percolation of groundwater. In the rock interval between the underlying mine workings and the weathered bedrock, two (2) water-bearing zones (referred to as the 'First' and 'Second' Shallow Bedrock Zones) have been identified with average elevations of 894 to 880 feet (AMSL) and 870

to 855 feet (AMSL) respectively (Table 1). The clustering of water levels and seasonal response indicates that the shallow water-bearing zones are separated hydraulically. However, a separating, low-permeability unit was not apparent from the boring logs or from the hydraulic conductivity data. The measured hydraulic conductivity of these zones ranged from 1 x 10^{-4} to 1 x 10^{-5} cm/sec (Table 2).

Within the Upper Freeport coal mine, groundwater flow occurs as open channel flow controlled by the elevation of the mine floor. The elevation of the mine floor beneath the site varies between 823 and 837 feet (AMSL). Water in the mine, which is recharged from drainage along the strip mine furrow and from overlying fractures, drains freely in a south-southeast direction towards Carnahan Run. Beneath the coal, a claystone unit referred to as the underclay, serves to limit the downward movement of groundwater from the mine.

At depth below the Upper Freeport coal, a sequence of sandy strata including the Butler and Freeport sandstones was identified as the deep aquifer. Based on a clustering of potentiometric heads (around elevation 800 ft (AMSL)) and a uniform response to seasonal variation, the whole sequence appears to be hydraulically connected and was, therefore, treated as one hydrogeologic unit. The top of the screened interval for deep wells installed at the site varies approximately between 782 and 800 feet (AMSL), which is approximately 30 to 50 feet below the mine. The average hydraulic conductivity measured in the deep wells was reported to be 3.8 x 10^{-5} cm/sec (Table 2).

3.0 ANALYSIS

3.1 Approach

Approximate values of hydraulic conductivity were determined using constant head conductivity tests in a single drilled borehole following methods provided in the third edition of the U.S. Department of Interiors Earth Manual (Attachment 1). The constant head, single borehole test is based on the same theories as the steady-state or the rim-type aquifer test, including the assumptions that the system reaches steady state and flow to, or from, the well is horizontal, radial, and laminar.

3.2 Summary of Method

This test commonly referred to as a packer test, is conducted by injecting water into an interval isolated within the borehole by inflatable packers and recording the volume of water injected for a measured period of time. The injection pressure is equal to the interval's gravity, or static head, plus added pressure head provided by the hydraulic pump controlled at the pressure gauge. The amount of hydraulic pressure added is dependent on the intake rate of the test interval, and is limited by the calculated maximum pressure that would result in the deformation of the rock being tested. The maximum pressure that could be applied was calculated for each test interval prior to testing (see Attachment 2 – Packer Permeability Field Data Sheets).

The packer tests were performed in the 3.78-inch diameter HQ coreholes drilled for rock descriptions at each of the Flute monitoring locations. The unconsolidated overburden was not packer tested, but hydraulic conductivities were determined for the overburden based on conventional slug testing performed in the paired overburden wells.

At NWS-01A, the packer test was performed above the mine void in the 4.87-inch diameter reamed borehole and, in the 3.78-inch HQ corehole below the mine. Testing was performed in 10-foot increments starting at the bottom of the borehole. At three (3) locations, where the mine void was encountered (NWS-01A, NWS-03, and NWS-05), testing was performed first from the top of the mine upward. Following the reaming of the borehole and placement of 4-inch diameter temporary steel casing to the mine floor, and coring below the mine, testing resumed from the bottom of the HQ corehole upward to the mine.

4.0 CALCULATION

Hydraulic conductivity is calculated from data collected on the flow rate, length and radius of the test interval in the borehole and the effective hydraulic head. The following equation was used to calculate the hydraulic conductivity given the length of the test section (i.e. 10 feet) was greater than 10 times the radius of the rock hole tested (i.e. 0.157 to 0.2 feet).

$$K = \frac{Q}{2(3.14)LH} \ln \frac{L}{r}$$

Where:

K	=	Hydraulic Conductivity (cm/sec)
Q	=	Constant rate of flow into test interval (ft.^{3}/min)
L	=	Length of test interval (ft.)
H	=	Differential head of water at test interval (ft.)
r	=	Radius of borehole (ft.)
ln	=	Natural Logarithm, log

Factor used to convert ft/min to cm/sec = 0.508

The differential head (H) used in the equation is equal to the gravity head (H_G, equivalent to the vertical distance from the potentiometric surface for the test interval to the pressure gauge), plus the applied hydraulic pressure (H_P) converted to linear units of head (i.e. Gauge Pressure (psi) x 2.31 ft/psi).

$$H = H_G + H_P$$

The gravity head used in the initial calculation was estimated based on the potentiometric elevation measured during previous investigations (see Attachment 3 – Groundwater Surface Maps) as summarized in Table 1. The potentiometric head at the level of the mine was taken to coincide with the elevation of the mine floor and was projected to decline incrementally with depth below the mine. This decline in head reflects the downward vertical gradients measured at nested well locations at the site.

The rate of discharge of water to the formation (Q) used in the calculation was typically taken near the end of the test record prior to depressurization of the test interval. In those

instances where the discharge rate appeared erratic, the average rate for the entire test interval was used to approximate the result. Field sheets recording the pressure test data are provided in Attachment 4.

5.0 RESULTS

The hydraulic conductivities calculated for the respective monitored FLUTe locations are provided in Tables 3 through 7. The hydraulic conductivities calculated for the individual bedrock wells installed at the site are provided in Tables 8 through 11. The water-bearing intervals selected for monitoring at each location are highlighted on these tables. The monitoring intervals for the nested FLUTe systems were selected based on the calculated hydraulic conductivities and borehole information from the rock core descriptions. The respective depths selected for the FLUTe multi-port monitoring systems are summarized in Table 12.

The results of the packer test and groundwater zones selected for monitoring correlated well with the water-bearing units identified in previous site investigations (see Table 2 to 6 for elevational comparisons). In general, the upper 30 to 40 feet of bedrock was fairly conductive with the conductivities of the Shallow Water-Bearing Zones varying between 2 x 10^{-5} cm/sec and 1.6 x 10^{-3} cm/sec within the range recorded during previous investigations (Section 2.2). At NWS-01A the entire rock column above the mine workings appeared to be conductive (5 x 10^{-5} cm/sec to 5.6 x 10-^{4} cm/sec) with numerous fractures noted in the rock core throughout the section. More typically, a low permeability, black shale (Upper Freeport shale) served to separate the upper (shallow) water-bearing zones from the Upper Freeport coal interval. At locations NWS-02, -03, and –05, a lower permeability rock unit occurred between the first and second shallow water bearing units.

Packer tests were not performed either at, or directly above and below the level of the Upper Freeport coal. At three (3) of the five FLUTe locations (NWS-01A, -03 and, -05) a mine void up to 5 feet wide was encountered, equivalent to the thickness of the coal seam. Directly below the Upper Freeport coal, the claystone and siltstone units were found to be fairly tight with conductivities often less than measurable (i.e. less than 5 x 10^{-7} cm/sec). Higher takes of water generally occurred 30 to 60 feet below the Upper Freeport coal, and were typically associated with sandier rock units (e.g. Butler and Freeport sandstones). Conductivities of the deep water-bearing zones monitored by the FLUTes varied from approximately 1 x 10^{-6} cm/sec to 4 x 10^{-6} cm/sec at NWS-01A, -02 and –04; and between 5 x 10^{-5} cm/sec to 7 x 10^{-4} cm/sec at NWS-03 and –05.

6.0 REFERENCES

(1) U.S. Department of the Interior, 1990, "Procedure for Constant Head Hydraulic Conductivity Tests in Single Drill Holes" USBR 7310-89; Bureau of Reclamation, Earth Manual Part 2, 3rd Edition, pp. 1245-1256.

Table 1
Groundwater Elevations for SLDA
Based on ARCO/BWXT 1996 Water Level Survey*

Boring/FLUTe Location	Estimated Ground Elevation	1st Shallow Bedrock Zone	2nd Shallow Bedrock Zone	Upper Freeport Coal Zone**	Deep Bedrock Zone
NWS-01A	928	915	882	826	800
NWS-02	942	910	880	819	800
NWS-03	945	910	880	829	800
NWS-04	922	892	868	837	880
NWS-05	910	887	868	836	800

* See 1996 Groundwater Potentiometric Maps by ARCO/BWXT
** Upper Freeport Coal water level based on approximate elevation of mine floor

TABLE 2
SLDA SUMMARY OF HYDROGEOLOGIC VALUES
(As Reported by ARCO/BWXT in the SLDA Site Characterization Report, 1994)

HYDRO - STRATIGRAPHIC UNIT	STRATIGRAPHIC UNIT	HYDRAULIC CONDUCTIVITY[1] (cm/s)		DIRECTION OF GW FLOW	HYDRAULIC GRADIENT[2]	PORE VELOCITY[3]	UNIT THICKNESS[4] (ft)
SS	Surficial Soil (SS)	1.69E-06	v	Vertically Downward	1.0		0 to 10
	Subsoil	3.73E-05	h	Horizontal - North/northwest	average = 0.1	5.9 m/yr (19.4 ft/yr)	5 to 10
	Bedrock Below Subsoil (Weathered Bedrock)	3.22E-07	v	Vertically Downward	1.0		5 to 15
1S	First Shallow Bedrock	1.15E-04	h	Horizontal - North/northwest	average = 0.1	120 m/yr (394 ft/yr)	5 to 20
	Bedrock Below First Shallow Bedrock (1st Shale)	1.20E-07	v	Vertically Downward	1.0		0 to 20
2S	Second Shallow Bedrock	1.25E-05	h	Horizontal - North/northwest	average = 0.1	120 m/yr (394 ft/yr)	10 to 25
	Bedrock Below Second Second Shallow Bedrock (2nd Shale)	2.30E-07	v	Vertically Downward	1.0		10 to 20
	Unsaturated Mine Fill	7.03E-03	v	Vertically Downward	1.0		18 to 30
	Mine Fill	1.13E-02	h	Horizontal - South	unknown		0 to 3
UF	Upper Freeport Formation	Channnel Flow		Horizontal - South/southeast	N/A	N/A	0 to 5
	Claystone Below Upper Freeport	1.05E-07	v	Vertically Downward	1.0		2 to 4
DB	Deep Bedrock Zone	3.81E-05	h	Horizontal - North	average = 0.01	4.0 m/ry (13.12 ft/yr)	20+

Notes:
1. Average hydraulic conductivity values as listed by ARCO/BW
2. Average horizontal gradients determined from groundwater elevation contour maps
3. Pore velocity is the horizontal groundwater flow through the open pores in the soil or rock
4. As reported in the SCR by ARCO/BW

TABLE 3
Boring NWS-01A
Packer Test Results

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Water Loss Q(ft³/min)	Hydraulic Pressure Hp(Ft.)	Hydraulic Pressure $+H_G$(Ft.)	Hydraulic Pressure =H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat. Column (BGS ft)	Log Remark
(Surface elevation: 928)									Very broken shale	Top of rock @ 16'
906				(Psi)					24'----------	Fractures at 29.8'
896	22-32	1.38	0.18	(10) = 23	13	36	1.58×10^{-4}	Semi –taker	Siltstone	
894 1 SBZ 886 880	32-42	1.77	0.24	(8) = 18	24	42	1.8×10^{-4}	Semi-taker		31.3' 34.9' 41.8'
876	42-52	6.37	0.85	(5) = 12	36	48	5.6×10^{-4}	Taker (erratic)	48'---------- Sandy Siltstone	Bedding fractures throughout
870 866 2 SBZ	52-62	15.0	2.0	(35) = 81	46	127	5.0×10^{-4}	Taker		
856 855	62-72	2.1	0.28	(45) = 104	55	159	5.6×10^{-5}	Semi-taker	69' ---------- Shale/Siltstone	Fracture at 63' shows signs of weathering
846	72-82	6.8	0.91	(60) = 139	65	204	1.4×10^{-4}	Semi-taker	80' ---------- Silty shale	Fractures 79' –82'
836	82-92	13.3	1.78	(20) = 46	76	122	4.6×10^{-4}	Taker	83' ---------- Shale	89.4' to 89.8' Highly fractured, iron staining
837 UF 823	92-110	--	--	-- --	--	--		Mine (no test)	97.4' ---------- **Mine Void** 102.3'----------	Freeport Coal
818 808	110-120	0.67	0.009	(40) = 92	102	194	1.5×10^{-6}	Tight	126'---------- Siltstone grades to Sandy/silty shale	Frequent horizontal fractures RQD=61%
DBZ 798	120-130	0	--	(60) = 139	110	239	$<1 \times 10^{-6}$	Tight		RQD = 94%

TABLE 3
Boring NWS-01A
Packer Test Results

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Water Loss Q(ft³/min)	Hydraulic Pressure Hp(Ft.)	Hydraulic Pressure $+H_G$(Ft.)	Hydraulic Pressure =H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat. Column (BGS ft)	Log Remark
DBZ 788	130-140	0	--	(50) = 115	120	235	$<1 \times 10^{-6}$	Tight	136'---------- Black shale	RQD = 93%
778	140-150	0.05	0.007	(55) = 127	128	255	$<1 \times 10^{-6}$	Tight		Sub angular fracture at 152'
768	150-160	0.12	0.016	(65) = 150	140	290	1.8×10^{-6}	Tight	150'---------- Sandy shale	Horizontal fractures and shale partings
758 757	160-170	0.12	0.017	(50) = 115	120	265	2.1×10^{-6}	Tight	163'---------- Fine to med Sandstone	Signs of some weathering

H_G (Gravity Head) Estimated based on water levels measured on 1/96 and 5/96.

$$K = Q / 2\pi L H (\ln \frac{L}{r})$$

where:

L=Length of test interval (10 ft.)
r=radius corehole (0.2 ft.)
Q=Water loss volume

H (Test Interval Head)=Hp (Pressure Head) + H_G (Gravity Head). Psi = Gauge pressure in pounds per square inch.

Notes:

1) Intervals selected for FLUTe monitoring shaded within column of Hydraulic conductivity results
2) Average interval for water-bearing zones defined at the site are shaded within Elevation column

Table 4
Boring NWS-02
Packer Test Results

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Water Loss Q(ft³/min)	Hydraulic Pressure Hp(Ft.) (Psi)	+H_G(Ft.)	=H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat.Column (BGS Ft.)	Log Remark
(Surface elevation: 942) 898									Claystone	Top of Rock 40'
888 894 1 SBZ 880	44-54	15	2.0	(5) = 12	32	42	1.6×10^{-3}	Taker	45'---------- Siltstone 52'---------- Sandstone; Shaly @56'	1" rubble @ 47' Rust fractures @ 50-51'
878	54-64	0.06	0.008	(50) = 115	42	157	1.7×10^{-6}		63'---------- Fine Sandstone	Losing most drill water
868 870 2 SBZ 858 855	64-74	0.05	0.007	(50) = 115	52	167	1.4×10^{-6}	Tight		
	74-84	0.9	0.12	(70) = 162	62	224	1.8×10^{-5}	Semi-taker	84'---------- Siltstone to Very fine Sandstone	Broken Zone @ 83'
848	84-94	0	---	(70) = 162	72	234	$<1 \times 10^{-6}$	Tight	93'---------- Shale	
838	94-104	0.07	0.009	(80) = 185	82	267	1.1×10^{-6}	Tight		2" rubble @ 95'
837 UF 828	104-114	0.34	0.05	(60) = 139	92	231	7.2×10^{-6}	Semi-taker	118.6'---------- Coal	Bituminous Shale Pillar/wall
823 819	114-123	---	---	--- ---	---	---		No Test	123'---------- Claystone/Siltstone	
809	123-133	0.05	0.007	(20) = 46	124	170	1.4×10^{-6}	Tight	133'---------- Siltstone	Massive Shaly Laminae
799 800	133-143	0	---	(50) = 115	142	257	$<1 \times 10^{-6}$	Tight	143'---------- Very Fine Sandstone	
789 DBZ	143-153	0.05	0.007	(50) = 115	142	257	1.2×10^{-5}	Tight	151'---------- Siltstone/Very Fine Sandstone	Possible conductive fracture @150.5'
779	153-163	0	---	(50) = 115	152	267	$<1 \times 10^{-6}$	Tight	160'---------- Shale (grades to Siltstone)	
769	163-173	0.05	0.007	(50) = 115	152	267	$<1 \times 10^{-6}$		174'---------- Sandstone 177' Bottom of Boring	1"-2" Rubble zone with coal @173'

Table 4
Boring NWS-02
Packer Test Results

H_G (Gravity Head) Estimated based on water levels measured on 1/96 and 5/96.

$$K = Q / 2\pi L H (\ln \frac{L}{r})$$

where:

L=Length of test interval (10 ft.)
r=radius corehole (0.157 ft.);
Q=Water loss volume;

H (Test Interval Head)=Hp (Pressure Head) [Hp(ft)=(Psi) x 2.31 ft/Psi)]+ H_G (Gravity Head). Psi = Gauge pressure in pounds per square inch.

Notes: See "Notes" on Table 3

TABLE 5
Boring NWS-03
Packer Test Results

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Water Loss Q(ft³/min)	Hydraulic Pressure Hp(Ft.)	+H_G(Ft.)	=H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat.Column (BGS Ft.)	Log Remark
(Surface elevation: 945)				(Psi)						
905	30-40	10	1.3	(0) = 0	20	20	2×10^{-3}	Taker	Claystone with siltstone	Top of Rock 26' Highly Weathered
895	40-50	0	0	(15) = 35	25	60	$<1 \times 10^{-6}$	Tight	47' (Grades to)---------- Siltstone	
894 1 SBZ 885 880	50-60	0.5	0.07	(20) = 46	35	81	2.6×10^{-5}	Taker		Core Highly Broken 47'-57'
									60'---------- Fine Grain Sandstone	RQD 77
875	60-70	0.24	0.03	(45) = 104	45	149	6.2×10^{-6}	Tight	65'---------- Shale/siltstone	RQD 83
870 865 2 SBZ	70-80	1.0	0.14	(50) = 115	55	170	2.5×10^{-5}	Semi-taker	70'---------- Fine Grain Sandstone with Shale interbeds	RQD 83-98
855 855	80-90	0	0	(50) = 115	65	180	$<1 \times 10^{-6}$	Tight	85'---------- Shale (RQD 96)	
845	90-100	0.4	0.05	(50) = 115	75	190	8.1×10^{-6}	Erratic		Core Highly Broken
840	95-105	0	0	(40) = 92	85	177	$<1 \times 10^{-6}$	Tight	(RQD 80)	Lost Drill Water
837 UF 823 820	105-124	---	--	-- --	--	--		Mine (No Test)	111'---------- Mine Void	
810	124-134	2.6	0.35	(60) = 139	125	265	4.3×10^{-5}	Erratic	116'---------- Claystone Siltstone (RQD 89)	Sandstone Laminations
800 800	134-144	0	0	(50) = 115	125	240	$<1 \times 10^{-6}$	Tight	135'---------- Fine Grain Sandstone	Fracture 134'
790	144-154	0.2	0.03	(50) = 115	135	250	3.7×10^{-6}	Tight		RQD 80-94
DBZ 780	154-164	14.1	1.9	(40) = 92	145	237	2.5×10^{-4}	Taker	154'---------- Very Fine Grained Sandstone	Shale Seam
770	164-174	3.2	0.42	(50) = 115	145	260	5.0×10^{-5}	Taker	160'---------- Black Shale	Lost Drill Water 160' Bottom Boring 177.7'

TABLE 5
Boring NWS-03
Packer Test Results

H_G (Gravity Head) Estimated based on water levels measured on 1/96 and 5/96.

$$K = Q / 2\pi L H (\ln \frac{L}{r})$$

where:

L=Length of test interval (10 ft.)
r=radius corehole (0.2 ft.)
Q=Water loss volume

H (Test Interval Head)=Hp (Pressure Head) + H_G (Gravity Head). Psi = Gauge pressure in pounds per square inch.

Notes: See "Notes" on Table 3

TABLE 6
Boring NWS-04
Packer Test Results

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Water Loss Q(ft³/min)	Hydraulic Pressure Hp(Ft.)	Hydraulic Pressure +H_G(Ft.)	Hydraulic Pressure =H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat. Column (BGS ft)	Log Remark
(Surface elevation: 922) 892 1 SBZ 882	30-40	0.3	0.04	(Psi) (10) = 23	30	53	2.5×10^{-5}	Taker (Erratic)	Silty sandstone 34'---------- grades to Siltstone/Mudstone	Top of rock @ 20' Highly fractured at 24-26' RQD=51%
880 872	40-50	4.9	0.65	(35) = 81	40	121	1.8×10^{-4}	Taker	44'---------- Shale with Siltstone interbeds	Vert fractures at 53' RQD=27%
2 SBZ 870 862	50-60	0.3	0.04	(40) = 92	50	142	9.4×10^{-6}		56'---------- Shale with horz fractures	
855 852	60-70	0.12	0.016	(50) = 115	60	175	3.0×10^{-6}			
842	70-80	0.01	0.001	(55) = 127	70	197	$<1 \times 10^{-6}$			Likely pillar, no void
UF 837 830	80-92	--	--	-- --	--	--		Mine (coal) no test	81'---------- Coal 85'---------- Claystone	
820 823	92-102	0.12	0.016	(85) = 196	90	286	1.8×10^{-6}		89'---------- Siltstone, grades to silty shale	
810	102-112	0.2	0.025	(85) = 196	95	291	1.8×10^{-6}			Subangular fractures 98.5', 102.5', 104'
800	112-122	0.35	0.047	(110) = 254	100	354	4.4×10^{-6}			
790 DBZ	122-132	0.06	0.008	(85) = 196	115	311	4.4×10^{-6}		127'---------- Fine Sandstone with shale	Easy coring at 121'
780	132-142	0.1	0.013	(100) = 231	120	351	1.2×10^{-6}			Easy coring at 135'

TABLE 6
Boring NWS-04
Packer Test Results

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Q(ft³/min)	Hydraulic Pressure Hp(Ft.)	+H_G(Ft.)	=H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat. Column (BGS ft)	Log Remark
DBZ 770	142-152	0.4	0.053	(115) = 266	130	396	4.5×10^{-6}		144'---------- Sandy shale	143.6' angular fracture
760	152-162	0.32	0.042	(95) = 219	140	359	3.9×10^{-6}			Minor fractures along bedding planes
750	162-172	0.07	0.009	(85) = 196	150	346	$<1 \times 10^{-6}$			
740	172-182	0.15	0.02	(65) = 150	160	310	2.1×10^{-6}			

H_G (Gravity Head) Estimated based on water levels measured on 1/96 and 5/96.

$$K = Q / 2\pi L H (\ln \frac{L}{r})$$

where:

L=Length of test interval (10 ft.)
r=radius corehole (0.2 ft.)
Q=Water loss volume

H (Test Interval Head)=Hp (Pressure Head) + H_G (Gravity Head). Psi = Gauge pressure in pounds per square inch.

Notes: See Notes on Table 3

TABLE 7
Boring NWS-05
Packer Test Results

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Water Loss Q(ft³/min)	Hydraulic Pressure Hp(Ft.)	+ H_G(Ft.)	=H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat.Column (BGS Ft.)	Log Remark
Surface elevation: 910 1 SBZ 877 860	23-33	6.3	0.8	(Psi) (20) = 46	23	69	3.6×10^{-4}	Taker	(Top of Rock 18') Fractured Siltstone (RQD=0) 32' ---------- Siltstone Mudstone	Many bedding fractures Iron stain 22' Vertical Fracture 29' Hard
867 870	33-43	0.4	0.05	(15) = 35	32	67	2.3×10^{-5}	Tight		
2 SBZ 857 855	43-53	2.6	0.35	(30) = 69	42	111	1.0×10^{-4}	Taker	43' ---------- Sandy Siltstone (RQD=0) 50' ---------- Massive Shale	Highly Fractured Vertically & Horizontally Iron Staining Hard
847	53-63	0	0	(12) = 28	52	80	$< 1 \times 10^{-6}$	Tight		
837 UF 828 823	63-82	--	--	-- --	--	--		Mine (Not Tested)	70.5' Coal 72' Void 74' Coal 78' Claystone 81' Limestone	Broken
818	82-92	0.2	0.025	(60) = 139	80	219	3.5×10^{-6}	Tight		Fracture at 92' (Lost Drill Water) and 96' Dk. Grey Shale
808	92-102	0.1	0.015	(60) = 139	80	219	2.1×10^{-6}	Tight	Siltstone To Shale (RQD=80-98)	
800 798	102-112	0.3	0.04	(50) = 115	90	205	6.0×10^{-6}	Semi-Taker	100' (Grades to)--------- Sandy siltstone (RQD=78)	Fracture at 106'
788	112-122	2.5	0.33	(40) = 92	90	182	5.6×10^{-5}	Taker		
778	122-132	0.1	0.015	(55) = 127	100	227	2.0×10^{-6}	Taker		Clay infilling at 126'----------
DBZ 768	132-142	0.2	0.025	(50) = 115	100	215	3.6×10^{-6}	Semi-Taker	(RQD = 90) 136' ---------- Quartz Sandstone (RQD=70-80)	Brittle Shale Interbeds
758	142-152	18.3	2.4	(0) = 0	110	110	6.8×10^{-4}	Taker		Bottom Boring 155.5'

TABLE 7
Boring NWS-05
Packer Test Results

H_G (Gravity Head) Estimated based on water levels measured on 1/96 and 5/96.

$$K = Q / 2\pi\, L\, H\, (\ln \frac{L}{r})$$

where:

L=Length of test interval (10 ft.)
r=radius corehole (0.2 ft.)
Q=Water loss volume

H (Test Interval Head)=Hp (Pressure Head) [Hp(ft)=(Psi) x 2.31 ft/Psi)]+ H_G (Gravity Head). Psi = Gauge pressure in pounds per square inch.

Notes: See "Notes" on Table 3

TABLE 8

BORING MW-51 PACKER TEST RESULTS

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Q(ft³/min)	Hydraulic Pressure Hp(Ft.)		+H_G(Ft.)	=H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat. Column (BGS ft)	Log Remark
Surface elevation: 923)				(Psi)						Fine sandstone	Top of rock @ 6'
1SBZ 900.5-890.5	22.5-32.5	15.65	2.1	(6)	=	13.8	34	47.8	1.5×10^{-3}	Taker	Highly fractured

BORING MW-52 PACKER TEST RESULTS

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Q(ft³/min)	Hydraulic Pressure Hp(Ft.)		+H_G(Ft.)	=H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat. Column (BGS ft)	Log Remark
Surface elevation: 922)										Claystone grades to Siltstone, then grades to sandy Siltstone	Top of rock @ 19.5'
1SBZ 891	21-31	4.6	0.6	(Psi) (15)	=	34.5	38	72.5	2.9×10^{-4}	Taker	
881	31-41	16.3	2.2	(5)	=	11.5	40	51.5	2.8×10^{-3}	Taker	Grades to silty Shale at 40' / Lost most of drilling water at 40' / Horiz fractures present

H_G (Gravity Head) Estimated based on water levels measured on 1/96 and 5/96.

$$K = Q / 2\pi L H (\ln \frac{L}{r})$$

where:

L=Length of test interval (10 ft.)
r =radius corehole (0.2 ft.)
Q=Water loss volume

H (Test Interval Head)=Hp (Pressure Head) + H_G (Gravity Head). Psi = Gauge pressure in pounds per square inch.

Notes: See Notes on Table 3

TABLE 9
BORING MW-53 PACKER TEST RESULTS

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Water Loss Q(ft³/min)	Hydraulic Pressure Hp(Ft.)		+H_G(Ft.)	=H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat. Column (BGS ft)	Log Remark
Surface elevation: 923)				(Psi)						Fine sandstone	Top of rock @ 13'
897	16-26	5.5	0.74	(10) =	23	10	33	7.5×10^{-4}	Taker		RQD=62% Rubble zone at 30'
887	26-36	13.2	1.76	(12) =	28	20	48	1.2×10^{-3}	Taker	40'---------- Silty Shale	horiz fractures RQD=73%
877	36-46	0.17	0.02	(60) =	138	28	166	4.0×10^{-6}	Tight	46'---------- Black Shale	RQD 92%
2SBZ 867	46-56	14.2	1.9	(50) =	115	40	155	4.1×10^{-4}	Taker		
857 851	57-67	10.9	1.46	(50) =	115	54	169	2.9×10^{-4}	Semi-taker		Bottom at 71'

H_G (Gravity Head) Estimated based on water levels measured on 1/96 and 5/96.

$$K = Q / 2\pi L H (\ln \frac{L}{r})$$

where:

L=Length of test interval (10 ft.)
r=radius corehole (0.2 ft.)
Q=Water loss volume

H (Test Interval Head)=Hp (Pressure Head) + H_G (Gravity Head). Psi = Gauge pressure in pounds per square inch.

Notes: See Notes on Table 3

TABLE 10
BORING MW-57 PACKER TEST RESULTS

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Water Loss Q(ft³/min)	Hydraulic Pressure Hp(Ft.)	$+H_G$(Ft.)	=H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat. Column (BGS ft)	Log Remark
Surface elevation: 945)				(Psi)					25'---------- Claystone	Top of rock @ 25'
907.5	27.5-37.5	0.33	0.044	(10) = 23	40	63	4.6×10^{-5}	Semi-taker	27'---------- Siltstone, very broken	RQD=62% Rubble zone at 30'
897.5 1SBZ	37.5-47.5	0.7	0.94	(20) = 46	40	86	3.7×10^{-5}		More competent	horiz fractures RQD=73%
887.5	47.5-57.5	0.23	0.03	(20) = 46	73	119	8.7×10^{-6}		39.7'---------- Mudstone and Shale	RQD 88%
2SBZ 877.5	57.5-67.5	0.35	0.05	(20) = 46	73	119	1.3×10^{-5}		50' ---------- Sandstone and shale, well cemented	
867.5	67.5-77.5	8.5	1.14	(50) = 115	73	188	2.0×10^{-4}	Taker	65' ---------- Fine Sandstone	RQD 83%
857.5	77.5-87.5	0.25	0.03	(40) = 92	73	165	6.8×10^{-6}		78' ---------- Shale	
847.5	87.5-97.5	0.7	0.09	(40) = 92	73	165	1.9×10^{-5}			RQD >90%
837.5	97.5-107.5	0.45	0.06	(50) = 115	85	200	1×10^{-5}			Probably coal pillar, no void
UF 827.5	107.5-117.5	7.9	1.06	(70) = 161	85	246	1.4×10^{-4}	Taker	112'---------- COAL 116'---------- Claystone	Bottom of hole at 121'

H_G (Gravity Head) Estimated based on water levels measured on 1/11/04

$$K = Q / 2\pi\, L\, H\, (\ln \frac{L}{r})$$

where:

L=Length of test interval (10 ft.)
r=radius corehole (0.2 ft.)
Q=Water loss volume

H (Test Interval Head)=Hp (Pressure Head) + H_G (Gravity Head). Psi = Gauge pressure in pounds per square inch.

TABLE 11
BORING MW-58 PACKER TEST RESULTS

Approximate Elevation (Feet amsl)	Depth (Feet)	Water Loss Q(gpm)	Water Loss Q(ft³/min)	Hydraulic Pressure Hp(Ft.)		+H_G(Ft.)	=H (Ft.)	Conductivity K (cm/s)	Test Comments	Strat. Column (BGS ft)	Log Remark
Surface elevation: 836)										21'---------- Sandstone	Top of rock @ 6'
DBZ				(Psi)						26'---------- Shale	RQD=36%
800	25.8-35.8	18.2	2.4	(0) =	0	30	30	2.7×10^{-3}	Taker	Vert. fractures 34'-36'	RQD=30%
790	35.8-45.8	0.05	0.007	(20) =	46	30	76	3.0×10^{-6}		Sandstone and Shale alternate	RQD 88%
780	45.8-55.8	0	0	--	--	--	--	--	Very tight	57'---------- fine Sandstone	RQD 94%
770	55.8-65.8	0	0	--	--	--	--	--	Very tight	Grades coarser with depth	RQD 83%
760	65.8-75.8	0.15	0.02	(30) =	69	65	134	9.75×10^{-6}	Very tight		RQD 92%

H_G (Gravity Head) Estimated based on water levels measured on 1/11/04

$$K = Q / 2\pi L H (\ln \frac{L}{r})$$

where:

L=Length of test interval (10 ft.)
r=radius corehole (0.2 ft.)
Q=Water loss volume

H (Test Interval Head)=Hp (Pressure Head) + H_G (Gravity Head). Psi = Gauge pressure in pounds per square inch.

Table 12
SLDA FLUTe Monitoring Intervals
Multiport Monitoring System Borehole Locations
NWS-01A, NWS-02, NWS-03, NWS-04 and NWS-05

LOCATION	STICK-UP (6" Steel Casing)	GROUND SURFACE ELEVATION (Ft AMSL)	SHALLOW BEDROCK				FREEPORT COAL		DEEP BEDROCK	
			1SBZ		2SBZ					
			Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation
NWS-01A	2.0	929.1	38-48	891.1-881.1	54-64	875.1-865.1	97-104	832.1-825.1	155-170	774.1-759.1
NWS-02	2.7	943.3	45-55	898.3-888.3	75-85	868.3-858.3	118-125	825.3-818.3	145-155	798.3-788.3
NWS-03	2.0	944.9	53-63	891.9-881.9	70-80	874.9-864.9	113-118	834.9-826.9	154-164	790.9-780.9
NWS-04	2.1	922.4	32-42	890.4-880.4	50-60	872.4-862.4	80-87	843.4-835.4	135-150	787.4-772.4
NWS-05	1.6	912.5	25-35	887.5-877.5	42-52	870.5-860.5	71-76	844.0-837.0	112-122	800.5-790.5
NWS-05 additional DBZ									145-155	767.5-757.5

SLDA PACKER TESTING DATA

ATTACHMENT 1

USDA EARTH MANUAL TEST METHODS

EARTH MANUAL

PART 2

Third Edition

Materials Engineering Branch
Research and Laboratory Services Division
Denver Office
1990

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

USBR 7310-89

PROCEDURE FOR

CONSTANT HEAD HYDRAULIC CONDUCTIVITY TESTS IN SINGLE DRILL HOLES

INTRODUCTION

This procedure is under the jurisdiction of the Geotechnical Services Branch, code D-3760, Research and Laboratory Services Division, Denver Office, Denver, Colorado. The procedure is issued under the fixed designation USBR 7310. The number immediately following the designation indicates the year of acceptance or the year of last revision.

Although the term "permeability" was used in all other procedures in this manual pertaining to the capacity of rock or soil to conduct a liquid, the similar term "hydraulic conductivity," is used throughout this procedure. (See designation USBR 3900 for differences in meaning of the two terms.)

Since geologic and hydrologic conditions encountered during drilling are not always predictable and may not be ideal, variations from this procedure may be necessary to suit the particular purpose of the test, and conditions at the test site. Much of the information for this procedure was taken from references [1] through [5],[1] which contain additional information on field hydraulic conductivity testing.

1. Scope

1.1 This designation outlines the procedure for performing tests to determine an approximate value of hydraulic conductivity (permeability) of soil or rock in an isolated vertical or inclined interval of a drill hole (borehole), either above or below the water table. Usually, the tests are performed as a part of the drilling program. This procedure can be used in holes of various diameters if suitable equipment is available, but N-size[3-in (76-mm)] nominal diameter drill holes are most commonly used.[2]

1.2 The constant head, single drill hole test is based on the same theories as the steady-state or Theim-type aquifer test; and the same assumptions are made. These assumptions are: (1) the aquifer is homogeneous, isotropic, and of uniform thickness; (2) the well (test interval) fully penetrates the aquifer and receives or delivers water to the entire thickness; (3) discharge or inflow is constant and has continued for a sufficient duration for the hydraulic system to reach a steady state; and (4) flow to or from the well is horizontal, radial, and laminar. Field conditions may not meet all of these assumptions. Equations and other factors affecting the test are given in paragraph 14., *Calculations*. This procedure should not be used for testing toxic waste containment that requires a very low loss of liquid.

1.3 Constant head hydraulic conductivity tests should be considered scientific tests. Great care should be exercised by those conducting the tests to eliminate as much error as possible.

[1] Number in brackets refers to the reference.
[2] Hereafter referred to as N-size holes.

2. Auxiliary Tests

2.1 The soil or rock penetrated by the drill hole should be identified, described, and classified from samples taken during the drilling operation. Soil can be sampled in accordance with USBR 7010, 7015, or 7105 and classified in accordance with USBR 5000. Rock cores or cuttings should be examined and appropriate description and classification made. Data obtained from the drill hole should be entered on appropriate log forms.

3. Applicable Documents

3.1 *USBR Procedures*:

USBR 1040 Calibrating Pressure Gauges
USBR 1050 Calibrating Pressure Transducers
USBR 3900 Standard Definitions of Terms and Symbols Relating to Soil Mechanics
USBR 5000 Determining Unified Soil Classification (Laboratory Method)
USBR 5005 Determining Unified Soil Classification (Visual Method)
USBR 5600 Determining Permeability and Settlement of Soils [8-in (203-mm) Diameter Cylinder]
USBR 5605 Determining Permeability and Settlement of Soils Containing Gravel
USBR 7010 Performing Disturbed Soil Sampling Using Auger Boring Method
USBR 7015 Performing Penetration Resistance Testing and Sampling of Soil
USBR 7105 Performing Undisturbed Soil Sampling by Mechanical Drilling Methods
USBR 7300 Performing Field Permeability Testing by the Well Permeameter Method

3.2 *USBR Document*:

3.2.1 Geology for Designs and Specifications by the Bureau of Reclamation. (This document covers both soil and rock.)

4. Summary of Method

4.1 *Pump-In Test.*–Water is injected into an isolated interval of a drill hole in soil or rock, and the volume of water injected is determined for a measured period of time. The injection pressure is a constant gravity head, with or without added pressure head provided by a hydraulic pump. The hydraulic conductivity is calculated from the flow rate, length and radius of test interval in the drill hole, and effective head.

4.2 *Artesian Test.*–Where water under artesian pressure flows out of the drill hole, the effective (shut-in) head at the test interval is measured and the hydraulic conductivity calculated from the flow rate, the length and radius of the well, and the effective head.

5. Significance and Use

5.1 Hydraulic conductivity tests are made to obtain data related to (a) identifying seepage potential and dewatering requirements, (b) drainage problems, (c) ground-water supply investigations, and (d) grouting requirements. The tests yield approximate values of hydraulic conductivity that are suitable for many engineering purposes. Reliability of the values obtained depends primarily on (a) homogeneity of the strata tested, (b) suitability of test equipment used for a given condition, (c) care taken in performing the test, and (d) adherence to requirements for proper use of the equations. The test is also used in formulating geologic descriptions and interpretation of material properties, particularly where there is poor sample recovery.

5.2 Where tests are performed in fractured rock, results could reflect secondary conductivity rates which would not represent primary conductivity of the intact mass. When the test is performed in fractured, brittle, swelling clay or rock, or where fractures contain loose material, hydraulic conductivity may be reduced and judgment should be used in applying results.

5.3 Generally, this procedure is suitable for materials in which the hydraulic conductivity ranges between 5 and 100,000 ft/yr (5×10^{-6} and 1×10^{-1} cm/s) and where results are to be used for engineering purposes. The procedure is not applicable in materials of lower permeability, particularly for purposes such as investigations for containment of toxic wastes.

6. Terminology

6.1 Definitions are in accordance with USBR 3900. Some definitions are from *Glossary of Geology* [6].

6.2 Terms not included in USBR 3900 specific to this designation are:

6.2.1 *Drill Hole.*–A circular hole made by drilling.

6.2.2 *Feed Pipe* (conductor pipe, injection pipe, riser pipe, drop pipe).–The main pipe (or rod) which conducts water from the collar of the hole into the test interval in the drill hole for the hydraulic conductivity test.

6.2.3 *Bailer.*–A cylindrical container with a valve on the bottom for admission of fluid, attached to a line and used for recovering and removing water, cuttings, and mud from a drill hole.

6.2.4 *Walking Beam.*–An oscillating rigid lever balanced on a fulcrum used to activate the cable in cable-tool drilling by alternating up and down motion.

6.2.5 *Aquifer.*–A water-bearing bed or stratum of earth, gravel, or porous rock with interconnected openings or pores through which water can move.

6.2.6 *Packer.*–A short expansible device deliberately set in a drill hole to prevent upward or downward fluid movement; generally for temporary use. The expansible part of the packer is called the gland. Straddle packers are two packers separated by a length of perforated pipe to span or straddle a test interval.

6.2.7 *Artesian.*–An adjective referring to ground water under hydrostatic pressure; i.e., an artesian aquifer is a confined aquifer. Artesian ground water rises above the confining layer in the drill hole and may or may not flow at ground surface.

6.2.8 *Ground Water.*–That part of the subsurface water that is in the zone of saturation.

6.2.9 *Water Table.*–The surface between the zone of saturation and the zone of aeration; that surface of a body of unconfined ground water at which the pressure is equal to that of the atmosphere.

6.2.10 *Perched Water Table.*–A water table, usually of limited area, maintained above the normal free water elevation by the presence of an intervening relatively impervious confining stratum.

6.2.11 *Gauge Saver.*–A vessel, with a pressure gauge, filled with glycerin or oil to protect the gauge from direct contact with fluid in the pressure line (see fig. 1).

6.2.12 *Holding Pressure* (applicable primarily for grouting).–The gauge pressure after the water-pumping system has been shut off at the valve ahead of the gauge and backflow is prevented.

6.2.13 *Back Pressure* (applicable primarily for grouting).–The gauge pressure in the system after the holding pressure has dissipated as determined by opening a valve and allowing the gauge to drop to zero, and then reclosing the valve.

6.2.14 *Backflow* (applicable primarily for grouting).–The reverse movement of water out of the drill hole when the holding and/or back pressure below the packers exceeds the pressure of the water column in the hole.

7. Interferences

7.1 During drilling, it is important to minimize movement of fines [minus No. 200 sieve-size material (75 μm)] into the material being tested and to remove any accumulation of fines from the wall of the drill hole during preparation for the test, so as to avoid obtaining test values

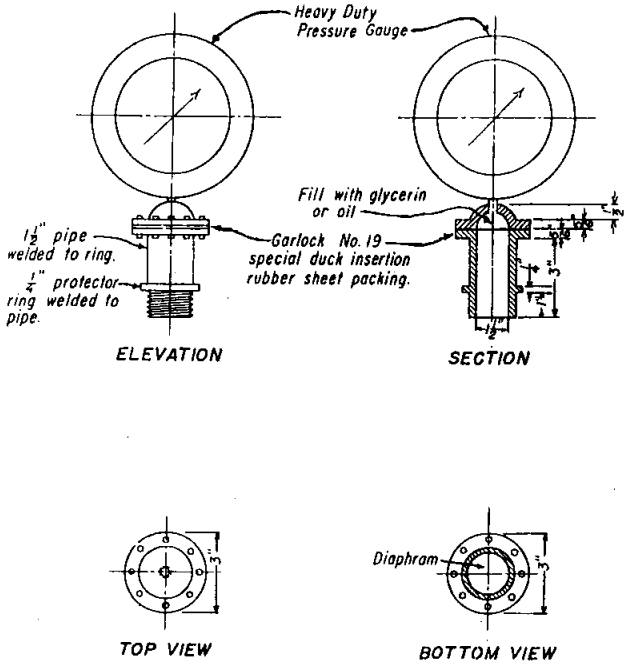


Figure 1. – Gauge saver device for protecting pressure gauge.
40-D-4287

lower than the actual hydraulic conductivity of the material being tested. Drilling using clear water without additives is preferred. Bentonitic muds should not be used in holes where hydraulic conductivity testing is to be performed. Biodegradable additives may be used if necessary, but only if the test interval is adequately cleaned before testing. The drilling procedure should be documented on the log form.

7.2 Test results can be adversely affected by injecting water containing sediment which would tend to plug voids in the material being tested.

7.3 The temperature of the injected water should be equal to or warmer than that of the ground or ground water. This reduces the tendency of air dissolved in the water to become entrapped in the voids of the material being tested and to cause low values of hydraulic conductivity. In most areas not affected by artesian conditions, the temperature at a depth of about 25 feet (8 m) below the ground surface remains relatively constant at the annual mean air temperature for the region. At significantly greater depths, temperature rises about 1 °F (0.6 °C) for each 500 to 1,000 feet (150 to 300 m) of depth. The temperature of the injected water, especially if it is known to be colder than the ground-water temperature, should be recorded on a geologic log, or the hydraulic conductivity test data forms (see subpar. 8.12 for suitable temperature measuring devices).

7.4 It is possible that dissolved minerals in the water used for a test may react chemically with substances in the material being tested to cause a change in the hydraulic conductivity. Therefore, it is desirable to use water for the test that is similar in quality to that expected to permeate the ground when the project is in operation.

8. Apparatus

8.1 *Drill Rigs* (see fig. 2):

8.1.1 *Rotary Drilling.*–A drilling method resulting in grinding a hole with a hard-toothed drill bit at the end of a rotating drill rod (pipe). The equipment consists essentially of a power unit, hoisting or tugging unit, controlled-feed rotary drill head and mounting frame, mast or tripod, and circulating pump. The rig should have various accessory drilling and sampling equipment (rods, bits, core barrels, augers), as required for drill hole advancement, sampling, and testing.

8.1.2 *Cable Tool Drilling.*–A method of drilling in which the material at the bottom of the hole is broken up by a steel bit with a blunt, chisel-shaped cutting edge. The drilling equipment consists essentially of a mast, a string of drill tools (casing, tubing, or pipe, of one size) that is alternately lifted and dropped by a hoist with a power unit, and a walking beam. A bailer is always used with a cable tool rig. Normally, a cable tool drilled hole is not satisfactory for hydraulic conductivity testing with packers.

8.2 *Injection Pump.*–A centrifugal or helical screw type pump providing a constant water flow is required. This may require a special pump separate from that used for drilling operations. Although there may be conditions where a larger or smaller pump may be required, high-quality pumps having a capacity of 40 gal/min (150 L/min) at a pressure of 120 lbf/in² (830 kPa) (such as Monyo model 3L-8 manufactured by the Robbins and Myers Company, Springfield, Ohio, or equivalent) are adequate for most hydraulic conductivity tests. The pump should provide the required flow at the required constant pressure with maximum allowable pressure fluctuation—due to pumping pulsations—of ±5 percent of the test gauge pressure. A surge chamber is required for all testing; this minimizes pulsations which can affect the injection rate in the test interval. Also, it makes readings more accurate and protects the pressure gauges against damage from sudden pressure changes.

8.3 *Feed Pipe.*–The feed pipe should be of adequate diameter to minimize head losses and have adequate tensile strength to withstand pumping pressures and stresses during hoisting or tugging. The feed pipe is commonly a threaded and coupled assembly of pipe or tubing having a uniform inside diameter. Drill rods, generally of N-size, can be used without seriously affecting reliability of test data if the flow rate to the test interval does not exceed about 15 gal/min (57 L/min) and the depth to the top of the interval does not exceed 50 feet (15 m).

NOTE 1.–Use of drill rods as feed pipe should be permitted only after the assembled drill rod string has been pressure tested to calibrate head losses at anticipated flows. If seals or sealing materials are used during calibration, the same type of seals or sealing materials (not oils or wax) should be used during hydraulic conductivity testing.

8.4 *Flowmeters.*–One or more calibrated flowmeters are required; the capacity of each meter should be specified.

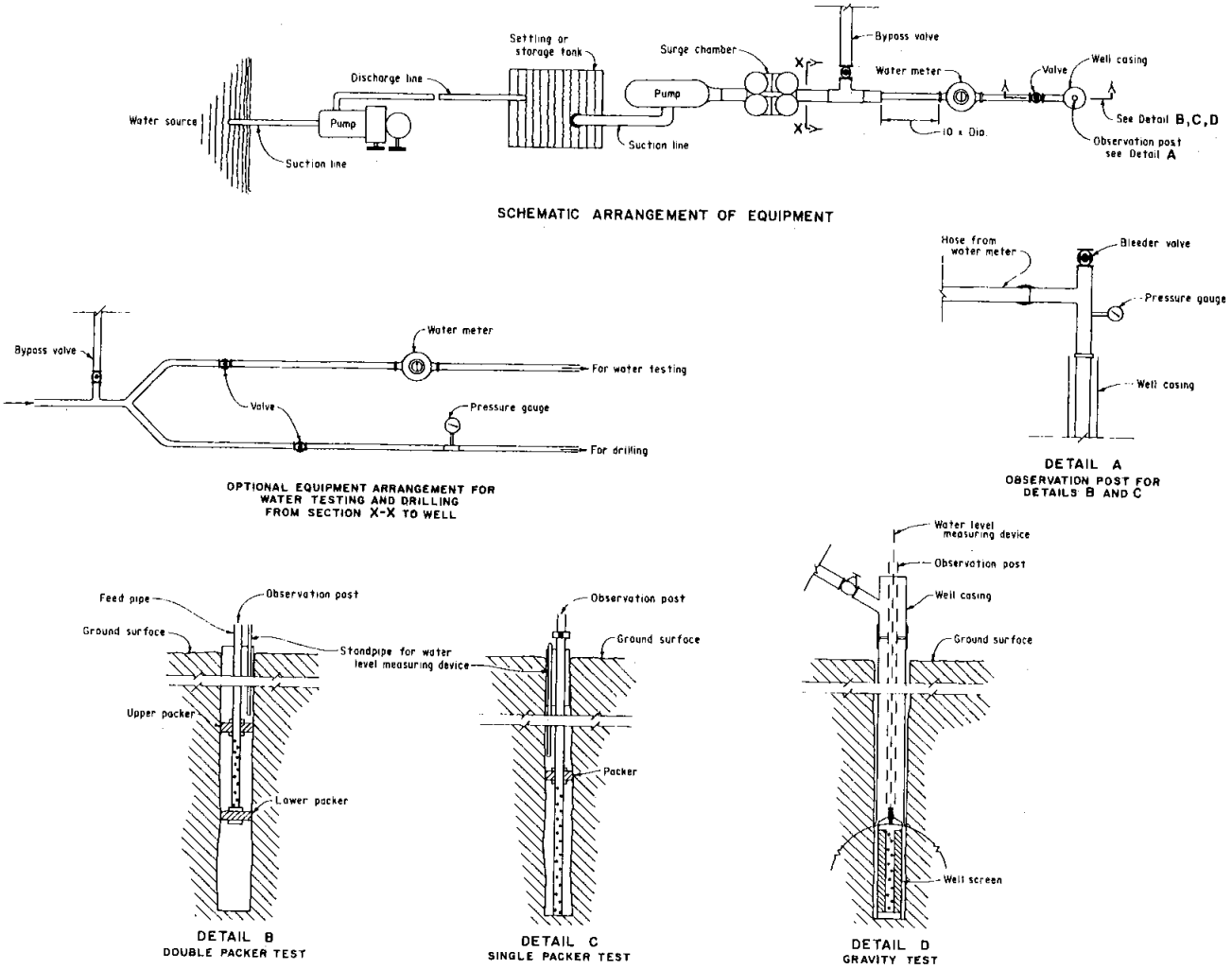


Figure 2. – Schematic arrangement of hydraulic conductivity equipment. 801-D-111

For flows up to 50 gal/min (200 L/min), a 1-inch (25-mm) diameter disk-type meter may be used. For higher flows, a 2- or 2-1/2-inch (50- or 65-mm) diameter impeller-type meter is recommended.

8.4.1 A straight uninterrupted section of pipe having an inside diameter equal to the rated size of the meter and a minimum length 10 times the inside diameter of the pipe should be provided upstream of the meter. Manufacturers commonly recommend pipe lengths of one to two times the inside diameter of straight pipe downstream from the meter.

8.5 *Pressure Sensors.*–Where required, calibrated pneumatic piezometers or electrical transducers can be used as down-hole sensors to measure pressures at the test interval during a hydraulic conductivity test. Down-hole sensors are preferred over the method of calibrating the piping system for head loss between a pressure gauge on the surface and the test interval. However, an above-ground pressure measurement can provide a check of the pressure sensor.

8.5.1 *Pneumatic Piezometers.*–A down-hole pneumatic piezometer system has been developed [7]. Descriptions of the equipment and procedure, as used at two damsites, are presented in appendix X1.

8.5.2 *Electrical Transducers.*–Electrical transducers have been used as down-hole pressure sensors by other agencies [8], particularly for very low hydraulic conductivities [below 1 ft/yr (1×10^{-6} cm/s)]. The USBR has used electrical down-hole sensors in preliminary trials. Electrical transducers measure pressures more accurately than pneumatic piezometers and can be connected to a strip-chart recorder for a continuous record. However, transducers are considered less rugged for field use and require more maintenance and experienced personnel to operate than do pneumatic piezometers.

8.6 *Pressure Gauges.*–When down-hole pressure sensors are not available or sensors are not working properly, calibrated pressure gauges can be used to estimate effective pressure in the test interval after correcting for friction loss through the feed pipe and packer. All pressure

gauges used in water testing should be high-quality, stainless steel, glycerin or oil filled, with pressure indicated in both lbf/in² and kPa (such as manufactured by Marsh Instrument Company, a unit of General Signal, P O Box 1011, Skokie, Illinois; or equal). Pressure gauge ranges should be compatible with testing requirements; they should be sized so that the gauge capacity does not exceed two to three times the maximum desired pumping pressure for each respective pumping stage. Gauges should have the smallest graduations possible and an accuracy of ±2.5 percent over the total range of the gauge. If a gauge saver is used with the gauge, calibration should be made with the gauge saver in place. Accuracy of the gauges should be checked before use and periodically during the testing program (see subpar. 11.2 for additional information).

8.6.1 One or more pressure gauges should be located downstream of the flowmeter and downstream of any valves at the top of the feed pipe. This location for pressure measurement can be used by inserting a sub (adaptor, or short piece of pipe) with the gauge — installed on the top of the feed pipe.

8.6.2 At least one additional calibrated replacement gauge should be available at the test site.

8.7 *Swivel.*–During the hydraulic conductivity test, it is preferable to eliminate the swivel and use a direct connection to the feed pipe. If a swivel must be used in the water line during testing, it should be of the nonconstricting type and calibrated for head loss. Significant friction loss can result from use of the constricting type.

8.8 *Packers.*–One or two (straddle) packers are required for the test. Packers may be either bottom-set mechanical, screw set mechanical, pneumatic inflatable, or liquid inflatable. The pneumatic inflatable packer is the preferable type for general use and is usually the only one suitable for use in soft rock and soil. The gland of this packer is longer and more flexible than the other types and will form a tighter seal in an irregular drill hole. A leather cup type of packer should not be used. To ensure a tight water seal, the length of contact between each expanded packer and the drill hole wall should not be less than three times the drill hole diameter.

NOTE 2.–More than one type of packer may be required to test the complete length of a drill hole. The type of packer used depends upon many factors, e.g., rock type, drill hole roughness, spacing and width of rock joints, and test pressures.

8.8.1 *Inflatable Packers.*–Inflatable packers with an expansible gland and a floating head (see app. fig. X1.2) should be designed for anticipated drill hole diameters and pressure conditions. For normal hydraulic conductivity testing, a reasonable maximum recommended working pressure inside and outside of the packer is 300 lbf/in² (2070 kPa) [8]. Inside pressure should be increased in water-filled holes, proportionally to the static head. For drill holes with sharp projections in the walls, a wire-reinforced packer gland having a higher working pressure [7] may be required. The pressure in the packer should not be high enough to fracture the material being tested. The pressure required to form a tight seal at the ends of a test interval depends on the flexibility of the gland, the friction of the floating head, and the drill hole roughness. The minimum differential pressure between the packer and the test interval can be determined by testing packers in a pipe slightly larger than the nominal diameter of the drill hole, in order to simulate possible enlargement of the drill hole during drilling. For a given test interval pressure, the packer pressure is increased until it provides a watertight seal between the packer and the material with which it is in contact. The pressure in the packer should range approximately between 30 and 300 lbf/in² (210 to 2100 kPa) greater than that in the test interval, with 100 lbf/in² (690 kPa) being normal. Pneumatic inflatable packers can be inflated with compressed air or compressed nitrogen.

8.8.2 Special pneumatic packers are available for use in wireline drilling operations. Because the packers must be able to pass through the wireline bit and then expand to completely seal the hole at the test interval, special materials are needed for the packer gland. A special packer assembly—consisting of two packers in tandem—is used with the upper packer being expanded inside the drill rod, just above the bit, and the lower packer expanded against the wall of the hole just below the bit. The two packers on the assembly can be positioned properly—relative to the bit—by a set of lugs or a ring located on the assembly. Special seals or connections are needed to attach the water supply to the wire-line drill pipe at the surface.

8.8.3 A minimum of two sets of replacement packers and/or spare glands should be available at the test site.

8.9 *Perforated Pipe Sections.*–Lengths of perforated steel pipe corresponding to the lengths of test intervals, are required between packers to admit water into the test intervals. The total area of all perforations should be greater than five times the inside cross-sectional area of the pipe. These perforated pipe sections should be calibrated for head loss.

8.10 *Well Screen.*–Well screen or slotted pipe may be required for testing in granular, unstable materials that require support [9]. As a general rule, the maximum size of slot width should be approximately equal to the 50-percent size of the particles around the drill hole (see subpar. 11.4).

8.11 *Water Level Measuring Device*:

8.11.1 Although there are other types of water level indicators, the electrical probe indicator is most commonly used. Essentially it consists of (1) a flexible, insulated conduit marked in linear units and enclosing two wires, each insulated except at the tips; (2) a low-voltage electrical source; and (3) a light or other means of indicating a closed circuit which occurs when the tips contact the water surface. Different brands of electric water level indicators and even different models of the same brand often have their own unique operating characteristics. Before using any electric water level indicator, it should first be tested at the surface in a bucket of water.

8.11.2 For approximate measurements of the water level when it is within about 100 feet (30 m) of the ground

surface, a cloth tape with a "popper" can be used. A "popper" can be made from a short pipe nipple (or length of tubing) by screwing a plug attached to a graduated tape into one end of the nipple and leaving the other end of the nipple open. When the "popper" is lowered in the drill hole and the open end of the pipe nipple strikes a water surface, it makes a popping sound, and the depth to water can be measured by the tape.

8.11.3 An accurate measurement of the water level can be made by chalking the lower end of the steel tape. After contacting the water level, the tape should be lowered about 1 more foot before retrieving it. Measurement is then made to the "wet line" on the tape.

8.12 *Temperature Measuring Device.*–Equipment for measuring ground-water temperature is available from commercial sources or can be made from a thermistor, two-conductor cable, reel, Wheatstone bridge, and a low-voltage electrical source. A maximum-minimum type thermometer is acceptable.

9. Regents and Materials

9.1 *Water* (See subpars. 7.2, 7.3, and 7.4.).–The clear water supply should be sufficient to perform the hydraulic conductivity test without interrruption and to maintain the required pressure throughout the test period.

9.2 *Sand or Gravel Backfill.*–Where a granular backfill is used to prevent sloughing of the drill hole wall, it should be a clean coarse sand or fine gravel. Laboratory permeability tests (USBR 5600 or 5605) should be made on the backfill material to make sure that it has a coefficient of permeability greater than one order of magnitude higher than that expected of the in situ material being tested.

10. Precautions

10.1 *Safety Precautions*:

10.1.1 This procedure may involve hazardous materials, operations, and equipment.

10.1.2 Use normal precautions for drilling [10, 11].

10.1.3 Precautions should be taken during calibration pressure testing of equipment, particularly testing of packers with compressed air or nitrogen (never use oxygen) to avoid injuries from a sudden packer or hose rupture.

10.2 *Technical Precautions*:

10.2.1 As a general rule, total pressure (static head plus gauge pressure) applied in the drill hole should not exceed 1 lbf/in² per foot (22.6 kPa/m) of rock and soil overburden at the center of the test interval, if the test interval is 10 feet (3 m) long or less. If the test interval exceeds 10 feet, pressure should not exceed 1 lbf/in² per foot of overburden at the top of the interval. In layered or fractured material, or for drill holes near steep abutments or slopes, 0.5 lbf/in² per foot (11.3 kPa/m) of material to the nearest free surface is an appropriate maximum pressure. Higher pressures than these may fracture the materials.

10.2.2 If there is excessive or complete loss of water when the hole is being drilled, drilling should be stopped before cuttings fill the voids, and a hydraulic conductivity test completed on a shorter than normal length test interval.

10.2.3 Hydraulic conductivity test equipment should be considered and treated as precision testing equipment. Gauges, thermometers, etc., should have their own protective cases; they should not be carried with drill tools or be tossed around. They should be calibrated frequently. It is recommended that all test equipment needed for hydraulic conductivity testing be kept separate from drilling equipment.

11. Calibration

11.1 *For Measurment of Effective Head*:

11.1.1 *Pressure Sensors.*–Calibrate down-hole pressure sensors by the methods and at frequencies prescribed by USBR 1050.

11.1.2 *Friction Loss Estimates.*–Where down-hole pressure sensors are not used, estimates of effective head at the test interval are made by subtracting friction loss from the applied head measured at the ground surface. The friction loss should be determined for all components of the piping system, from the pressure gauge to the test interval.

11.1.2.1 Calibrate friction loss in parts or sections of the piping systems including (1) the swivel (if used); (2) feed pipe (per unit length); and (3) the packer assembly. Record the data, with references to the particular parts calibrated, in tabular or graphical form so the accumulative friction loss can be totaled for determination of effective head at the test interval. The calibration procedure is as follows:

11.1.2.1.1 Lay out the individual or joined parts to be calibrated on a horizontal surface with calibrated pressure gauges at each end.

11.1.2.1.2 Pump water through the system at incremental, increasing flow rates to the maximum flow rate expected to be used in the test; allow the flow to stabilize between incremental flows.

11.1.2.1.3 Record the pressure at each gauge for each incremental flow rate.

11.1.2.1.4 Calculate the friction head loss for each incremental flow rate.

$$f = 2.31\left(\frac{P_1 - P_2}{d}\right) \qquad (1)$$

where:

f = friction head loss in feet of head per linear foot of pipe, ft/ft or m/m

P_1 = upstream pressure, lbf/in² or kPa

P_2 = downstream pressure, lbf/in² or kPa

d = pipe length, ft or m ($d = 1$ for swivel or packer assembly)

2.31 = converts from pressure in lbf/in² to head in feet or 0.102 converts from pressure in kPa to head in meters

Example, assume

P_1 = 18.6 lbf/in² or 128 kPa

P_2 = 13.2 lbf/in² or 91.0 kPa

d = 10.0 ft or 3.05 m

Inch-pound application:

$$f = 2.31\left(\frac{18.6 - 13.2}{10.0}\right) = 1.25 \text{ ft/ft}$$

SI application:

$$f = 0.102\left(\frac{128 - 91.0}{3.05}\right) = 1.24 \text{ m/m}$$

11.1.2.1.5 Plot friction head loss versus flow rate. Figure 3 is an example of a plot of friction head loss (f) at relatively low flow rates for a 10-foot (3.3-m) length of 1-1/4-inch (32-mm) diameter pipe. Since head loss in pipe at turbulent flow is approximately related to velocity squared, a plot of friction head loss versus the square of the flow rate is nearly a straight line (see fig. 4).

NOTE 3.–There are standard tables and charts which provide unit friction losses for various sizes of pipe, elbows, tees, reducers, etc., for clean and rusty conditions. Although such information is sometimes used, it is preferable to determine friction losses in the piping system and packers actually used for the hydraulic conductivity test.

11.1.2.1.6 To calibrate a packer, inflate the packer in a short length of casing or pipe in which a valve and pressure gauge have been installed. A pressure gauge is also installed in the rods immediately ahead of the packer assembly. Pump water into the rods at incremental increases (or decreases) of flow rate—allowing the system to stabilize after each incremental change—until the highest anticipated flow rate is reached.

NOTE 4.–For packers smaller than N-size, such as the B-size used in wireline equipment, there are significant head losses, and relatively low flow rates must be maintained. This requires water meters and pressure gauges capable of accurately measuring the low flows and small changes in pressures.

11.2 *Pressure Gauges.*–Calibrate each pressure gauge (see USBR 1040) by comparing it with a test or master gauge. The master gauge should not be used during drilling or hydraulic conductivity testing. Calibrate each gauge at the start of a testing program plus one additional calibration per week during tests of long duration.

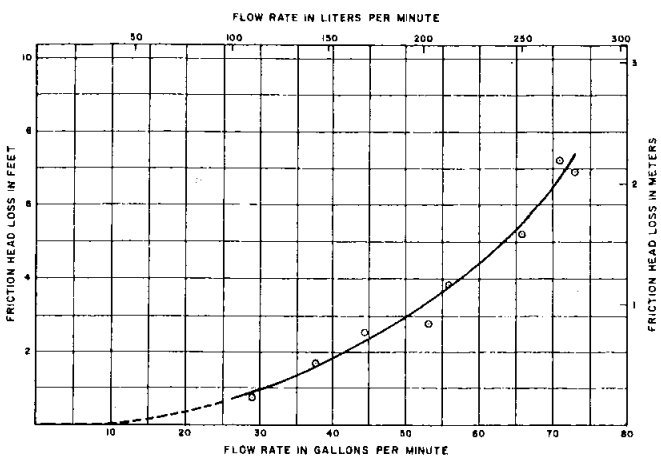


Figure 3. – Head loss due to friction at increasing flow rates for a 10-foot (3-m) 1-1/4-inch (32-mm) diameter iron pipe.

11.3 *Flowmeters.*–Calibrate a flowmeter by flowing water into a container of known volume; the container used for the volume check should be commensurate in size with the flowmeter size and graduations. From these data, flow rates can be calculated for comparison with meter readings. All flowmeters should be calibrated to an accuracy of ±1 percent. Calibration should be done at the start of the testing program plus one additional calibration per week during tests of long duration.

NOTE 5.–Some impeller-type flowmeters have an accuracy range significantly less than indicated by the dial. Minimum and maximum rates should be established.

11.4 *Well Screens and Perforated or Slotted Pipe Sections.*–From manufacturers' data or by calibration, determine the head losses in expected flow ranges to ensure there is no restriction of flow into the material being tested.

12. Conditioning

12.1 Not applicable, special conditioning requirements are not needed for this procedure.

13. Procedure

13.1 *Cleaning of Drill Hole*:

13.1.1 Remove any accumulation of fine particles (smear, mud cake, compaction caused by driving casing, etc.) from the drill hole wall. Such accumulation significantly restricts the flow of water into or from the hole. Exercise good judgment in cleaning the hole, since excess cleaning may be detrimental. If there is a question as to whether or not drill holes in particular materials need cleaning, hydraulic conductivity tests can be performed in holes with cleaning and others without cleaning. If cleaning does not significantly change test results at a site, cleaning of additional intervals in the same materials may not be necessary.

13.1.1.1 When the test interval is above the water table, it may be possible to brush or scratch the drill hole wall to break up accumulated fines. For unstable materials which require use of a well screen, materials which cave against the screen may break up the accumulation of fines on the wall. Mild surging with a bailer, while adding water, also may help break up a disturbed or compacted zone, but this may stir up fines which then plug the voids in the material to be tested. Mild jetting—followed immediately by bailing or pumping—also is a possibility.

13.1.1.2 When the test interval is below the water table—in materials that are rock-like and self-supporting—use of a water jet in the hole (preferably accompanied with pumping to induce flow into the borehole) is one of the best methods to clean the hole. After jetting, bail or pump the sediment-laden water from the test interval. Jetting can also be used through a screen below the water

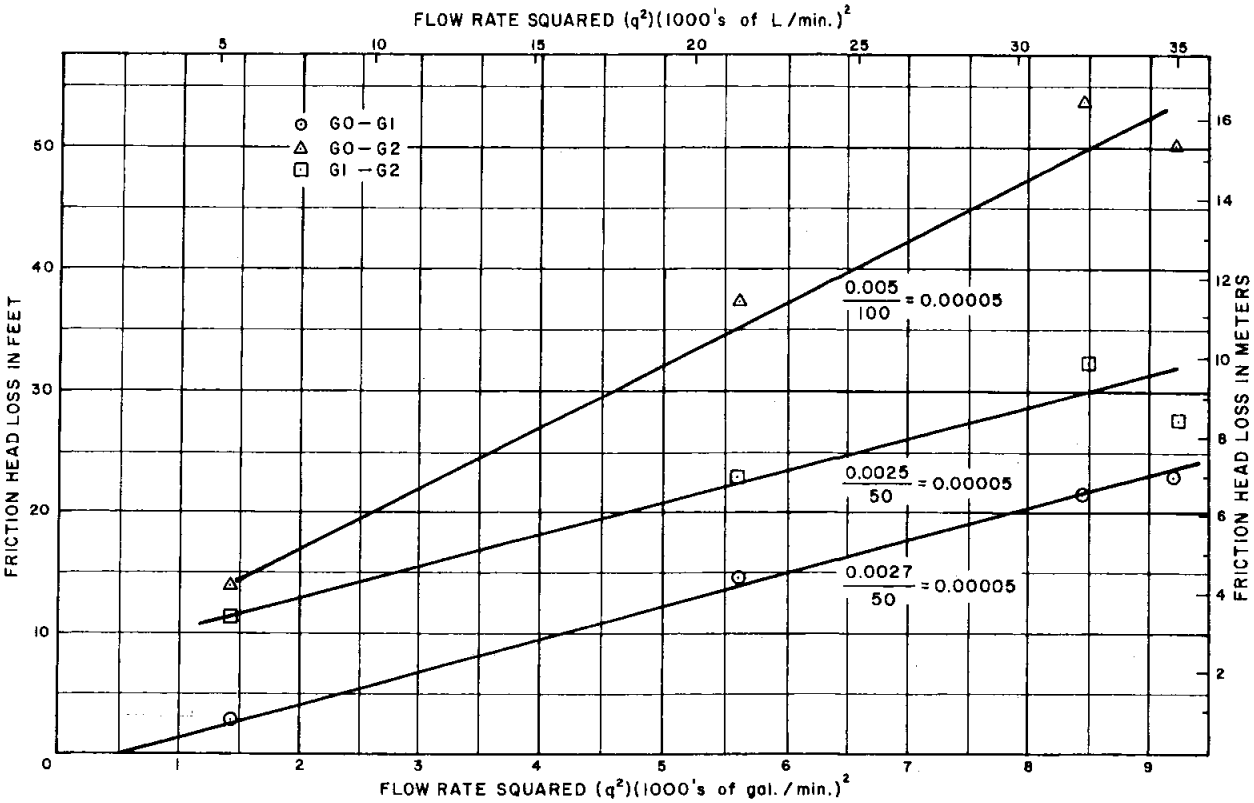


Figure 4. – Plot of feed pipe calibration data — example.

table in unstable materials. For soft rock, flushing the sides of the drill hole by running the bit or a bailer up and down the hole may enlarge the hole by erosion or otherwise change the characteristics of the fracture systems.

13.1.1.3 Finally, clean the drill hole by pumping or bailing water from the bottom upward, with the pumping continued until the return fluid is clear without cuttings or sediment. Record the method used in cleaning the hole on the log of drill hole or on a special testing form.

13.2 *Length of Test Interval*:

13.2.1 The length of the test interval depends on (1) purpose of the test, (2) stratigraphic interval, and (3) flow rate. Where materials are relatively uniform, use a test interval of about 10 feet (3 m). Where flow rates are high, shorten the test interval to locate high flow rate zones; where rates are very low, the interval may be lengthened if desired.

13.3 *Ground-Water Level Determination*:

13.3.1 Depth to ground-water level must be determined before calculating hydraulic conductivity. Measure depths to water levels with an electrical probe or other suitable equipment (see subpar. 8.11).

13.3.2 *Auger Holes.*–In power auger or other types of holes to which water is not added as part of the drilling process, report the presence or absence of a water level, depth to water level, and date of initial and final water level measurement. In materials of low hydraulic conductivity, several days to several weeks may be required for a water level to stabilize in the hole. Report evidence of moisture in the cuttings and if a perched water level was observed.

13.3.3 *Rotary or Cable Tool Holes.*–For drill holes in which addition of water to the hole is an integral part of the drilling process:

13.3.3.1 Bail or pump the hole dry or to a stable water level at the close of the last shift each day and record level.

13.3.3.2 Report the presence or absence of water and depth to water at the beginning of the first shift each day. Additional readings are desirable whenever water level in the hole has not been disturbed for an appreciable period of time.

13.3.3.3 Report changes in water level detected as the hole is drilled deeper. Record factors that affect the water level such as depth of casing, and/or cemented intervals. These data may be helpful in recognizing perched or confined (artesian) conditions.

13.3.3.4 Upon completion of the hole, the water must be bailed down to the extent practicable, the water level measured, and the date recorded of hole completion. Measure the water level for a period of days or weeks until equilibrium is reached.

NOTE 6.–At times, exceptions must be made to the requirement for continuation of water level readings. Such is the case when

state or local laws require that the hole be filled continuously from bottom to top immediately upon hole completion and before the drill crew leaves the site. In other instances, landowners may allow right-of-entry for only a limited time for measurements.

13.3.4 *Perched and Artesian Aquifers.*–It is important to recognize perched and artesian aquifers, especially those under sufficient pressure to raise the water level above the confining layer but not to the ground surface (see [5]). They must be distinguished from water table aquifers (those which continue in depth). If perched water table or artesian aquifers—separated by dry or less permeable strata—are encountered in the same drill hole, the resulting water level in the hole is a composite; therefore, conclusions and interpretations based on such data are misleading. If a perched water table is recognized (or suspected) during drilling, water levels must be determined for each zone for calculation of hydraulic conductivity. This might require completion of the drill hole with a watertight seal set at a suitable horizon to separate two water table conditions. In this type installation, two strings of pipe or conduit are required: one extending down to the portion of the hole immediately above the packer, and a second string extending through the packer to a point near the bottom of the hole. Water-level measurements provide the basis for determining a perched condition or if the lower water table is under artesian pressure.

13.3.5 *Multiple Water-Level Measurements.*–In some instances, it is desirable to install multiple conduits and packers or plugs in a drill hole so that ground-water levels (or pressure heads) in several water-bearing horizons can be measured over an extended period of time (see [5], pp. 7-14).

13.4 *Pressure Tests With Packers*:

13.4.1 The recommended arrangement of typical equipment for packer pressure tests, without a pressure sensor is shown on figure 2. (See app. fig. X1.1 for equipment with a pressure sensor.) Beginning at the source of water, the general arrangement is clean water source, suction line, pump, discharge line to storage and/or settling tank, suction line, water-supply pump, surge chamber, line to bypass valve junction, water meter, gate or plug valve, tee with sub for pressure gauge, short length of pipe on which the pressure gauge is attached, tee and off-line bleeder valve for evaluating back and/or holding pressure, flexible 1-1/4-inch (32-mm) diameter hose, and 1-1/4-inch-diameter feed pipe to packer or packers in drill hole, which isolate the test interval. All connections should be tight and as short and straight as possible with minimum change in diameter of hose and pipe. Friction loss decreases as the pipe diameter is increased.

13.4.2 When the material is subject to caving, and casing and/or grout is needed to support the walls of the drill hole, the hole should be water tested as it is advanced. Other hole conditions may make this procedure desirable or necessary. The following procedure is commonly used:

13.4.2.1 After the hole has been drilled to the top of the interval to be tested, it may be desirable to remove the drill string from the hole and advance casing or grout to the bottom of the hole.

13.4.2.2 Advance the hole 5 to 10 feet (1.5 to 3 m) into the material to be tested.

13.4.2.3 Remove the drill string from the hole.

13.4.2.4 Clean the interval to be tested, and record the depth to the water table, if present. If a composite water level is suspected, the water level affecting the test should be determined by measurements through the feed pipe after the packer has been seated and the water level has stabilized.

13.4.2.5 If the hole will stand open, seat a single packer at the top of the test interval. Record the type of packer, its depth, and packer pressure if it is the inflatable type.

13.4.2.6 Pump water into the interval at a rate to develop a suitable pressure. The pressure to be used depends upon testing depths and ground water levels or pressures. Materials subject to deformation or heaving, such as by separation of bedding planes or joints, or materials at shallow depths, must not be subjected to high pressures (see subpar. 10.2.1). For comparison of flow rates in different parts of a single foundation and with results from other foundations, some of the following pressures are commonly used: 25, 50, 75, and 100 lbf/in^2 (170, 350, 520, and 690 kPa).

NOTE 7.–At test pressures less than 25 lbf/in^2, errors in measurement of pressure and volume of water may increase unless special low pressure gauges are used. Gravity tests provide more accurate results under these conditions. At pressures higher than 10 lbf/in^2, difficulties in securing a tight packer seal and the likelihood of leakage increase rapidly. However, under artesian pressures or in deep holes the water pressure—as registered on a surface gauge—will need to be sufficient to overcome the effective head at the test interval and firmly seal the packer.

NOTE 8.–Where the hole is subject to caving, a pump-down wire-line system has been developed that can be used to eliminate removal of the drill string from the hole. With this system, the hole is drilled to the bottom of the interval to be tested, and the drill rod is raised so the end of the rod is at the top of the test interval. The tandem packer (see subpar. 8.8.2) is then lowered through the drill rod and expanded to seal both inside the rod and against the wall of the hole at the top of the test interval. Models of this equipment are available which have transducers below the packer for measuring water pressures at the test interval.

13.4.2.7 For determining effective head, artesian heads encountered in the drill hole are treated the same as water table conditions; i.e., the depth from the pressure gauge, or the water level maintained during the test, to the stabilized water level is used as the gravity head. If the artesian head stabilizes above the ground surface, the gravity component of the effective head is negative and is measured between the stabilized level and the pressure gauge height. If a flow-type test is used, the effective head is the difference between the stabilized water level and the level maintained during the flow period.

13.4.2.8 After pressures are selected, based on ground-water conditions and the purpose of the test, perform a test at each pressure. Usually, a 5-cycle procedure is used, three increasing steps to the maximum pressure and then two decreasing steps to the starting pressure. This cycling allows a more detailed evaluation of test results than testing at a single pressure and commonly allows extrapolation to ascertain at what pressures the following may occur (1) laminar flow, (2) turbulent flow, (3) dilation of fractures, (4) washouts, (5) void filling, or (6) hydraulic fracturing. However, the equations normally used to calculate hydraulic conductivity are based on laminar flow conditions.

NOTE 9.–In some instances, only a single water pressure test at a given interval in the drill hole may be required. For example, if geologic conditions are known, and there is no need to perform the steps in subparagraphs 13.4.2.2 through 13.4.2.6, a single value of hydraulic conductivity with a relatively low application of pressure may suffice.

13.4.2.9 During each test, continue pumping water to the test interval at the required pressure until the flow rate becomes stable. As a general guide, maintain flow rates during three or more 5-minute intervals during which 1-minute readings of flow are made and recorded. In tests above the water table, water should be applied to the test interval until the flow rate stabilizes before starting the 5-minute measurement intervals. Where tests are below the water table, flow rates usually stabilize faster than for the tests above the water table, and the time period before the 5-minute test intervals may be shorter. These time periods may need to be varied, particularly when tests to determine grouting requirements are made

13.4.2.10 Determine and record the presence of back pressure and decay of holding pressure. After the test, deflate the packer and remove it from the drill hole.

13.4.2.11 Advance the drill hole and, if necessary, the casing; repeat the procedure in subparagraphs 13.4.2.3 through 13.4.2.10 until the required depth of drill hole is reached. When casing is used in a drill hole, always set the packer in the material below the casing.

13.4.3 If the hole will stay open without casing, it can be drilled to final depth, and after cleaning the hole, hydraulic conductivity tests can be performed from the bottom of the hole upward using straddle (double) packers. Although a single packer can be used to test the bottom interval of the hole, starting at the bottom with double packers will cause loss of borehole testing of only about the length of the bottom packer and will save one complete trip in and out of the hole with the drill string assembly to change the packers. After the test for the bottom interval is completed, straddle packers are used for successive test intervals up the drill hole. See subparagraph 13.4.2, where caving or other hole conditions will not allow this procedure.

13.5 *Gravity Tests*:

13.5.1 Constant-head gravity tests are usually performed without packers above or below the water table with drill holes of N-size or larger (see fig. 2, detail D). This type of test is often made in reasonably stable-walled drill holes up to 25 feet (7.6 m) depth where water pressure at the test interval needs to be kept low. The test is usually performed in successive 5- or 10-foot (1.5- or 3-m) intervals as the drill hole is advanced. The upper end of each test interval is normally determined by the bottom depth of tightly reamed or driven casing. If the casing is not believed to be tight, appropriate entries should be recorded on the log form. If the wall of the drill hole is stable, the test can be performed in the unsupported hole. If the wall needs to be supported, use a well screen (see subpar. 11.4 for calibration) inserted through the casing. It may be necessary to ream or drive the casing to the bottom of the interval, set the screen, and then pull back the casing to expose the screen. After the test, the screen is removed and the casing reamed or driven to the bottom of the hole.

NOTE 10.–Clean coarse sand or fine gravel backfill (see subpar. 9.2) may be used instead of a well screen. Ream or drive the casing to the bottom of the interval, clean it out, and add the backfill as the casing is pulled back to expose the test interval. Record use of this procedure on the log form.

13.5.1.1 If the drill hole is self-supporting, clean and prepare it in the normal manner (see subpar. 13.1).

13.5.1.2 If the drill hole is not self-supporting, lower the well screen and casing into the hole.

13.5.1.3 For test intervals above the water table, maintain a constant head of water [within 0.2 foot (60 mm)] at the top of the test interval by injecting water through a small diameter tube extending below the water level maintained during the test. For test intervals below the water table or influenced by artesian conditions, maintain a constant head a short distance above the measured static water level.

Monitor the water level with a water-level indicator. If the water-level indicator is inserted in a small diameter pipe in the casing, the wave or ripple action on the water surface will be dampened and permit more accurate water-level measurements.

NOTE 11.–When the flow rate is very low, the constant water level can be maintained by pouring water in the hole from a graduated container.

13.5.1.4 Record the flow rate at time intervals until a constant flow rate is reached.

13.5.1.5 Repeat the procedure of subparagraphs 13.5.1.3 and 13.5.1.4 at one or more different water levels.

13.5.1.6 This test is essentially the same as designation USBR 7300 (see also [3], p. 74); the instructions in USBR 7300 for performing the test and calculating hydraulic conductivity apply to this procedure also.

14. Calculations

14.1 For pressure or constant gravity head hydraulic conductivity tests, calculate the hydraulic conductivity of

the soil or rock by the following equation (expressed in consistent units) [4]:

$$k = \frac{q}{2\pi LH} \ln \frac{L}{r}, \text{ where } L \geqq 10r \qquad (2)$$

or

$$k = \frac{q}{2\pi LH} \sinh^{-1} \frac{L}{2r}, \text{ where } 10r \geqq L \geqq r \qquad (3)$$

where:

k = hydraulic conductivity, ft/yr or cm/s
q = constant rate of flow into the test interval, ft^3/yr or cm^3/s
L = length of the test interval, ft or cm
H = differential head of water at test interval, ft or cm
r = radius of the borehole, ft or cm
ln = natural logarithm, $\log_e$
$\sinh^{-1}$ = inverse hyperbolic sine, $\sinh^{-1} x \ln (x + \sqrt{x^2 + 1})$

14.2 An example calculation for a single packer test in the bottom of a borehole below the water table follows:

Example, assume:

r = 1.8 in or 0.15 ft = 4.6 cm
q = 2.2 gal/min or 8.3 L/min
$q = 1.5 \times 10^5$ ft^3/yr = 140 cm^3/s
L = 3.0 ft = 91 cm
H_g, gravity = distance from ground-water level to pressure gauge = 10.2 ft = 311 cm
H_p, pressure = 5 $lbf/in^2 \times 2.31$ $ft_{water}/(lbf/in^2)$
= 11.6 ft = 354 cm of water
$H = H_g + H_p$ = 21.8 ft = 664 cm
$\frac{L}{r} = \frac{3.0}{0.15} = 20$, hence use equation (2):

$$k = \frac{q}{2\pi LH} \ln \frac{L}{r}$$

$$k = \frac{1.5 \times 10^5 \text{ ft}^3/\text{yr}}{2\pi (3.0 \text{ ft}) 21.8 \text{ ft}} \ln \frac{3.0 \text{ ft}}{0.15 \text{ ft}}$$

$$k = 1.1 \times 10^3 \text{ ft/yr} = 1.1 \times 10^{-3} \text{ cm/s}$$

NOTE 12.–These equations are most applicable and reliable where the length of test interval is at least $5r$, and the interval is below the water table. The equations are based on laminar flow of fluid through porous media. Flow rates, high enough to cause turbulent flow, invalidate the results in all types of material. In fractured material, the calculated value should be considered an apparent hydraulic conductivity even under laminar flow conditions.

14.3 For pressure tests, when the test interval is below the water table, H is the distance from the water table to the elevation of the pressure gauge plus applied pressure converted to linear units of water head.

Where the test interval is above the water table, H is the distance from the midpoint of the isolated test interval to the elevation of the pressure gauge plus the applied pressure converted to linear units of water head.

For gravity tests above the water table, H is the distance between the bottom of the test interval and the water level maintained during the test.

For gravity tests below the water table, H is the distance between the pretest stabilized water level in the drill hole and the water level maintained during the test.

14.4 If there is artesian pressure, an additional pressure must be applied to overcome the artesian pressure to provide an effective test pressure. For example, if there is an artesian pressure of 5 lbf/in^2 (34 kPa) at the pressure gauge, 15 lbf/in^2 (103 kPa) could be applied, then the effective pressure would be 15 lbf/in^2 minus 5 lbf/in^2 which equals 10 lbf/in^2 (69 kPa).

14.5 The calculations can be done conveniently by (1) a nomograph [12], (2) a hand calculator with the proper functions, or (3) a computer. For repeated tests, it is convenient to prepare a table for one or more diameter drill holes and lengths of test intervals and combine the terms on the right side of the equations, other than q and H, into a coefficient.

NOTE 13.–The lugeon (lugeon unit, lugeon coefficient) [13, 14, 15, 16], has been used as an index of hydraulic conductivity, in connection with cyclic tests, and for grouting purposes.

15. Report

15.1 Record field test data on a daily driller's report, and/or on the log of the drill hole or on a special reporting form designed for the specific project. Record the following:

15.1.1 Log of the drill hole.

15.1.2 Elevations of the ground surface, the water table, and the top and bottom of the test interval.

15.1.3 Diameter of the drill hole at test interval.

15.1.4 Method of cleaning the drill hole.

15.1.5 Size of the feed pipe and any well screen.

15.1.6 Water pressure and/or gravity head, and flow rate for each time interval.

15.1.7 Total amount of water used per test.

15.1.8 Average temperature of ground water and water used in the test.

15.1.9 Packer inflation pressures.

15.1.10 Capacity of pump supplying water to the test interval.

15.1.11 All head loss calibration data.

15.1.12 Note any comments considered necessary to help evaluate the test results.

15. References

[1] "Permeability Tests Using Drill Holes and Wells," Bureau of Reclamation Geology Report No. G-97, Denver, Colorado, January 3, 1951.

[2] *Ground Water Manual*, 1st ed., rev. reprint, Bureau of Reclamation, U.S. Government Printing Office, Washington, D.C., 1981.

[3] *Drainage Manual*, 1st ed., 2d print., Bureau of Reclamation, U.S. Government Printing Office, Washington, D.C., 1981 1984.

[4] Zangar, Carl N., *Theory and Problems of Water Percolation*, Engineering Monograph No. 8, Bureau of Reclamation, Denver, Colorado, 1953.

[5] *Drill Hole Water Tests*, Technical Instructions–Provisional, Engineering Geology, Bureau of Reclamation, July 1970 (unpublished).

[6] *Glossary of Geology*, 2d ed., American Geological Institute, Falls Church, Virginia, 1980.

[7] Hatcher, R. C., "High Pressure Inflatable Packer with Pneumatic Piezometer," Bureau of Reclamation Report GR-10-75, Denver, Colorado, October 1975.

[8] Bennett, R. D. and R. F. Anderson, "New Pressure Test for Determining Coefficient of Permeability of Rock Masses," Technical Report GL-82-3, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi, 1982.

[9] *Ground Water and Wells*, A Reference Book for the Water-well Industry, 1st ed., published by Edward E. Johnson, Inc., Saint Paul, Minnesota, 1966.

[10] *Driller's Safety Manual*, 1st ed., reprint, Bureau of Reclamation, Denver, Colorado, 1982.

[11] Acker, W. L., III, *Basic Procedures for Soil Sampling and Core Drilling*, published by the Acker Drilling Company, Scranton, Pennsylvania, 1974.

[12] *Underground Mining Methods Handbook* No. 580, W-88, Society of Mining Engineers, Littleton, Colorado, p. 62, 1982.

[13] Lugeon, M., "Barrages et Geologie Dunod, Paris," 1933.

[14] Houlsby, A. C., "Routine Interpretation of the Lugeon Water-Test," Quarterly Journal, Engineering Geology, vol. 9, pp. 303-313, 1976.

[15] Heitfeld, K. H., and L. Krapp, "The Problem of Water Permeability in Dam Geology," Bull. International Association of Engineering Geology, No. 23, pp. 79-83, 1981.

[16] Pearson, R. and M. S. Money, "Improvements in the Lugeon or Packer Permeability Test," Quarterly Journal, Engineering Geology, vol. 10, the Netherlands, pp. 221-239, 1977.

SLDA PACKER TESTING DATA

ATTACHMENT 2

FIELD DATA SHEETS

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-01A

DATE 10/26/03

TEST # #1

1) TEST INTERVAL= 92 - 82 bgs

2) TEST MIDPOINT= 87

3) GW DEPTH (BGS)= 25 ft (assumed)

4) MEASURED DEPTH OF COREHOLE= 103

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (87) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 37.67

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (87) - GW DEPTH BGS (25) X 0.433 PSI = 26.85

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.82 (FROM STEP 7)= 30.82 DIVIDED BY TEST MIDPOINT (87 FEET)= 0.35 PSI/FT
30#GAGE + ____ (FROM STEP 7)= 40.82 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.47 PSI/FT
40#GAGE + ____ (FROM STEP 7)= 50.82 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.58 PSI/FT
50#GAGE + ____ (FROM STEP 7)= 60.82 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.70 PSI/FT
60#GAGE + ____ (FROM STEP 7)= 70.82 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.81 PSI/FT
70#GAGE + ____ (FROM STEP 7)= 80.82 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.93 PSI/FT
80#GAGE + ____ (FROM STEP 7)= 90.82 DIVIDED BY TEST MIDPOINT (____ FEET)= 1.04 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #1

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/26/03
INTERVAL=	[illegible]
BOREHOLE #	NGIS-[illegible]

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	4194.4	07	54	30	10
	4194.4		55	00	10
	4195.2		55	30	10
	4195.3		56	00	10
	4195.3		56	30	10
	4197.2		57	00	20
	4201.0		57	30	20
	4207.0		58	00	20
	4222.5		59	00	20
	4235.1	8	00	[illegible]	30
	4254.3		01	00	30
	4321.0		02	[illegible]	30
	4316.0		03	00	15
			05	00	15
	121.6		105 min		

121.6 / 105 min 1.158 g/m

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-01A

DATE 10/26/03

TEST # #2

1) TEST INTERVAL= 82 - 72

2) TEST MIDPOINT= 77

3) GW DEPTH (BGS)= 25 ASSUMED

4) MEASURED DEPTH OF COREHOLE= 103

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (77) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 33.34

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (77) - GW DEPTH BGS (25) X 0.433 PSI = 22.52

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 0.82	(FROM STEP 7)= 30.82	DIVIDED BY TEST MIDPOINT (77 FEET)=	0.40	PSI/FT
30#GAGE +	(FROM STEP 7)= 40.82	DIVIDED BY TEST MIDPOINT (FEET)=	0.53	PSI/FT
40#GAGE +	(FROM STEP 7)= 50.82	DIVIDED BY TEST MIDPOINT (FEET)=	0.66	PSI/FT
50#GAGE +	(FROM STEP 7)= 60.82	DIVIDED BY TEST MIDPOINT (FEET)=	0.79	PSI/FT
60#GAGE +	(FROM STEP 7)= 70.82	DIVIDED BY TEST MIDPOINT (FEET)=	0.92	PSI/FT
70#GAGE +	(FROM STEP 7)= 80.82	DIVIDED BY TEST MIDPOINT (FEET)=		PSI/FT
80#GAGE +	(FROM STEP 7)= 90.82	DIVIDED BY TEST MIDPOINT (FEET)=		PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/20/03
INTERVAL=	[illegible]
BOREHOLE #	NWS-01A

MP: [illegible]

PAGE 2

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
4317.8	09	15	00	10 FILL
4321.5		15	30	
4321.0		16	00	back
4321.05		16	30	
4321.05		17	00	
4321.3		17	30	20
4321.5		18	00	
4321.4		19	00	
4321.4		20	00	30
4321.9		21	00	
4321.8		22	00	
4321.8		23	00	
4322.0		24	00	40
4322.0		25	00	40
4322.2		26	00	50
4322.2		27	00	
4322.4		28	00	
4322.4		29	00	60
4322.60		30	00	
4322.9		32	00	
4333.8		33	00	
4344.2		34	00	65
4356.2		35	00	
4416.8		40	00	
4422.8		41	00	50
4427.8		42	00	50
4430.4		43	00	40
4432.5		44	00	40
4433.1		45	00	30
4432.4		46	00	20
[illegible]		[illegible]	00	20
[illegible]		[illegible]	[illegible]	10
115.7			53 min	

TE # 3

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** MW5-01A

DATE 10/26/03

TEST # #3

1) TEST INTERVAL= 72 - 62

2) TEST MIDPOINT= 67

3) GW DEPTH (BGS)= 25 Assumed

4) MEASURED DEPTH OF COREHOLE= 105

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (67) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 29.01

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (67) - GW DEPTH BGS (25) X 0.433 PSI = 18.17

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= _____

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.84 (FROM STEP 7)= 20.84 DIVIDED BY TEST MIDPOINT (67 FEET)= 0.46 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 40.84 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.61 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 50.84 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.76 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 60.84 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.91 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 70.84 DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
70#GAGE + ___ (FROM STEP 7)= 80.84 DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
80#GAGE + ___ (FROM STEP 7)= ___ DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/20/03
INTERVAL=	72-62
BOREHOLE #	NWS-01A

67 MP

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INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
4433.5	10	04	00	10 FILL
4444.2		4	30	10
4446.7		5	00	
4448.1		5	30	↓
4448.2		6	00	↓
4448.4		7	00	20
4448.5		8	00	
4448.7		9	00	↓
4448.9		10	00	30
4449.2		11	00	30
4449.4		12	00	
4449.7		13	00	↓
4450.0		14	00	40
4452.1		15	00	
4453.0		16	00	↓
4455.4		17	00	50
4462.1		20	00	50
4464.1		21	00	40
4465.8		22	00	40
4467.5		23	00	30
4469.1		24	00	30
4470.5		25	00	20
4472.1		26	00	20
4473.4		27	00	20
4474.5		28	00	10
4475.7		29	00	10
4476.8		30	00	10
43.3		26	MIN	

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** MW5-01A

DATE 10/27

TEST # 1-5

1) TEST INTERVAL= 62 - 52

2) TEST MIDPOINT= 57

3) GW DEPTH (BGS)= 25 ASSUMED

4) MEASURED DEPTH OF COREHOLE= 105

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (57) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 24.68

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (57) - GW DEPTH BGS (25) X 0.433 PSI = 13.86

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.81 (FROM STEP 7)= 30.81 DIVIDED BY TEST MIDPOINT (57 FEET)= 0.54 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 40.81 DIVIDED BY TEST MIDPOINT (57 FEET)= 0.72 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 50.81 DIVIDED BY TEST MIDPOINT (57 FEET)= 0.89 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 60.81 DIVIDED BY TEST MIDPOINT (57 FEET)= 1.06 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 70.81 DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
70#GAGE + ___ (FROM STEP 7)= ___ DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
80#GAGE + ___ (FROM STEP 7)= ___ DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/26/03
INTERVAL=	62-52
BOREHOLE #	NWS-01A

57 AP

PAGE 2

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
4477.0	11	43	00	2 FILL
4485.0		43	30	2 FILL
4491.0		44	00	10
4494.8		44	30	10
4497.9		45	00	↓
4501.2		45	30	↓
4504.6		46	00	↓
4507.6		46	30	↓
4511.8		47	00	20
4523.5		48	00	↓
4535.2		49	00	↓
4547.0		50	00	↓
4556.6		51	00	30
4575.2		52	00	↓
4590.2		53	00	↓
4607.2		54	00	40
4625.8		55	00	30-40
4696.8		59	00	30-35
4714.8	1200	00	00	20
4730.2		01	00	20
4743.6		02	00	10
4755.3		03	00	10
278.3		20	min	

Test #5

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** MWS-01A

DATE 10/27

TEST # 4.5

1) TEST INTERVAL= 87 - 112

2) TEST MIDPOINT= 47

3) GW DEPTH (BGS)= 25 Assumed

4) MEASURED DEPTH OF COREHOLE= 125

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (47) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 20.35

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (47) - GW DEPTH BGS (25) X 0.433 PSI = 9.53

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE +	10.82	(FROM STEP 7)= 30.82	DIVIDED BY TEST MIDPOINT (47	FEET)= 0.66	PSI/FT
30#GAGE +		(FROM STEP 7)= 40.82	DIVIDED BY TEST MIDPOINT (	FEET)= 0.87	PSI/FT
40#GAGE +		(FROM STEP 7)= 50.82	DIVIDED BY TEST MIDPOINT (	FEET)= 1.08	PSI/FT
50#GAGE +		(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (	FEET)= ____	PSI/FT
60#GAGE +		(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (	FEET)= ____	PSI/FT
70#GAGE +		(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (	FEET)= ____	PSI/FT
80#GAGE +		(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (	FEET)= ____	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/27/03
INTERVAL=	52-42
BOREHOLE #	PIWS-01A

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	4759.4	12	22	00	5 FILL
	4770.8		22	30	5
	4778.2		23	00	5
	4788.1		23	30	5
	4793.3		24	00	5
	4811.8		25	00	5
	4825.6		28	00	1-5 erratic
	4829.5		30	00	1-5 "
	70.1		8	min	

could not increase pressure above 5#

TP-37-46

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SON **BOREHOLE #:** NWS-OCM

DATE 10/27

TEST # 46

1) TEST INTERVAL= 42 - 32

2) TEST MIDPOINT= 37

3) GW DEPTH (BGS)= 25 Assumed

4) MEASURED DEPTH OF COREHOLE=

5) LENGTH OF STICKUP ABOVE GROUND

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (37) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 16.02

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (37) - GW DEPTH BGS (25) X 0.433 PSI = 5.20

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.82	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (37	FEET)= 0.83	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= 1.1	PSI/FT
40#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
50#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
60#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
70#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
80#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/27/03
INTERVAL=	12 32
BOREHOLE #	[illegible] 01A

37 MP

PAGE 2

INITIAL:

could not exceed 8#

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
4829.1	12	51	00	5 FILL
4832.6		51	30	8
4834.9		52	00	8
4835.6		52	30	
4837.2		53	00	
4838.5		54	00	
4840.8		55	00	
4842.2		56	00	
4849.1	13	00	00	
20 gal		9	min.	

20 gal 9 min 2.2 gal/min

TEST #7

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-01A

PAGE 1

DATE 11/22/03

TEST # 7

1) TEST INTERVAL= 22 - 32

2) TEST MIDPOINT= 27

3) GW DEPTH (BGS)= 25 Assumed

4) MEASURED DEPTH OF COREHOLE= 105

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (27) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 11.69

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (27) - GW DEPTH BGS (25) X 0.433 PSI = 0.87

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 0.80 (FROM STEP 7)= 10.82 DIVIDED BY TEST MIDPOINT (27 FEET)= 1.61 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 10.82 DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ___ (FROM STEP 7)= 10.82 DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
50#GAGE + ___ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
60#GAGE + ___ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
70#GAGE + ___ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ___ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #7

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/27/03
INTERVAL=	32-22
BOREHOLE #	NWB-01A

27 ME

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	4848.2	13	16	00	10 Max
	4851.6		16	30	10
	4853.1		17	00	10
	Missed				10
Could not	4855.9		19	00	10
exceed 10#	4857.6		20	00	↓
	4859.0		21	00	↓
	4860.05		22	00	↓
	11.85		6		

TEST #8

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-01A

DATE 11/05/03

TEST # #8

1) TEST INTERVAL= 110 - 160 bgl

2) TEST MIDPOINT= 165

3) GW DEPTH (BGS)= 97

4) MEASURED DEPTH OF COREHOLE= 173.6 bgl

5) LENGTH OF STICKUP ABOVE GROUND 1.3

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (165) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 71.45

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (165) - GW DEPTH BGS (97) X 0.433 PSI = 29.44

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 42.01

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 42.01	(FROM STEP 7)= 62.01	DIVIDED BY TEST MIDPOINT (165 FEET)=	0.38	PSI/FT
30#GAGE +	(FROM STEP 7)= 72.01	DIVIDED BY TEST MIDPOINT (FEET)=	0.44	PSI/FT
40#GAGE +	(FROM STEP 7)= 82.01	DIVIDED BY TEST MIDPOINT (FEET)=	0.50	PSI/FT
50#GAGE +	(FROM STEP 7)= 92.01	DIVIDED BY TEST MIDPOINT (FEET)=	0.56	PSI/FT
60#GAGE +	(FROM STEP 7)= 102.01	DIVIDED BY TEST MIDPOINT (FEET)=	0.62	PSI/FT
70#GAGE +	(FROM STEP 7)= 112.01	DIVIDED BY TEST MIDPOINT (FEET)=	0.68	PSI/FT
80#GAGE +	(FROM STEP 7)= 122.01	DIVIDED BY TEST MIDPOINT (FEET)=	0.74	PSI/FT
	132.01	142.01	0.80 0.86	

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	11/04/03
INTERVAL=	130-160
BOREHOLE #	NWS-01A

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
4929.0	08	34	00	10
4930.0		34	30	15
4930.0		35	00	15
4930.0		35	30	15
4931.5		36	00	20
4930.8		36	30	20
4930.8		37	00	20
4931.8		37	30	30
4931.8		38	00	30
4931.8		38	30	30
4932.1		39	00	40
4932.1		39	30	40
4932.1		40	00	40
4932.5		40	30	50
4932.6		41	00	50
4932.6		41	30	50
4932.7		42	00	50
4932.8		43	00	60
4932.8		44	00	60
4933.0		45	00	70
4933.0		48	00	70
4933.0		49	00	60
4933.0		50	00	50
4933.0		51	00	40
4933.0		52	00	30
10 gal		18 min		

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** [illegible]

DATE [illegible]

TEST # [illegible]

1) TEST INTERVAL= [illegible]

2) TEST MIDPOINT= [illegible]

3) GW DEPTH (BGS)= 97

4) MEASURED DEPTH OF COREHOLE= [illegible]

5) LENGTH OF STICKUP ABOVE GROUND [illegible]

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ([illegible]) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 67.12

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ([illegible]) - GW DEPTH BGS (97) X 0.433 PSI = [illegible]

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= [illegible]

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + [illegible] (FROM STEP 7)= [illegible] DIVIDED BY TEST MIDPOINT ([illegible] FEET)= 0.40 PSI/FT
30#GAGE + ___ (FROM STEP 7)= [illegible] DIVIDED BY TEST MIDPOINT (___ FEET)= 0.46 PSI/FT
40#GAGE + ___ (FROM STEP 7)= [illegible] DIVIDED BY TEST MIDPOINT (___ FEET)= [illegible] PSI/FT
50#GAGE + ___ (FROM STEP 7)= [illegible] DIVIDED BY TEST MIDPOINT (___ FEET)= 0.59 PSI/FT
60#GAGE + ___ (FROM STEP 7)= [illegible] DIVIDED BY TEST MIDPOINT (___ FEET)= 0.66 PSI/FT
70#GAGE + ___ (FROM STEP 7)= [illegible] DIVIDED BY TEST MIDPOINT (___ FEET)= [illegible] PSI/FT
80#GAGE + ✓ (FROM STEP 7)= [illegible] DIVIDED BY TEST MIDPOINT (✓ FEET)= [illegible] PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	11/5/03
INTERVAL=	1000 - 1130
BOREHOLE #	[illegible]

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	4932.8	09	03	00	10	FILL
	4935.2			30	10	
	4934.0		04	00	10	
	4934.0		4	30	10	
	4935.8		5	00	20	
	4935.5		5	30	20	
	4935.5		6	00	20	
	4935.5		6	30	20	
	4936.4		7	00	30	
	4936.4		7	30	30	
	4936.4		8	00	30	
	4936.5		8	30	40	
	4936.6		9	00	40	
	4936.6		9	30	40	
	4936.6		10	00	40	
	4936.6		10	30	50	
	4936.7		11	00	50	
	4936.8		11	00	50	
	4937.1		13	00	60	
	4937.4		14	00	60	
	4937.4		15	00	60	
	4937.8		16	00	70	
	4937.8		17	00	70	
	4937.8		20	00	60	
	4937.8		21	00	50	
	4937.8		22	00	40	
	4937.8		23	00	30	
	5 gal					
			20	Min		

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER CH **BOREHOLE #:** NUS 01A PAGE 1

DATE [illegible]

TEST # 11 10

1) TEST INTERVAL= 140 - 150

2) TEST MIDPOINT= 145

3) GW DEPTH (BGS)= 97

4) MEASURED DEPTH OF COREHOLE= 173.6

5) LENGTH OF STICKUP ABOVE GROUND 1.3

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (145) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 62.79

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (145) - GW DEPTH BGS (97) X 0.433 PSI = 20.78

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 42.01

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 42.01	(FROM STEP 7)= 62.01	DIVIDED BY TEST MIDPOINT (145	FEET)= 0.43	PSI/FT
30#GAGE +	(FROM STEP 7)= 72.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.50	PSI/FT
40#GAGE +	(FROM STEP 7)= 82.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.57	PSI/FT
50#GAGE +	(FROM STEP 7)= 92.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.63	PSI/FT
60#GAGE +	(FROM STEP 7)= 102.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.70	PSI/FT
70#GAGE +	(FROM STEP 7)= 112.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.77	PSI/FT
80#GAGE +	(FROM STEP 7)= 122.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.84	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TEST #10

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TESTER:	SAI
DATE:	11/5/03
INTERVAL=	150' - 140
BOREHOLE #	N005 of A

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	4937.5	09	34	00	10 psi
	4940.2		34	30	10
	4939.0		35	00	10
	4939.0		35	30	10
	4940.5		36	00	20
	4940.5		36	30	20
	4940.5		37	00	20
	4940.5		37	30	30
	4940.6		38	00	30
	4940.6		39	00	30
	4940.6		40	00	30
	4940.9		41	00	40
	4940.9		42	00	40
	4940.9		43	00	40
	4940.9		44	00	40
	4941.1		45	00	50
	4941.1		46	00	50
	4941.2		47	00	60
	4941.2		50	00	60
	4941.2		51	00	50
	4941.2		52	00	40
	4941.2		53	00	30
	3.7 gal		19 min		

3.7 gal

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SW **BOREHOLE #:** NUIS-01A

DATE 11/5/03

TEST # #11

TPSI-#11

1) TEST INTERVAL= 140 - 130 bgs

2) TEST MIDPOINT= 135

3) GW DEPTH (BGS)= 97

4) MEASURED DEPTH OF COREHOLE= 173.6

5) LENGTH OF STICKUP ABOVE GROUND 1.3

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (135) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 58.46

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (135) - GW DEPTH BGS (97) X 0.433 PSI = 16.45

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 42.01

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT

30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT

40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT

50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT

60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT

70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT

80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT

IN THIS EXAMPLE-

DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 42.01	(FROM STEP 7)= 62.01	DIVIDED BY TEST MIDPOINT (135	FEET)= 0.46	PSI/FT
30#GAGE +	(FROM STEP 7)= 72.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.53	PSI/FT
40#GAGE +	(FROM STEP 7)= 82.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.61	PSI/FT
50#GAGE +	(FROM STEP 7)= 92.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.68	PSI/FT
60#GAGE +	(FROM STEP 7)= 102.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.76	PSI/FT
70#GAGE +	(FROM STEP 7)= 112.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.83	PSI/FT
80#GAGE +	(FROM STEP 7)= 122.01	DIVIDED BY TEST MIDPOINT (	FEET)= 0.90	PSI/FT
	132.01		0.98	

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TEST # 11

PAGE 2

TESTER:	SN
DATE:	11/5/03
INTERVAL=	140-130
BOREHOLE #	NWS 01A

MP: 135

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
4941.2	10	05	00	10
4943.8		5	30	10
4943.2		6	00	10
4943.2		6	30	10
4944.6		7	00	20
4944.4		7	30	30
4944.4		8	00	30
4944.5		8	30	30
4944.5		9	00	30
4944.5		9	30	30
4944.5		10	00	40
4944.5		12	00	40
4944.6		14	00	50
4944.6		16	00	50
4944.6		18	00	60
4944.6		19	00	50
4944.6		20	00	40
4944.6		21	00	30
3.4 gal			17 min	

3.4 gal

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** MW5 OIA

DATE 11/3/03

TEST # #12

TEST #12

1) TEST INTERVAL= 130 - 120

2) TEST MIDPOINT= 125

3) GW DEPTH (BGS)= 97

4) MEASURED DEPTH OF COREHOLE= 173.6

5) LENGTH OF STICKUP ABOVE GROUND 1.2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (125) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 54.13

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (125) - GW DEPTH BGS (97) X 0.433 PSI = 12.12

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 42.01

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 42.01 (FROM STEP 7)= 62.01 DIVIDED BY TEST MIDPOINT (125 FEET)= 0.50 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 72.01 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.58 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 82.01 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.66 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 92.01 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.74 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 102.01 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.82 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 112.01 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.90 PSI/FT
80#GAGE + ___ (FROM STEP 7)= 122.01 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.98 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	11/5/03
INTERVAL=	120-120
BOREHOLE #	NWS 01A

MP 125

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	4944.5	10	36	00	10
	4947.1		36	30	10
	4945.7		37	00	10
	4945.7		37	30	10
	4945.7		38	00	10
	4946.9		38	30	20
	4946.9		39	00	20
	4946.9		40	00	20
	4947.4		41	00	30
	4947.4		42	00	30
	4947.4		43	00	30
	4947.4		44	00	40
	4947.4		46	00	40
	4947.5		48	00	60
	4947.5		50	00	50
	4947.5		52	00	60
	4947.5		54	00	60
	4947.5		56	00	50
	4947.5		56	00	40
	4947.5		54	00	30
	3 gal		21 min		

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-01A

DATE 11/5/03

TEST # 13

TEST 13

1) TEST INTERVAL= 120 - 111

2) TEST MIDPOINT= 115.5

3) GW DEPTH (BGS)= 97

4) MEASURED DEPTH OF COREHOLE= 173.3

5) LENGTH OF STICKUP ABOVE GROUND 1.3

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (115.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 50.01

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (115.5) - GW DEPTH BGS (97) X 0.433 PSI = ~~12.5~~ 8.01

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 42

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 42	(FROM STEP 7)= 62	DIVIDED BY TEST MIDPOINT (115.5	FEET)= 0.54	PSI/FT
30#GAGE +	(FROM STEP 7)= 72	DIVIDED BY TEST MIDPOINT (	FEET)= 0.62	PSI/FT
40#GAGE +	(FROM STEP 7)= 82	DIVIDED BY TEST MIDPOINT (	FEET)= 0.71	PSI/FT
50#GAGE +	(FROM STEP 7)= 92	DIVIDED BY TEST MIDPOINT (	FEET)= 0.80	PSI/FT
60#GAGE +	(FROM STEP 7)= 102	DIVIDED BY TEST MIDPOINT (	FEET)= 0.88	PSI/FT
70#GAGE +	(FROM STEP 7)= 112	DIVIDED BY TEST MIDPOINT (	FEET)= 0.97	PSI/FT
80#GAGE +	(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TEST #13

PAGE 2

TESTER:	JN
DATE:	11/5/03
INTERVAL=	110 - 111
BOREHOLE #	NWS-01

M 115.5

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	4947.2	11	17	00	10
	4947.2		17	30	10
	4948.2		18	30	10
	4949.0		19	00	20
	4949.0		20	00	20
	4949.2		21	00	20
	4949.2		22	00	20
	4950.1		23	00	30
	4950.1		24	00	30
	4950.3		25	00	40
	4950.3		26	00	40
	4950.5		27	00	50
	4950.5		28	00	50
	4950.6		30	00	60
	4950.6		31	00	60
	4950.5		32	00	50
	4950.5		33	00	40
	4950.5		34	00	30
	3.4 gal		17	MIN	

3.4 gal / 17 min 0.2 gal/min

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-02 PAGE 1

DATE 10/21/03

TEST # #1

1) TEST INTERVAL= 114.4 - 104.4

2) TEST MIDPOINT= 109.4

3) GW DEPTH (BGS)= 17.5

4) MEASURED DEPTH OF COREHOLE= 123

5) LENGTH OF STICKUP ABOVE GROUND 2.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (109.4) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 47.37

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (109.4) - GW DEPTH BGS (17.5) X 0.433 PSI = 39.79

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 7.58

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 7.58 (FROM STEP 7)=27.58 DIVIDED BY TEST MIDPOINT (109.4 FEET)=0.25 PSI/FT
30#GAGE + ___ (FROM STEP 7)=37.58 DIVIDED BY TEST MIDPOINT (___ FEET)=0.34 PSI/FT
40#GAGE + ___ (FROM STEP 7)=47.58 DIVIDED BY TEST MIDPOINT (___ FEET)=0.43 PSI/FT
50#GAGE + ___ (FROM STEP 7)=57.58 DIVIDED BY TEST MIDPOINT (___ FEET)=0.53 PSI/FT
60#GAGE + ___ (FROM STEP 7)=67.58 DIVIDED BY TEST MIDPOINT (___ FEET)=0.62 PSI/FT
70#GAGE + ___ (FROM STEP 7)=77.58 DIVIDED BY TEST MIDPOINT (___ FEET)=0.71 PSI/FT
80#GAGE + ___ (FROM STEP 7)=87.58 DIVIDED BY TEST MIDPOINT (___ FEET)=0.80 PSI/FT
90 0.89

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

NWS-02

TEST #1

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/21/02
INTERVAL=	114.4 to 104.4
BOREHOLE #	NWS-02

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	3796.9	9	44	00	20
	3797.5		44	30	20
	3797.5		45	00	20
	3797.5		45	30	30
	3797.5		46	00	30
	3797.65		46	30	40
	3797.75		47	00	40
	3797.9		47	30	50
	3797.9		48	00	50
	3798.1		48	30	60
	3798.3		49	00	60
	3798.5		49	30	70
	3798.75		50	00	70
	3799.23		50	30	80
	3799.78		51	00	80
	MISSED		51	30	90
	3801.2		52	00	100
	3801.8		52	30	100
	3802.3		53	00	100
	3802.5		53	30	90
	3803.1		54	00	80
	3803.3		54	30	70
	3803.5		55	00	60
	3803.5		55	30	50
	3803.6		56	00	40
	3803.6		56	30	30
	607 gals			121.5 minutes	

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-02 PAGE 1

DATE 10/20/03

TEST # 1

1) TEST INTERVAL= 104.4 - 94.4

2) TEST MIDPOINT= 99.4

3) GW DEPTH (BGS)= 17.5

4) MEASURED DEPTH OF COREHOLE= 118

5) LENGTH OF STICKUP ABOVE GROUND 2.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (99.4) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 43.04

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (99.4) - GW DEPTH BGS (17.5) X 0.433 PSI = 35.46

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 7.58

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 7.58	(FROM STEP 7)= 27.58	DIVIDED BY TEST MIDPOINT (99.4	FEET)= 0.28	PSI/FT
30#GAGE +	(FROM STEP 7)= 37.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.38	PSI/FT
40#GAGE +	(FROM STEP 7)= 47.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.48	PSI/FT
50#GAGE +	(FROM STEP 7)= 57.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.58	PSI/FT
60#GAGE +	(FROM STEP 7)= 67.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.68	PSI/FT
70#GAGE +	(FROM STEP 7)= 77.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.78	PSI/FT
80#GAGE +	(FROM STEP 7)= 87.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.88	PSI/FT
90	97.58		0.98	

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #2

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/21/03
INTERVAL=	104.4 to 99.4
BOREHOLE #	NWS-02

99.4 MP

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	3803.05	10	7	30	20
	3804.4		8	00	20
	3804.4		8	30	20.
	3804.45		9	00	30
	3804.45		9	30	30
	3804.52		10	00	40
	3804.52		10	30	40
	3804.7		11	00	50
	3804.75		11	30	50
	3804.8		12	00	60
	3804.8		12	30	60
	3804.9		13	00	70
	3804.9		13	30	70
	3804.9		14	00	80
	3805.0		14	30	90
	MISSED ~~3804~~.		15	00	80
	erratic 3804		15	30	80
	erratic 3805.0		16	00	70
	3805.0		16	30	60
	3805.0		17	00	50
	3804.98		17	30	40
	1.93 gal			10 min	

1.93/10 min 0.19 g/m

TEST #2

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN BOREHOLE #: NWS-02

DATE 10/21/03

TEST # #3

PAGE 1

1) TEST INTERVAL= 94.4 - 84.4

2) TEST MIDPOINT= 89.4

3) GW DEPTH (BGS)= 17.5

4) MEASURED DEPTH OF COREHOLE= 18.3

5) LENGTH OF STICKUP ABOVE GROUND 2.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (89.4) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 38.7

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (89.4) - GW DEPTH BGS (17.5) X 0.433 PSI = 31.13

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 7.58

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 7.58 (FROM STEP 7)= 27.58 DIVIDED BY TEST MIDPOINT (89.4 FEET)= 0.31 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 37.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.42 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 47.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.53 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 57.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.64 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 67.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.75 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 77.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.86 PSI/FT
80#GAGE + ___ (FROM STEP 7)= 87.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.97 PSI/FT

10) **TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE.** MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #3

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/21/03
INTERVAL=	94.4 to 84.4
BOREHOLE #	NWS-02

89.4 MP

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	3804.75	10	30	00	20
	3805.2		30	30	20
	3805.3		31	00	20
	3805.4		31	30	30
	3805.4		32	00	30
	3805.5		32	30	40
	3805.5		33	00	40
	3805.5		33	30	50
	3805.5		34	00	60
	3805.5		34	30	70
	Missed		35	00	80
	3805.5		35	30	80
	3805.5		36	30	90
	3805.5		37	00	70
	3805.5		37	30	50
	3805.5		38	00	50
	0.75 g		8	MIA	

TEST #4

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-02

DATE 10/21/03

TEST # #4

1) TEST INTERVAL= 84.4 - 74.4

2) TEST MIDPOINT= 79.4

3) GW DEPTH (BGS)= 17.5

4) MEASURED DEPTH OF COREHOLE=

5) LENGTH OF STICKUP ABOVE GROUND

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (79.4) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 34.38

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (79.4) - GW DEPTH BGS (17.5) X 0.433 PSI = 26.80

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 7.58

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 7.58	(FROM STEP 7)= 27.58	DIVIDED BY TEST MIDPOINT (79.4	FEET)= 0.35	PSI/FT
30#GAGE +	(FROM STEP 7)= 37.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.47	PSI/FT
40#GAGE +	(FROM STEP 7)= 47.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.59	PSI/FT
50#GAGE +	(FROM STEP 7)= 57.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.73	PSI/FT
60#GAGE +	(FROM STEP 7)= 67.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.87	PSI/FT
70#GAGE +	(FROM STEP 7)= 77.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.93	PSI/FT
80#GAGE +	(FROM STEP 7)= 87.58	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #4

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/21/03
INTERVAL=	84.4 to 74.4
BOREHOLE #	NWS-02

79.4 MP

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	3805.38	10	50	00	20
	3809.3		50	30	20
	3809.48		51	00	20
	3809.15		51	30	20
	3809.1		52	00	20
	3809.3		52	30	30
	3809.5		53	00	30
	3809.5		53	30	30
	3809.8		54	00	40
	3809.99		54	30	40
	3810.1		55	00	40
	3810.3		55	30	40
	3810.6		56	00	50
	3810.		56	30	50
	3810.05		57	00	50
	3811.15		57	30	50
	3811.52		58	00	60
	3811.89		58	30	60
	3812.30		59	00	60
	3812.65		59	30	70
	3812.3	11	00	00	70
	3813.2		00	30	70
	3813.35		1	00	70
	3814.2		1	30	70
	3814.52		2	00	70
	3814.8		2	30	70
	3815.3		3	00	70
	3815.8		3	30	80
	3816.2		4	00	70
	3816.4		4	30	70
	3816.8		5	00	60
	3817.0		5	30	50
	3817.1		6	00	40
	3817.3		6	30	30
	3817.35		7	00	30
	3817.4		7	30	20
				9.5 min	
	12.02				

TEST # 5

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** N015-02

DATE 10/21/03

TEST # #5

1) TEST INTERVAL= 74.4 - 64.4

2) TEST MIDPOINT= 69.4

3) GW DEPTH (BGS)= 17.5

4) MEASURED DEPTH OF COREHOLE=

5) LENGTH OF STICKUP ABOVE GROUND

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (69.4) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 30.05

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (69.4) - GW DEPTH BGS (17.5) X 0.433 PSI = 22.47

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 7.58

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 7.58 (FROM STEP 7)= 27.58 DIVIDED BY TEST MIDPOINT (69.4 FEET)= 0.40 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 37.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.54 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 47.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.69 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 57.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.83 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 67.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.97 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 77.58 DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
80#GAGE + ___ (FROM STEP 7)= 87.58 DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST # 5

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/21/08
INTERVAL=	74.4 to 64.4
BOREHOLE #	MW08 08

67.4 MP

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	3817.0	11	18	00	20
	3817.6		18	30	20
	3817.6		19	00	20
	3817.7		19	30	30
	3817.72		20	00	30
	3817.78		20	30	40
	3817.8		21	00	40
	3817.8		21	30	40
	3817.82		22	00	50
	3817.88		22	30	50
	3817.95		23	00	60
	3817.95		23	30	60
	3818.0		24	00	60
	3818.1		24	30	70
	3818.1		25	00	70
	3818.1		25	30	60
	3818.1		26	00	50
	3818.03		26	30	40
	3818.0		27	00	40
	3818.0		27	30	30
	3817.98		28	00	20
	3817.98		28	30	20
	Total		10.5 MIN		

TEST #6

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SNJ BOREHOLE #: [illegible]

DATE 10/21/03

TEST # #6

PAGE 1

1) TEST INTERVAL= 64.4 - 54.4

2) TEST MIDPOINT= 59.4

3) GW DEPTH (BGS)= 17.5

4) MEASURED DEPTH OF COREHOLE=

5) LENGTH OF STICKUP ABOVE GROUND

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (59.4) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 25.72

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (59.4) - GW DEPTH BGS (17.5) X 0.433 PSI = 18.14

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 7.58

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 7.58 (FROM STEP 7)= 27.58 DIVIDED BY TEST MIDPOINT (59.4 FEET)= 0.46 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 37.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.63 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 47.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.80 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 57.58 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.97 PSI/FT
60#GAGE + ___ (FROM STEP 7)= ___ DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
70#GAGE + ___ (FROM STEP 7)= ___ DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
80#GAGE + ___ (FROM STEP 7)= ___ DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT

10) **TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE.** MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #6

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/21/03
INTERVAL=	64.4 to 54.5 59.4 m
BOREHOLE #	MAS-02

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	3818.0	11	43	30	20
	3818.5		44	00	20
	3818.75		44	30	20
	3818.8		45	00	20
erratic	3819.0		45	30	30
"	3819.1		46	00	30
	3819.4		46	30	40
	3819.5		47	00	40
	3819.62		47	30	40
	3819.86		48	00	50
	3820.0		48	30	50
	3820.04		49	00	60
	3820.06		49	30	60
	3820.08		50	00	50
	3820.0		50	30	50
	3821.3		51	00	40
	3821.35		51	30	30
	3821.5		52	00	30
	3821.6		52	30	30
	3821.8		53	00	20
	3821.08		53	30	20
	3821.2		54	00	20
	3.2 gal		10.5 min		

3.2/10.5 = 0.305 gpm

7

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-02

DATE 10/21/03

TEST # 7

1) TEST INTERVAL= 54.4 - 44.4

2) TEST MIDPOINT= 49.4

3) GW DEPTH (BGS)= 17.5

4) MEASURED DEPTH OF COREHOLE=

5) LENGTH OF STICKUP ABOVE GROUND

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (49.4) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 21.39

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (49.4) - GW DEPTH BGS (17.5) X 0.433 PSI = 13.81

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 7.58

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 7.58	(FROM STEP 7)= 27.58	DIVIDED BY TEST MIDPOINT (49.4	FEET)= 0.56	PSI/FT
30#GAGE +	(FROM STEP 7)= 37.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.76	PSI/FT
40#GAGE +	(FROM STEP 7)= 47.58	DIVIDED BY TEST MIDPOINT (	FEET)= 0.96	PSI/FT
50#GAGE +	(FROM STEP 7)= 57.58	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
60#GAGE +	(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
70#GAGE +	(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
80#GAGE +	(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST # 7

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/21/03
INTERVAL=	54.4 to 44.4
BOREHOLE #	N105-02

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	3821.8	12	07	00	10
	3824.8		07	30	10 5
	3825.9		08	00	10
	3825		08	30	10
	3833.75		09	00	10
	3860.		10.	00	
	3872		11.	00	
	3890		12	00	0
	3910		13	00	10
	3929		14	00	
	3951		15	00	
	129.2		8	min	

TAKER

129.2 / 8 = 16.15

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** NWS-02

DATE 10-24-03

TEST # 8

1) TEST INTERVAL= 173.4 - 163.4

2) TEST MIDPOINT= 178.4

3) GW DEPTH (BGS)= 26.41

4) MEASURED DEPTH OF COREHOLE= 177.0

5) LENGTH OF STICKUP ABOVE GROUND 3.8

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (178.4 + 3.8) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 78.89

159

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (178.4) - GW DEPTH BGS (26.4) X 0.433 PSI = 65.88

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 13.1

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA				
20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
40#GAGE + 13.1	(FROM STEP 7)= 53.1	DIVIDED BY TEST MIDPOINT (178.4	FEET)= 0.30	PSI/FT
50#GAGE + ↓	(FROM STEP 7)= 63.1	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.35	PSI/FT
60#GAGE + ↓	(FROM STEP 7)= 73.1	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.40	PSI/FT
70#GAGE + ↓	(FROM STEP 7)= 83.1	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.46	PSI/FT
80#GAGE + ↓	(FROM STEP 7)= 93.1	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.5	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

NOTE: [illegible] BUT DID NOT TAKE. COULD THE [illegible]

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-29-03
INTERVAL=	173-163
BOREHOLE #	NWS-02

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	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	4175.4	4	01	30	0-40
	4183.0	4	02	50	
START TEST OVER →	4184.2	4	09	10	0-50
	4185.2	4	10	10	50
	4185.2	4	11	10	50
TIGHT STOP TEST	4185.3	4	12	10	50

PACKER RISING STOP TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** NWS-02

DATE 10-24-02

TEST # 9

1) TEST INTERVAL= 168.4-150.4

2) TEST MIDPOINT= 159.4

3) GW DEPTH (BGS)= 26.4

4) MEASURED DEPTH OF COREHOLE= 177.0

5) LENGTH OF STICKUP ABOVE GROUND 3.8

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI =

FROM TEST #8

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 13.1

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
40#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
50#GAGE + 13.1	(FROM STEP 7)= 63.1	DIVIDED BY TEST MIDPOINT (158	FEET) 0.39	PSI/FT
60#GAGE + ↓	(FROM STEP 7)= 73.1	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.46	PSI/FT
70#GAGE + ↓	(FROM STEP 7)= 83.1	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.52	PSI/FT
80#GAGE + ↓	(FROM STEP 7)= 93.1	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.59	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-24-03
INTERVAL=	163-153
BOREHOLE #	NWJS-02

PAGE 2

INITIAL:

TIGHT

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
4185.4	4	28	15	0-40
4186.2	4	29	15	40-50
4186.2	4	30	15	50
4186.2	4	31	15	50

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TP **BOREHOLE #:** NWS-02

DATE 11-24-16

TEST # 10

1) TEST INTERVAL= 153.4 - 143.4

2) TEST MIDPOINT= 148.4

3) GW DEPTH (BGS)= 26.4

4) MEASURED DEPTH OF COREHOLE= 177.0

5) LENGTH OF STICKUP ABOVE GROUND 3.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = } From TESTING

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 13.1

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
40#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
50#GAGE + 13.1	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (148.4	FEET)= 0.42	PSI/FT
60#GAGE + ____	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (____	FEET)= 0.49	PSI/FT
70#GAGE + ____	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (____	FEET)= 0.55	PSI/FT
80#GAGE + ____	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (____	FEET)= 0.62	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-24-03
INTERVAL=	153-143
BOREHOLE #	NWK-02

PAGE 2

PACKER ASSEMBLY / RESING

STOP TEST

INITIAL:

RE-START →

TIGHT

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
4196.0	4	39	20	0-50 ←
4197.9	4	40	20	
4197.9	4	44	40	0-50
4198.7	4	45	40	50
4198.7	4	46	40	50
4199.8	4	47	40	50

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** NWS-02

DATE 10-24-02

TEST # 11

1) TEST INTERVAL= 143.4-133.4

2) TEST MIDPOINT= 138.4

3) GW DEPTH (BGS)= 26.4

4) MEASURED DEPTH OF COREHOLE= 177.0

5) LENGTH OF STICKUP ABOVE GROUND 3.0

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 13.1

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
40#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
50#GAGE + 13.1	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (138.4	FEET)= 0.45	PSI/FT
60#GAGE + ↓	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.52	PSI/FT
70#GAGE + ↓	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.60	PSI/FT
80#GAGE + ↓	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.67	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	JB
DATE:	10-24-03
INTERVAL=	143-133
BOREHOLE #	NWS-02

PAGE 2

INITIAL: TGHT

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
4199.9	5	02	30	50
4199.9	5	03	30	50
4199.9	5	04	30	50
4199.9	5	05	30	50

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TPS **BOREHOLE #:** NWS-02

DATE 10-22-02

TEST # 12

1) TEST INTERVAL= 128.4-133.1

2) TEST MIDPOINT= 128.4

3) GW DEPTH (BGS)= 26.4

4) MEASURED DEPTH OF COREHOLE= 177

5) LENGTH OF STICKUP ABOVE GROUND 3.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = } FROM TEST #8

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 13.1

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE +	____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT
30#GAGE +	____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT
40#GAGE +	____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT
50#GAGE +	13.1	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (128.4 FEET)=	0.49	PSI/FT
60#GAGE +	↓	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (↓ FEET)=	0.57	PSI/FT
70#GAGE +	↓	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (↓ FEET)=	0.65	PSI/FT
80#GAGE +	↓	(FROM STEP 7)= 13.1	DIVIDED BY TEST MIDPOINT (↓ FEET)=	0.73	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TV
DATE:	10-24-02
INTERVAL=	131-123 → NEW ZONE = 136-126
BOREHOLE #	NWS-02

PAGE 2

PACKER RISING

INITIAL:	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
	4189.5	5	16	40	0-
	4190.0	5	25	50	0-
		5	26	50	
	4192.2	5	29	55	0-20
	4194.3	5	30	55	20
	4194.3	5	31	55	20
	4194.4	5	32	55	20

TRYING FOR 20#

PACKER RISING POSSIBLY BECAUSE UPPER PACKER IS IN CSG. AND 5' SECTION & LOWER BELOW CSG

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** NW-03

DATE 10-11-03

TEST # 13

1) TEST INTERVAL= 134-124

2) TEST MIDPOINT= 129

3) GW DEPTH (BGS)= 20' approx

4) MEASURED DEPTH OF COREHOLE= 177.7

5) LENGTH OF STICKUP ABOVE GROUND 3'

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
50#GAGE + 8.7 (FROM STEP 7)=58.7 DIVIDED BY TEST MIDPOINT (129 FEET)= 0.45 PSI/FT
60#GAGE + ↓ (FROM STEP 7)=68.7 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.53 PSI/FT
70#GAGE + ↓ (FROM STEP 7)=78.7 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.61 PSI/FT
80#GAGE + ↓ (FROM STEP 7)=88.7 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.68 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #13

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-11-03
INTERVAL=	134-124
BOREHOLE #	NW-03

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3549.6	4	53	40	0-40	TRYING FOR 50#
12.6	3562.2	4	54	40	40-50	
11.0	3573.2	4	55	40	50	
3.7	3576.9	4	56	40	50	FLOW RATE DROPPING
3.5	3580.4	4	57	40	50	
4.0	3584.4	4	58	40	60	BUMP TO 60#
2.7	3587.1	4	59	40	60	
3.9	3591.0	5	00	40	60-30-6	FLOW DROP
3.0	3594.0	5	01	40	60	
1.7	3595.7	5	02	40	70	
	MISSED	5	03	40	70-0	
6.4	3602.5	5	15	10	0-70	WATER GONE
5.5	3614.0	5	16	10	70	
15.7	3629.7	5	17	10	70	STOP TO LOAD
19.3	3649.0	5	18	10	70	
16.0	3665.0	5	19	10	60	WATER
15.3	3680.3	5	20	10	60	
	36	5	21	10	60	PACKER MOVING STOP TEST

BAD GAGE ??

JACKING APART FORMATION?

PACKER MOVED STOPPED TEST

TO

PACKERS INFLATED 180 PSI

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** NW-03

DATE 10-1-03

TEST # 12

1) TEST INTERVAL= 144-134

2) TEST MIDPOINT= 139

3) GW DEPTH (BGS)= 20 (approx)

4) MEASURED DEPTH OF COREHOLE= 177.7

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA				
20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
40#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
50#GAGE + 8.7	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (139	FEET)= 0.42	PSI/FT
60#GAGE + ↓	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.49	PSI/FT
70#GAGE + ↓	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.56	PSI/FT
80#GAGE + ↓	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.63	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #12

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-11-05
INTERVAL=	WL 144-124
BOREHOLE #	NW-03

PAGE 2

GPM	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3534.6	4	36	25	0-40	
10.1	3544.7	4	37	25	40-50	
4.9	3549.6	4	39	25	50	STOPPED TAKING
0	3549.6	4	39	25	50	
0	3549.6	4	40	25	50	STOPPED TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** NWF03

DATE 10-11-03

TEST # 11

1) TEST INTERVAL= 154-164

2) TEST MIDPOINT= 159

3) GW DEPTH (BGS)= 20.72

4) MEASURED DEPTH OF COREHOLE= 177.7

5) LENGTH OF STICKUP ABOVE GROUND 3'

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT	(____ FEET)=	____	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT	(____ FEET)=	____	PSI/FT
40#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT	(____ FEET)=	____	PSI/FT
50#GAGE + 8.7	(FROM STEP 7)= 58.7	DIVIDED BY TEST MIDPOINT	(44 FEET)=	0.39	PSI/FT
60#GAGE + ↓	(FROM STEP 7)= 68.7	DIVIDED BY TEST MIDPOINT	(↓ FEET)=	0.46	PSI/FT
70#GAGE + ↓	(FROM STEP 7)= 78.7	DIVIDED BY TEST MIDPOINT	(↓ FEET)=	0.52	PSI/FT
80#GAGE + ↓	(FROM STEP 7)= 88.7	DIVIDED BY TEST MIDPOINT	(↓ FEET)=	0.59	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

Test 11

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-11-03
INTERVAL=	154-144
BOREHOLE #	NW-03

PAGE 2

GPM	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	3531.0	4	16	15	0-50
2.4	3533.4	4	17	15	50
0.6	3534.0	4	18	15	50
0.2	3534.2	4	19	15	50
0.2	3534.4	4	20		50

TIGHT ZONE STOP TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** NW-03

DATE 10-11-03

TEST # 10

1) TEST INTERVAL= 164 - 154

2) TEST MIDPOINT= 159

3) GW DEPTH (BGS)= 20' ~~BGS~~ INFER

4) MEASURED DEPTH OF COREHOLE= 177.7

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
40#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
50#GAGE + 8.7	(FROM STEP 7)= 58.7	DIVIDED BY TEST MIDPOINT (159	FEET)= 0.37	PSI/FT
60#GAGE + ↓	(FROM STEP 7)= 68.7	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.43	PSI/FT
70#GAGE + ↓	(FROM STEP 7)= 78.7	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.49	PSI/FT
80#GAGE + ↓	(FROM STEP 7)= 88.7	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.55	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

LOST [illegible] TEST #10
[illegible] 160'

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-11-03
INTERVAL=	164-154
BOREHOLE #	NW-03

PAGE 2

GPM

INITIAL:

9.5
10.8
11.7
16.5
14.0

12.5

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
3474.3	3	48	30	0-15	GOING FOR 50#
3484.0	3	49	30	15-40	
3494.8	3	50	30	40	CRANKING UP PUMP
3506.5	3	51	30	40	
3523.0	3	52	30	41.5	CAN'T GET 50#
3537.0	3	53	30	41.8	

QUIT TEST
CLOSE
DRAIN PRESSURE TO 50#

TEST #9

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

START @ 50# GAGE

TESTER:	TB
DATE:	10-11-03
INTERVAL=	174-164
BOREHOLE #	NW-03

6gpm	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3280.9	2	52	20	0-50	
4.5 20.0	3300.9	2	53	20	50	
13.9	3313.9	2	54	20	50	
10.7	3324.5	2	55	20	50	
9.9 11.0	MISSED	2	56	20	60	BUMP TO 60
8.7	3346.5	2	57	20	60	
3.8	3355.2	2	58	20	60	
STOPPED TEST	3359.0	2	59	20	60	STOPPED TEST
18.7	3357.5	3	13	30	0-40	
13.7	3376.2	3	14	30	40-50	
13.9	3389.9	3	15	30	60	
11.9 11.7	3403.8	3	16	30	70	RAN OUT OF WATER
10.7	3415.5	3	17	30	70	
11.3	3426.2	3	18	30	70	
6.3	3437.5	3	19	30	70	
7.8 8.3	3443.8	3	20	30	60	DROP TO 60#
8.8	3452.1	3	21	30	60	
6.1	3460.9	3	22	30	60	
6.3 6.0	3467.0	3	23	30	50	
6.7	3473.0	3	24	30	50	
	3479.7	3	25	30	50	END TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** NW-03

DATE 10-11-03

TEST # 9

1) TEST INTERVAL= 174-164

2) TEST MIDPOINT= 169

3) GW DEPTH (BGS)= 20' ASSUMED

4) MEASURED DEPTH OF COREHOLE= 177.7

5) LENGTH OF STICKUP ABOVE GROUND _____

HOLE CLOSED TO 118' WATER IN BOREHOLE @ 94.7'

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (169) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 73.17

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (169) - GW DEPTH BGS (149) X 0.433 PSI = 64.51

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
50#GAGE + 9.7 (FROM STEP 7)= 58.7 DIVIDED BY TEST MIDPOINT (169 FEET)= 0.34 PSI/FT
60#GAGE + ____ (FROM STEP 7)= 68.7 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.40 PSI/FT
70#GAGE + ____ (FROM STEP 7)= 78.7 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.46 PSI/FT
80#GAGE + ____ (FROM STEP 7)= 88.7 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.52 PSI/FT
90# 98.7 0.58

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB BOREHOLE #: NW1-02

DATE

TEST # #8

1) TEST INTERVAL=

2) TEST MIDPOINT=

3) GW DEPTH (BGS)=

4) MEASURED DEPTH OF COREHOLE=

5) LENGTH OF STICKUP ABOVE GROUND

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 15.2

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (35) - GW DEPTH BGS (15) X 0.433 PSI = 6.5

(20)

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____ (FROM STEP 7)= 18.1 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.8 PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
50#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
60#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-7-03
INTERVAL=	30-40
BOREHOLE #	NW-03

PAGE 2

GPM	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	3016.00	9	32	15	0.5
14.0	30 30.0	9	34	15	0
9.2	30 37.5	9	35	15	0
10.3	30 46.5	9	36	15	0
11.5	30 58.0	9	37	15	0
9.9	30 69.9	9	38	15	0

AVE = 10.98

TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TPB BOREHOLE #: NW-05

DATE 10-[illegible]

TEST # 7

1) TEST INTERVAL= 40-50

2) TEST MIDPOINT= 45

3) GW DEPTH (BGS)= 20' APPROX

4) MEASURED DEPTH OF COREHOLE= 117

5) LENGTH OF STICKUP ABOVE GROUND 2'

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (45) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 19.5

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (45) - GW DEPTH BGS (25) X 0.433 PSI = 10.8
(20)

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

10# + 8.7 = 18.7 (FROM STEP 7)= 28.7 DIVIDED BY TEST MIDPOINT (45 FEET)= .63 PSI/FT
20#GAGE + ____ (FROM STEP 7)= 38.7 DIVIDED BY TEST MIDPOINT (____ FEET)= .86 PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
50#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
60#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #7

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-7-02
INTERVAL=	40-70
BOREHOLE #	NW-03

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GPM

INITIAL: 2.8

0.5

2.5

0

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
30 12.4	9	04	00	0
30 14.1	9	09	00	5-~~10~~
[illegible]	9	09	00	4
30 15.0	9	14	00	5-10
30 17.5	9	14	00	15
30 17.5	9	16	00	10
30 17.5	9	17	00	13
30 17.5	9	18	00	13
30 17.5	9	19	00	15

FILL BORING

TIGHT ZONE

STOP TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER JB BOREHOLE #: NW-03

DATE 10-1-03

TEST # 10

1) TEST INTERVAL= 60-50

2) TEST MIDPOINT= 55

3) GW DEPTH (BGS)= ~~115~~ approx 20'

4) MEASURED DEPTH OF COREHOLE= 117

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (55) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 23.8

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (55) - GW DEPTH BGS (35) X 0.433 PSI = 15.2
20

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.6

10'

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

TEST RANGE

20#GAGE + 8.6 (FROM STEP 7)= 28.6 DIVIDED BY TEST MIDPOINT (55 FEET)= 0.52 PSI/FT
30#GAGE + ____ (FROM STEP 7)= 38.6 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.70 PSI/FT
40#GAGE + ____ (FROM STEP 7)= 48.6 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.88 PSI/FT
50#GAGE + ____ (FROM STEP 7)= 58.6 DIVIDED BY TEST MIDPOINT (____ FEET)= 1.06 PSI/FT
60#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) **TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE.** MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TEST #6

TESTER:	TB
DATE:	10-7-03
INTERVAL=	20-40
BOREHOLE #	NW-02

GPM	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	02997.9	7	20	45	0	FILLING BORING
2.0	299 9.9	7	21	45	20	
1.0	300 0.9	7	22	45	20	
0.1	300 1.0	7	23	45	20	
0.3	300 1.3	7	24	45	20	
1.3	300 2.6	7	25	45	30	PUMP TO 30#
0.7	300 3.3	7	26	45	30	
0.7	300 4.0	7	27	45	30	TRY TO BUMP TO 40#
1.5	300 5.5	7	28	45	30 → 40	BLEED OFF AIR
1.0	300 6.5	7	29	45	40	
0.7	300 6.7	8	00	45	40	
BACK FLOW	300 6.7	8	01	45	40	
2.0	300 6.7	8	02	45	30	BLEED OFF DROP TO 30#
0.6	300 6.3	8	03	45	30	
0.7	300 6.9	8	04	45	30	
1.2	301 1.1	8	05	45	30	DROP TO 20#
0.5	301 1.6	8	06	45	20	
0.8	301 2.4	8	07	45	20	BLEED OFF WATER TO REDUCE PRESS
0.8	301 2.6	8	08	45	20	

END TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TF BOREHOLE #: NW-03

DATE 10-6-03

TEST # 5

1) TEST INTERVAL= 70-60

2) TEST MIDPOINT= 65

3) GW DEPTH (BGS)= 201 +/-

4) MEASURED DEPTH OF COREHOLE= 117

5) LENGTH OF STICKUP ABOVE GROUND

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (65) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 28.14

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (65) - GW DEPTH BGS (45) X 0.433 PSI = 19.5

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.6

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 8.6 (FROM STEP 7)= 28.6 DIVIDED BY TEST MIDPOINT (65 FEET)= 0.44 PSI/FT
30#GAGE + 8.6 (FROM STEP 7)= 38.6 DIVIDED BY TEST MIDPOINT (65 FEET)= 0.59 PSI/FT
40#GAGE + 8.6 (FROM STEP 7)= 48.6 DIVIDED BY TEST MIDPOINT (65 FEET)= 0.74 PSI/FT
50#GAGE + 8.6 (FROM STEP 7)= 58.6 DIVIDED BY TEST MIDPOINT (65 FEET)= ____ PSI/FT
60#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #5

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TP
DATE:	10-6-02
INTERVAL=	60-70
BOREHOLE #	MW03

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STARTED TESTING AFTER BORING FILLED W/ WATER

GPM	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	2904.8	6	28	55	20	
0.8	2904.8	6	29	55	20	
0.0	2904.8	6	30	55	20	STOPPED TAKING
0.7	2905.5	6	31	55	30	
0.0	2905.5	6	32	55	30	STOPPED TAKING
0.4	2905.7	6	33	55	40	
0.3	2906.0	6	34	55	40	
0.1	2906.1	6	35	55	40	BUMP TO 50#
0.3	2906.4	6	36	55	50	
0.5	2906.9	6	37	55	50	
0.2	2907.1	6	38	55	50	
0.4	2907.5	6	39	55	50	
0.0	2907.5	6	40	55	40	DROP TO 40#
0.2	2907.7	6	41	55	40	
0.2	2907.9	6	42	55	40	
0.0	2907.9	6	43	55	30	DROP TO 30#
0.1	2908.0	6	44	55	30	
0.0	2908.0	6	45	55	30	DROP TO 20#
PIPE FLOW LOSS →	2908.0	6	46	55	20	
0.1	2908.1	6	47	55	20	STOP TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB BOREHOLE #: NW1-02

DATE 10-6-02

TEST # 4

1) TEST INTERVAL= 80-70

2) TEST MIDPOINT= 75

3) GW DEPTH (BGS)= 20+/-

4) MEASURED DEPTH OF COREHOLE= 117

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (75) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 32.47

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (75) - GW DEPTH BGS (55) X 0.433 PSI = ~~32~~ 23.8

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (75 FEET)= ____ PSI/FT
30#GAGE + 8.7 (FROM STEP 7)= 38.7 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.51 PSI/FT
40#GAGE + ____ (FROM STEP 7)= 48.7 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.65 PSI/FT
50#GAGE + ____ (FROM STEP 7)= 58.7 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.78 PSI/FT
60#GAGE + ____ (FROM STEP 7)= 68.7 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.92 PSI/FT
70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) **TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE.** MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #1

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10.6.03
INTERVAL=	40-70
BOREHOLE #	NW-03

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GPM	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	2955.1	6	00	45	30	STARTED TESTING AFTER ISOLATING FILLED W/ WATER
0.9	2956.0	6	01	45	30	
0.3	2956.9	6	02	45	30	
1.2	2958.11	6	03	45	40	INCR. TO 40#
0.5	2958.6	6	04	45	40	
0.1	2958.7	6	05	45	40	DROPPING TO 0.0 GPM
1.1	2959.8	6	06	45	50	INCR TO 50#
0.9	2960.7	6	07	45	50	
1.1	2961.8	6	08	45	50	DROP TO 40#
1.1	2962.9	6	09	45	40	
0.4	2963.3	6	10	45	40	
0.7	2964.0	6	11	45	40	
0.4	2964.4	6	12	45	40	DROP TO 30#
0.5	2965.0	6	13	45	30	
0.2	2965.2	6	14	45	30	
0.5	2965.7	6	15	45	30	
0.3	2966.0	6	16	45	30	
0.2	2966.2	6	17	45	30	STOPPED TEST
0.2	2966.2	6	18	45	30	0.0 GPM

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB BOREHOLE #: NW-03

DATE 10-20-03

TEST # 3

1) TEST INTERVAL= 90-100

2) TEST MIDPOINT= 95

3) GW DEPTH (BGS)= 20+/-

4) MEASURED DEPTH OF COREHOLE= 117

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (95) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 36.9

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (95) - GW DEPTH BGS (20) X 0.433 PSI = 28.14

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
30#GAGE + 8.7 (FROM STEP 7)= 42.7 DIVIDED BY TEST MIDPOINT (95 FEET)= 0.45 PSI/FT
40#GAGE + ↓ (FROM STEP 7)= 48.7 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.57 PSI/FT
50#GAGE + ↓ (FROM STEP 7)= 58.7 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.67 PSI/FT
60#GAGE + ↓ (FROM STEP 7)= 68.7 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.82 PSI/FT
70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #3

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-6-02
INTERVAL=	90-80
BOREHOLE #	NW-03

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	29432	5	42	50	30
1.7	29434.9	5	43	50	30
0.1	29435.0	5	44	50	30
0.2	29435.2	5	45	50	40
0.0	29435.2	5	46	50	40

CLOSING PACKER
SHUT OFF FLOW
TO WATER TANK
30# SLIP
40#
TIGHT
ZONE
QUIT
TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER JB BOREHOLE #: NW 07

DATE 10-6-02

TEST # 2

1) TEST INTERVAL= 100-90 PULLED OFF 5' RODS

2) TEST MIDPOINT= 95

3) GW DEPTH (BGS)= 201 +/-

4) MEASURED DEPTH OF COREHOLE= 117

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (95) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 41.1

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (95) - GW DEPTH BGS (75) X 0.433 PSI = 32.47

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.5

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + 8.5 (FROM STEP 7)= 48.5 DIVIDED BY TEST MIDPOINT (95 FEET)= .51 PSI/FT
50#GAGE + ↓ (FROM STEP 7)= 58.5 DIVIDED BY TEST MIDPOINT (↓ FEET)= .61 PSI/FT
60#GAGE + ↓ (FROM STEP 7)= 68.5 DIVIDED BY TEST MIDPOINT (↓ FEET)= .71 PSI/FT
70#GAGE + ↓ (FROM STEP 7)= 78.5 DIVIDED BY TEST MIDPOINT (↓ FEET)= .81 PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) **TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE.** MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #2

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	JB
DATE:	8-6-05
INTERVAL=	10-10
BOREHOLE #	NW-05

PAGE 2

ERRATIC TEST

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	2938.5	5	22	20	40-50	CLIMBING TO 70
10.0	2940.5	5	23	20	60-70	CANT CONTROL BLEED OFF
	missed	5	24			
BACKFLOWED →	2942.9	5	25	20	40	
0.0	2943.8	5	26	20	40→50	BUMP TO 50#
0.5	2946.3	5	27	20	50-55	
0.3	2946.6	5	28	20	50-60	CLIMBING
						BASICALLY TIGHT ZONE
						STOP TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB BOREHOLE #: NIN-03

DATE 10-[illegible]-03

TEST # 1

1) TEST INTERVAL= 105.3 - 95.3

2) TEST MIDPOINT= 100.3

3) GW DEPTH (BGS)= ASSUME 20'

4) MEASURED DEPTH OF COREHOLE= 117

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (100) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 43.3

92.9
16.0
108.9

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (100) - GW DEPTH BGS (20) X 0.433 PSI = 34.6

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

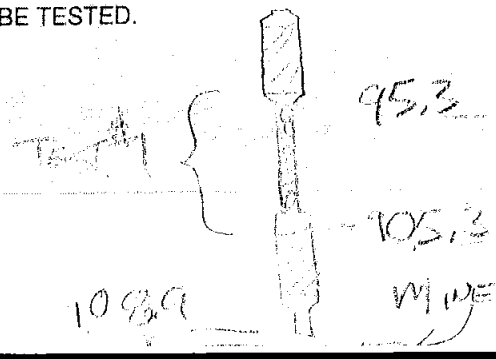
9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

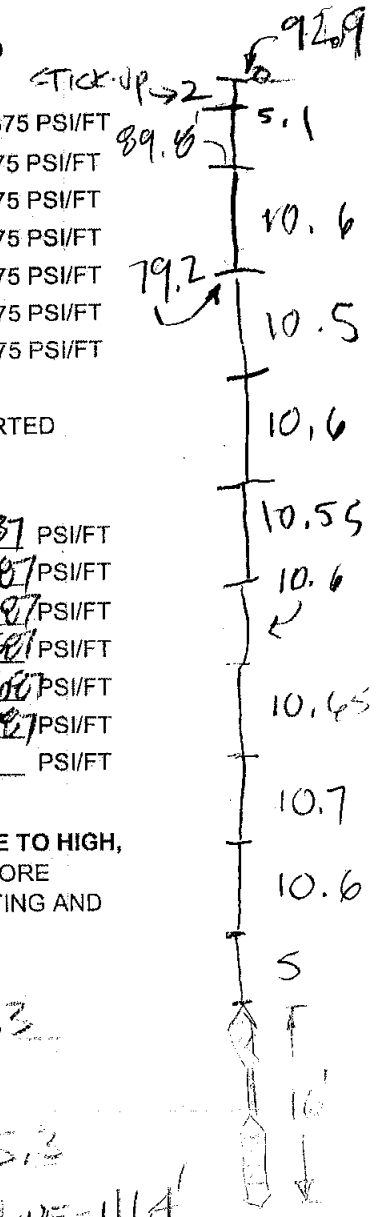
EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 8.7 (FROM STEP 7)= 28.7 DIVIDED BY TEST MIDPOINT (100 FEET)= .287 PSI/FT
30#GAGE + ____ (FROM STEP 7)= 38.7 DIVIDED BY TEST MIDPOINT (____ FEET)= .387 PSI/FT
START → 40#GAGE + ____ (FROM STEP 7)= 48.7 DIVIDED BY TEST MIDPOINT (____ FEET)= .487 PSI/FT
50#GAGE + ____ (FROM STEP 7)= 58.7 DIVIDED BY TEST MIDPOINT (____ FEET)= .587 PSI/FT
60#GAGE + ____ (FROM STEP 7)= 68.7 DIVIDED BY TEST MIDPOINT (____ FEET)= .687 PSI/FT
70#GAGE + ____ (FROM STEP 7)= 78.7 DIVIDED BY TEST MIDPOINT (____ FEET)= .787 PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.





TEST #1

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-6-03
INTERVAL=	95-105
BOREHOLE #	NW-03

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	2915.2	5	08	20	40	TIGHT
	2915.2	5	09	20	40	

TEST # 1

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NW05-04

DATE 10/12/03

TEST # 1

1) TEST INTERVAL= 80-70

2) TEST MIDPOINT= 75

3) GW DEPTH (BGS)= 22

4) MEASURED DEPTH OF COREHOLE= 90 ft

5) LENGTH OF STICKUP ABOVE GROUND 2 ft

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (75) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 32.48

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (75) - GW DEPTH BGS (22) X 0.433 PSI = 22.95

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 9.53

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 9.53 (FROM STEP 7)= 29.53 DIVIDED BY TEST MIDPOINT (75 FEET)= 0.39 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 39.53 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.53 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 49.53 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.66 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 59.53 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.79 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 69.53 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.93 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 79.53 DIVIDED BY TEST MIDPOINT (___ FEET)= 1.06 PSI/FT
80#GAGE + ___ (FROM STEP 7)= 89.53 DIVIDED BY TEST MIDPOINT (___ FEET)= 1.19 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #1

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/12/03
INTERVAL=	80-170
BOREHOLE #	NWS-04

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3692.0	09	44	30	20	FILL
0943 fill packer w/ Nitrogen!	3692.0		45	00	20	
	3692.0		45	30	20	
	3692.0		46	00	20	
	3692.0		47	00	30	up
	3692.5		47	30	30	
	3692.5		48	00	30	
	3692.5		48	30	40	up
	3692.5		49	00	40	
	3692.5		50	00	40	
	3692.55		50	30	50	up
	3692.55		51	00	50	
	3692.55		52	00	50	
	3692.58		53	00	60	up
	3692.58		54	00	60	
	3692.59		55	00	50	down
	3692.59		55	30	50	
	3692.59		56	00	40	down
	3692.59		56	30	40	
	3692.59		57	00	30	down
						EXD
	0.59 gal			12½ MIN		

0.05 gal/min

TEST #2

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** MWS-04

DATE 10/12/05

TEST # #2

1) TEST INTERVAL= 70 - 60

2) TEST MIDPOINT= 65

3) GW DEPTH (BGS)= 22

4) MEASURED DEPTH OF COREHOLE= 90

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (65) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 28.15

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (65) - GW DEPTH BGS (22) X 0.433 PSI = 18.62

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 9.53

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 9.53	(FROM STEP 7)= 29.53	DIVIDED BY TEST MIDPOINT (65	FEET)= 0.45	PSI/FT
30#GAGE +	(FROM STEP 7)= 39.53	DIVIDED BY TEST MIDPOINT (	FEET)= 0.61	PSI/FT
40#GAGE +	(FROM STEP 7)= 49.53	DIVIDED BY TEST MIDPOINT (	FEET)= 0.76	PSI/FT
50#GAGE +	(FROM STEP 7)= 59.53	DIVIDED BY TEST MIDPOINT (	FEET)= 0.92	PSI/FT
60#GAGE +	(FROM STEP 7)= 69.53	DIVIDED BY TEST MIDPOINT (	FEET)= 1.07	PSI/FT
70#GAGE +	(FROM STEP 7)= 79.53	DIVIDED BY TEST MIDPOINT (	FEET)= 1.22	PSI/FT
80#GAGE +	(FROM STEP 7)= 89.53	DIVIDED BY TEST MIDPOINT (	FEET)= 1.38	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #2

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SW
DATE:	10/12/02
INTERVAL=	20 - 60
BOREHOLE #	NWS-04

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3692.35	10	11	30	20	fill
	3692.60		12	00	20	
	3692.63		12	30	20	
	3692.70		13	00	20	
	3692.90		13	30	30	up
	3693.00		14	00	30	
	3693.10		14	30	30	
	3693.20		15	00	30	
	3693.2		15	30	40	up
	3693.25		16	00	40	
	3693.30		17	00	40	
	3693.48		18	00	40	
	3693.51		18	30	40	up
	3693.60		19	00	40	
	3693.75		20	00	50	up
	3693.82		21	00	50	
	3693.90		21	30	50	down
	3693.91		22	00	40	
	3693.91		22	30	40	
	3693.91		23	00	30	
	3693.91		23	30	30	
	3693.91		24	00	30	
	1.56		11 1/2 min			
	991					

0.14 gpm

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NMS-04

DATE 10/12/03

TEST # 1 of 3

1) TEST INTERVAL= 60 - 50

2) TEST MIDPOINT= 55

3) GW DEPTH (BGS)= 22

4) MEASURED DEPTH OF COREHOLE= 90

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (55) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 23.815

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (55) - GW DEPTH BGS (22) X 0.433 PSI = 14.29

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 9.53

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 9.53	(FROM STEP 7)= 29.53	DIVIDED BY TEST MIDPOINT (55 FEET)=	0.54	PSI/FT
30#GAGE +	(FROM STEP 7)= 39.53	DIVIDED BY TEST MIDPOINT (FEET)=	0.72	PSI/FT
40#GAGE +	(FROM STEP 7)= 49.53	DIVIDED BY TEST MIDPOINT (FEET)=	0.90	PSI/FT
50#GAGE +	(FROM STEP 7)= 59.53	DIVIDED BY TEST MIDPOINT (FEET)=	1.08	PSI/FT
60#GAGE +	(FROM STEP 7)= 69.53	DIVIDED BY TEST MIDPOINT (FEET)=	1.26	PSI/FT
70#GAGE +	(FROM STEP 7)= 79.53	DIVIDED BY TEST MIDPOINT (FEET)=		PSI/FT
80#GAGE +	(FROM STEP 7)= 89.53	DIVIDED BY TEST MIDPOINT (FEET)=		PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #3

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/10/03
INTERVAL=	60.50
BOREHOLE #	NWS-04

PAGE 2

INITIAL:

MID POINT 55

DO NOT EXCEED 45#

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
3693.60	10	34	30	10	FILL
3693.70		35	00	10	
3693.70		35	30	10	
3693.70		36	00	10	
3693.9		36	30	20	up
3693.95		37	00	20	
3693.98		37	30	20	
3693.97		38	00	20	
3693.98		38	30	20	
3694.10		39	00	30	up
3694.11		39	30	30	
3694.20		40	00	30	
3694.40		40	30	40	up
3694.70		41	00	40	
3694.90		41	30	40	
3695.00		42	00	40	
3695.30		43	00	40	
3695.40		43	30	40	down
3695.50		44	00	30	
3695.50		44	30	30	down
3695.25		45	00	20	
3695.25		45	30	20	
3695.20		46	00	20	
3695.20		46	30	20	down
3695.18		47	00	10	
3695.18		47	30	10	
1.5 gal		13 min			

.12 gal/min

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER [illegible] **BOREHOLE #:** NW-04

PAGE 1

DATE [illegible]

TEST # [illegible]

1) TEST INTERVAL= 30 - 60

2) TEST MIDPOINT= 45

3) GW DEPTH (BGS)= 22

4) MEASURED DEPTH OF COREHOLE= 90

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (45) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 19.49

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (45) - GW DEPTH BGS (22) X 0.433 PSI = 9.96

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 9.53

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 9.53 (FROM STEP 7)= 29.53 DIVIDED BY TEST MIDPOINT (45 FEET)= 0.66 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 39.53 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.88 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 49.53 DIVIDED BY TEST MIDPOINT (___ FEET)= 1.1 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 59.53 DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
60#GAGE + ___ (FROM STEP 7)= 69.53 DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
70#GAGE + ___ (FROM STEP 7)= 79.53 DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
80#GAGE + ✓ (FROM STEP 7)= 89.53 DIVIDED BY TEST MIDPOINT (✓ FEET)= ___ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/12/03
INTERVAL=	50 - 40
BOREHOLE #	MWS-04

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3695.0	10	56	30	10	FILL
	3695.3		57	00	10	
	3695.3		57	30	10	
	3695.3		58	00	10	up
	3695.5		58	30	15	
	3695.6		59	00	15	
	3695.75		59	30	15	
	3696.1	11	00	00	20	up
	3696.5	11	00	30	20	
	3696.65		01	00	20	
	3697.20		01	30	20	
	3697.6		02	00	20	up
	3698.60		02	30	30	
	3699.80		03	00	30	
			03	30	30	
	3702.8		04	00	30	
	3704.5		05	00	30	up
	3709.5		06	00	35	
	3715.1		07	00	35	
	3719.6		08	00	35	
	3724.2		09	00	35	
	3726.7		09	30	35	down
	3728.6		10	00	25	
	3729.1		10	30	25	
	3731.5		11	00	25	down
	3732.5		11	30	20	
	3733.7		12	00	20	
	3734.9		12	30	20	
	3736.3		13	00	20	down
	3736.8		13	30	10	
	3737.6		14	00	10	
	3738.3		14	30	10	
	3739.0		15	00	10	
	44 gals			15 1/2 MIN		

DO NOT EXCEED 40#

TAKER

MISSED

2.84 gal/min

TEST # 5

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-04 PAGE 1

DATE 10/12/03

TEST # #5

1) TEST INTERVAL= 40-30

2) TEST MIDPOINT= 35

3) GW DEPTH (BGS)= 22

4) MEASURED DEPTH OF COREHOLE= 90

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (35) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 15.16

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (35) - GW DEPTH BGS (22) X 0.433 PSI = 5.63

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 9.53

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 9.53	(FROM STEP 7)= 29.53	DIVIDED BY TEST MIDPOINT (35 FEET)=	0.84	PSI/FT
30#GAGE + ___	(FROM STEP 7)= 39.53	DIVIDED BY TEST MIDPOINT (___ FEET)=	1.23	PSI/FT
40#GAGE + ___	(FROM STEP 7)= 49.53	DIVIDED BY TEST MIDPOINT (___ FEET)=	___	PSI/FT
50#GAGE + ___	(FROM STEP 7)= 59.53	DIVIDED BY TEST MIDPOINT (___ FEET)=	___	PSI/FT
60#GAGE + ___	(FROM STEP 7)= 69.53	DIVIDED BY TEST MIDPOINT (___ FEET)=	___	PSI/FT
70#GAGE + ___	(FROM STEP 7)= 79.53	DIVIDED BY TEST MIDPOINT (___ FEET)=	___	PSI/FT
80#GAGE + ___	(FROM STEP 7)= ___	DIVIDED BY TEST MIDPOINT (___ FEET)=	___	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #5

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/12/03
INTERVAL=	40' 30
BOREHOLE #	NWS-01

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3739.2	11	27	00	10	FILL
	3739.44		27	30	10	
	3739.45		28	00	10	
	3739.45		28	30	10	
	3739.50		29	00	10	
Do not exceed 25#	3739.60		29	30	15	up
	3739.80		30	00	15	
	3739.82		30	30	15	
	3739.94		31	00	15	
	3740.02		31	30	20	up
	3740.04		32	00	20	
	3740.09		32	30	20	
	3741.20		33	00	20	
	3742.4		33	30	20	
	3744.2		34	00	25	
	3744.4		34	30	25	
	3744.4		35	00	25	
	3744.5		35	30	25	
	3744.5		36	00	25	
	missed		36	30	25	
TAKER	3746.25		37	00	20	
	missed		37	30	20	
	3747.1		38	00	20	
	3747.4		38	30	20	
	3747.9		39	00	15	
	3748.2		39	30	15	
	3748.6		40	00	15	
	3749.4		40	30	15	
	3749.41		41	00	10	
	3749.70		41	30	10	
	3749.85		42	00	10	
	3750.02		42	30	10	
	3750.05		42	00	10	
	10.25			16 min		

0.68

TEST #6

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-04

DATE 10/20/03

TEST # #6

1) TEST INTERVAL= 182-172

2) TEST MIDPOINT= 177

3) GW DEPTH (BGS)= 25

4) MEASURED DEPTH OF COREHOLE= 185.6

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (177) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 76.64

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (177) - GW DEPTH BGS (25) X 0.433 PSI = 65.82

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.82 (FROM STEP 7)= 30.82 DIVIDED BY TEST MIDPOINT (177 FEET)= 0.17 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 40.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.23 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 50.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.29 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 60.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.34 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 70.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.40 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 80.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.46 PSI/FT
80#GAGE + ___ (FROM STEP 7)= 90.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.51 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST # 6

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/20/03
INTERVAL=	182 - 172
BOREHOLE #	NWS-04

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3750.05	15	42	00	10	FILL
	3751.05			30	10	
	3751.05		43	00	10	
	3751.05		43	30	10	
	3751.80		44	00	20	up
	3751.8		44	30	20	
	3751.9		45	00	20	
	3751.9		45	30	20	
	3751.9		46	00	30	up
	3752.2		46	30	30	
	3752.2		47	00	30	
	3752.2		47	30	30	up
	3752.3		48	00	40	
	3752.35		48	30	40	
	3752.35		49	00	40	
	3752.35		49	30	40	up
	3752.4		50	00	50	
	3752.55		50	30	50	
	3752.7		51	00	50	
	3752.75		51	30	50	up
	3752.8		52	00	60	
	3752.8		52	30	60	
	3753.0		53	00	60	up
	3753.05		53	30	70	
	3753.1		54	00	70	
	3753.2		54	30	60	down
	3752.98		55	00	60	
	3752.50		55	30	50	
	3752.9		56	00	50	down
	3752.8		56	30	40	
	3752.6		57	00	30	down
	3752.3		57	30	30	
	3752.2		58	00	20	
	3751.5		58	30	20	

1.5 gal in 16½ mins

TEST #1 7

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SR **BOREHOLE #:** N105-04

DATE 10/20/03

TEST # H 7

1) TEST INTERVAL= 172 - 162

2) TEST MIDPOINT= 167

3) GW DEPTH (BGS)= 25

4) MEASURED DEPTH OF COREHOLE= 185.6

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (167) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 72.31

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (167) - GW DEPTH BGS (25) X 0.433 PSI = 61.49

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.82 (FROM STEP 7)= 30.82 DIVIDED BY TEST MIDPOINT (167 FEET)= 0.18 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 40.82 DIVIDED BY TEST MIDPOINT ( ) FEET)= 0.24 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 50.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.30 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 60.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.36 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 70.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.42 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 80.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.48 PSI/FT
80#GAGE + ___ (FROM STEP 7)= 90.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.54 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #7

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/20/03
INTERVAL=	172-162
BOREHOLE #	NWS-04

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3750.8	16	06	00	20	FILL
	3752.05		6	30	20	
	3752.6		7	00	30	
	3752.5		7	30	30	up
	3752.8		8	00	40	
	3752.85		8	30	40	
	3752.9		9	00	40	
	3753.05		9	30	50	up
	3753.1		10	00	50	
	3753.12		10	30	50	
	3753.3		11	00	60	up
	3753.3		11	30	60	
	3753.4		12	00	70	
	3753.4		12	30	70	
	3753.4		13	00	70	
	3753.5		13	30	80	up
	3753.5		14	00	80	up
	3753.6		14	30	90	
	3753.6		15	00	90	
	3753.6		15	30	80	
	3753.6		16	00	80	
	3753.6		16	30	70	
	3753.6		17	00	60	
	3753.6		17	30	50	
	3753.6		18	00	40	
			18	30	30	

2.8 gals IN 12 1/2 mins

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER CA **BOREHOLE #:** NMS-04

DATE 10/20/03

TEST # 8

1) TEST INTERVAL= 162 - 152

2) TEST MIDPOINT= 157

3) GW DEPTH (BGS)= 25

4) MEASURED DEPTH OF COREHOLE= 185.6

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (157) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 67.98

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (157) - GW DEPTH BGS (25) X 0.433 PSI = 57.16

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.82 (FROM STEP 7)= 30.82 DIVIDED BY TEST MIDPOINT (157 FEET)= 0.20 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 40.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.26 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 50.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.32 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 60.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.39 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 70.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.45 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 80.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.51 PSI/FT
80#GAGE + N (FROM STEP 7)= 90.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.58 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

Test #8

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/20/03
INTERVAL=	160-152
BOREHOLE #	NWS-04

Mid point 157

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3753.6	16	26	30	20	FILL
	3757.8		27	00	20	
	3757.7		27	30	20	up
	3757.5		28	00	30	
	3757.8		28	30	40	up
	3757.8		29	00	40	
	3757.9		29	30	50	up
	3757.9		30	00	60	
	3758.0		30	30	60	
	3758.0		31	00	60	up
	3758.12		31	30	70	
	3758.12		32	00	70	up
	3758.2		32	30	80	
	3758.25		33	00	90	
	3758.25		33	30	90	down
	3758.5		34	00	100	up
	3758.75		34	30	100	
	3758.9		35	00	100	down
	3759.0		35	30	90	
	3759.2		36	00	90	down
	3759.3		36	30	80	
	3759.3		37	00	80	
	3759.3		37	30	70	
	3759.3		38	00	70	
	3759.35		38	30	60	down
	3759.32		39	00	50	
	3759.32		39	30	40	
	3759.29		40	00	40	

5.7 gal in 13½ mins

0.4 gpm

TEST #9

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-04 PAGE 1

DATE 10/20/03

TEST # #9

1) TEST INTERVAL= 152 - 142

2) TEST MIDPOINT= 147

3) GW DEPTH (BGS)= 25

4) MEASURED DEPTH OF COREHOLE= 185.6

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (147) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 63.65

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (147) - GW DEPTH BGS (25) X 0.433 PSI = 52.83

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.82 (FROM STEP 7)= 30.82 DIVIDED BY TEST MIDPOINT (147 FEET)= 0.21 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 40.82 DIVIDED BY TEST MIDPOINT ( ) FEET)= 0.28 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 50.82 DIVIDED BY TEST MIDPOINT ( ) FEET)= 0.35 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 60.82 DIVIDED BY TEST MIDPOINT ( ) FEET)= 0.41 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 70.82 DIVIDED BY TEST MIDPOINT ( ) FEET)= 0.48 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 80.82 DIVIDED BY TEST MIDPOINT ( ) FEET)= 0.55 PSI/FT
80#GAGE + ___ (FROM STEP 7)= 90.82 DIVIDED BY TEST MIDPOINT ( ) FEET)= 0.62 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #9

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/20/03
INTERVAL=	152 - 142
BOREHOLE #	NWS-04

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	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3758.5	16	48	00	20	FILL
	3760.0		48	30	20	
	3760.1		49	00	20	
	3760.5		49	30	30	up
	3760.6		50	00	30	
	3760.6		50	30	40	
	3760.6		51	00	40	up
	3760.8		51	30	50	
	3760.8		52	00	50	up
	3760.9		52	30	60	
	3760.9		53	00	60	
	3760.92		53	30	70	up
	3760.95		54	00	70	
	3761.0		54	30	80	up
	3761.05		55	00	80	
	3761.1		55	30	90	up
	3761.15		56	00	100	
	3761.5		56	30	110	up
	3761.5		57	00	110	
	3761.8		57	30	110	
	3762.1		58	00	120	up
	3762.3		58	30	120	
	3762.5		59	00	110	
	3762.7		59	30	100	
	3762.8	17	00	00	90	
	3763.1		00	30	90	
	3763.1		01	00	80	
	3763.1		01	30	70	
	3763.05		02	00	60	
	3763.05		02	30	50	

4.6 gpm in 14 1/2

TEST # 10

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-04

DATE 10/20/02

TEST # 10

1) TEST INTERVAL= 142 - 132

2) TEST MIDPOINT= 137

3) GW DEPTH (BGS)= 25

4) MEASURED DEPTH OF COREHOLE= 185.6

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (137) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 59.32

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (137) - GW DEPTH BGS (25) X 0.433 PSI = 48.50

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE +	10.82	(FROM STEP 7)= 30.82	DIVIDED BY TEST MIDPOINT (137 FEET)=	0.22 PSI/FT
30#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (FEET)=	0.30 PSI/FT
40#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (FEET)=	0.37 PSI/FT
50#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (FEET)=	0.44 PSI/FT
60#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (FEET)=	0.52 PSI/FT
70#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (FEET)=	0.59 PSI/FT
80#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (FEET)=	0.66 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #10

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	CN
DATE:	10/20/03
INTERVAL=	112.-132.
BOREHOLE #	NWS-04

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	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3771.2	17	13	30	10	FILL
	3771.2		14	00	10	
	3771.8		14	30	20	
	3771.8		15	00	20	up
	3772.0		15	30	30	
	3772.0		16	00	30	up
	3772.15		16	30	40	
	3772.15		17	00	40	
	3772.15		17	30	50	
	3772.25		18	00	50	
	3772.3		18	30	60	
	3772.3		19	00	60	
	3772.4		19	30	70	
	3772.41		20	00	80	
	3772.45		20	30	90	
	3772.5		21	00	100	
	3772.55		21	30	110	
	3772.55		22	00	100	
	3772.50		23	00	90	
	3772.50		24	00	80	
	3772.50		25	00	70	
	3772.35		26	00	40	

1.2 gals in 12½ mins

TEST #11

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SAJ **BOREHOLE #:** NWS-04

DATE 10/20/03

TEST # 11

1) TEST INTERVAL= 132 - 122

2) TEST MIDPOINT= 127

3) GW DEPTH (BGS)= 25

4) MEASURED DEPTH OF COREHOLE= 185.6

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (127) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 54.99

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (127) - GW DEPTH BGS (25) X 0.433 PSI = 44.17

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.82 (FROM STEP 7)= 30.82 DIVIDED BY TEST MIDPOINT (127 FEET)= 0.24 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 40.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.32 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 50.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.40 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 60.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.48 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 70.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.56 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 80.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.64 PSI/FT
80#GAGE + ___ (FROM STEP 7)= 90.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.72 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #11

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/20/03
INTERVAL=	132-122
BOREHOLE #	NW5-04

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	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3772.1	17	33	00	20	FILL
	3779.0		33	30	20	
	3780.05		34	00	20	
	3780.05		34	30	20	up
	3780.15		35	00	30	
	3780.15		35	30	30	
	3780.20		36	00	40	up
	3780.23		36	30	40	
	3780.3		37	00	50	up
	3780.3		37	30	50	
	3780.35		38	00	60	up
	3780.4		38	30	60	
	3780.41		39	00	70	up
	3780.41		39	30	70	
	3780.41		40	00	80	up
	3780.49		40	30	80	
	3780.5		41	00	90	up
	3780.5		41	30	90	
	3780.5		42	00	100	up
	3780.5		42	30	90	down
	3780.5		43	00	80	
	3780.5		43	30	50	
	3780.5		44	00	40	

8.4 gals IN 11 MINS

TEST #12

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS-04

DATE 10/20/03

TEST # #12

1) TEST INTERVAL= 122 - 112

2) TEST MIDPOINT= 117

3) GW DEPTH (BGS)= 25

4) MEASURED DEPTH OF COREHOLE= 185.6

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (117) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 50.66

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (117) - GW DEPTH BGS (25) X 0.433 PSI = 39.84

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.82 (FROM STEP 7)= 30.82 DIVIDED BY TEST MIDPOINT (117 FEET)= 0.26 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 40.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.35 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 50.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.43 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 60.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.52 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 70.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.61 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 80.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.69 PSI/FT
80#GAGE + ___ (FROM STEP 7)= 90.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.78 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST # 12

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/20/03
INTERVAL=	72-112
BOREHOLE #	NUS-04

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3780.3	17	54	00	20	FILL
	3785.5		54	30	20	
	3785.5		55	00	20	
	3785.3		55	30	20	
	3785.25		56	00	30	
	3785.25		56	30	30	
	3785.4		57	00	40	
	3785.4		57	30	40	
	3785.4		58	00	50	
	3785.5		58	30	50	
	3785.5		59	00	60	
	3785.65		59	30	60	
	3785.65	18	00	00	60	
	3785.70		00	30	70	
	3785.70		01	00	70	
	3785.8		01	30	80	
	3785.8		02	00	80	
	3785.8		02	30	90	
	3785.8		03	00	90	
	3785.85		03	30	100	
	3785.90		04	00	110	
	3786.2		04	30	120	
	3786.25		5	00	100	
	3786.25		5	30	100	
	3786.1		6	00	70	
	3785.9		6	30	40	

5.6 GALS IN 12 1/2 MINS

TEST # 13

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** NWS 04

DATE 10/20/03

TEST # # 13

PAGE 1

1) TEST INTERVAL= 112 - 102

2) TEST MIDPOINT= 107

3) GW DEPTH (BGS)= 25

4) MEASURED DEPTH OF COREHOLE= 185.6

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (107) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 46.33

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (107) - GW DEPTH BGS (25) X 0.433 PSI = 35.5

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.82 (FROM STEP 7)= 20.82 DIVIDED BY TEST MIDPOINT (107 FEET)= 0.29 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 40.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.38 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 50.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.47 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 60.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.57 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 70.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.66 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 80.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.76 PSI/FT
80#GAGE + ___ (FROM STEP 7)= 90.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.85 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST # 13

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	EN
DATE:	10/20/03
INTERVAL=	112 - 102
BOREHOLE #	NWS-04

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	3785.5	18	16	30	20
	3785.65		17	00	20
	3786.65		17	30	20
	3785.65		18	00	30
	3786.67		18	30	30
	3786.8		19	00	30
	3786.9		19	30	40
	3786.9		20	00	40
	3787.15		20	30	50
	3787.25		21	00	50
	3787.15		21	30	60
	3787.3		22	00	60
	3787.4		22	30	60
	3787.5		23	00	70
	3787.6		23	30	70
	3787.85		24	00	80
	3787.9		24	30	80
	3788.05		25	00	90
	3788.1		25	30	90
	3788.2		26	00	70
	3788.25		26	30	70
	3788.19		27	00	50
	3788.19		27	30	50
	3788.10		28	00	40

2.6 gpm 10 13½ minutes

TEST # 14

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** N105 04

DATE 10/20/03

TEST # 14

1) TEST INTERVAL= 102 - 92

2) TEST MIDPOINT= 97

3) GW DEPTH (BGS)= 25

4) MEASURED DEPTH OF COREHOLE= 185.6

5) LENGTH OF STICKUP ABOVE GROUND 2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (97) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 42

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (97) - GW DEPTH BGS (25) X 0.433 PSI = 31.18

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.82

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.82 (FROM STEP 7)= 30.82 DIVIDED BY TEST MIDPOINT (97 FEET)= 0.32 PSI/FT
30#GAGE + ___ (FROM STEP 7)= 40.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.42 PSI/FT
40#GAGE + ___ (FROM STEP 7)= 50.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.52 PSI/FT
50#GAGE + ___ (FROM STEP 7)= 60.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.63 PSI/FT
60#GAGE + ___ (FROM STEP 7)= 70.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.73 PSI/FT
70#GAGE + ___ (FROM STEP 7)= 80.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.83 PSI/FT
80#GAGE + ___ (FROM STEP 7)= 90.82 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.94 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #14

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/20/03
INTERVAL=	102.92
BOREHOLE #	NW3-04

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3789.7	18	39	00	20	FILL
	3789.4		39	30	20	
	3789.3		40	00	20	
	3789.98		40	30	30	
	3789.98		41	00	30	
	3790.05		41	30	40	
	3790.07		42	00	40	
	3790.12		42	30	50	
	3790.15		43	00	50	
	3790.24		43	30	60	
	3790.28		44	00	60	
	3790.35		44	30	70	
	3790.38		45	00	70	
	3790.44		45	30	70	
	3790.50		46	00	80	
	3790.55		46	30	80	
	3790 6.3		47	00	90	
	37900.8		47	30	90	
	37907.1		48	00	80	
	3790 7.5		48	30	80	
	3790 7.5		49	00	60	
	3790 77		49	30	60	
	3790 77		50	00	40	

[illegible] 11 minutes

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

NWS-05

PAGE 1

TESTER TB **BOREHOLE #:** NWS-05

DATE 10-6-07

TEST # 1

1) TEST INTERVAL= 63.1 - 53.1

2) TEST MIDPOINT= 58.1

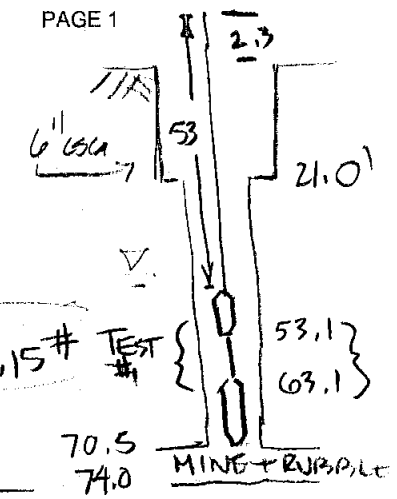
3) GW DEPTH (BGS)= approx 20'

4) MEASURED DEPTH OF COREHOLE= 15

5) LENGTH OF STICKUP ABOVE GROUND 2.3

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (58.1) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 25.15#



7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (58) - GW DEPTH BGS (20) X 0.433 PSI = 16.4

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.75

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 8.75	(FROM STEP 7)= 29	DIVIDED BY TEST MIDPOINT (58	FEET)= 0.5	PSI/FT
30#GAGE +	(FROM STEP 7)= 39	DIVIDED BY TEST MIDPOINT (58	FEET)= 0.67	PSI/FT
40#GAGE +	(FROM STEP 7)= 49	DIVIDED BY TEST MIDPOINT (	FEET)= 0.84	PSI/FT
50#GAGE +	(FROM STEP 7)= 59	DIVIDED BY TEST MIDPOINT (	FEET)= 1.01	PSI/FT
60#GAGE +	(FROM STEP 7)= 69	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
70#GAGE +	(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
80#GAGE +	(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

NOTE: SJB HAS 0-30 PSI GAGE ONLY!

TEST #1 NWS-05

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-6-05
INTERVAL=	62.1-82.1
BOREHOLE #	

PAGE 2 180# ON PACKER

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	2801.9	12	00	54	0	PACKER LEAK TIGHT JUMPS TO 30# CONT KEEP IT AT 20# TIGHT ZONE
	2819.8	12	02	54	30	
	2819.8	12	03	54	12	
	2819.8	12	04	54	12	

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** NWS-05

DATE 10-6-03

TEST # 2

1) TEST INTERVAL= 53-43

2) TEST MIDPOINT= 48

3) GW DEPTH (BGS)= approx 20'

4) MEASURED DEPTH OF COREHOLE= 75

5) LENGTH OF STICKUP ABOVE GROUND 2.3

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (48) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 20.7

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (48) - GW DEPTH BGS (20) X 0.433 PSI = 12.1

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.6

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 8.6 (FROM STEP 7)= 28.6 DIVIDED BY TEST MIDPOINT (48 FEET)= .59 PSI/FT
30#GAGE + ____ (FROM STEP 7)= 38.6 DIVIDED BY TEST MIDPOINT (48 FEET)= .80 PSI/FT
40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
50#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
60#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #2 NWS-05

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	10-6-03
INTERVAL=	53-43
BOREHOLE #	NWS-05

PAGE 2

	GPM	WATER METER READING	TIME:	HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	2.0	2819.9		12	20	29	10	
		2821.6		12	21	29	10	
	1.7	2823.2		12	22	29	10	
	1.9	2824.4		12	23	29	10	
	2.5	2827.9		12	24	29	20	
	2.4	2830.3		12	25	29	20	
	2.3	2832.6		12	26	29	20	
	2.3	2834.9		12	27	29	20	
	3.1	2837.0		12	28	29	30	FLUCTUATING PRESSURE
	2.7	2840.7		12	29	29	30	
	2.6	2843.3		12	30	29	30	
		2845.6		12	31	29	20	
		2848.0		12	32	29	20	
		2850.2		12	33	29	20	
		2851.5		12	34	29	10	
		2852.9		12	35	29	10	
		2855.4		12	36	29	10	ZONE STOPPED TAKING WATER QUIT TEST

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB BOREHOLE #: NW[illegible]-05

DATE 10-10-02

TEST # 3

1) TEST INTERVAL= 43-33

2) TEST MIDPOINT= 38

3) GW DEPTH (BGS)= APPROX 20'

4) MEASURED DEPTH OF COREHOLE= 75

5) LENGTH OF STICKUP ABOVE GROUND 7'

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (38.1) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 16.49

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (38) - GW DEPTH BGS (20) X 0.433 PSI = 7.79

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT

30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT

40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT

50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT

60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT

70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT

80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT

IN THIS EXAMPLE-

DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

10 8.7 18.7 = 0.49

20#GAGE + 8.7 (FROM STEP 7)= 28.7 DIVIDED BY TEST MIDPOINT (38 FEET)= 0.75 PSI/FT

30#GAGE + 8.7 (FROM STEP 7)= 38.7 DIVIDED BY TEST MIDPOINT (38 FEET)= 1.0 PSI/FT

40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

50#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

60#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #3

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TP
DATE:	10-6-03
INTERVAL=	47.-53
BOREHOLE #	NWS-05

PAGE 2

	GPM	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
							FILLING BORING
INITIAL:	5.4	2853.3	12	57	15	10 8	PACKER LEAKING?
	0	2859.12	12	58	15	8-12	
		2859.12	12	59	15	10	
	0.8	2860.0	13	01	15	10	PRESSURE
	1.1	2861.1	13	02	15	10	DROPPED TO
	0.7	2861.8	13	03	15	20	8. RAISED
	0.6	missed	13	04	15	20	PRESSURE
		2862.0	13	05	15	20	TO 10#
	0	2862.4	13	06	15	20	HOLE TOOK
		2862.4	13	07	15	10	0.8 GPM
	0	2862.4	13	08	15	10	
	0	2862.4	13	09	15	10	~~STOP~~ 0.0
							OPEN @ 10#
							HOLE TAKIN
							THEN STOPPIN
							THEN TAKING
							BASICALLY
							A TIGHT
							HOLE

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER JB **BOREHOLE #:** NWS-05

DATE 10-10-03

TEST # 4

1) TEST INTERVAL= 23'-23'

2) TEST MIDPOINT= 28

3) GW DEPTH (BGS)= approx 20

4) MEASURED DEPTH OF COREHOLE= 75

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (28) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 12.12

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (28) - GW DEPTH BGS (20) X 0.433 PSI = 3.46

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

10# + 8.

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT

30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT

40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT

50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT

60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT

70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT

80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT

IN THIS EXAMPLE-

DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

10# + 8.7 18.7 28 = .66 PSI/FT

TEST DATA

20#GAGE + 8.7 (FROM STEP 7)= 28.7 DIVIDED BY TEST MIDPOINT (28 FEET)= 1.0 PSI/FT

30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

50#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

60#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

5# + 8.7 13.7 28 = 0.48

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #4 33'-23'

TIME SPENT TESTING
10:30-1:30
2:30-3:30

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

PAGE 2

TESTER:	TP
DATE:	10-10-02
INTERVAL=	33'-23'
BOREHOLE #	NW5-05

	GPM	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	7.5	2862.0	2	31	30	2.5	FILLING BORING
		2869.5	2	32	30	2.5	
	3.5	2873.0	2	33	30	5 10	
	0.9	2873.9	2	34	30	7	HARD TO KEEP @ 5#
	0.3	2874.2	2	35	30	7	
	1.1	2875.3	2	36	30	10	RAISE TO 10#
	0.6	2875.9	2	37	30	10-12	
	0.3	2876.2	2	38	30	12	
	0.1	2876.3	2	39	30	10-20	RAISE TO 20#
	4.6	2880.9	2	40	30	20	
20#	4.7	2885.6	2	41	30	20→18	
	6.3	2891.9	2	42	30	20	
	3.1	2895.0	2	43	30	20→10	DROP TO 10#
		2898.4	2	44	30	12 11	
		2901.6	2	45	30	11	
		2905.0	2	46	30	11	
		2906.7	2	47	30	11→5	DROP TO 5#
		2907.6	2	48	30	5	
		2908.6	2	49	30	5	
		2910.8	2	50	30	5	
		2911.5	2	51	30	5	

1 of 2

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB/SN BOREHOLE #: NWS-05 PAGE 1

DATE 10-8-03

TEST # 5

1) TEST INTERVAL= 152 - 142

2) TEST MIDPOINT= 147

3) GW DEPTH (BGS)= 20' (assumed)

4) MEASURED DEPTH OF COREHOLE= 155.5

5) LENGTH OF STICKUP ABOVE GROUND [redacted]

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (147) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 63.65

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (147) - GW DEPTH BGS (20) X 0.433 PSI = 54.99

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= (8.66)

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 8.7 (FROM STEP 7)= 28.7 DIVIDED BY TEST MIDPOINT (147 FEET)= 0.19 PSI/FT
30#GAGE + 1 (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + 8.7 (FROM STEP 7)= 48.7 DIVIDED BY TEST MIDPOINT (147 FEET)= 0.33 PSI/FT
50#GAGE + ____ (FROM STEP 7)= 58.7 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.39 PSI/FT
60#GAGE + ____ (FROM STEP 7)= 68.7 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.47 PSI/FT
70#GAGE + ____ (FROM STEP 7)= 78.7 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.53 PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= 0.68 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #5

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB / SN
DATE:	10/8/03
INTERVAL=	142.-152
BOREHOLE #	NWS-05

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL: →	3070.2	4	20	45	0	FILL BORING
	3095.5	4	21	45	0	
	3095.5	4	22	45	0	
	3108.0	4	23	45	0	
	3123.8	4	24	45	0	
	3159.8	4	25	45	0	
	3179.9	4	26	45	0	

109.7 gals / 6 min.

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TP/SN BOREHOLE #: NW15-05 PAGE 1

DATE 10-6-03

TEST # 6

1) TEST INTERVAL= 142 - 132

2) TEST MIDPOINT= 137

3) GW DEPTH (BGS)= 20' (BGS MAY)

4) MEASURED DEPTH OF COREHOLE= 155.9

5) LENGTH OF STICKUP ABOVE GROUND 2.0

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (137) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 59.3

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (137) - GW DEPTH BGS (117) X 0.433 PSI = 50.66
20

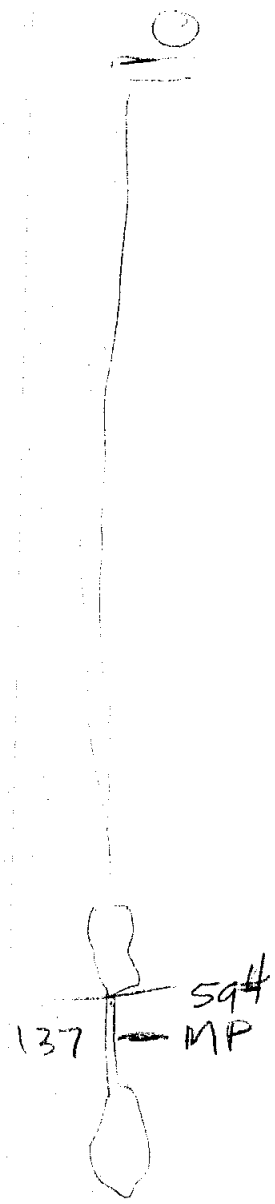
8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA					
20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
40#GAGE + 8.7	(FROM STEP 7)= 48.7	DIVIDED BY TEST MIDPOINT (137	FEET)= ____	PSI/FT
50#GAGE + ↓	(FROM STEP 7)= 58.7	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.42	PSI/FT
60#GAGE + ↓	(FROM STEP 7)= 68.7	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.50	PSI/FT
70#GAGE + ↓	(FROM STEP 7)= 78.7	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.57	PSI/FT
80#GAGE + ↓	(FROM STEP 7)= 88.7	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.64	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.



USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TR/EN
DATE:	10-6-[illegible]
INTERVAL=	14.2-12.2
BOREHOLE #	NW5-05

PAGE 2

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
31799	4	44	45	0-40	FILL BORING
31858	4	45	45	40	
31867.8	4	46	45	48	
31871.8	4	47	45	48	
31871.2	4	48	45	50	SLOWED TO 0.0
31871.5	4	49	45	50	BUMP UP TO 50#
31871.5	4	50	45	58	
31871.8	4	51	45	60	SLOW TO 0.0
31871.9	4	52	45	60	BUMP TO 60#
31872.1	4	53	45	60	
31872.1	4	54	45	50	DROP TO 50#
31872.1	4	55	45	40	TIGHT
					STOP TEST

8.3 gal / 10 min

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB/SN BOREHOLE #: NWS-05

DATE 10-3-06

TEST # 7

1) TEST INTERVAL= 122-132

2) TEST MIDPOINT= 127

3) GW DEPTH (BGS)= 20' (approx)

4) MEASURED DEPTH OF COREHOLE= 155.5

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 9.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + 9.7 (FROM STEP 7)= 19.7 DIVIDED BY TEST MIDPOINT (127 FEET)= ____ PSI/FT
50#GAGE + ____ (FROM STEP 7)= 29.7 DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
60#GAGE + ____ (FROM STEP 7)= 68.7 DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
70#GAGE + ____ (FROM STEP 7)= 78.7 DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= 88.7 DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #7

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB/SA
DATE:	10-3-05
INTERVAL=	152-122
BOREHOLE #	NWS-05

PAGE 2

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
3187.4	5	07	30	0-40	FILL BORING
3192.2	5	08	30	40	
3192.5	5	09	30	40	
3192.6	5	10	30	40	
3192.8	5	11	30	50	RAISE TO 50# SLOWING TO 0.1GPM
3192.9	5	12	30	50	
3193.0	5	13	30	50	
3193.1	5	14	30	60	
3193.2	5	15	30	60	
3193.3	5	16	30	60	TIGHT ZONE STOP TEST

5.9 gal / 9 min.

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TP/[illegible] BOREHOLE #: NWG-05 PAGE 1

DATE 10 3 [illegible]

TEST # 2

1) TEST INTERVAL= 122 - 112

2) TEST MIDPOINT= 117

3) GW DEPTH (BGS)= 20' [illegible]

4) MEASURED DEPTH OF COREHOLE= 155 1/2

5) LENGTH OF STICKUP ABOVE GROUND

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI =

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA				
20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
40#GAGE + 8.7	(FROM STEP 7)= 48.7	DIVIDED BY TEST MIDPOINT (117	FEET)= 0.41	PSI/FT
50#GAGE + ____	(FROM STEP 7)= 58.7	DIVIDED BY TEST MIDPOINT (____	FEET)= 0.50	PSI/FT
60#GAGE + ____	(FROM STEP 7)= 68.7	DIVIDED BY TEST MIDPOINT (____	FEET)= 0.58	PSI/FT
70#GAGE + ____	(FROM STEP 7)= 78.7	DIVIDED BY TEST MIDPOINT (____	FEET)= 0.67	PSI/FT
80#GAGE + ____	(FROM STEP 7)= 88.7	DIVIDED BY TEST MIDPOINT (____	FEET)= 0.76	PSI/FT

10) **TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE.** MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST 4

VERTICAL FRACTURE ZONE @ MW 112

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TE/SN
DATE:	10/2/02
INTERVAL=	122-112
BOREHOLE #	NNS-05

PAGE 2

ACTUAL INTERVAL 121.5-111.5 VARIED 0.5 DRONE [illegible]

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	3192.9	5	30	25	0-40	
	3198.8	5	31	25	40	
	3204.8	5	32	25	40	
	3211.9	5	33	25	40	
	3218.8	5	34	25	40	
	3218.0	5	35	25	50	RAISE PRESS,
	3220.8	5	36	25	50	
	3223.1	5	37	25	50	
	3226.4	5	38	25	60	RAISE PRESS.
	3229.5	5	39	25	60	
	3232.6	5	40	25	60	
	3235.2	5	41	25	50	DROP PRESS.
	3238.1	5	42	25	50	
	3240.9	5	43	25	50	
MISSED	[illegible]	5	44	25	40	DROP PRESS
	3245.2	5	45	25	40	
	3249.0	5	46	25	40	
	3250.2	5	47	25	40	
	57.4 gal					
	17 MIN					

1 of 2

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TR/(SN) **BOREHOLE #:** NWS-05

DATE 10-8-03

TEST # 9

1) TEST INTERVAL= 112-102

2) TEST MIDPOINT= 107

3) GW DEPTH (BGS)= 20' (ASSUMED)

4) MEASURED DEPTH OF COREHOLE= 159.5

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.6

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 8.6 (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (107 FEET)= ____ PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ____ (FROM STEP 7)= 48.6 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.45 PSI/FT
50#GAGE + ____ (FROM STEP 7)= 58.6 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.54 PSI/FT
60#GAGE + ____ (FROM STEP 7)= 68.6 DIVIDED BY TEST MIDPOINT (____ FEET)= .64 PSI/FT
70#GAGE + ____ (FROM STEP 7)= 78.6 DIVIDED BY TEST MIDPOINT (____ FEET)= .73 PSI/FT
80#GAGE + ____ (FROM STEP 7)= 88.6 DIVIDED BY TEST MIDPOINT (____ FEET)= .82 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #9

2 of 2

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB/SD
DATE:	10-8-02
INTERVAL=	112-102
BOREHOLE #	NW-05

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	00 3258.2	18 18	06	30	40	
	3255.4		07	00	40	
	3255.5		07	30	40	
	3255.5		08	00	40	
	3255.5		08	30	40	
	3255.4		09	00	40	Back flow
	3255.5		10	00	40	
	3255.5		11	00	40	increase
	3260.0		11	10	50	
	3260.0		11	40	50	
	3260.0		12	00	50	
	3261.0		12	30	50	
	3261.0		13	00	50	
	5.8 gal					
	6.7 min					

Test #10

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TP/SN **BOREHOLE #:** NMS-05

DATE 10-9-03

TEST # 10

1) TEST INTERVAL= 102 - 92

2) TEST MIDPOINT= 97

3) GW DEPTH (BGS)= 20+/-

4) MEASURED DEPTH OF COREHOLE= 155.5

5) LENGTH OF STICKUP ABOVE GROUND 2 1/2'

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.6

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 8.6 (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (97 FEET)= ____ PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ____ (FROM STEP 7)= 48.6 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.50 PSI/FT
50#GAGE + ____ (FROM STEP 7)= 58.6 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.60 PSI/FT
60#GAGE + ____ (FROM STEP 7)= 68.6 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.71 PSI/FT
70#GAGE + ____ (FROM STEP 7)= 78.6 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.81 PSI/FT
80#GAGE + ____ (FROM STEP 7)= 88.6 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.91 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST # 10

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB / SN
DATE:	10/8/02
INTERVAL=	102 - 72
BOREHOLE #	NWS-05

PAGE 2

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
3271.2	18	30	00	40	
3274.8	18	30	30	40	
3274.8	18	31	00	40	
3274.8		31	30	40	
3274.0		32	00	40	
3275.1		32	30	40	
3275.2		32	00	50	UP
3275.3		33	30	50	
3275.3		34	00	60	
3275.5		34	30	60	
3275.6		35	00	60	
3275.6		35	30	60	
3275.6		36	00	50	Down
3275.5		36	30	40	
3275.5		37	00	40	
4.3 gal / 7 min					

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN
DATE 10/8/03
TEST # 11

BOREHOLE #: NWS-05

1) TEST INTERVAL= 92-82
2) TEST MIDPOINT= 87
3) GW DEPTH (BGS)= 20 (assumed)
4) MEASURED DEPTH OF COREHOLE= 155.5
5) LENGTH OF STICKUP ABOVE GROUND 2 1/2
6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (87) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 37.67

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (87) - GW DEPTH BGS (20) X 0.433 PSI = 29

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 8.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 8.7 (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ____ (FROM STEP 7)= 48.7 DIVIDED BY TEST MIDPOINT (87 FEET)= 0.56 PSI/FT
50#GAGE + ____ (FROM STEP 7)= 58.7 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.67 PSI/FT
60#GAGE + ____ (FROM STEP 7)= 68.7 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.79 PSI/FT
70#GAGE + ____ (FROM STEP 7)= 78.7 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.90 PSI/FT
80#GAGE + ____ (FROM STEP 7)= 88.7 DIVIDED BY TEST MIDPOINT (____ FEET)= 1.02 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST # 11

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	10/8/03
INTERVAL=	10-82
BOREHOLE #	NUS-05

PAGE 2

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
3274.3	18	51	30	0	FILL
3283.3		52	00	40	
3283.4		52	30	40	
3283.4		53	00	40	
3283.4		53	30	40	
3283.5		54	00	50	up
3283.7		54	30	50	
3283.9		55	00	50	
3284.2		55	30	50	
3284.5		56	00	60	up
3284.7		56	30	60	
3284.8		57	00	60	
3284.9		57	30	50	down
3285.1		58	00	50	
3285.1		58	30	40	down
3285.2		59	00	40	
3285.3		59	30	40	
11 gal					
8 min					

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** MW-53

DATE 11/11/03

TEST # TEST #1

1) TEST INTERVAL= 67.5 - 57.5 BGS

2) TEST MIDPOINT= 62.5

3) GW DEPTH (BGS)= 47.8

4) MEASURED DEPTH OF COREHOLE= 71

5) LENGTH OF STICKUP ABOVE GROUND 1.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (62.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 27.06

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (62.5) - GW DEPTH BGS (47.8) X 0.433 PSI = 6.37

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 20.69

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 20.69	(FROM STEP 7)= 40.69	DIVIDED BY TEST MIDPOINT (62.5	FEET)= 0.65	PSI/FT
30#GAGE +	(FROM STEP 7)= 50.69	DIVIDED BY TEST MIDPOINT (	FEET)= 0.81	PSI/FT
40#GAGE +	(FROM STEP 7)= 60.69	DIVIDED BY TEST MIDPOINT (	FEET)= 0.97	PSI/FT
50#GAGE +	(FROM STEP 7)= 70.69	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
60#GAGE +	(FROM STEP 7)= 80.69	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
70#GAGE +	(FROM STEP 7)= 90.69	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
80#GAGE +	(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #1

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	11/4/03
INTERVAL=	67.5-57.5
BOREHOLE #	MW-53

MP 62.5

PAGE 2

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
5146.3	14	00	00	10
5147.6		00	30	10
5147.8		01	00	10
5147.8		01	30	10
5147.8		02	00	10
5148.1		02	30	20
5148.2		03	00	20
5148.2		04	00	20
5148.2		04	30	30
5148.4		05	00	30
5148.45		06	00	30
5148.5		06	30	40
5148.5		07	00	40
5148.6		08	00	40
5149.0		08	30	50
5149.2		09	00	50
5151.1		10	00	50
5155.2		11	00	50
5160.0		12	00	50
5165.9		13	00	50
5205.5		15	00	50
5208.0		17	00	40
5207.3		18	00	40
5205.2		19	00	30
5202.2		20	00	25
5200.0		21	00	25
		21	min	
53.7 gal				

2.6 gal/min

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** MW-53

DATE 11/4/03

TEST # Test #2

1) TEST INTERVAL= 56.5 - 46.5 bgs

2) TEST MIDPOINT= 51.5

3) GW DEPTH (BGS)= 47.8

4) MEASURED DEPTH OF COREHOLE= 71

5) LENGTH OF STICKUP ABOVE GROUND 1.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (51.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 22.3

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (51.5) - GW DEPTH BGS (47.8) X 0.433 PSI = 1.6

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 20.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 20.7	(FROM STEP 7)= 40.7	DIVIDED BY TEST MIDPOINT (51.5	FEET)= 0.79	PSI/FT
30#GAGE + ___	(FROM STEP 7)= 50.7	DIVIDED BY TEST MIDPOINT (___	FEET)= 0.98	PSI/FT
40#GAGE + ___	(FROM STEP 7)= 60.7	DIVIDED BY TEST MIDPOINT (___	FEET)= 1.12	PSI/FT
50#GAGE + ___	(FROM STEP 7)= 70.7	DIVIDED BY TEST MIDPOINT (___	FEET)= ___	PSI/FT
60#GAGE + ___	(FROM STEP 7)= ___	DIVIDED BY TEST MIDPOINT (___	FEET)= ___	PSI/FT
70#GAGE + ___	(FROM STEP 7)= ___	DIVIDED BY TEST MIDPOINT (___	FEET)= ___	PSI/FT
80#GAGE + ___	(FROM STEP 7)= ___	DIVIDED BY TEST MIDPOINT (___	FEET)= ___	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	11/11/03
INTERVAL=	56.5 - 46.5
BOREHOLE #	MW-53

MP = 51.5

PAGE 2

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
5196.0	14	34	00	10
5196.0		34	30	10
5196.0		35	00	10
5196.5		35	30	20
5196.6		36	00	20
5196.7		36	30	20
5196.9		37	00	30
5197.3		38	00	30
5197.5		39	00	30
5200.4		40	00	40
5204.1		41	00	40
5208.4		42	00	40
5220.1		43	00	50
5234.2		44	00	50
5249.2		45	00	50
5281.3		47	00	50
5319.8		50	00	50
5325.6		51	00	40
5335.7		52	00	40
5331.2		53	00	30
5328.0		54	00	30
132 gals		20	min	

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** MW-53

DATE 11/11/03

TEST # TEST #3

1) TEST INTERVAL= 46.5 - 36.5

2) TEST MIDPOINT= 41.5 bgs

3) GW DEPTH (BGS)= 47.8

4) MEASURED DEPTH OF COREHOLE= 71

5) LENGTH OF STICKUP ABOVE GROUND 1.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (41.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 17.99

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (41.5) - GW DEPTH BGS (47.8) X 0.433 PSI = -2.73

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 20.72

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE +	20.7	(FROM STEP 7)= 40.7	DIVIDED BY TEST MIDPOINT	(41.5 FEET)=	0.98 PSI/FT
30#GAGE +		(FROM STEP 7)= 50.7	DIVIDED BY TEST MIDPOINT	(FEET)=	1.22 PSI/FT
40#GAGE +		(FROM STEP 7)= 60.7	DIVIDED BY TEST MIDPOINT	(FEET)=	PSI/FT
50#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT	(FEET)=	PSI/FT
60#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT	(FEET)=	PSI/FT
70#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT	(FEET)=	PSI/FT
80#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT	(FEET)=	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	JN
DATE:	11/11/03
INTERVAL=	46.5-36.5
BOREHOLE #	MW-53

PAGE 2

INITIAL:	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
	5321.05	15	17	00	10
	5321.8		17	30	10
	5321.9		18	00	10
	5321.9		19	00	10
	5322.3		20	00	20
	5322.4		21	00	20
	5322.5		22	00	20
	5322.1		23	00	30
	5322.1		24	00	30
	5322.6		25	00	40
	5322.7		26	00	40
	5323.1		27	00	50
	5323.3		28	00	50
	5323.5		29	00	50
	5323.6		30	00	60
	5323.7		31	00	60
	5323.9		32	00	60
	5324.5		35	00	60
	5325.1		38	00	70
	5325.5		41	00	70
	5325.4		42	00	60
	5325.2		43	00	50
	5324.4		44	00	40
	5324.4		45	00	40
	3.35 gal		28	min	

0.12 gpm

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SW **BOREHOLE #:** MW 53

DATE 11/11/03

TEST # TG1 11 4

1) TEST INTERVAL= 36.5 - 26.5

2) TEST MIDPOINT= 31.5 625

3) GW DEPTH (BGS)= 47.8

4) MEASURED DEPTH OF COREHOLE= 71

5) LENGTH OF STICKUP ABOVE GROUND 1.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (31.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 13.67

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (31.5) - GW DEPTH BGS (47.8) X 0.433 PSI = -7.1

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 20.77

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 20.7	(FROM STEP 7)= 40.7	DIVIDED BY TEST MIDPOINT (31.5 FEET)=	1.29	PSI/FT
30#GAGE + ____	(FROM STEP 7)= 50.7	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT
40#GAGE + ____	(FROM STEP 7)= 60.7	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT
50#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT
60#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT
70#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT
80#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #4

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	11/11/03
INTERVAL=	36.5-26.5
BOREHOLE #	MW 53

MID 31.5

PAGE 2

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
5324.5	15	58	00	10
5325.0		58	30	10
5325.3		59	00	10
5325.6		59	30	10
5329.9	16	00	00	10
5338.5		01	00	12
5360.1		02	00	12
5366.9		3	00	
5380.2		4	00	
5393.6		5	00	
5407.5		6	00	
5422.8		7	00	
5446.6		9	00	
122.1 gal		11	min	

11 gpm

TEST #5

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER SN **BOREHOLE #:** MW 53

DATE 11/11/03

TEST # #5

1) TEST INTERVAL= 26.5 16.5

2) TEST MIDPOINT= 21.5

3) GW DEPTH (BGS)= 47.8 bgs

4) MEASURED DEPTH OF COREHOLE= 71

5) LENGTH OF STICKUP ABOVE GROUND 1.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (21.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 9.3

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (21.5) - GW DEPTH BGS (47.8) X 0.433 PSI = -11.39

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 20.7

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 20.7 (FROM STEP 7)= 40.7 DIVIDED BY TEST MIDPOINT (21.5 FEET)= 1.9 PSI/FT
30#GAGE + ____ (FROM STEP 7)= 50.7 DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
50#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
60#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #5

MW-53

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	SN
DATE:	11/11/03
INTERVAL=	26.5-16.5
BOREHOLE #	MW-53

MP = 21.5

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	5458.9	16	21	00	10
	5456.5		21	30	
	5461.0		22	00	
	5473.2		23	00	
	5485.6		24	00	
	5502.8		25	00	
	5511.6		26	00	4.5 MIN
	5527.4		29	30	
	68.5		8½	2 MIN	

27.4
2.8
24.6
/4.5 = 5.5

8.06 9PM

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** MW-57 PAGE 1

DATE 11-8-02

TEST # 1

1) TEST INTERVAL= 117.5-107.5

2) TEST MIDPOINT= 112.5

3) GW DEPTH (BGS)= 20'

4) MEASURED DEPTH OF COREHOLE= 121.1

5) LENGTH OF STICKUP ABOVE GROUND 6 1/2

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 48.755,4

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (112.5) - GW DEPTH BGS (20) X 0.433 PSI = 40.05

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 15.4

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
START 50#GAGE + 15# (FROM STEP 7)= 65 DIVIDED BY TEST MIDPOINT (112.5 FEET)= 0.57 PSI/FT
60#GAGE + ↓ (FROM STEP 7)= 75 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.66 PSI/FT
70#GAGE + ↓ (FROM STEP 7)= 85 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.75 PSI/FT
80#GAGE + ↓ (FROM STEP 7)= 95 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.84 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TEST #1

PAGE 2

TESTER:	TB
DATE:	11-9-03
INTERVAL=	117.5-127.5
BOREHOLE #	MW-57

INITIAL:

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
4950.3	4	50	37	50	
4954.9	4	51	37	50	
4959.0	4	52	37	50	
4962.8	4	53	37	50	BUMP TO 60
4969.9	4	54	37	60	
4975.9	4	55	37	60	
4982.5	4	56	37	60	BUMP TO 70
4991.0	4	57	37	70	
4999.0	4	58	37	70	
5006.8	4	59	37	70	
5013.4	5	00	37	60	DROP TO 60
5020.5	5	01	37	60	
5027.3	5	02	37	60	DROP TO 50
5035.5	5	03	37	50	
5036.8	5	04	37	50	
5043.0	5	05	37	50	

5006.8
4991.0
15.8 g

2 min

7.9 gpm

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** MW-57

DATE 11-9

TEST # 2

1) TEST INTERVAL= 107.5 - 97.5

2) TEST MIDPOINT= 102.5

3) GW DEPTH (BGS)= 20'

4) MEASURED DEPTH OF COREHOLE= 121.1

5) LENGTH OF STICKUP ABOVE GROUND 6'

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (102.5 - 0.0 = 102.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 46.98

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (102.5) - GW DEPTH BGS (82.5) X 0.433 PSI = 35.72

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 11.26

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
50#GAGE + 11.3 (FROM STEP 7)= 61.3 DIVIDED BY TEST MIDPOINT (102.5 FEET)= 0.59 PSI/FT
START 60#GAGE + ↓ (FROM STEP 7)= 71.3 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.69 PSI/FT
70#GAGE + ↓ (FROM STEP 7)= 81.3 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.79 PSI/FT
80#GAGE + ↓ (FROM STEP 7)= 91.3 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.89 PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TEST #2

PAGE 2

TESTER:	TR
DATE:	11-9-02
INTERVAL=	101.5-97.5
BOREHOLE #	MW-59

INITIAL:

LEAKING HOSE REPAIR TIGHT

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
05045.7	10	04	15	0-50	FILLING
05046.6	10	05	15	50	
05046.6	10	06	15	50	

5046.6
5045.7
0.9 g

2 min
0.45 gpm

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** MW-57

DATE 11-9-03

TEST # 3

1) TEST INTERVAL= 97.5 - 87.5

2) TEST MIDPOINT= 92.5

3) GW DEPTH (BGS)= 20

4) MEASURED DEPTH OF COREHOLE= 121.1

5) LENGTH OF STICKUP ABOVE GROUND 5.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (92.5 + 5.5 = 98.0) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 42.43

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (92.5) - GW DEPTH BGS (20 = 72.5) X 0.433 PSI = 31.39

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 11.04

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
30#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
40#GAGE + 11.0	(FROM STEP 7)= 51	DIVIDED BY TEST MIDPOINT (92.5	FEET)= 0.55	PSI/FT
50#GAGE + ↓	(FROM STEP 7)= 61	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.65	PSI/FT
60#GAGE + ↓	(FROM STEP 7)= 71	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.76	PSI/FT
70#GAGE + ↓	(FROM STEP 7)= 81	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.87	PSI/FT
80#GAGE + ↓	(FROM STEP 7)= 91	DIVIDED BY TEST MIDPOINT (↓	FEET)= 0.98	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TEST #3

PAGE 2

TESTER:	TB
DATE:	11-9-03
INTERVAL=	97.5-87.5
BOREHOLE #	MW-57

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL	5046.3	10	22	00	0-40	FILLING
	5047.7	10	23	00	40	
	5047.7	10	24	00	40	

Tight

5047.7
5046.3
1.4

2 min
0.7 gpm

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** MW-57

DATE 11-9-02

TEST # 4

1) TEST INTERVAL= 87.5 - 77.5

2) TEST MIDPOINT= 82.5

3) GW DEPTH (BGS)= 20

4) MEASURED DEPTH OF COREHOLE= 121.1

5) LENGTH OF STICKUP ABOVE GROUND 5.0

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (82.5 + 5.0 = 87.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 37.9

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (82.5) - GW DEPTH BGS (62.5) X 0.433 PSI = 27.0

20

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.9

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
30#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
40#GAGE + 11 (FROM STEP 7)= 51 DIVIDED BY TEST MIDPOINT (82.5 FEET)= 0.62 PSI/FT
50#GAGE + 11 (FROM STEP 7)= 61 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.73 PSI/FT
60#GAGE + 11 (FROM STEP 7)= 71 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.86 PSI/FT
70#GAGE + 11 (FROM STEP 7)= 81 DIVIDED BY TEST MIDPOINT (√ FEET)= 0.98 PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #4

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	11-9-03
INTERVAL=	81.5-77.5
BOREHOLE #	MW-57

TEST #4

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	5047.4	10	35	55	0-40	FILLING
	5048.8	10	36	55	40	
	5049.1	10	37	55	40	
	5049.3	10	38	55	40	

TIGHT
0.2 GPM

5049.3
5048.8
0.5 g

2 min
0.25 gpm

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** MW-57

DATE 11-9-03

TEST # 5

1) TEST INTERVAL= 77.5 - 67.5

2) TEST MIDPOINT= 72.5

3) GW DEPTH (BGS)= 20

4) MEASURED DEPTH OF COREHOLE= 121.1

5) LENGTH OF STICKUP ABOVE GROUND 4.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (72.5 + 4.5 = 77.0) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 33.3

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (72.5) - GW DEPTH BGS (52.5) X 0.433 PSI = 22.7

20

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.6

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT
30#GAGE + 10.6	(FROM STEP 7)= 40.6	DIVIDED BY TEST MIDPOINT (72.5 FEET)=	0.56	PSI/FT
40#GAGE +	(FROM STEP 7)= 50.6	DIVIDED BY TEST MIDPOINT (FEET)=	0.69	PSI/FT
50#GAGE +	(FROM STEP 7)= 60.6	DIVIDED BY TEST MIDPOINT (FEET)=	0.83	PSI/FT
60#GAGE +	(FROM STEP 7)= 70.6	DIVIDED BY TEST MIDPOINT (FEET)=	0.97	PSI/FT
70#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT
80#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____ FEET)=	____	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	11-9-03
INTERVAL=	77.5 - 61.5
BOREHOLE #	MW-51

TEST #5

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	5049.1	10	52	15	0-30	FILLING
	5051.7	10	53	15	30	
	5055.1	10	54	15	30	
	5059.6	10	55	15	40	Bump to 40#
	5064.1	10	56	15	40	
	5069.7	10	57	15	40	
	5076.0	10	58	15	50	Bump to 50#
	5084.0	10	59	15	50	
	5093.0	11	00	15	50	
	5099.6	11	01	15	40	DESCEND
	5106.5	11	02	15	40	
	5113.5	11	03	15	40	
	5119.4	11	04	15	30	
	5124.2	11	05	15	30	

5093.0
5076.0

. 2 min

8.5 gpm

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TP **BOREHOLE #:** MW-57

DATE 11-9-05

TEST # 6

1) TEST INTERVAL= 67.5 - 57.5

2) TEST MIDPOINT= 62.5

3) GW DEPTH (BGS)= 20

4) MEASURED DEPTH OF COREHOLE= 121.1

5) LENGTH OF STICKUP ABOVE GROUND 4.0

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (62.5 + 4.0 = 66.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 28.8

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (62.5) - GW DEPTH BGS (42.5) X 0.433 PSI = 18.4

20

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.4

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10.4 (FROM STEP 7)= 30.4 DIVIDED BY TEST MIDPOINT (62.5 FEET)= 0.48 PSI/FT
30#GAGE + 10.4 (FROM STEP 7)= 40.4 DIVIDED BY TEST MIDPOINT (62.5 FEET)= 0.65 PSI/FT
40#GAGE + ↓ (FROM STEP 7)= 50.4 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.80 PSI/FT
50#GAGE + ↓ (FROM STEP 7)= 60.4 DIVIDED BY TEST MIDPOINT (↓ FEET)= 0.96 PSI/FT
60#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TP
DATE:	11-9-03
INTERVAL=	67.5-57.5
BOREHOLE #	MW-57

TEST #6

PAGE 2

INITIAL:

TIGHT

5119.6
5118.9
.7g

2 min

0.35

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE	
5118.9	11	20	15	0-20	FILLING
5119.6	11	21	15	20	
5119.6	11	22	15	20	

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** MW-57

DATE 11-9-03

TEST # 7

1) TEST INTERVAL= 57.5-47.5

2) TEST MIDPOINT= 52.5

3) GW DEPTH (BGS)= 20

4) MEASURED DEPTH OF COREHOLE= 121.1

5) LENGTH OF STICKUP ABOVE GROUND 3.5

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (52.5 / 3.5 / 55.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 24.0

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (52.5) - GW DEPTH BGS (32.5 / 20) X 0.433 PSI = 14.1

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 9.9

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10	(FROM STEP 7)= 30	DIVIDED BY TEST MIDPOINT	(52.5 FEET)=	0.57	PSI/FT
30#GAGE + 10	(FROM STEP 7)= 40	DIVIDED BY TEST MIDPOINT	(FEET)=	0.76	PSI/FT
40#GAGE + 10	(FROM STEP 7)= 50	DIVIDED BY TEST MIDPOINT	(FEET)=	0.95	PSI/FT
50#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT	(____ FEET)=	____	PSI/FT
60#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT	(____ FEET)=	____	PSI/FT
70#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT	(____ FEET)=	____	PSI/FT
80#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT	(____ FEET)=	____	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	11-9-03
INTERVAL=	57.5-47.5
BOREHOLE #	MW-57

TEST #1

PAGE 2

INITIAL: TIGAT

WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
5118.92	11	36	10	0-20
5123.0	11	37	10	20
5123.1	11	38	10	20
5123.5	11	39	10	20
5123.7	11	40	10	20

FILLING

0.2 GPM

5123.7
5122.0
0.7 GPM

3 min

9115
8712
7B

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** MW-57

DATE 11-9-03

TEST # 8

1) TEST INTERVAL= 47.5 - 37.5

2) TEST MIDPOINT= 42.5

3) GW DEPTH (BGS)= 20

4) MEASURED DEPTH OF COREHOLE= 121.1

5) LENGTH OF STICKUP ABOVE GROUND 3.0

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (42.5 + 3.0 = 45.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 19.7

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (42.5) - GW DEPTH BGS (22.5) X 0.433 PSI = 9.5

20

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.2

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

START

TEST DATA

10 11	10.2	20.2	42.5	0.47	
20#GAGE +		(FROM STEP 7)= 30.2	DIVIDED BY TEST MIDPOINT (	FEET)= 0.71	PSI/FT
30#GAGE +		(FROM STEP 7)= 40.2	DIVIDED BY TEST MIDPOINT (	FEET)= 0.94	PSI/FT
40#GAGE +		(FROM STEP 7)= 50.2	DIVIDED BY TEST MIDPOINT (	FEET)= 1.2	PSI/FT
50#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
60#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
70#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT
80#GAGE +		(FROM STEP 7)=	DIVIDED BY TEST MIDPOINT (	FEET)=	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	11-9-03
INTERVAL=	47.5-37.5
BOREHOLE #	MW-57

Test #8

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	5123.5	11	58	15	10
	5132.1	11	59	15	10
	5134.3	12	00	15	10
	5136.1	12	01	15	20
TAKING IN STORTS →	5136.9	12	02	15	20
	5138.2	12	03	15	20
	5137.8	12	04	15	10
	5137.5	12	05	15	10

5138.2
5136.1
2.1 g
3 min

0.7 gpm

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** MW-57

DATE 11-9-02

TEST # 9

1) TEST INTERVAL= 37.5 - 27.5 LAST TEST CS6 @ 20'

2) TEST MIDPOINT= 32.5

3) GW DEPTH (BGS)= 20

4) MEASURED DEPTH OF COREHOLE= 121.1

5) LENGTH OF STICKUP ABOVE GROUND 3

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (32.5) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 15.4

30

35.5

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (32.5) - GW DEPTH BGS (12.5) X 0.433 PSI = 5.4

20

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 10.0

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT

30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT

40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT

50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT

60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT

70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT

80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT

IN THIS EXAMPLE-

DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

10 +10 20 32.5 = 0.62

TEST DATA

20#GAGE + 10 (FROM STEP 7)= 30 DIVIDED BY TEST MIDPOINT (32.5 FEET)= 0.92 PSI/FT

30#GAGE + 10 (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

40#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

50#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

60#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	11-9-03
INTERVAL=	37.5-27.5
BOREHOLE #	M(1)-57

TEST #9

PAGE 2

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	5147.1	11	18	20	10
INCREASE PUMP SPEED	5143.2	12	19	20	↓
	5148.0	12	20	20	↓
	5148.5	12	21	20	↓
BACKFLOW	5148.0	12	22	20	↓
	5148.5	12	23	20	↓

TAKING MEASUREMENTS & STOP

1.3 gal / 4 min

0.325 gpm

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB BOREHOLE #: MW-58 PAGE 1

DATE 11-3-03

TEST #

1) TEST INTERVAL= 75.8 – 65.8

2) TEST MIDPOINT= 70.8

3) GW DEPTH (BGS)= 9.0

4) MEASURED DEPTH OF COREHOLE= 79.4

5) LENGTH OF STICKUP ABOVE GROUND 3.0

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT
by: MIDPOINT DEPTH (70.8) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 30.6

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT
by: MIDPOINT DEPTH (70.8) - GW DEPTH BGS (9.0) X 0.433 PSI = 26.7

61.8

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 4.0

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 4 (FROM STEP 7)= 24 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.33 PSI/FT
30#GAGE + 4 (FROM STEP 7)= 34 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.48 PSI/FT
40#GAGE + 4 (FROM STEP 7)= 44 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.62 PSI/FT
50#GAGE + 4 (FROM STEP 7)= 54 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.76 PSI/FT
60#GAGE + 4 (FROM STEP 7)= 64 DIVIDED BY TEST MIDPOINT (____ FEET)= 0.90 PSI/FT
70#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT
80#GAGE + ____ (FROM STEP 7)= ____ DIVIDED BY TEST MIDPOINT (____ FEET)= ____ PSI/FT

10) **TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE.** MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #1

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TB
DATE:	11-3-02
INTERVAL=	75.0-65.0
BOREHOLE #	MW-90

PAGE 2

	WATER METER READING	TIME:	HOUR	MIN	SEC	GAGE PRESSURE	
INITIAL:	4860.9		2	55	30	0	BEFORE
	MISSED		2	56	30		
	4861.1		2	57	30	30	
	4861.1		2	58	30	30	

PACKER SLIPPING IN HOLE

TIGHT

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** MW-58

DATE 11-3-03

TEST # 2

1) TEST INTERVAL= 65.9 - 55.9

2) TEST MIDPOINT= 60.8

3) GW DEPTH (BGS)= 9.0

4) MEASURED DEPTH OF COREHOLE= 79.4

5) LENGTH OF STICKUP ABOVE GROUND 4.0

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (60.8) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 26.3

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (60.8) - GW DEPTH BGS (9.0) X 0.433 PSI = 22.4

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 3.9

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

START →

20#GAGE + 4 (FROM STEP 7)= 24 DIVIDED BY TEST MIDPOINT (60.8 FEET)= 0.39 PSI/FT
30#GAGE + 4 (FROM STEP 7)= 34 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.55 PSI/FT
40#GAGE + 4 (FROM STEP 7)= 44 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.72 PSI/FT
50#GAGE + 4 (FROM STEP 7)= 54 DIVIDED BY TEST MIDPOINT (___ FEET)= 0.88 PSI/FT
60#GAGE + ___ (FROM STEP 7)= ___ DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
70#GAGE + ___ (FROM STEP 7)= ___ DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT
80#GAGE + ___ (FROM STEP 7)= ___ DIVIDED BY TEST MIDPOINT (___ FEET)= ___ PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

TEST #2

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TC
DATE:	11-3-03
INTERVAL=	65.8-55.8
BOREHOLE #	MW-58

PAGE 2

INITIAL: VERY TIGHT

WATER METER READING	TIME:	HOUR	MIN	SEC	GAGE PRESSURE
4861.1		3	10	30	30
4861.1		3	11	30	30
4861.1		3	12	30	30

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TB **BOREHOLE #:** MW-59

DATE 11-2-[illegible]

TEST # 3

1) TEST INTERVAL= 55.9 - 45.0

2) TEST MIDPOINT= 50.8

3) GW DEPTH (BGS)= 9.0

4) MEASURED DEPTH OF COREHOLE= 79.4

5) LENGTH OF STICKUP ABOVE GROUND 4.0

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH (50.8) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) = 21.99

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH (50.8) - GW DEPTH BGS (41.8) X 0.433 PSI = 18.09

9.0

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 3.9

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 4	(FROM STEP 7)= 24	DIVIDED BY TEST MIDPOINT (50.8	FEET)= 0.47	PSI/FT
30#GAGE +	(FROM STEP 7)= 34	DIVIDED BY TEST MIDPOINT (	FEET)= 0.66	PSI/FT
40#GAGE +	(FROM STEP 7)= 44	DIVIDED BY TEST MIDPOINT (	FEET)= 0.86	PSI/FT
50#GAGE +	(FROM STEP 7)= 54	DIVIDED BY TEST MIDPOINT (	FEET)= 1.1	PSI/FT
60#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (	FEET)= ____	PSI/FT
70#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (	FEET)= ____	PSI/FT
80#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (	FEET)= ____	PSI/FT

START

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TG
DATE:	11-3-05
INTERVAL=	55.8 - 45.8
BOREHOLE #	MW-2

PAGE 2

	WATER METER READING	TIME:	HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	4960.0		3	26	35	30
	4960.8		3	27	35	30
	4960.8		3	28	35	30
	4960.0		3	29	35	30

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER IB **BOREHOLE #:** MW-49

DATE 11-3-02

TEST # 1

1) TEST INTERVAL= 45.4 - 35.4

2) TEST MIDPOINT= 40.8

3) GW DEPTH (BGS)= 9.0

4) MEASURED DEPTH OF COREHOLE= 79.4

5) LENGTH OF STICKUP ABOVE GROUND 3

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 3.9 (FROM PREVIOUS TEST)

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 10	(FROM STEP 7)= 14	DIVIDED BY TEST MIDPOINT (40.8	FEET)= 0.34	PSI/FT
30#GAGE + 4	(FROM STEP 7)= 34	DIVIDED BY TEST MIDPOINT (40.8	FEET)= 0.83	PSI/FT
40#GAGE + 4	(FROM STEP 7)= 44	DIVIDED BY TEST MIDPOINT (40.8	FEET)= 1.1	PSI/FT
50#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
60#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
70#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
80#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

Tempally

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TG
DATE:	11-3-05
INTERVAL=	45.8 - 35.8
BOREHOLE #	MW-50

	WATER METER READING	TIME: HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	4861.1	4	33	20	0-20
PACKER RISING	4861.3	4	34	20	20
	4861.3	4	35	20	20
TIGHT	4861.4	4	36	20	20

0.1 g

2 min

0.05 gpm

USACE SLDA SITE - PACKER PERMEABILITY FIELD DATA

TESTER TG **BOREHOLE #:** MW-28

DATE 11-3-02

TEST # 5

1) TEST INTERVAL= 35.8 - 25.8

2) TEST MIDPOINT= 30.8

3) GW DEPTH (BGS)= 9

4) MEASURED DEPTH OF COREHOLE= 79.4

5) LENGTH OF STICKUP ABOVE GROUND _____

6) CALCULATE STATIC WATER COLUMN PRESSURE FROM STICKUP TO TEST MIDPOINT

by: MIDPOINT DEPTH ( ) X 0.433 PSI (PRESSURE EXERTED BY WATER COLUMN) =

7) CALCULATE GW COLUMN PRESSURE ON TEST MIDPOINT

by: MIDPOINT DEPTH ( ) - GW DEPTH BGS ( ) X 0.433 PSI = _____

8) DETERMINE PRESSURE DIFFERENCE (SUBTRACT #7 RESULTS FROM #6)= 3.9 (From prev. test)

9) DETERMINE PRESSURES EXERTED ON TEST INTERVAL AS GAGE PRESSURE IS INCREASED

EXAMPLE: 20#GAGE + 17.5# (FROM STEP 8)= 37.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.375 PSI/FT
30#GAGE + 17.5# (FROM STEP 8)= 47.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.475 PSI/FT
40#GAGE + 17.5# (FROM STEP 8)= 57.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.575 PSI/FT
50#GAGE + 17.5# (FROM STEP 8)= 67.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.675 PSI/FT
60#GAGE + 17.5# (FROM STEP 8)= 77.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.775 PSI/FT
70#GAGE + 17.5# (FROM STEP 8)= 87.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.875 PSI/FT
80#GAGE + 17.5# (FROM STEP 8)= 97.5# DIVIDED BY TEST MIDPOINT (100 FEET)= 0.975 PSI/FT
IN THIS EXAMPLE-
DO NOT INCREASE PRESSURE ABOVE 80 PSI GAGE BECAUSE THE PRESSURE EXERTED ON THE FORMATION WILL EXCEED LITHOSTATIC PRESSURE (1.0 PSI/FT OF DEPTH)

TEST DATA

20#GAGE + 4 (10)	(FROM STEP 7)= 24 (14)	DIVIDED BY TEST MIDPOINT 30.8 (30.8)	FEET)= .78 (0.45)	PSI/FT
30#GAGE + ↓	(FROM STEP 7)= 34	DIVIDED BY TEST MIDPOINT (↓	FEET)= 1.1	PSI/FT
40#GAGE + ↓	(FROM STEP 7)= 44	DIVIDED BY TEST MIDPOINT (↓	FEET)= ____	PSI/FT
50#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
60#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
70#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT
80#GAGE + ____	(FROM STEP 7)= ____	DIVIDED BY TEST MIDPOINT (____	FEET)= ____	PSI/FT

10) TEST WILL BE CONDUCTED IN A STEPWISE FASHION, INCREASING FROM LOW PRESSURE TO HIGH, THEN DROPPING BACK TO LOW PRESSURE. MAKE SURE THE FLOW RATES ARE STABLE BEFORE INCREASING OR DECREASING PRESSURE. IF THE FORMATION IS TIGHT (0.0 GPM) STOP TESTING AND PULL UP PACKER ASSEMBLY TO THE NEXT INTERVAL TO BE TESTED.

Results

USACE SLDA SITE - PACKER PEMEABILITY FIELD DATA

TESTER:	TRS
DATE:	11-3-05
INTERVAL=	30.5-25.5
BOREHOLE #	MW-28

PAGE 2

	WATER METER READING	TIME:	HOUR	MIN	SEC	GAGE PRESSURE
INITIAL:	4906.3		4	45	45	8
	4912.5		4	46	45	8
	4918.0		4	47	45	10 ← JACK-UP PUMP
	4910.0		4	48	45	8
	4928.2		4	49	45	8

18.2 GPM

2.4 gpm

SLDA PACKER TESTING DATA

ATTACHMENT 3

SITE BACKGROUND DATA

Table 1

Hydraulic Conductivity Estimates: 1995 Field Program at Parks Township SLDA

Well/ Number	TEST INTERVAL Top of Interval Depth (ft)	Bottom of Interval Depth (ft)	Test Interval Lithology	Test Interval Type	Test Type:			Data Analysis Method (1)	Geometric Mean Hydraulic Conductivity (cm/sec)	Data Quality Notes(2)
MW-37	57.17	67.17	Shale	Well	PI	CH	H	BRec	2.74E-04	NA
MW-37	18	28	Shale	Packer	PI	FH	H	BRec	4.66E-05	
MW-37	32	42	Shale/Sandstone	Packer	PI	CH	H	BRec	2.42E-03	**, L
MW-38	50	60	Shale	Well	PI	CH	H	BRec	1.07E-03	NA
MW-38	25	35	Sandstone/Shale	Packer	PI	FH	H	BRec	5.20E-05	
MW-39	12	22	Sandstone	Packer	PI	CH	H	BRec	7.18E-03	**, L
MW-39	27	37	Shale/Sandstone	Packer	PI	FH	H	BRec	2.69E-06	
MW-39	36	46	Shale	Packer	PI	FH	H	BRec	3.18E-06	
MW-40	169.5	189.5	Sandstone	Well	PI	CH	H	BRec	7.23E-05	NA
MW-40	20	30	Claystone	Packer	PI	FH	H	BRec	1.26E-04	
MW-40	33	43	Shale	Packer	PI	FH	H	BRec	1.71E-06	U
MW-40	55	65	Shale	Packer	PI	FH	H	BRec	1.01E-05	U
MW-40	86	96	Shale	Packer	PI	CH	H	BRec	2.20E-04	
MW-41	24.65	34.65	Sandstone/Siltstone	Well	PI	FH	H	BRec	1.17E-05	NA
MW-41	25	35	Sandstone/Siltstone	Packer	PI	FH	H	BRec	1.39E-05	L
MW-41	35	45	Shale/Siltstone	Packer	PO	RCVR	H	BRec	8.96E-07	**
MW-42	29.6	39.6	Shale	Well	PI	FH	H	BRec	3.48E-07	NA
MW-42	30	40	Shale	Packer	PI	FH	H	BRec	2.88E-07	
MW-42	36	46	Shale/Sandstone	Packer	PI	FH	H	BRec	4.08E-05	U
MW-43	35	45	Claystone/Shale	Well	PI	FH	H	BRec	6.42E-06	NA
MW-43	22	32	Siltstone/Sandstone	Packer	PI	CH	H	BRec	1.36E-03	
MW-43	32	42	Claystone/Shale	Packer	PI	CH	H	BRec	9.82E-04	
MW-44	42	52	Sandstone/Shale	Well	PI	CH	H	BRec	7.50E-05	NA
MW-44	26	36	Shale	Packer	PI	FH	H	BRec	1.38E-05	
MW-44	42	52	Shale	Packer	PO	RCVR	H	BRec	2.36E-04	**
MW-45	55.17	65.17	Shale/Sandstone	Well	PI	FH	H	BRec	1.32E-05	NA
MW-45	21	31	Claystone/Shale	Packer	PI	FH	H	BRec	5.58E-05	**
MW-45	39	49	Shale/Sandstone	Packer	PI	FH	H	BRec	8.92E-07	U, L
MW-45	56	66	Shale	Packer	PO	RCVR	H	NC	NC	NC
MW-46	19	29	Claystone/Shale	Packer	PI	FH	H	BRec	9.42E-06	
MW-46	42	52	Shale/Siltstone	Packer	PI	FH	H	BRec	4.99E-05	**
MW-46	62	72	Shale	Packer	PI	FH	H	BRec	1.52E-04	U, L
MW-46	68	78	Shale	Packer	PI	FH	H	BRec	1.36E-04	U

Notes:

Test Interval Type:

ell: Screen & Filter Pack

Packer: Packer interval in open rock

Test Type:

Pump In (PI)

Pump Out (PO)

Falling Head (FH)

Constant Head (CH)

Recovery (RCVR)

Horizontal (H)

(1) BRec - Bureau of Reclamation - fixed interval, Design of Small Dams, 1960.

(2) Data Quality Note: Shading indicates uncertainty in the estimated conductivity. See Section 3.0 for discussion on data quality.

U or L: Potential leakage into upper (U) or lower (L) packer zones may bias result high.

** : Data not linear, may bias conductivity high or low.

NC: Not Calculated, initial head unknown

NA: Not Applicable

TABLE.XLS

EXHIBIT D-6
SUMMARY OF HYDROGEOLOGIC DATA

WELL ID	UNIT MONITORED BY WELL	TOP OF CASING REFERENCE ELEVATION MSL	1-Feb-93	1-May-93	1-Aug-93	8-Sep-93	7-Oct-93	11-Nov-93	22-Dec-93	24-Feb-94	24-Mar-94	19-Apr-94	6-Jun-94	29-Jul-94	30-Aug-94	1-Nov-94
01U13 TPZ	SS		NI	893 30	DRY	893 35	DRY	895 45	904 52	896 52	897 20	897.55	894.20	DRY	893.30	893.33
01U17 TPZ	SS		NI	DRY	899 59	DRY	DRY	900 50	900 14	899 77	DRY	DRY	DRY	DRY	900.64	899.57
01U29 TPZ	SS	911 14	NI	895 76	DRY	DRY	DRY	896 26	896.94	897 46	899 44	900 04	DRY	DRY	895.41	893 92
02U11 TPZ	SS		NI	903 15	DRY	DRY	DRY	902 92	DRY	DRY	903 34	903 59	DRY	DRY	DRY	902.65
02U13 TPZ	SS	921 40	NI	913 95	911 94	912 40	912.96	913.40	911.52	913.13	913 40	912 52	911.40	911.05	913.40	911.10
03U05 TPZ	SS		NI	908 27	908 24	908 63	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	908 10
05U07 TPZ	SS	935.85	NI	932.14	929 17	928 85	928.49	929 75	DRY	DRY	932 85	932.85	930.85	929.35	928.72	929 85
06U05 TPZ	SS	939.74	NI	931.02	927.28	927 03	926.47	926 74	929.06	937.02	932.29	932.24	929 17	927.39	928.10	926.69
07U05 TPZ	SS	934.80	NI	931.24	927 31	927 00	926.51	926.80	928.80	927 20	932 20	932.30	929.55	927.52	927.80	926 82
08U04 TPZ	SS	937.49	NI	927.43	922.06	922.02	DRY	923.92	924.71	927.89	929 16	929.21	925.08	921.19	924.88	921.69
08U06 TPZ	SS	939.51	NI	927.35	922.87	922.78	923.24	926.25	924.12	928.03	928.51	929.11	925.01	924.33	926.68	922.73
09U07 TPZ	SS		NI	907 41	DRY	DRY	DRY	DRY	912.88	919.54	DRY	DRY	DRY	DRY	920.76	906.45
10L18 TPZ	UF	863.21	NI	836.97	836.74	837.61	837.66	837.01	837.01	838 21	837.38	838.47	DRY	DRY	837.11	836 91
10L19 TPZ	UF	855 92	NI	836 45	835 74	835 77	836 85	836.66	836.47	836.92	836 92	836.62	836 31	835.92	836.10	836.05
10L23 TPZ	UF	852.41	NI	836 46	835 76	835 75	835 85	836 70	836.41	837.11	836.94	836.58	836.41	835.89	836.41	836.11
10L30 TPZ	UF	862 35	NI	NI	DRY	DRY	838 14	838 53	851.95	839 67	838 56	837 93	DRY	DRY	DRY	837.55
10L31 TPZ	UF	857 80	NI	NI	835 57	835 67	835.57	836 70	836.42	837.18	836.92	837 03	836.11	835 66	836.35	835 80
10L32 TPZ	UF	847 18	NI	NI	836 00	836 18	DRY	DRY	DRY	837.41	837 18	837.38	836.32	835.85	836.78	835 98
MW-01	UF	844 54	835 30	836 72	836 33	836 49	835 81	836 48	836.39	836 62	837 21	836.91	836.20	835.82	836.20	835.90
MW-02	DB	882 94	803 47	803 08	802 49	803 94	802 52	802 50	845 14	803 98	806 94	808 23	803.90	803 31	802.89	802 04
MW-02A	UF	864 12	936 27	836 95	837 01	836 38	836 51	837 08	836.67	836 20	837 22	837.01	836.24	836 29	836.43	836.22
MW-03	UF	889 20	836 18	836 58	836 17	856 69	835 75	836 29	836.65	836.28	836 87	845.05	836 03	835.85	835.85	835 64
MW-04	UF	891 39	835 18	835 54	835 56	836 88	834 90	835 60	835.52	835 23	839 45	835 71	834.99	835.39	835.04	834 90
MW-05	UF	864 19	837 40	837 81	837 20	837 19	837 19	838 01	837.55	838 69	839 19	838.04	837 25	836 82	836.62	836 68
MW-06	UF	861 12	836 29	836 76	835 57	838 67	835 81	836.51	837.47	836 79	837 44	837.12	836.20	835.88	836 18	835 86
MW-07	1S	920 56	897 39	897 01	891 55	894 61	895 38	895 40	896 56	896 79	898 58	899.14	896.13	894.98	895.19	895 36
MW-08	1S	930 51	914 96	914 96	913 55	912 99	913 39	913 81	915 32	915 69	917.35	916.96	914.75	913.51	914.10	913.72
MW-09	WB	944 18	919 26	918 66	917 60	916 99	917 78	917 11	918 75	918 18	920 72	920.95	919 56	918.68	918.61	918.26
MW-10	WB	944 12	922 67	923 38	921 73	921 12	923 27	921 67	923 99	925.00	926.30	926 12	923.91	922.53	922.98	922 48
MW-11D	2S	908 62	867 22	870 74	866 64	874 90	869 62	867.30	866 62	867 08	DRY	866.62	867.02	871.32	868.85	868.72
MW-11B	SS	907 98	895 39	DRY	896 62	895 66	895.56	DRY	895 56	899.65	900 76	900.78	DRY	896.75	DRY	DRY
MW-12D	1S	918 08	893 11	892 02	890 86	892 51	891 83	892 06	893 56	892.91	894.25	895.06	892.59	892.08	890.95	891.35
MW-13	WB	947 26	920 41	917 30	916 63	915 98	915 82	916 08	918 64	919.71	920 62	921.26	919 52	919.58	918.33	918 54
MW-14	WB	945 65	929.25	927 80	925 93	924 73	924 95	925 65	928 40	929.19	930 99	931.30	928.54	925.90	926.33	925 82
MW-15	WB	938 72	NI	NI	921 11	920 39	920 53	921 25	923 59	923.93	925.49	925.72	923 72	921.04	921.99	920.85
MW-16	UF	946 32	NI	NI	834 78	835 07	834 42	DRY	835 42	DRY	DRY	DRY	DRY	DRY	DRY	DRY
MW-16BC	DB	945 56	NI	NI	799 17	798 76	798 77	798 39	745 56	799 85	800.56	943.56	799 85	799.02	798 89	798.48
MW-17	2S	912 42	NI	NI	862 10	864 72	861 42	863 04	774 42	862.74	860.42	861.42	862.74	861.32	861.92	861.42
MW-19	DB	860 22	801 71	802 24	801 10	802 92	800 52	800 72	802 35	802.58	805 05	805 07	802.47	801.09	800.92	799 58
MW-20	UF	868 60	NI	836 04	835 85	836 62	834 35	836 03	836.60	836.28	836.37	835.30	835.97	835.83	835.55	835.79
MW-21	UF	886 55	NI	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
MW-22	DB	892 08	NI	802 03	800 92	802 78	803 21	800 54	801 88	802.35	804 98	804 76	802 21	800.76	800.67	799 34
MW-23	DB	862 57	NI	842 80	798 95	800 78	798 15	803 29	830 47	813 47	802 37	810 76	813 15	809.86	811.39	807 53
MW-24	WB	948 25	NI	NI	925 74	925 65	925 76	926 47	929 05	929 80	931 84	888 82	929 15	926 54	927.05	926 53
MW-25	1S	909 37	NI	NI	891 57	892 70	892 26	893 71	895 27	895 39	897 02	897 86	894 45	892 37	893.59	892 87
MW-26	1S	918 86	NI	NI	890 34	892 44	892 22	892 79	893 36	893 45	894 86	895 86	893 15	891 70	891.52	891 92
MW-27	1S	929 22	NI	NI	890 70	890 79	890 84	DRY	891 22	890 97	890 72	891 06	890 92	890.79	DRY	890 87
MW-28	1SH	926 54	NI	NI	874 83	874 50	873 84	DRY	874 03	874 83	888 43	891 03	884 70	874 72	874.50	873 44
MW-29	1SH	911 83	NI	NI	887 60	888 47	888 25	888 76	883 83	883 99	884 68	887 50	883 42	881 48	881 46	881 57
MW-30	UF	952 38	NI	NI	839 58	838 63	831 73	832 18	830 14	828 40	829 38	830 38	828 32	828 38	828 10	828 08
MW-31	UF	930 14	NI	NI	833 44	833 45	833 81	833 60	834 14	833 46	834 72	834 14	833 39	930 14	833 37	833 39
MW-32	1S	926 07	NI	NI	784 30	816 09	803 59	804 56	896 07	896 08	897 07	888 87	895 96	895 15	895 17	895 71
MW-33	2S	939.32	NI	NI	890 33	894 62	894 32	894 92	867.20	880.16	867 34	867 46	879 94	880 05	879.83	880 05

See Notes on Last Page

EXHIBIT D-6
SUMMARY OF HYDROGEOLOGIC DATA

WELL ID	UNIT MONITORED BY WELL	TOP OF CASING REFERENCE ELEVATION MSL	1-Feb-93	1-May-93	1-Aug-93	6-Sep-93	7-Oct-93	11-Nov-93	22-Dec-93	24-Feb-94	24-Mar-94	19-Apr-94	6-Jun-94	29-Jul-94	30-Aug-94	1-Nov-94
MW-34A	DB	926.45	NI	NI	877.50	879.93	879.99	880.00	807.13	793.31	799.45	795.22	793.99	793.45	792.71	790.41
MW-35	DB	912.38	NI	NI	791.12	796.35	795.45	792.77	796.55	794.56	832.38	796.06	795.25	794.38	793.89	791.50
MW-36	DB	860.74	NI	NI	784.28	793.93	811.16	793.73	813.74	NI	810.59	810.06	807.24	804.94	805.16	802.84
MW-37	2S	925.31	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-38	1S	942.77	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-39	UF	890.70	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-40	DB	938.35	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-41	1S	911.67	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-42	1S	915.31	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-43	1SH	915.11	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-44	1SH	929.70	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-45	2S	928.61	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW-46	UF	923.11	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
PZ-01	SS	906.41	893.17	891.92	890.48	891.00	891.80	892.49	893.81	894.82	896.31	896.41	892.90	890.67	893.01	891.23
PZ-02	SS	911.97	895.02	893.78	892.56	892.15	892.10	893.64	894.97	895.40	897.49	898.29	894.66	892.14	892.26	892.44
PZ-03A	SS	919.28	902.59	902.41	901.66	901.55	902.53	902.68	902.28	902.03	903.06	903.28	902.34	901.05	901.70	900.99
PZ-04	SS		DRY	DRY	900.17	908.71	899.77	DRY	DRY	899.60	DRY	899.77	899.63	DRY	DRY	DRY
PZ-05	SS	928.52	DRY	DRY	908.96	917.77	908.91	DRY	908.85	908.77	909.27	908.85	908.69	908.77	DRY	DRY
PZ-06A	SS	941.96	936.41	934.90	931.47	930.01	929.41	929.29	934.96	938.49	938.65	938.49	935.62	931.18	931.79	929.88
PZ-07	SS	941.99	935.57	933.82	931.73	930.49	929.99	930.11	934.99	937.61	937.99	937.99	934.69	931.36	932.21	930.63
PZ-08	SS	931.81	920.98	919.85	918.29	917.68	917.55	917.90	919.36	920.86	922.43	922.71	920.61	918.18	918.58	918.19
PZ-09	SS	936.92	927.33	926.06	921.50	920.67	920.70	922.00	925.78	927.27	929.21	929.92	927.05	921.69	924.21	921.12
TWSP 01-01	SS	907.29	NI	NI	896.31	894.83	895.40	896.86	898.68	899.20	900.29	900.74	899.50	898.64	898.96	897.57
TWSP 01-02	SS	910.37	NI	NI	902.06	906.85	902.76	904.79	904.82	907.03	906.77	905.90	902.00	901.83	902.22	901.82
TWSP 01-03	SS	913.21	NI	NI	909.99	909.21	905.81	905.58	903.35	907.48	907.61	907.72	906.11	904.70	905.21	905.61
TWSP 01-04	SS	916.23	NI	NI	910.57	911.73	913.52	911.52	911.62	912.23	911.50	911.41	909.81	909.33	911.05	909.75
TWSP 01-05	SS	919.22	NI	NI	911.38	909.63	DRY	909.22	910.22	910.71	910.52	911.22	910.82	910.97	914.02	909.86
TWSP 01-06	SS	920.14	NI	NI	914.35	914.88	915.65	916.66	917.14	916.56	916.68	916.79	915.14	915.00	916.39	914.44
TWSP 01-07	SS	909.48	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 01-08	SS	912.81	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 01-09	SS	914.65	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 01-10	SS	917.36	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 01-11	SS	919.89	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 01-12	SS	918.14	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 02-01	SS	922.92	NI	NI	918.67	917.59	918.07	919.42	919.41	919.92	920.32	920.31	DRY	917.57	918.62	917.92
TWSP 02-02	SS	923.92	NI	NI	910.37	915.34	913.92	913.27	912.61	912.3	912.92	912.43	914.46	917.92	914.53	913.52
TWSP 02-03	SS	922.65	NI	NI	908.86	911.65	910.91	917.65	913.17	914.65	914.04	913.8	911.75	910.95	912.65	910.95
TWSP 02-04	SS	922.26	NI	NI	911.70	911.50	915.36	915.61	913.64	916.62	916.63	914.98	911.96	909.04	914.36	911.66
TWSP 02-05	SS	922.24	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 02-06	SS	922.27	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 02-07	SS	922.38	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 03-01	SS	919.96	NI	NI	911.00	DRY	DRY	DRY	DRY	DRY	909.45	913.54	DRY	DRY	DRY	908.83
TWSP 03-02	SS	922.73	NI	NI	912.37	918.73	910.91	912.27	DRY	DRY	911.73	912.55	DRY	DRY	DRY	910.53
TWSP 04-01	SS	932.20	NI	NI	926.05	922.57	922.30	922.63	926.94	928.48	928.78	928.48	926.98	925.98	926.20	925.54
TWSP 04-02	SS	934.97	NI	NI	929.79	929.17	928.79	929.87	931.71	934.32	933.97	934.07	930.58	928.97	930.87	929.17
TWSP 05-01	SS	936.79	NI	NI	931.41	928.44	928.44	929.69	931.56	FROZEN	934.55	934.26	931.31	929.37	932.79	929.28
TWSP 05-02	SS	934.94	NI	NI	929.48	925.49	925.60	929.94	930.3	931.47	930.94	930.52	930.09	928.94	929.14	927.59
TWSP 05-03	SS	934.24	NI	NI	929.88	929.13	928.90	930.24	931.43	FROZEN	932.74	932.53	931.06	929.24	927.56	929.74
TWSP 05-04	SS	935.30	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 05-05	SS	936.16	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 06-01	SS	933.46	NI	NI	926.94	923.85	928.46	925.46	926.46	925.46	926.46	927.46	927.29	924.37	926.46	925.63
TWSP 06-02	SS	937.92	NI	NI	927.92	928.55	927.37	931.58	926.92	933.28	933.61	933.46	930.42	928.68	928.77	927.99
TWSP 06-03	SS	940.92	NI	NI	931.54	930.12	929.38	929.31	933.92	937.92	938.71	937.92	935.41	933.92	930.94	929.92

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SUMMARY OF HYDROGEOLOGIC DATA

WELL ID	UNIT MONITORED BY WELL	TOP OF CASING REFERENCE ELEVATION MSL	1-Feb-93	1-May-93	1-Aug-93	6-Sep-93	7-Oct-93	11-Nov-93	22-Dec-93	24-Feb-94	24-Mar-94	19-Apr-94	6-Jun-94	29-Jul-94	30-Aug-94	1-Nov-94
TWSP 06-04	SS	939.67	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 07-01	SS	933.83	NI	NI	925.53	925.08	925.07	926.53	926.13	928.83	929.12	928.6	926.38	924.61	927.29	924.18
TWSP 07-02	SS	938.29	NI	NI	930.60	929.95	929.61	929.14	929.29	928.66	933.29	933.06	930.89	930.59	929.29	929.15
TWSP 07-03	SS	941.58	NI	NI	932.86	931.95	931.32	930.98	936.1	938.83	939.58	938.18	934.72	932.58	932.36	931.66
TWSP 07-04	SS	933.84	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 07-05	SS	936.22	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 07-06	SS	940.10	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 08-01	SS	939.89	NI	NI	930.00	929.69	929.27	929.55	932.44	935.24	935.89	935.89	935.09	930.72	930.89	930.19
TWSP 08-02	SS	942.08	NI	NI	932.27	931.43	931.40	931.59	936.63	939.2	939.08	939.08	935.30	935.30	934.78	933.78
TWSP 09-01	SS	925.60	NI	NI	912.18	912.19	DRY	DRY	DRY	DRY	DRY	DRY	916.02	913.02	916.87	913.83
TWSP 09-02	SS	925.43	NI	NI	913.99	913.26	911.86	DRY	DRY	DRY	DRY	911.64	DRY	DRY	DRY	912.56
TWSP 09-03	SS	925.17	NI	NI	917.84	918.67	917.89	915.84	917.72	914.69	915.34	915.49	DRY	915.77	DRY	914.27
TWSP 09-04	SS	925.24	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 09-05	SS	925.14	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 10-01	UF	851.55	NI	NI	836.07	835.95	835.96	836.79	836.55	836.91	837.1	836.75	836.40	835.95	836.55	836.20
TWSP 10-02	UF	852.77	NI	NI	836.08	835.78	835.86	836.67	836.44	836.92	836.91	836.95	836.34	835.89	836.49	836.07
TWSP 10-03	UF	853.88	NI	NI	836.40	836.02	836.15	836.88	836.88	836.88	836.78	837.3	853.88	DRY	836.79	836.69
TWSP 10-04	UF	855.34	NI	NI	DRY	DRY	DRY	836.61	836.84	836.86	836.92	836.85	836.24	DRY	836.24	836.09
TWSP 10-05	UF	856.43	NI	NI	DRY	DRY	DRY	836.53	836.7	DRY	836.86	836.62	836.26	DRY	DRY	836.13
TWSP 10-06	UF	858.31	NI	NI	DRY	839.31	DRY	839.93	DRY	DRY	837.93	837.46	837.21	DRY	DRY	837.11
TWSP 10-07	UF	859.57	NI	NI	837.47	837.17	DRY	836.62	838.57	DRY	838.7	838.47	859.57	DRY	DRY	836.57
TWSP 10-08	UF	860.98	NI	NI	838.57	839.99	DRY	839.12	838.31	840.1	838.78	838.58	DRY	DRY	838.18	837.58
TWSP 10-09	UF	852.45	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 10-10	UF	854.12	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 10-11	UF	856.79	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 10-12	UF	860.74	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP 10-13	UF	861.63	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP B-01	SS	913.77	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
TWSP B-02	SS	910.71	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
XXMW-18	2S		NI	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
XXSB-34																
XXSB-39																
XXSB-09																
XXSB-12S																

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SUMMARY OF HYDROGEOLOGIC DATA

WELL ID	UNIT MONITORED BY WELL	1-Dec-94	6-Feb-95	16-Mar-95	11-Apr-95	5-May-95	10-Jul-95	1-Aug-95	11-Sep-95	4-Oct-95	20-Nov-95	7-Dec-95	17-Jan-96
01U13 TPZ	SS	895.87	DRY	897.20	899.05	897.20	894.60	893.80	894.50	DRY	893.80	DRY	893.84
01U17 TPZ	SS	900.77	DRY	DRY	DRY	901.17	DRY	DRY	DRY	DRY	DRY	DRY	DRY
01U20 TPZ	SS	897.39	893.87	899.99	900.41	898.68	DRY	DRY	DRY	DRY	DRY	895.14	894.72
02U11 TPZ	SS	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
02U13 TPZ	SS	911.40	DRY	DRY	911.58	912.46	911.40	911.00	910.40	DRY	910.92	912.40	911.30
03U06 TPZ	SS	DRY	DRY	908.84	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
05U07 TPZ	SS	924.21	931.50	932.54	932.85	932.42	930.85	930.55	930.75	928.85	930.55	928.85	930.58
06U05 TPZ	SS	934.74	926.16	931.74	931.41	930.49	929.74	928.74	925.34	926.74	927.94	926.89	928.74
07U08 TPZ	SS	927.80	924.18	931.40	925.19	930.45	929.70	928.80	922.10	928.80	928.80	927.07	928.91
08U04 TPZ	SS	924.49	926.66	928.84	DRY	927.49	925.69	924.19	920.89	921.49	924.10	922.99	924.19
08U08 TPZ	SS	924.69	926.91	928.58	925.75	928.51	925.51	924.21	924.11	922.51	924.15	922.51	924.51
09U07 TPZ	SS	913.64	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
10L18 TPZ	UF	836.73	DRY	837.05	837.01	841.58	837.51	836.91	837.01	DRY	836.91	836.21	836.91
10L19 TPZ	UF	836.52	833.76	836.67	836.58	840.19	836.32	836.22	835.62	835.26	836.22	836.18	835.92
10L23 TPZ	UF	836.51	833.07	836.58	836.01	837.29	836.41	836.21	833.11	835.41	836.21	836.11	835.61
10L30 TPZ	UF	838.00	DRY	836.26	DRY	838.94	DRY	837.45	DRY	DRY	837.55	DRY	837.44
10L31 TPZ	UF	847.57	832.59	836.27	836.15	847.32	836.10	835.80	834.80	834.96	833.69	835.80	835.10
10L32 TPZ	UF	743.84	834.72	836.54	765.57	842.35	836.38	836.08	836.08	DRY	836.08	836.18	835.28
MW-01	UF	836.74	836.36	836.54	836.43	831.73	836.24	836.04	836.14	835.22	834.96	835.99	836.02
MW-02	DB	801.94	804.00	804.50	804.02	804.27	803.94	802.34	802.44	802.94	802.19	802.94	802.01
MW-02A	UF	836.12	836.33	836.50	836.12	836.67	836.47	836.42	836.02	836.12	836.10	836.30	835.72
MW-03	UF	836.04	836.14	836.20	835.30	836.35	836.20	836.00	836.20	835.20	DRY	835.85	835.34
MW-04	UF	835.77	835.09	835.39	836.39	834.68	835.49	835.09	836.29	DRY	DCM	DCM	DCM
MW-05	UF	808.59	837.58	837.90	838.19	839.54	837.19	837.09	837.09	836.38	DRY	837.19	836.19
MW-06	UF	836.65	836.37	836.67	826.60	835.32	835.82	836.12	835.02	835.12	834.92	836.02	835.36
MW-07	1S	884.45	897.24	897.56	897.03	896.56	896.16	895.56	892.76	890.31	893.68	894.46	895.56
MW-08	1S	916.17	916.49	917.51	916.51	916.96	915.21	914.51	914.01	913.53	912.64	913.95	914.99
MW-09	WB	917.23	920.16	820.49	919.70	919.49	918.76	918.26	917.66	917.36	917.21	917.66	917.64
MW-10	WB	924.12	926.36	927.13	926.12	925.78	925.32	924.32	922.98	DRY	DCM	DCM	DCM
MW-11D	2S	868.92	867.15	867.09	868.62	866.88	870.62	869.82	866.62	867.62	868.92	865.62	869.01
MW-11S	SS	DRY	898.45	900.55	900.39	890.96	DRY	895.46	895.46	895.46	DRY	DRY	894.99
MW-12D	1S	892.81	893.05	893.76	893.69	893.06	892.06	891.66	891.66	891.84	890.78	893.06	891.16
MW-13	WB	920.15	921.26	921.71	921.06	920.66	910.26	919.76	919.26	919.26	918.81	918.91	918.82
MW-14	WB	930.90	929.75	930.65	930.09	929.40	928.65	927.15	924.85	925.20	925.05	926.07	926.79
MW-16	WB	923.49	924.93	923.72	918.97	924.72	923.42	922.12	920.92	914.10	920.09	921.17	922.02
MW-16	UF	DRY	DRY	DRY	859.82	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
MW-16BC	DB	799.56	798.82	798.92	798.86	798.76	798.76	798.06	797.56	798.01	797.56	797.56	798.02
MW-17	2S	859.52	861.67	860.69	861.81	859.90	861.22	861.92	860.32	861.05	862.23	859.42	861.67
MW-19	DB	800.88	802.14	802.60	802.09	802.13	801.82	799.22	799.32	799.37	799.25	799.89	NR
MW-20	UF	836.22	836.10	836.29	836.15	836.12	836.40	836.20	834.60	834.79	834.63	834.26	835.63
MW-21	UF	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	865.14
MW-22	DB	800.70	801.84	802.35	801.93	801.92	801.78	799.08	799.08	799.08	799.00	799.67	797.98
MW-23	DB	799.67	811.99	815.34	815.27	815.81	816.02	814.17	813.87	813.90	813.64	814.57	813.37
MW-24	WB	928.98	930.35	931.04	930.82	929.93	929.05	927.75	927.45	925.88	925.78	926.74	928.25
MW-25	1S	895.06	895.82	896.37	896.66	895.55	893.17	892.77	891.97	DRY	890.60	891.89	893.43
MW-26	1S	892.86	893.64	894.32	894.01	893.51	892.66	892.36	891.86	888.36	891.35	891.93	893.10
MW-27	1S	890.64	890.86	890.51	890.73	890.54	890.92	891.02	890.22	890.77	890.88	890.40	891.01
MW-28	1SH	873.43	875.49	879.03	887.03	885.03	885.83	885.53	874.50	DRY	DCM	DCM	DCM
MW-29	1SH	881.83	881.43	881.58	884.83	888.18	882.83	881.83	880.23	879.83	880.98	889.83	881.83
MW-30	UF	827.69	828.37	828.68	828.57	828.56	828.38	828.58	824.38	828.38	827.91	827.98	829.48
MW-31	UF	840.91	833.58	840.76	833.94	843.72	833.64	833.64	832.34	833.48	833.34	833.48	834.17
MW-32	1S	896.45	897.03	897.07	896.66	896.57	896.27	895.87	895.47	888.77	893.57	894.07	894.94
MW-33	2S	880.65	880.49	880.82	881.22	867.44	867.99	867.07	868.07	862.20	879.77	879.92	880.66

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EXHIBIT J-6
SUMMARY OF HYDROGEOLOGIC DATA

WELL ID	UNIT MONITORED BY WELL	1-Dec-94	6-Feb-95	16-Mar-95	11-Apr-95	5-May-95	10-Jul-95	1-Aug-95	11-Sep-95	4-Oct-95	20-Nov-95	7-Dec-95	17-Jan-96
MW-34A	DB	790.60	791.63	796.45	792.09	791.93	792.05	790.45	789.45	791.14	790.48	791.00	792.06
MW-35	DB	793.36	792.78	800.38	793.06	792.88	793.38	792.88	792.38	792.38	791.62	792.18	793.17
MW-36	DB	804.28	802.56	802.74	802.43	802.54	802.54	799.84	792.59	799.87	799.59	800.24	800.40
MW-37	2S	NI	NI	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	DRY
MW-38	1S	NI	NI	NI	NI	NI	NI	NI	NI	NI	896.15	896.41	899.06
MW-39	UF	NI	NI	NI	NI	NI	NI	NI	NI	NI	834.85	835.04	835.58
MW-40	DB	NI	NI	NI	NI	NI	NI	NI	NI	NI	804.45	804.01	804.58
MW-41	1S	NI	NI	NI	NI	NI	NI	NI	NI	NI	890.13	889.67	891.94
MW-42	1S	NI	NI	NI	NI	NI	NI	NI	NI	NI	888.20	889.76	890.63
MW-43	1SH	NI	NI	NI	NI	NI	NI	NI	NI	NI	873.34	873.64	873.74
MW-44	1SH	NI	NI	NI	NI	NI	NI	NI	NI	NI	881.70	880.22	882.01
MW-45	2S	NI	NI	NI	NI	NI	NI	NI	NI	NI	872.59	867.13	874.41
MW-46	UF	NI	NI	NI	NI	NI	NI	NI	NI	NI	830.61	DRY	833.24
PZ-01	SS	883.93	894.71	895.41	896.04	895.41	892.21	891.61	892.11	889.91	890.15	891.06	891.69
PZ-02	SS	894.97	DRY	896.97	896.97	895.97	893.77	892.97	892.17	891.97	892.00	891.97	892.97
PZ-03A	SS	901.59	DRY	900.74	896.18	902.28	901.98	901.38	900.58	900.28	899.63	900.28	901.78
PZ-04	SS	DRY	DRY	DRY	DRY	DRY	899.80	899.80	899.80	DRY	DRY	DRY	899.89
PZ-05	SS	908.67	DRY	908.52	908.52	910.52	908.72	908.72	908.72	908.52	DRY	908.32	908.72
PZ-06A	SS	932.63	937.34	938.21	937.96	936.49	935.06	933.46	931.46	929.79	929.18	929.65	933.76
PZ-07	SS	933.29	936.87	937.28	936.99	935.67	933.99	932.49	933.49	930.48	929.89	930.61	932.59
PZ-08	SS	924.31	911.63	922.60	919.60	921.81	920.81	919.61	917.11	916.68	916.46	917.81	919.81
PZ-09	SS	926.92	928.74	918.32	928.92	928.48	926.72	924.42	920.12	DRY	920.12	922.48	925.07
TWSP 01-01	SS	897.57	899.74	899.83	899.95	899.86	898.69	898.39	895.29	DRY	897.93	897.66	898.42
TWSP 01-02	SS	902.37	905.37	906.12	906.07	904.37	902.37	902.47	902.37	904.37	902.37	902.37	902.47
TWSP 01-03	SS	908.77	907.39	908.21	907.21	908.73	908.21	905.31	901.71	DRY	907.21	906.21	905.31
TWSP 01-04	SS	911.05	912.23	912.45	911.98	907.75	910.63	910.23	909.23	908.73	DRY	910.55	910.35
TWSP 01-05	SS	909.47	910.22	910.22	910.44	910.39	911.12	911.22	911.22	909.40	DRY	909.22	911.68
TWSP 01-06	SS	915.63	916.37	916.34	916.14	916.14	915.14	912.54	912.14	911.46	916.88	916.14	912.54
TWSP 01-07	SS	NI	NI	NI	NI	NI	NI	NI	904.48	909.48	901.78	901.48	903.80
TWSP 01-08	SS	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	902.91	903.11	904.23
TWSP 01-09	SS	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	905.05	905.65	906.00
TWSP 01-10	SS	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	DRY	DRY	DRY
TWSP 01-11	SS	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	DRY	DRY	910.44
TWSP 01-12	SS	NI	NI	NI	NI	NI	NI	NI	918.14	918.14	910.96	913.14	913.93
TWSP 02-01	SS	917.72	919.35	919.30	909.12	919.06	918.52	917.92	916.12	915.92	919.52	918.92	917.96
TWSP 02-02	SS	913.42	912.32	912.27	913.62	913.73	914.92	914.92	916.12	912.57	912.81	911.92	914.92
TWSP 02-03	SS	912.65	912.65	913.13	912.23	911.89	912.05	912.05	910.55	909.35	910.95	910.65	912.23
TWSP 02-04	SS	918.93	913.26	914.03	913.46	914.26	913.06	912.76	911.26	910.83	913.06	911.28	912.76
TWSP 02-05	SS	NI	NI	NI	NI	NI	NI	NI	NI	922.24	915.04	914.24	914.84
TWSP 02-06	SS	NI	NI	NI	NI	NI	NI	NI	NI	DRY	909.47	DRY	922.27
TWSP 02-07	SS	NI	NI	NI	NI	NI	NI	NI	NI	922.38	911.88	911.38	915.22
TWSP 03-01	SS	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	908.76
TWSP 03-02	SS	DRY	DRY	DRY	DRY	DRY	911.03	912.93	DRY	DRY	DRY	DRY	912.93
TWSP 04-01	SS	926.20	927.49	928.04	927.90	927.69	927.2	923.5	923.90	925.2	926.30	925.70	923.69
TWSP 04-02	SS	929.97	931.97	932.97	929.26	932.52	931.27	930.27	930.27	928.53	930.17	928.97	930.25
TWSP 05-01	SS	930.99	931.79	933.08	933.49	933	931.79	927.69	929.09	928.63	929.79	929.18	927.93
TWSP 05-02	SS	930.09	930.58	930.70	930.61	930.28	929.94	929.54	925.54	927.89	930.64	929.50	929.82
TWSP 05-03	SS	930.89	931.91	932.24	932.24	932.04	931.24	930.24	938.44	928.81	931.16	929.24	930.24
TWSP 05-04	SS	NI	NI	NI	NI	NI	NI	NI	927.10	935.30	931.90	929.56	932.20
TWSP 05-05	SS	NI	NI	NI	NI	NI	NI	NI	926.36	936.18	929.28	929.16	930.16
TWSP 06-01	SS	925.46	926.34	930.60	927.46	928.46	928.36	927.46	926.26	925.58	926.38	925.78	927.46
TWSP 06-02	SS	928.60	931.92	932.92	932.49	931.92	931.12	930.22	928.42	927.92	928.42	927.92	930.22
TWSP 06-03	SS	931.92	935.92	934.92	937.22	935.92	933.92	932.82	930.72	929.49	929.36	928.92	932.82

See Notes on Last Page

EXHIBIT D-6
SUMMARY OF HYDROGEOLOGIC DATA

WELL ID	UNIT MONITORED BY WELL	1-Dec-94	6-Feb-95	16-Mar-95	11-Apr-95	5-May-95	10-Jul-95	1-Aug-95	11-Sep-95	4-Oct-95	20-Nov-95	7-Dec-95	17-Jan-96
TWSP 06-04	SS	NI	NI	NI	NI	NI	NI	NI	NI	939.67	929.87	929.32	929.40
TWSP 07-01	SS	926.11	929.20	930.63	927.11	927.62	926.63	925.63	924.13	923.83	926.83	925.08	925.67
TWSP 07-02	SS	928.77	930.29	932.76	931.92	929.84	930.29	931.29	929.87	929.43	929.49	929.29	931.29
TWSP 07-03	SS	932.45	936.95	935.58	937.86	936.48	934.58	933.58	932.08	931.63	931.15	930.83	933.61
TWSP 07-04	SS	NI	NI	NI	NI	NI	NI	NI	923.54	933.84	927.26	927.18	927.84
TWSP 07-05	SS	NI	NI	NI	NI	NI	NI	NI	930.52	936.22	927.87	926.22	926.57
TWSP 07-06	SS	NI	NI	NI	NI	NI	NI	NI	932.10	940.10	930.10	930.00	929.90
TWSP 08-01	SS	930.89	935.89	936.89	934.89	934.14	933.49	931.99	929.89	929.16	929.43	929.89	931.99
TWSP 08-02	SS	932.88	937.53	938.42	937.08	936.22	935.28	934.08	932.75	932.08	931.68	931.58	934.08
TWSP 09-01	SS	910.74	DRY	916.60	914.10	DRY	914.4	915.6	DRY	DRY	920.40	DRY	915.67
TWSP 09-02	SS	DRY	DRY	DRY	DRY	DRY	DRY	911.73	911.43	911.43	914.93	914.03	911.93
TWSP 09-03	SS	912.87	DRY	DRY	915.17	915.43	914.27	914.67	911.57	DRY	917.17	915.17	915.07
TWSP 09-04	SS	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	913.64	DRY	DRY
TWSP 09-05	SS	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	915.64	912.29	912.14
TWSP 10-01	UF	836.69	834.11	836.85	836.55	836.57	836.55	836.15	834.85	835.55	836.15	836.55	836.45
TWSP 10-02	UF	836.55	835.09	836.54	836.29	837.44	836.17	835.97	836.97	835.27	835.97	836.12	835.97
TWSP 10-03	UF	836.36	836.69	840.38	DRY	839.5	836.38	836.18	835.58	835.28	835.98	DRY	836.23
TWSP 10-04	UF	836.54	DRY	836.34	DRY	DRY	836.14	836.04	DRY	DRY	DRY	DRY	836.04
TWSP 10-05	UF	836.43	DRY	938.26	DRY	DRY	DRY	836.03	DRY	DRY	DRY	DRY	836.02
TWSP 10-06	UF	837.31	DRY	DRY	837.31	DRY	DRY	837.31	837.31	DRY	DRY	DRY	837.31
TWSP 10-07	UF	837.69	DRY	DRY	837.92	DRY	837.37	836.97	DRY	DRY	DRY	DRY	837.05
TWSP 10-08	UF	840.98	DRY	DRY	837.98	DRY	DRY	837.98	837.58	DRY	DRY	DRY	837.98
TWSP 10-09	UF	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	DRY	DRY	DRY
TWSP 10-10	UF	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	DRY	DRY	DRY
TWSP 10-11	UF	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	DRY	DRY	DRY
TWSP 10-12	UF	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	838.64	859.24	837.63
TWSP 10-13	UF	NI	NI	NI	NI	NI	NI	NI	DRY	DRY	DRY	DRY	DRY
TWSP B-01	SS	NI	NI	NI	NI	NI	NI	NI	912.97	913.77	DRY	904.73	
TWSP B-02	SS	NI	NI	NI	NI	NI	NI	NI	NI	DRY	902.49	898.31	
XXMW-18	2S	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
XXSB-34										NM	NM	NM	NM
XXSB-39													
XXSB-09													
XXSB-12S													

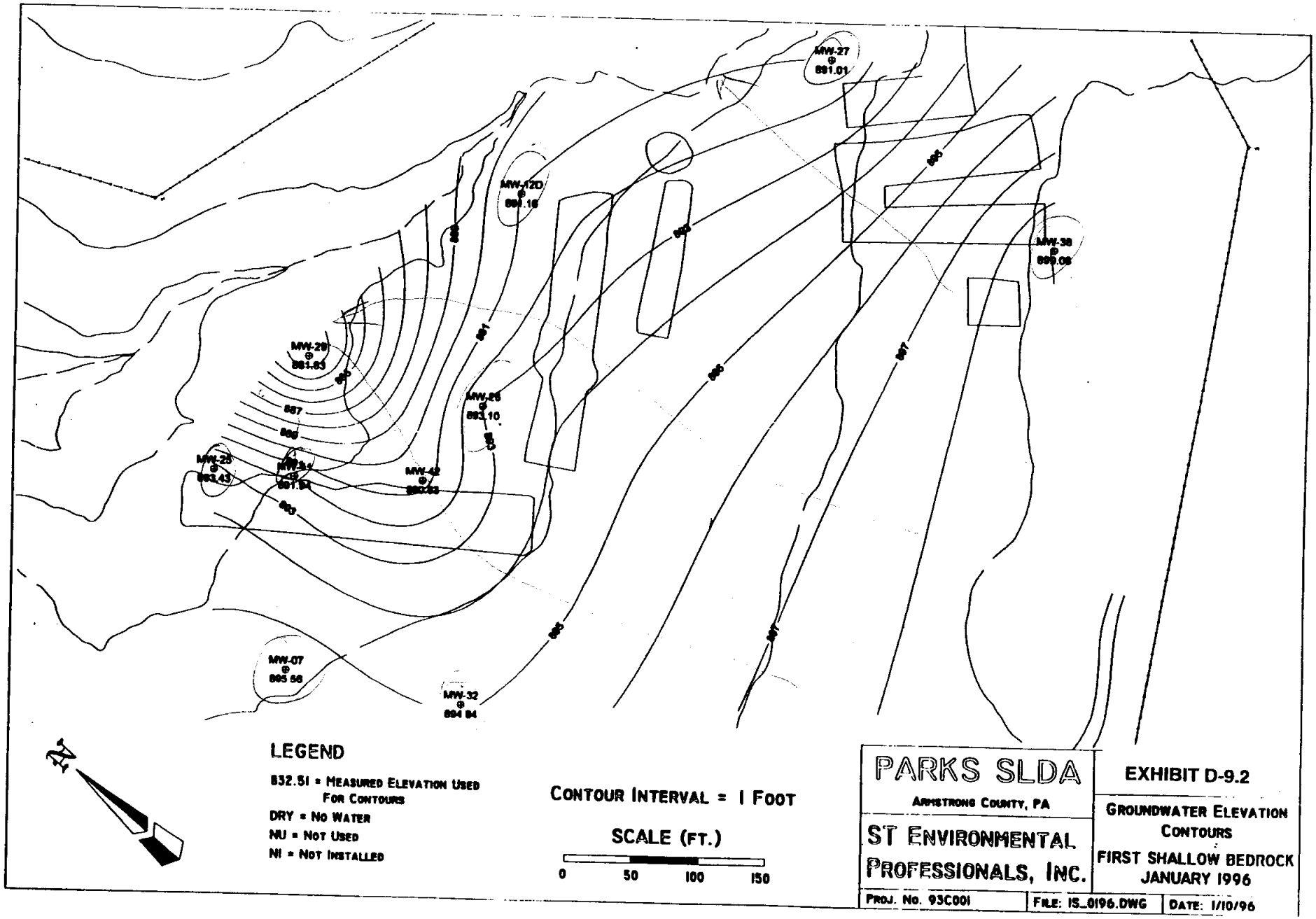
NOTES:

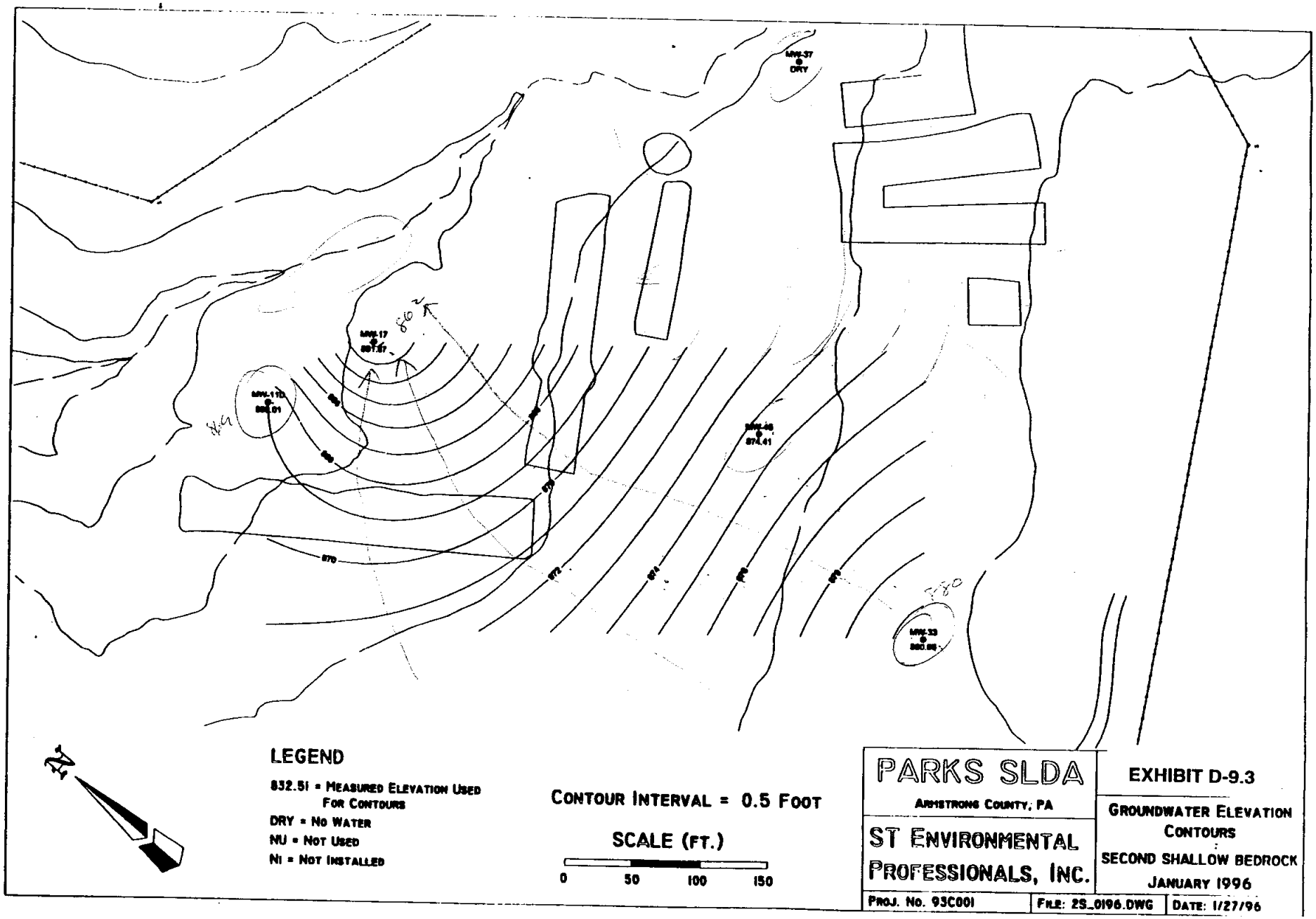
NI = Not Installed
DRY = No Water Measured in Well
NR = No Reading
NM = Not Measured
BGL = Below Ground Surface
MSL = Feet Mean Sea Level
Shading Indicates Estimated Value

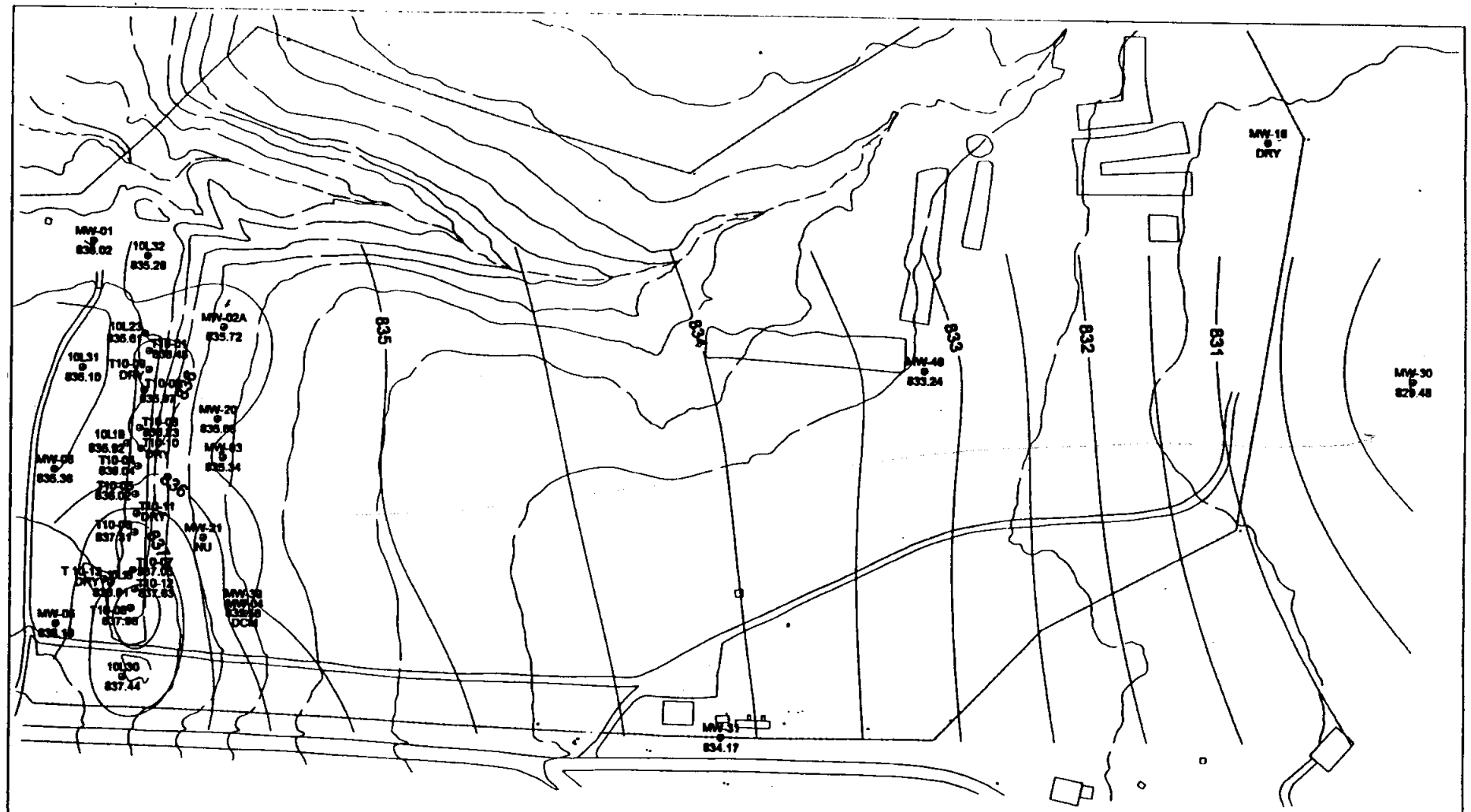
WB = Weathered Bedrock
1S = First Shallow Bedrock
1SH = First Shale
2S = Second Shallow Bedrock
2SH = Second Shale
UF = Upper Freeport
DB = Deep Bedrock

SS = surficial soils (overburden)

See Notes on Last Page


MW-27
891.01
MW-12D
891.16
MW-38
889.08
MW-29
891.83
MW-26
893.10
MW-25
893.43
MW-42
890.53
MW-07
895.56
MW-32
894.84
887
886
885
884
883
882
881
880
879
878
877
LEGEND
832.51 = Measured Elevation Used For Contours
DRY = No Water
NU = Not Used
NI = Not Installed
Contour Interval = 1 Foot
Scale (ft.)
0
50
100
150
PARKS SLDA
Armstrong County, PA
ST Environmental Professionals, Inc.
Exhibit D-9.2
Groundwater Elevation Contours
First Shallow Bedrock
January 1996
Proj. No. 93C001
File: IS_0196.DWG
Date: 1/10/96


MW-37
DRY
MW-17
MW-17D
MW-46
MW-33
870
872
874
876
878
LEGEND
832.51 = Measured Elevation Used For Contours
DRY = No Water
NU = Not Used
NI = Not Installed
Contour Interval = 0.5 Foot
Scale (ft.)
0
50
100
150
PARKS SLDA
Armstrong County, PA
ST Environmental Professionals, Inc.
Proj. No. 93C001
File: 2S_0196.DWG
Date: 1/27/96
EXHIBIT D-9.3
Groundwater Elevation Contours
Second Shallow Bedrock
January 1996



LEGEND

832.51 = Measured Elevation Used For Contouring

DRY = No Water

NU = Not Used

NI = Not Installed

Contour Interval = 0.5 Foot

SCALE (FT.)

0 100 200 300

PARKS SLDA

Armstrong County, PA

ST Environmental Professionals, Inc.

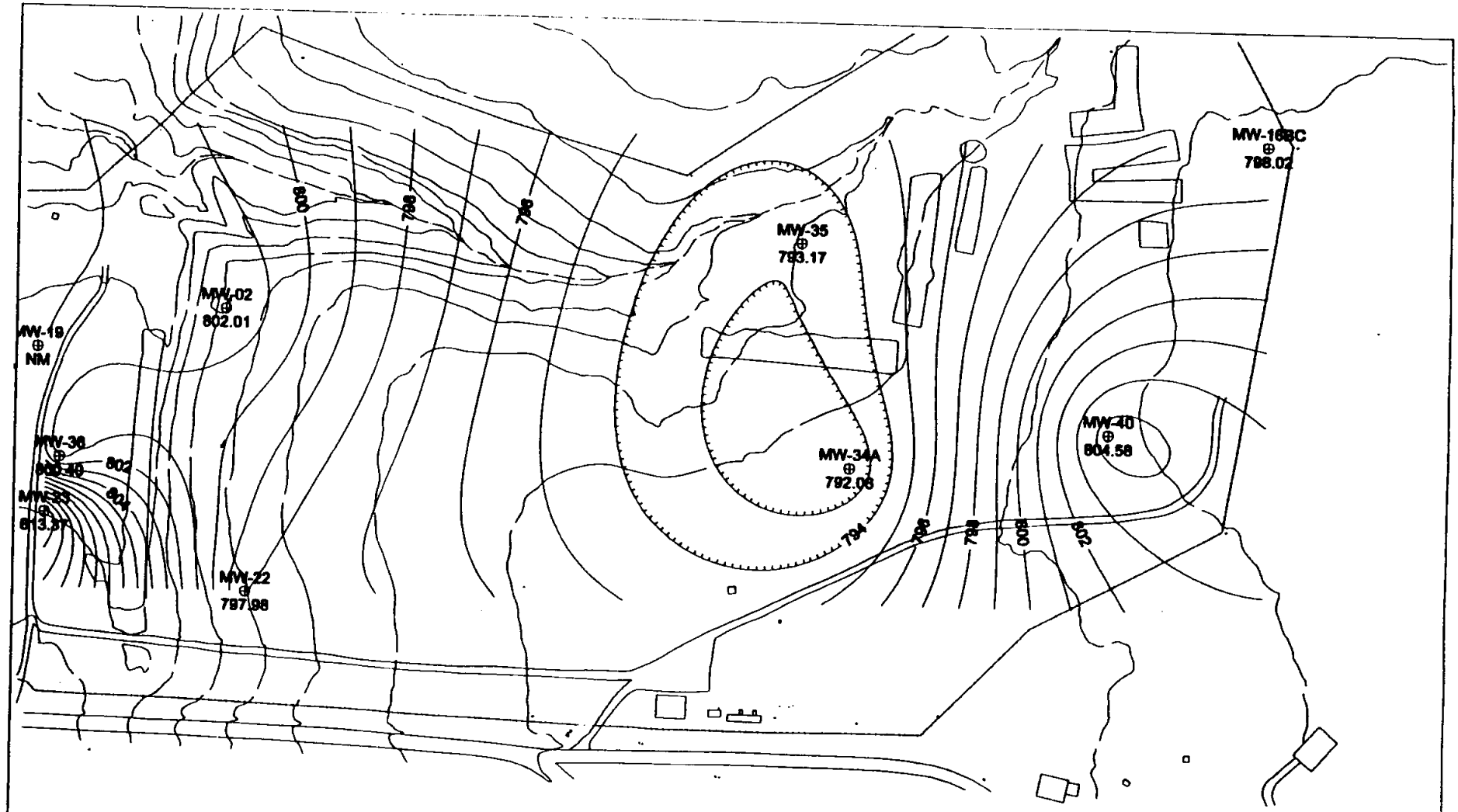
EXHIBIT D-9.4

Groundwater Elevation Contours

Upper Freeport

January 1996

Proj. No. 93C001 | File: UF_0196.DWG | Date: 1/27/96



LEGEND

832.51 = Measured Elevation Used For Contouring

DRY = No Water

NU = Not Used

NI = Not Installed

Contour Interval = 0.5 Foot

Scale (ft.)

0 100 200 300

PARKS SLDA

Armstrong County, PA

ST Environmental Professionals, Inc.

Proj. No. 93C001 | File: 09_0196.DWG | Date: 1/27/96

EXHIBIT D-9.5

Groundwater Elevation Contours

Deep Bedrock

January 1996

TPZ's probably not 1S

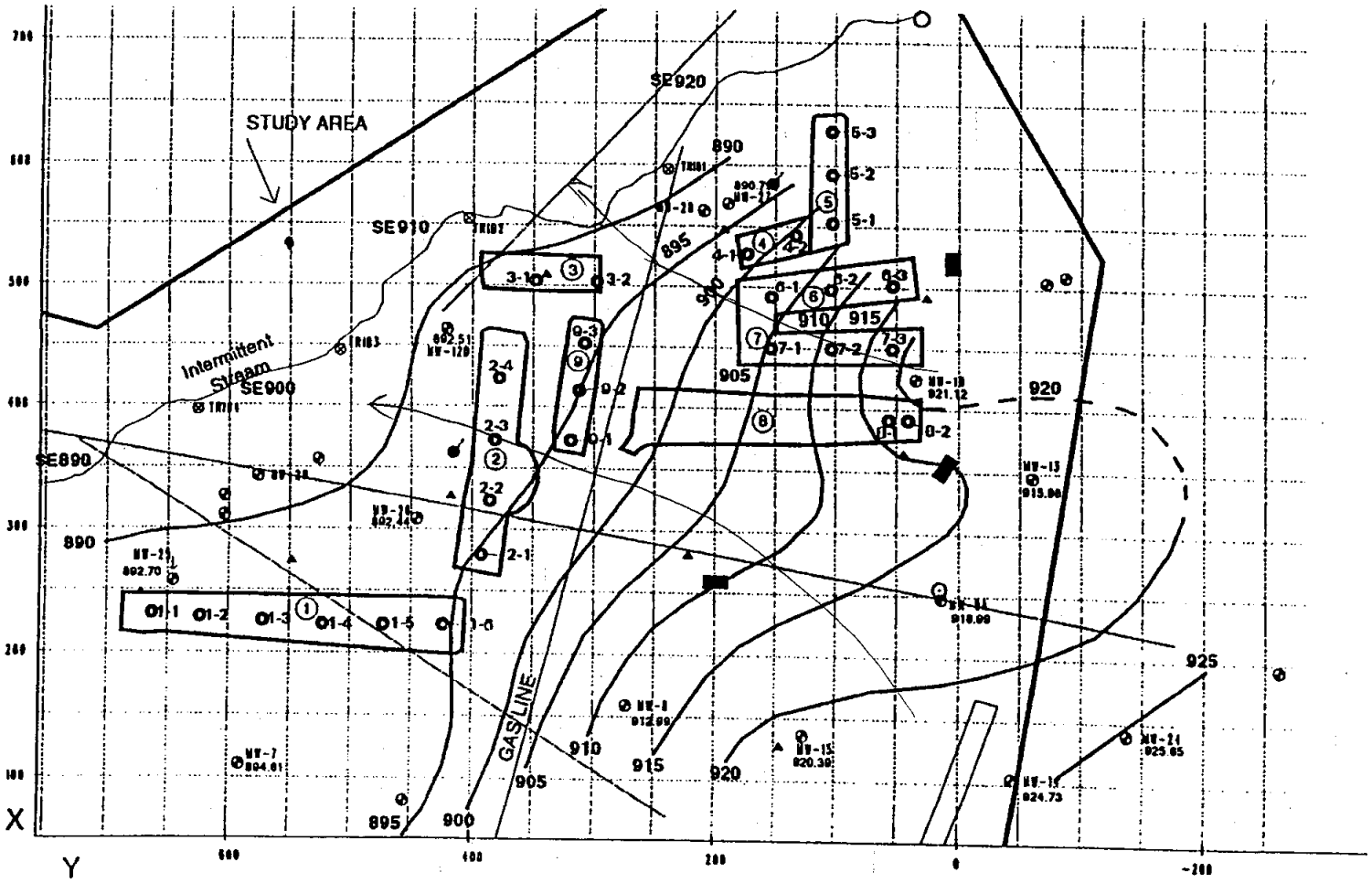
TABLE 3-2
GROUNDWATER ELEVATIONS
May 17, 1999

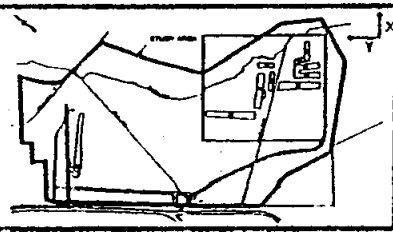
WELL ID	UNIT MONITORED BY WELL	WATER LEVEL ELEVATION May 17, 1999
MW-07	1S	897.56
MW-12D	1S	892.89
MW-25	1S	894.72
MW-26	1S	893.86
MW-27	1S	892.01
MW-32	1S	897.41
MW-38	1S	899.77
MW-41	1S	893.67
TPZ01	1S	880.26
TPZ02	1S	890.47
TPZ03	1S	883.35
TPZ04	1S	893.23
TPZ05	1S	897.23
MW-42	1SH	893.31
MW-29	1SH	892.45
MW-43	1SH	867.89
MW-11D	2S	867.45
MW-17	2S	864.42
MW-33	2S	881.77
MW-45	2S	873.78
01U13 TPZ	SS	897.50
02U11 TPZ	SS	913.70
05U07 TPZ	SS	925.27
06U05 TPZ	SS	929.74
07U05 TPZ	SS	929.80
08U04 TPZ	SS	926.02
MW-11S	SS	895.96
PZ-01	SS	893.78
PZ-02	SS	895.10
PZ-03A	SS	902.62
PZ-05	SS	908.67
PZ-06A	SS	935.38
PZ-07	SS	934.99
PZ-08	SS	921.05
PZ-09	SS	928.92
TPZ06	SS	DRY < 897.8
TPZ07	SS	910.05
TPZ08	SS	DRY < 911.7
TWSP 01-01	SS	899.16
TWSP 01-02	SS	902.37
TWSP 01-03	SS	904.74
TWSP 01-04	SS	910.23
TWSP 01-05	SS	910.22
TWSP 01-06	SS	914.14
TWSP 01-07	SS	903.65
TWSP 01-08	SS	905.96
TWSP 01-09	SS	909.65
TWSP 01-10	SS	907.94
TWSP 01-12	SS	912.94
TWSP 02-01	SS	918.17
TWSP 02-02	SS	913.92
TWSP 02-03	SS	912.65
TWSP 02-04	SS	912.64
TWSP 02-05	SS	916.77
TWSP 02-06	SS	911.79
TWSP 02-07	SS	912.38
TWSP 03-02	SS	912.26
TWSP 04-01	SS	927.57

WELL ID	UNIT MONITORED BY WELL	WATER LEVEL ELEVATION May 17, 1999
TWSP 04-02	SS	931.36
TWSP 05-01	SS	931.79
TWSP 05-02	SS	928.21
TWSP 05-03	SS	931.24
TWSP 05-04	SS	931.30
TWSP 05-05	SS	931.53
TWSP 06-01	SS	928.46
TWSP 06-02	SS	930.59
TWSP 06-03	SS	933.92
TWSP 06-04	SS	933.27
TWSP 07-01	SS	926.83
TWSP 07-02	SS	931.29
TWSP 07-03	SS	934.58
TWSP 07-04	SS	929.37
TWSP 07-05	SS	929.64
TWSP 07-06	SS	932.37
TWSP 08-01	SS	930.89
TWSP 08-02	SS	935.56
TWSP 09-01	SS	915.60
TWSP 09-03	SS	912.87
TWSP 09-04	SS	912.84
TWSP 09-05	SS	914.62
TWSP B-01	SS	907.77
TWSP B-02	SS	899.23
SG01	ST	918.13
SG02	ST	911.15
SG03	ST	897.61
SG04	ST	883.37
10L18 TPZ	UF	837.11
10L31 TPZ	UF	835.80
10L32 TPZ	UF	836.18
MW-01	UF	836.77
MW-02A	UF	837.12
MW-03	UF	836.88
MW-05	UF	838.19
MW-06	UF	836.82
MW-16	UF	946.32
MW-20	UF	836.60
MW-21	UF	886.55
MW-30	UF	829.13
MW-31	UF	834.14
MW-39	UF	835.70
MW-46	UF	831.43
TWSP 10-01	UF	836.55
TWSP 10-02	UF	836.30
TWSP 10-03	UF	836.35
TWSP 10-04	UF	836.34
TWSP 10-05	UF	839.35
TWSP 10-06	UF	837.31
TWSP 10-07	UF	837.82
TWSP 10-11	UF	836.69
TWSP 10-12	UF	837.74
MW-08	WB	915.81
MW-09	WB	921.41
MW-13	WB	922.65
MW-14	WB	930.10
MW-15	WB	924.02
MW-24	WB	930.12

UNIT MONITORED LEGEND

SS - Soil Zone
WB - Weathered Bedrock
1S - First Shallow Bedrock Zone
1SH - First Shale
2S - Second Shallow Bedrock Zone
2SH - Second Shale
UF - Upper Freeport Mine Horizon
UC - Undercaly
DB - Deep bedrock Zone





NOTE: 'SE' Indicates 'Stream Elevation'

0 ft 75 ft 150 ft 225 ft 300 ft 375 ft

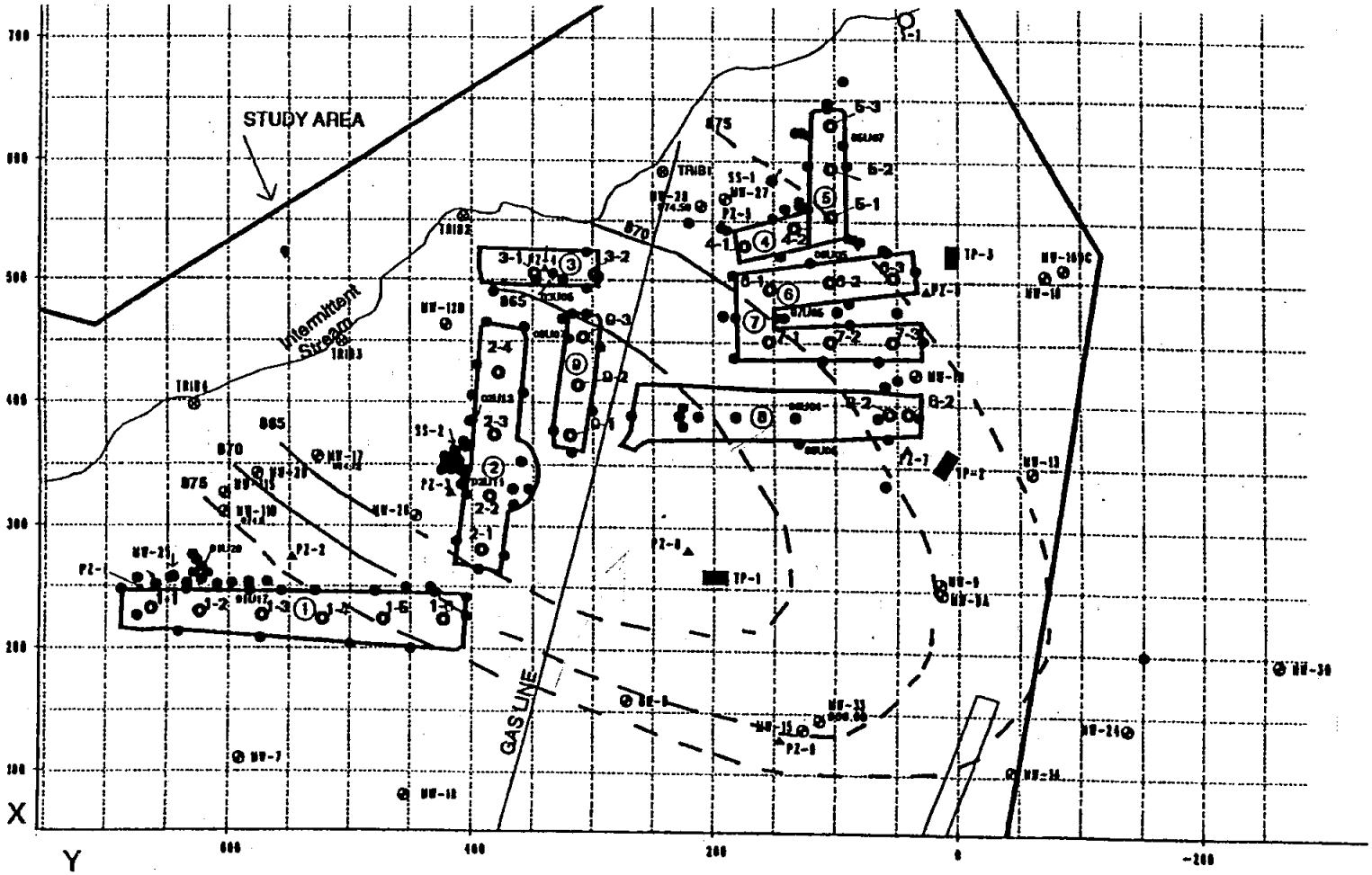
- Auger Boring
- Monitoring Well
- Piezometer
- Stream Sample
- Seep Sample
- Test Boring
- Test Pit
- Tributary Sample
- Contours (ft above MSL)
- Fracture Trace Lines

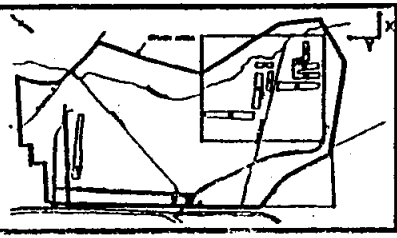
Upper Trenches Area Ground Water Elevation Contours (Sept. 1993): First Shallow Bedrock Unit

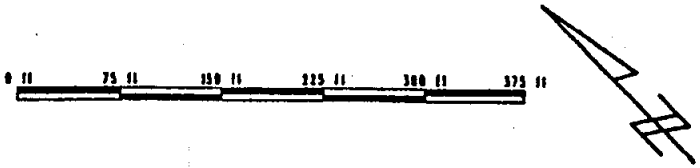
PARKS SLDF - SCR

FIGURE 3-16c

Rev 4







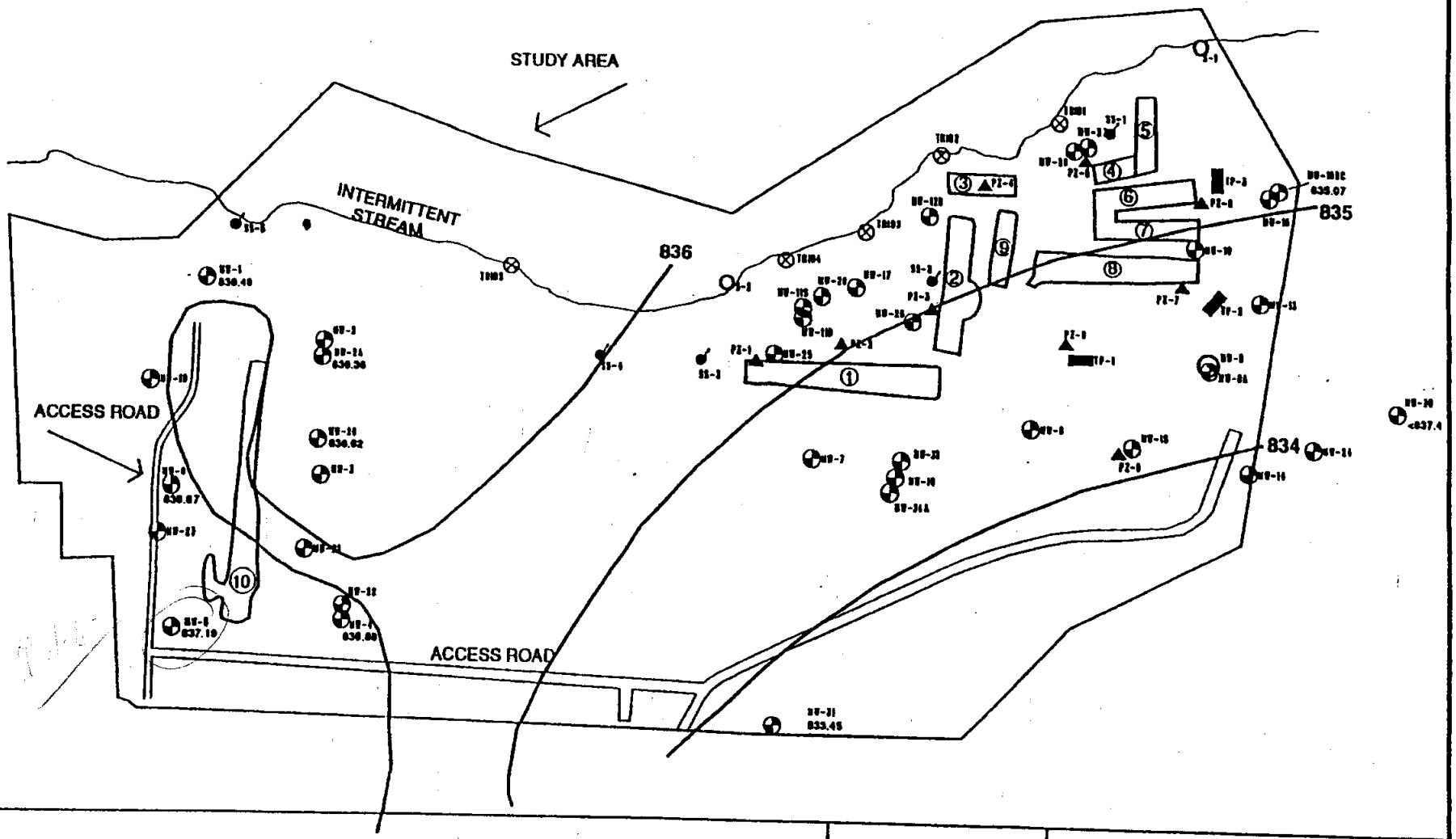
- Auger Boring
- Monitoring Well
- Piezometer
- Stream Sample
- Seep Sample
- Test Boring
- Test Pit
- Tributary Sample
- TWSP Sample
- Contours (ft above MSL)

Upper Trenches Area Ground Water Elevation Contours (Sept. 1993): Second Shallow Bedrock Zone

PARKS SLDF-SCR

FIGURE 3-16d

Rev 4



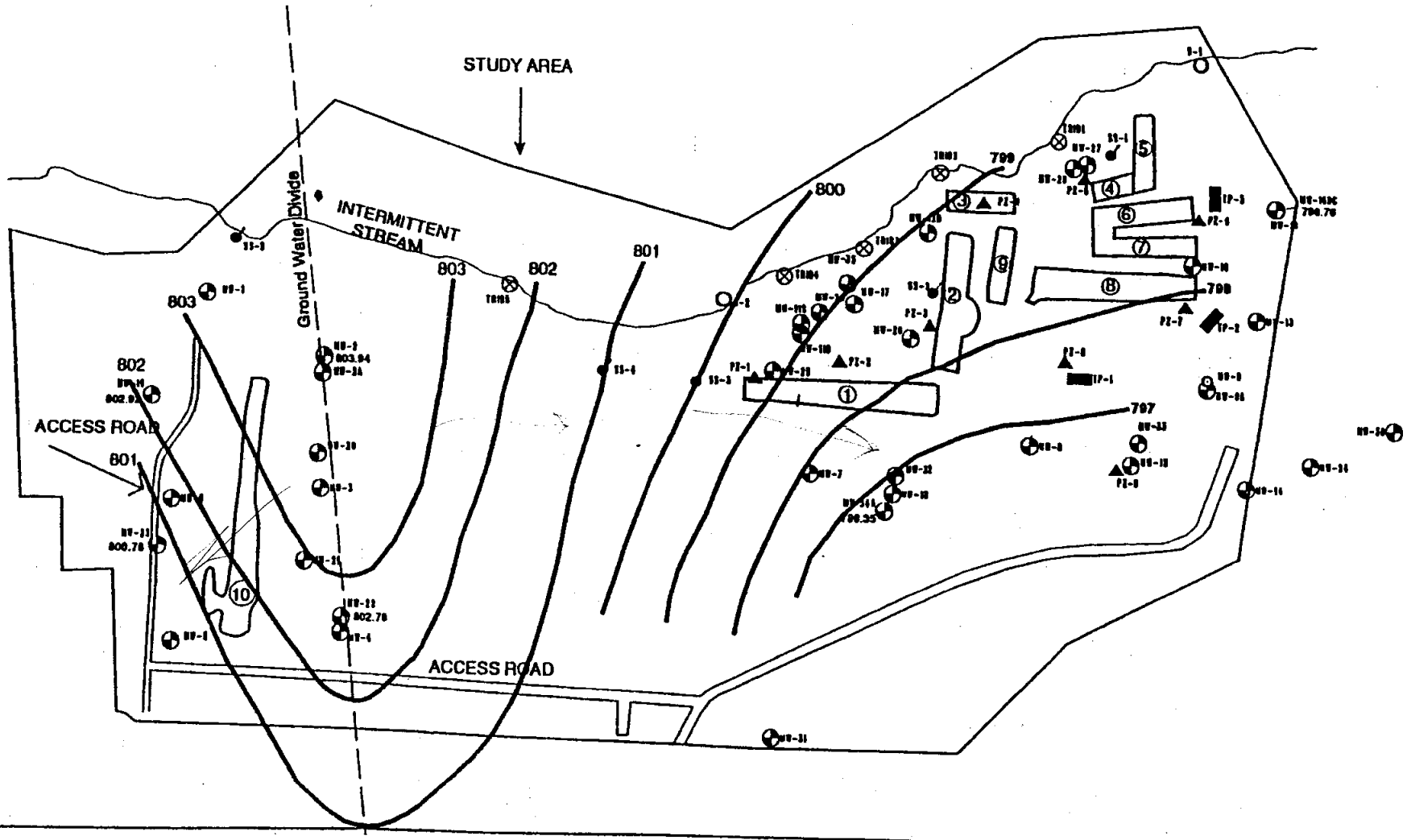
- Auger Boring
- Monitoring Well
- Piezometer
- Stream Sample
- Seep Sample
- Test Boring
- Test Pit
- Tributary Sample
- Contours (ft above MSL)

Ground Water Elevation Contours (Sept. 1993): Upper Freeport Mine Horizon

PARKS SLDF - SCR

FIGURE 3-16e

Rev 4



- Auger Boring
- Monitoring Well
- Piezometer
- Stream Sample
- Seep Sample
- Test Boring
- Test Pit
- Tributary Sample
- Contours (ft above MSL)

Ground Water Elevation Contours (Sept. 1993): Deep Bedrock Zone

PARKS SLDF - SCR

FIGURE 3-16f

Rev 4

APPENDIX G

SLUG TEST DATA AND CALCULATIONS

Calculated Hydraulic Conductivity Values
SLDA Site

Well	cm/sec			ft/min			ft/day		
	Average	Falling	Rising	Average	Falling	Rising	Average	Falling	Rising
MW-54	1.85E-04	-	1.85E-04	3.64E-04	-	3.64E-04	0.5	-	0.5
MW-56	4.99E-04	-	4.99E-04	9.83E-04	-	9.83E-04	1.4	-	1.4
MW-59	3.82E-05	4.04E-05	3.61E-05	7.53E-05	7.96E-05	7.10E-05	0.1	0.1	0.1
MW-64	5.74E-03	-	5.74E-03	1.13E-02	-	1.13E-02	16.3	-	16.3
MW-69	1.85E-03	2.45E-03	1.24E-03	3.64E-03	4.83E-03	2.45E-03	5.2	7.0	3.5

Well	Average			Description at screened interval
	cm/sec	ft/min	ft/day	
MW-54	1.85E-04	3.64E-04	0.5	Silt and Clay
MW-56	4.99E-04	9.83E-04	1.4	Clayey Silt, some F-M sand
MW-59	3.82E-05	7.53E-05	0.1	Silt and Clayey Silt
MW-64	5.74E-03	1.13E-02	16.3	Silty Clay/F-M Sand
MW-69	1.85E-03	3.64E-03	5.2	Sand and Silt/Silt and Clay

N:\11172781.00000\EXCEL\SLDA Slug Tests\[SLDA Slug Test Summary.xls]Summary

Well	Max Displacement	Depth to Water	Total Depth	Height of Water Column	Aquifer Thickness	Screen Length	Top of Water above Top of Screen	Well Radius (ft)	Borehole Radius (ft)
MW-54r	1.00	17.64	19.5	1.86	3.72	5	No	0.0833	0.333
MW-56r	1.00	20.7	26	5.30	10.60	10	No	0.0833	0.333
MW-59f	1.00	4.70	11.00	6.30	12.60	5	Yes	0.0833	0.333
MW-59r	1.00	4.70	11.00	6.30	12.60	5	Yes	0.0833	0.333
MW-64r	1.00	9.54	19.00	9.46	18.92	10	No	0.0833	0.333
MW-69r	1.00	9.92	20.00	10.08	20.16	10	Yes	0.0833	0.333
MW-69f	1.00	9.92	20.00	10.08	20.16	10	Yes	0.0833	0.333

Note:

-DTW measurements were used from data collected on 12/17-12/18/03. DTW measurements were subtracted and adjusted to account for well stickup.

-Falling head tests were rejected due to a partially penetrating well screens for wells MW-54, MW-56 and MW-64.

-Aquifer thickness was assumed to be twice the thickness of the water column.

- Multiple tests were performed on MW-64 and MW-69. Analysis of data based on tests conducted with a five foot slug. A two foot slug was used on wells MW-56 and MW-59.

- Data from MW-54 was collected following a baildown, due to insufficent volume of water present for use with a slug.

N:\11172781.00000\EXCEL\SLDA Slug Tests\[SLDA Slug Test Summary.xls]Set up

URS Corporation

CALCULATION COVER SHEET

Client: USACE

Project Name: SLDA

Project/Calculation Number: 11172781.00000

Title: Estimates of Hydraulic Conductivity

Total Number of Pages (incl. Cover sheet): 10

Total Number of Computer Runs: 1

Prepared by: M. DeLozier

Date: 1-Mar-04

Checked by: C. TAYLOR

Date: 1 MAR 04

Description and Purpose:
Estimation of hydraulic conductivity.

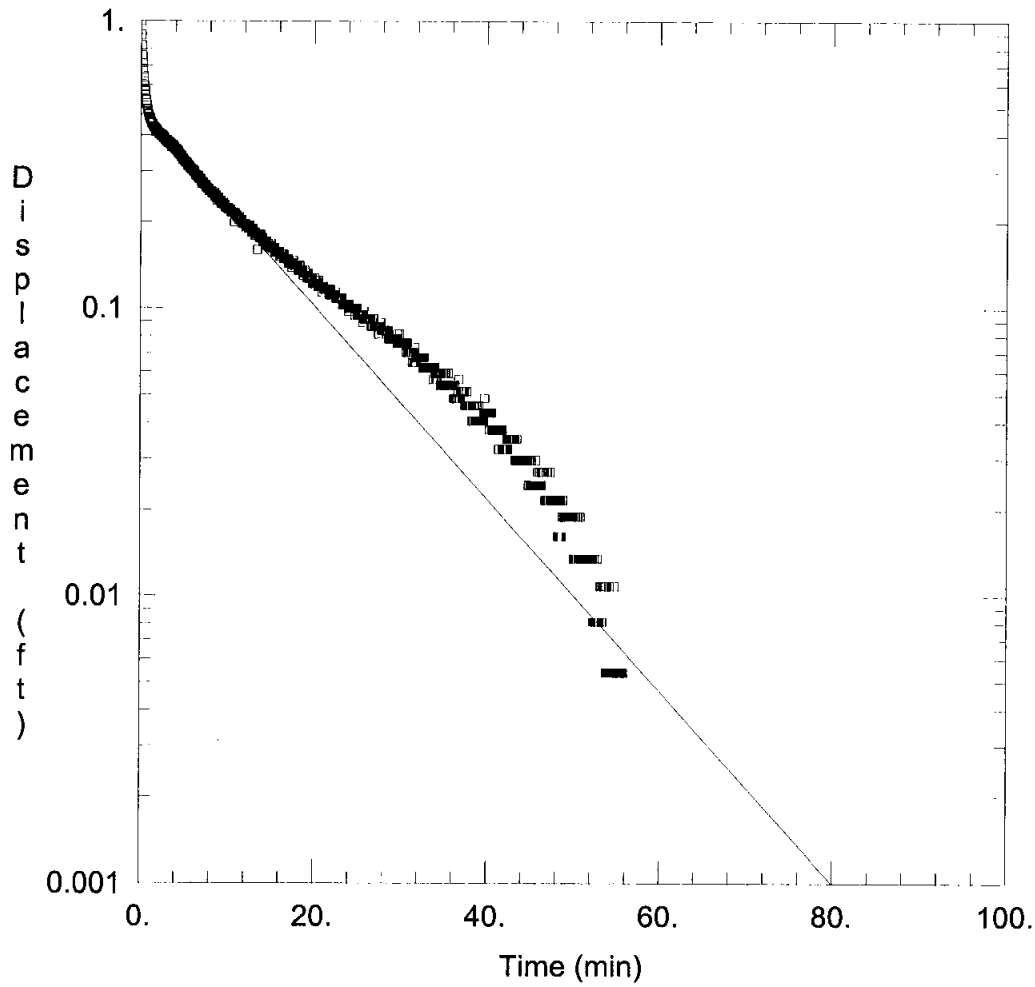
Design basis/references/assumptions:
Bouwer, H., & R.C. Rice. 1976. A slug test for determining hydraulic conductivity of unconfined aquifers with fully or partially penetrating wells. *Water Resources Research* 12:423-28.

Remarks/conclusions: THE RESULTS FOR MW-S4 ARE PROVIDED FOR QUALITATIVE USES ONLY.

Calculation Approved by: 3/1/04
Project Manager/Date

Revision No.:	Description of Revision:	Approved by:

N:\11172781.00000\EXCEL\SLDA Slug Tests\[Calc. Cover Sheet.xls]CCS1



WELL TEST ANALYSIS

Data Set: N:\11172781.00000\EXCEL\SLDA Slug Tests\MW-54r.aqt
Date: 03/01/04 Time: 09:17:30

PROJECT INFORMATION

Company: URS Corporation
Client: USACE
Project: 11173233
Test Location: SLDA

AQUIFER DATA

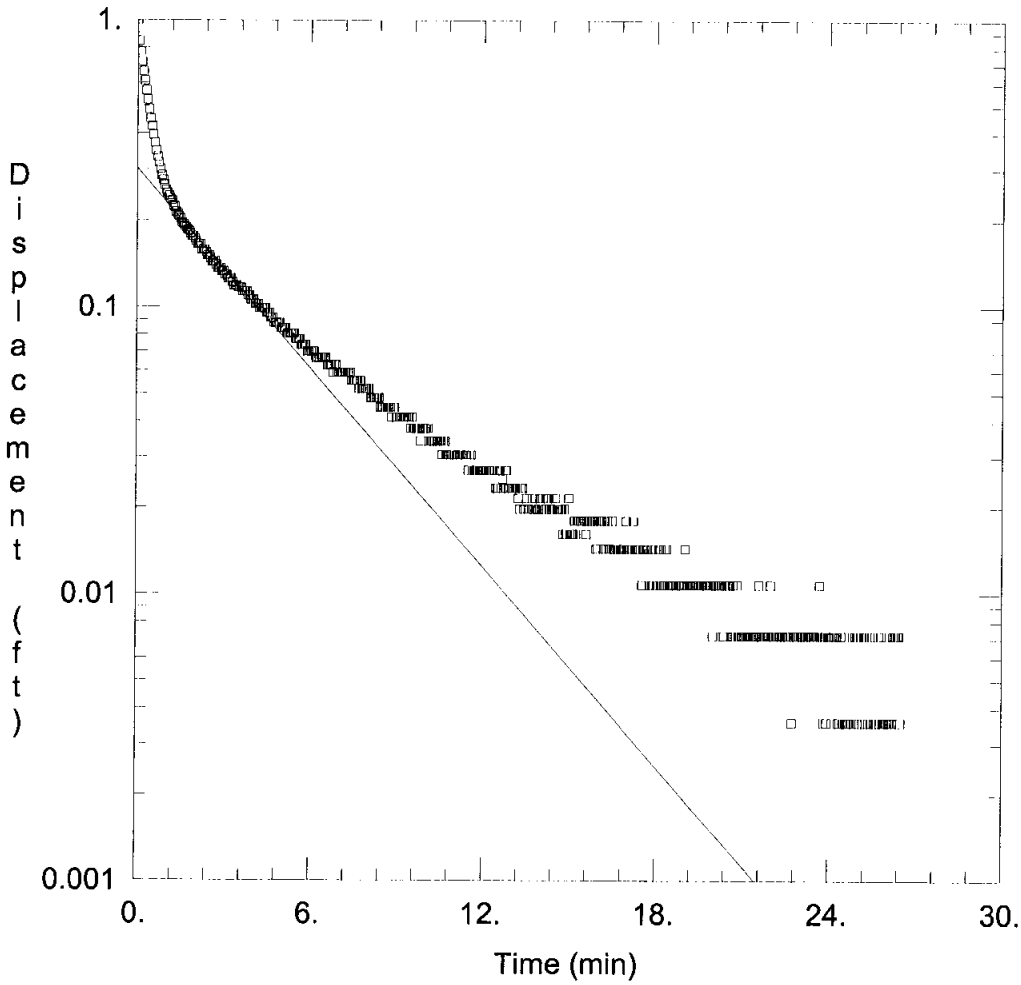
Saturated Thickness: 3.72 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-54r)

Initial Displacement: 1. ft
Wellbore Radius: 0.333 ft
Screen Length: 5. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.0833 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 1.86 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0003638 ft/min
y0 = 0.4768 ft



WELL TEST ANALYSIS

Data Set: N:\11172781.00000\EXCEL\SLDA Slug Tests\MW-56r.aqt
Date: 03/01/04 Time: 09:17:49

PROJECT INFORMATION

Company: URS Corporation
Client: USACE
Project: 11173233
Test Location: SLDA

AQUIFER DATA

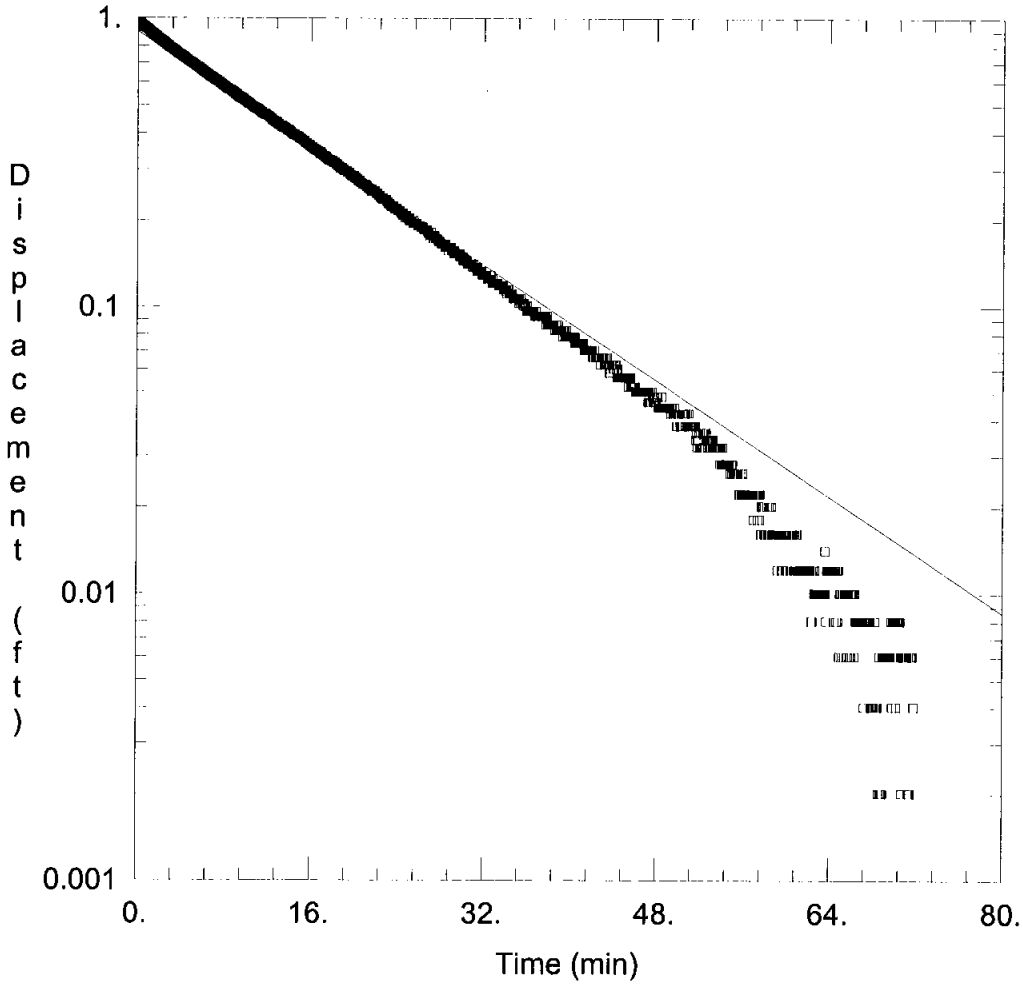
Saturated Thickness: 10.6 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-56r)

Initial Displacement: 1. ft
Wellbore Radius: 0.333 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.0833 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 5.3 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0009825 ft/min
y0 = 0.3014 ft



WELL TEST ANALYSIS

Data Set: N:\11172781.00000\EXCEL\SLDA Slug Tests\MW-59r.aqt
Date: 03/01/04 Time: 09:18:01

PROJECT INFORMATION

Company: URS Corporation
Client: USACE
Project: 11173233
Test Location: SLDA

AQUIFER DATA

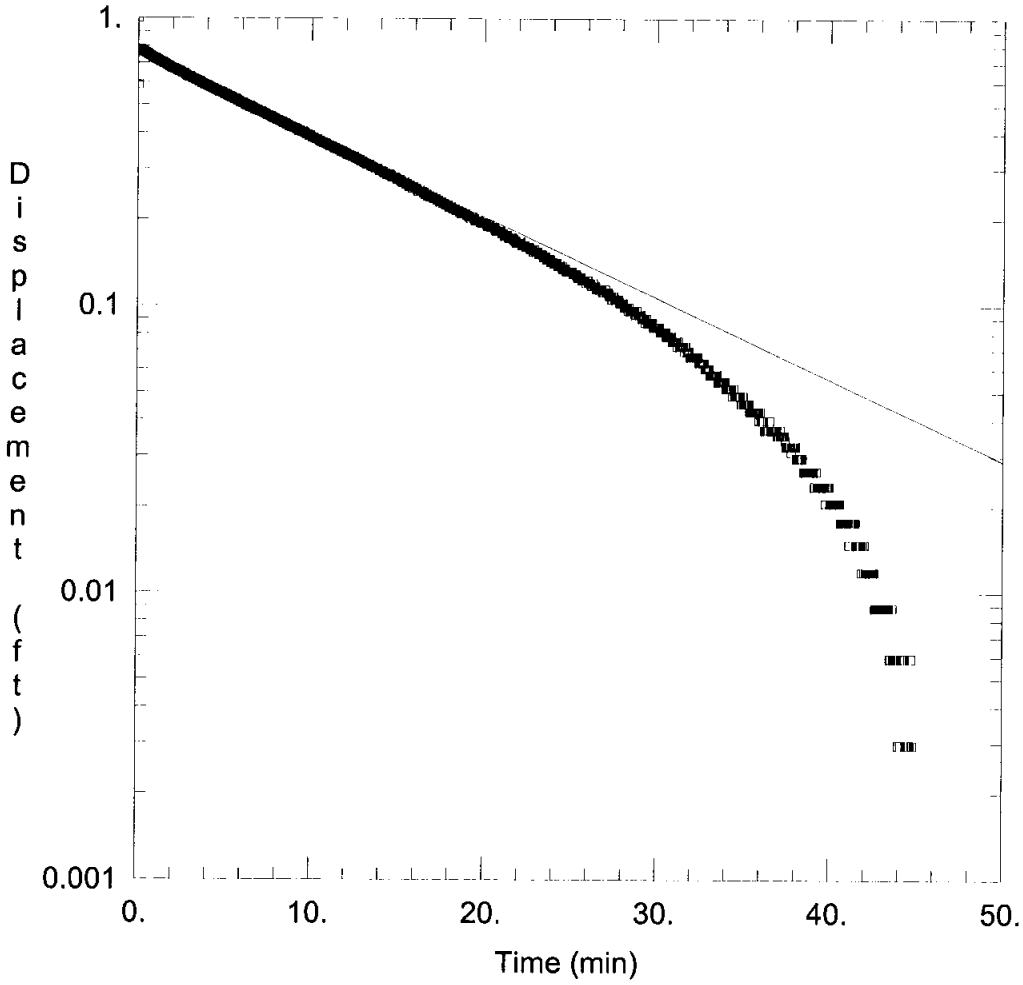
Saturated Thickness: 12.6 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-59r)

Initial Displacement: 1. ft
Wellbore Radius: 0.333 ft
Screen Length: 5. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.0833 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 6.3 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 7.102E-05 ft/min
y0 = 0.8969 ft



WELL TEST ANALYSIS

Data Set: N:\11172781.00000\EXCEL\SLDA Slug Tests\MW-59f.aqt
Date: 03/01/04 Time: 09:17:55

PROJECT INFORMATION

Company: URS Corporation
Client: USACE
Project: 11173233
Test Location: SLDA

AQUIFER DATA

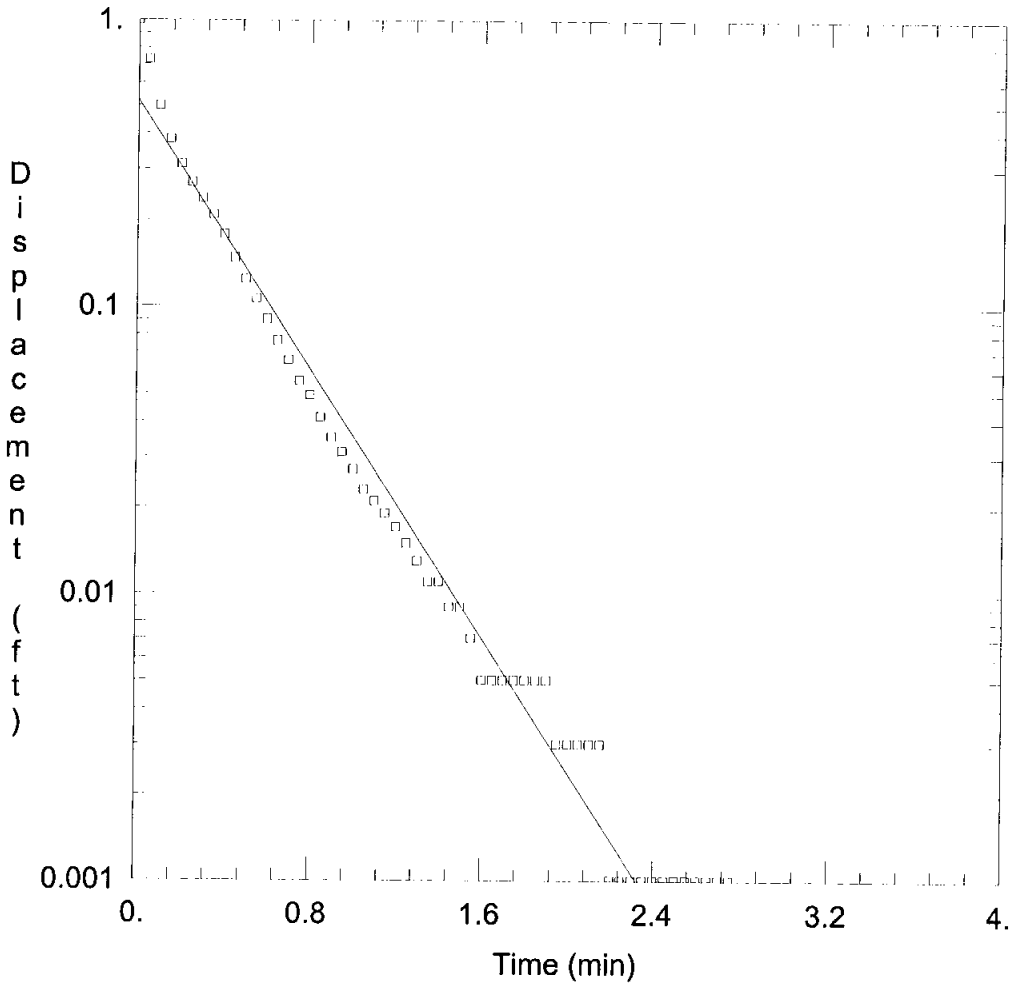
Saturated Thickness: 12.6 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-59f)

Initial Displacement: 1. ft
Wellbore Radius: 0.333 ft
Screen Length: 5. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.0833 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 6.3 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 7.955E-05 ft/min
y0 = 0.7482 ft



WELL TEST ANALYSIS

Data Set: N:\11172781.00000\EXCEL\SLDA Slug Tests\MW-64r.aqt
Date: 03/01/04 Time: 09:17:43

PROJECT INFORMATION

Company: URS Corporation
Client: USACE
Project: 11173233
Test Location: SLDA

AQUIFER DATA

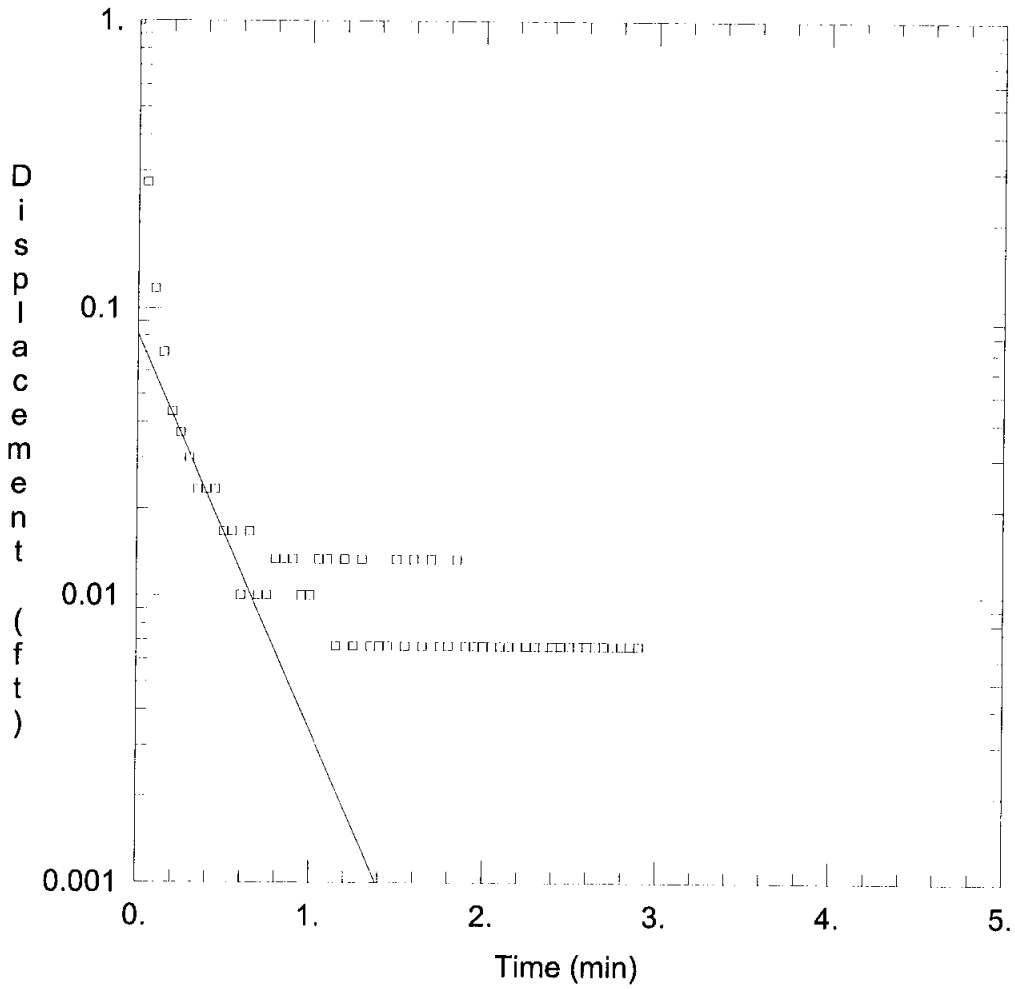
Saturated Thickness: 18.92 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-64r)

Initial Displacement: 1. ft
Wellbore Radius: 0.333 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.0833 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 9.46 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0113 ft/min
y0 = 0.5233 ft



WELL TEST ANALYSIS

Data Set: N:\11172781.00000\EXCEL\SLDA Slug Tests\MW-69r.aqt
Date: 03/01/04 Time: 09:18:06

PROJECT INFORMATION

Company: URS Corporation
Client: USACE
Project: 11173233
Test Location: SLDA

AQUIFER DATA

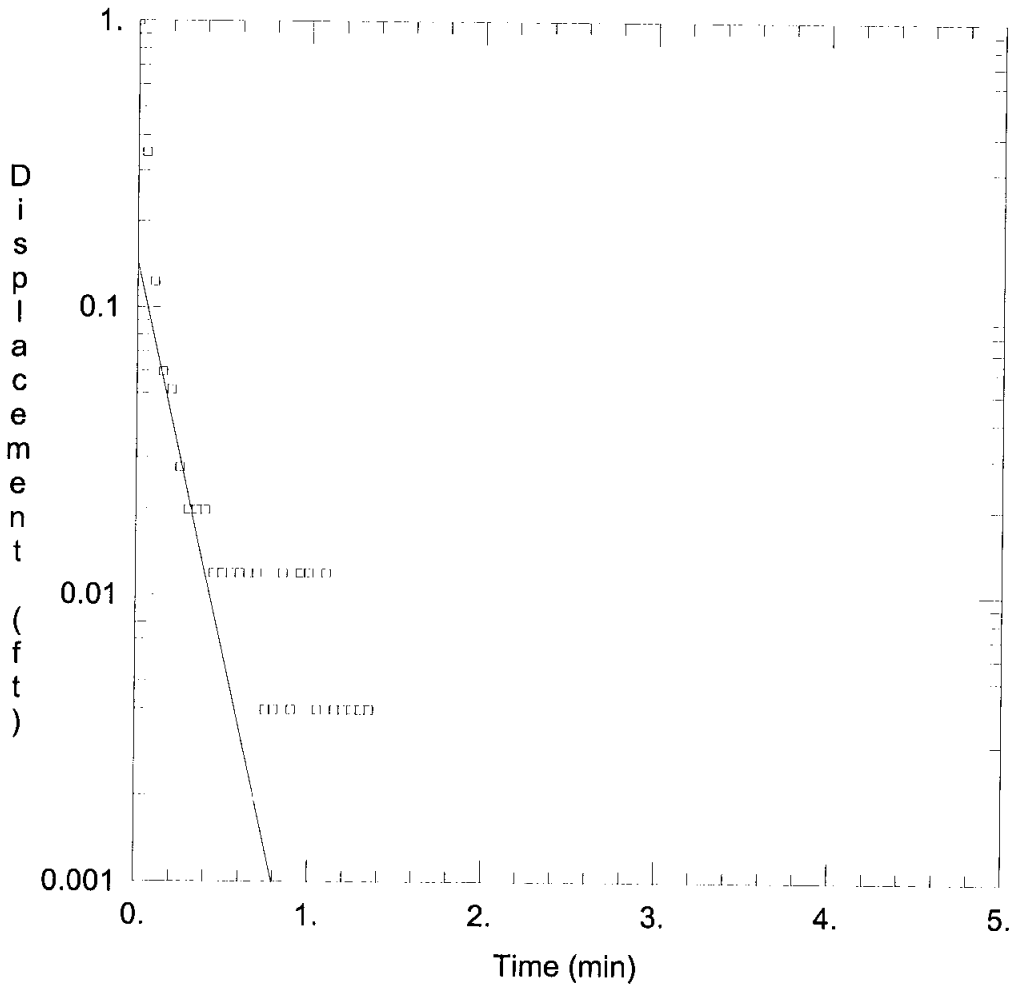
Saturated Thickness: 20.16 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-69r)

Initial Displacement: 1. ft
Wellbore Radius: 0.333 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.0833 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 10.08 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.00245 ft/min
y0 = 0.08109 ft



WELL TEST ANALYSIS

Data Set: N:\11172781.00000\EXCEL\SLDA Slug Tests\MW-69f.aqt
Date: 03/01/04 Time: 09:18:11

PROJECT INFORMATION

Company: URS Corporation
Client: USACE
Project: 11173233
Test Location: SLDA

AQUIFER DATA

Saturated Thickness: 20.16 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-69f)

Initial Displacement: 1. ft
Wellbore Radius: 0.333 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.0833 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 10.08 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.004827 ft/min
y0 = 0.1452 ft

URS CORPORATION, INC.

SLUG TEST FIELD DATA RECORDS

TEST #	Well	Max Displacement (ft)	Depth to Water (ft)	Total Depth (ft)	Height of Water Column (ft)	Aquifer Thickness (ft)	Screen Length (ft)	Top of Water above Top of Screen (Y/N)	Well Radius ~~(ft)~~	Borehole Radius ~~(ft)~~	Date of Test	
1	MW - 59		4.70	14.35	9.65		5	Y	2"	8"	12/17/03	2' slug
1	MW - 64		11.87	22.25	10.38		10	Y	2"	8"	12/18/03	
1	MW - 69		12.68	22.95	10.27		10	Y	2"	8"	12/18/03	
—	MW - 74		DRY						2"		NOT DONE	
—	MW - 47		DRY						2"		NOT DONE	
—	MW - 54		20.72	22.89	2.17		5	N	2"	8"	INSUFFICIENT WATER	
1	MW - 56		23.05	28.33	5.28		10	N	2"	8"	12/18/03	
	MW -											
2	MW - 69		12.70	22.95	10.25		10	Y	2"	8"	12/18/03	4' SLUG
3	MW - 69		12.70	22.95	11.11		10	Y	2"	8"	12/18/03	
	MW -											
2	MW - 64		11.84	22.25	10.41		10	Y	2"	8"	12/18/03	4' slug
	MW -											
	MW -											
	MW -											
	MW -											
	MW - DIDA BAIL DOWN TEST FOR MW-54,											
	MW - 54		20.76	22.89	2.13		5	N	2"	5"		
	MW -	REMOVED ~2 liters										
	MW -	INSERTED LOGGER										
	MW -	STARTED TEST										
	MW -	21.85 INITIAL WATER LEVEL										
	MW -	21.49 WHEN TEST STOPPED										
	MW -	SEE DATA FILE SLDA MW54-BAIL										
	MW -											
	MW -											
	MW -											
	MW -											
	MW -											
	MW -											
	MW -											
	MW -											
	MW -											
	MW -											
	MW -											
	MW -											
	MW -											
	MW -											

NOTES:

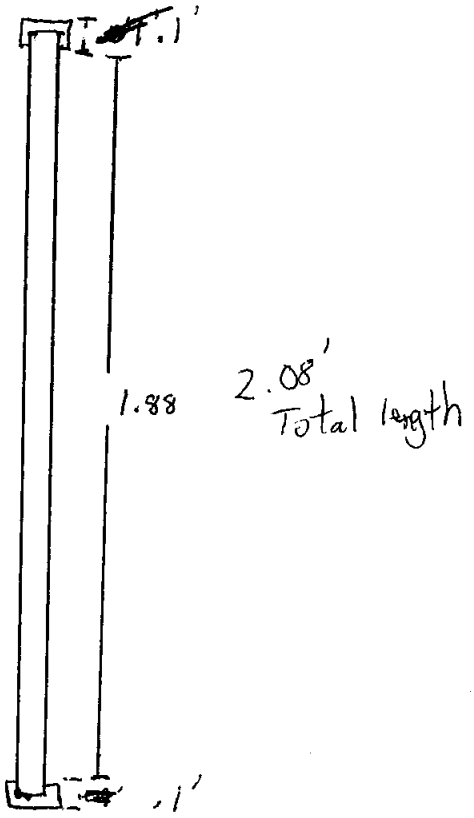
FILE NAMES: MW-59 - SLDA MW-59 in, SLDA MW-59 out
MW-64 - SLDA MW-64 in, SLDA MW-64 out, SLDA MW64 #2 in, SLDA MW64 #2 out
MW-69 - SLDA MW-69 in, SLDA MW69 out, SLDA MW69 #2 (4')
SLDA MW-69 #2 out, SLDA MW69 #3 in, SLDA MW69 #3 out
MW-56 - SLDA MW56 in, SLDA-MW56 out
*MW-54 - SLDA MW54 bail

SEE ATTACHED SHEET FOR SLUG DIMENSIONS.

SLDA SLUG TESTS

2' SLUG

USED ON TEST 1 FOR
MW-59, MW-64, MW-69
MW-56

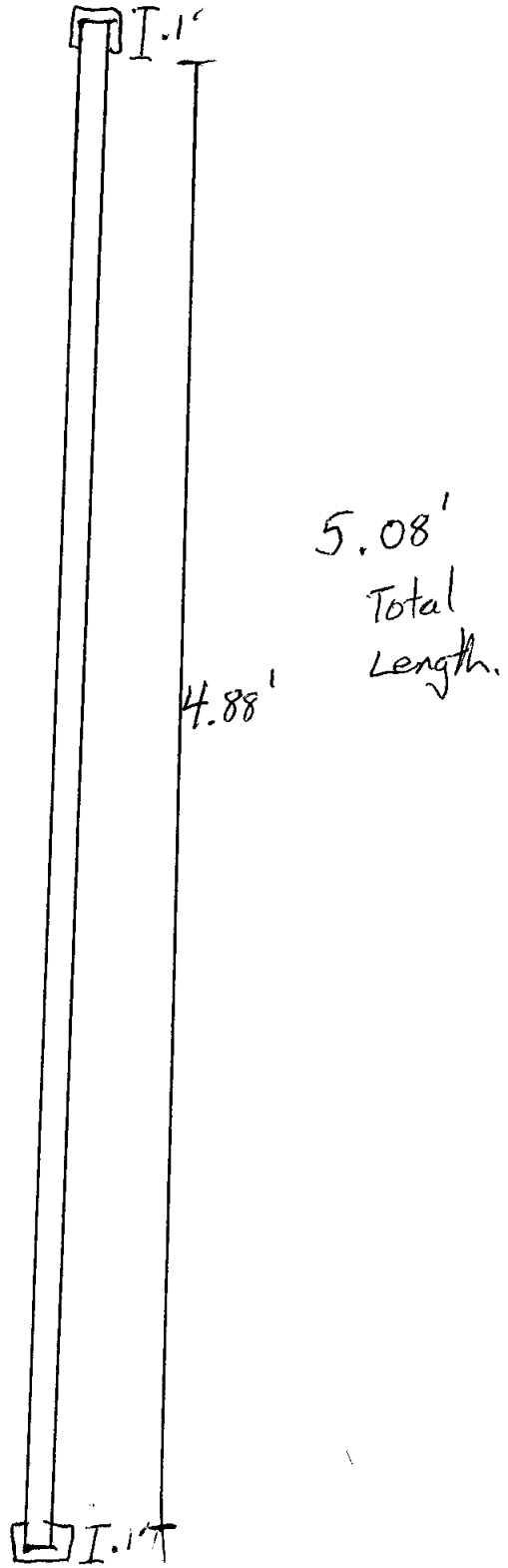


3/4" ID schedule 40 PVC
with End caps

~5' SLUG

USED ON TEST 2, MW-69
MW-64

AND TEST 3 MW-69



3/4" ID
Schedule 40 PVC
with end caps

APPENDIX H

GROUNDWATER ELEVATION DATA

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
01U13	475012.00	1460059.00	NA	NA	NA	SS	0						
PZ								05/24/93 0000	14.80		0.00		
PZ								08/01/93 0000	NM	-	NM	-	Dry
PZ								09/06/93 0000	14.75		0.00		
PZ								10/07/93 0000	NM	-	NM	-	Dry
PZ								11/11/93 0000	12.65		0.00		
PZ								12/22/93 0000	3.58		0.00		
PZ								02/21/94 0000	11.58		0.00		
PZ								03/24/94 0000	10.90		0.00		
PZ								04/19/94 0000	10.55		0.00		
PZ								05/23/94 0000	13.90		0.00		
PZ								07/29/94 0000	NM	-	NM	-	Dry
PZ								08/22/94 0000	14.80		0.00		
PZ								10/31/94 0000	14.77		0.00		
PZ								12/01/94 0000	12.23		0.00		
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	10.90		0.00		
PZ								04/11/95 0000	9.05		0.00		
PZ								05/05/95 0000	10.90		0.00		
PZ								07/10/95 0000	13.50		0.00		
PZ								08/01/95 0000	14.30		0.00		
PZ								09/11/95 0000	13.60		0.00		
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	14.30		0.00		
PZ								12/07/95 0000	NM	-	NM	-	Dry
PZ								01/17/96 0000	14.26		0.00		
PZ								05/17/99 0000	10.60		0.00		
01U17	474920.75	1460132.90	912.30	NA	917.06	SS	0						
PZ								05/24/93 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								08/01/93 0000	14.16	902.90	0.00	902.90	
PZ								09/06/93 0000	NM	-	NM	-	Dry
PZ								10/07/93 0000	NM	-	NM	-	Dry
PZ								11/11/93 0000	13.25	903.81	0.00	903.81	
PZ								12/22/93 0000	13.61	903.45	0.00	903.45	
PZ								02/21/94 0000	13.98	903.08	0.00	903.08	
PZ								03/24/94 0000	NM	-	NM	-	Dry
PZ								04/19/94 0000	NM	-	NM	-	Dry
PZ								05/23/94 0000	NM	-	NM	-	Dry
PZ								07/29/94 0000	NM	-	NM	-	Dry
PZ								08/22/94 0000	13.11	903.95	0.00	903.95	
PZ								10/31/94 0000	14.18	902.88	0.00	902.88	
PZ								12/01/94 0000	12.98	904.08	0.00	904.08	
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	NM	-	NM	-	Dry
PZ								04/11/95 0000	NM	-	NM	-	Dry
PZ								05/05/95 0000	12.58	904.48	0.00	904.48	
PZ								07/10/95 0000	NM	-	NM	-	Dry
PZ								08/01/95 0000	NM	-	NM	-	Dry
PZ								09/11/95 0000	NM	-	NM	-	Dry
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	NM	-	NM	-	Dry
PZ								12/07/95 0000	NM	-	NM	-	Dry
PZ								01/17/96 0000	NM	-	NM	-	Dry
PZ								11/25/03 0000	11.73	905.33	0.00	905.33	
PZ								01/11/04 0000	14.32	902.74	0.00	902.74	
PZ								06/07/04 0000	15.16	901.90	0.00	901.90	
01U29	474985.00	1460104.00	NA	NA	NA	SS	0						
PZ								05/24/93 0000	15.38		0.00		

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								08/01/93 0000	NM	-	NM	-	Dry
PZ								09/06/93 0000	NM	-	NM	-	Dry
PZ								10/07/93 0000	NM	-	NM	-	Dry
PZ								11/11/93 0000	12.88		0.00		
PZ								12/22/93 0000	14.20		0.00		
PZ								02/21/94 0000	13.68		0.00		
PZ								03/24/94 0000	11.70		0.00		
PZ								04/19/94 0000	11.10		0.00		
PZ								05/23/94 0000	NM	-	NM	-	Dry
PZ								07/29/94 0000	NM	-	NM	-	Dry
PZ								08/22/94 0000	15.73		0.00		
PZ								10/31/94 0000	17.22		0.00		
PZ								12/01/94 0000	13.75		0.00		
PZ								01/30/95 0000	17.27		0.00		
PZ								03/16/95 0000	11.15		0.00		
PZ								04/11/95 0000	10.73		0.00		
PZ								05/05/95 0000	12.46		0.00		
PZ								07/10/95 0000	NM	-	NM	-	Dry
PZ								08/01/95 0000	NM	-	NM	-	Dry
PZ								09/11/95 0000	NM	-	NM	-	Dry
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	NM	-	NM	-	Dry
PZ								12/07/95 0000	16.00		0.00		
PZ								01/17/96 0000	16.42		0.00		
02U11	474863.23	1460294.30	920.70	NA	925.99	SS	0						
PZ								05/24/93 0000	20.55	905.44	0.00	905.44	
PZ								08/01/93 0000	NM	-	NM	-	Dry
PZ								09/06/93 0000	NM	-	NM	-	Dry
PZ								10/07/93 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								11/11/93 0000	20.78	905.21	0.00	905.21	
PZ								12/22/93 0000	NM	-	NM	-	Dry
PZ								02/21/94 0000	NM	-	NM	-	Dry
PZ								03/24/94 0000	20.36	905.63	0.00	905.63	
PZ								04/19/94 0000	20.11	905.88	0.00	905.88	
PZ								05/23/94 0000	NM	-	NM	-	Dry
PZ								07/29/94 0000	NM	-	NM	-	Dry
PZ								08/22/94 0000	NM	-	NM	-	Dry
PZ								10/31/94 0000	21.05	904.94	0.00	904.94	
PZ								12/01/94 0000	NM	-	NM	-	Dry
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	NM	-	NM	-	Dry
PZ								04/11/95 0000	NM	-	NM	-	Dry
PZ								05/05/95 0000	NM	-	NM	-	Dry
PZ								07/10/95 0000	NM	-	NM	-	Dry
PZ								08/01/95 0000	NM	-	NM	-	Dry
PZ								09/11/95 0000	NM	-	NM	-	Dry
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	NM	-	NM	-	Dry
PZ								12/07/95 0000	NM	-	NM	-	Dry
PZ								01/17/96 0000	NM	-	NM	-	Dry
PZ								05/17/99 0000	10.00	915.99	0.00	915.99	
PZ								11/25/03 0000	19.78	906.21	0.00	906.21	
PZ								01/11/04 0000	20.41	905.58	0.00	905.58	
PZ								06/07/04 0000	21.95	904.04	0.00	904.04	
02U13	474875.66	1460324.19	921.00	NA	923.45	SS	0						
PZ								05/24/93 0000	7.45	916.00	0.00	916.00	
PZ								08/01/93 0000	9.46	913.99	0.00	913.99	
PZ								09/06/93 0000	9.00	914.45	0.00	914.45	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								10/07/93 0000	8.44	915.01	0.00	915.01	
PZ								11/11/93 0000	8.00	915.45	0.00	915.45	
PZ								12/22/93 0000	9.88	913.57	0.00	913.57	
PZ								02/21/94 0000	8.27	915.18	0.00	915.18	
PZ								03/24/94 0000	8.00	915.45	0.00	915.45	
PZ								04/19/94 0000	8.88	914.57	0.00	914.57	
PZ								05/23/94 0000	10.00	913.45	0.00	913.45	
PZ								07/29/94 0000	10.35	913.10	0.00	913.10	
PZ								08/22/94 0000	8.00	915.45	0.00	915.45	
PZ								10/31/94 0000	10.30	913.15	0.00	913.15	
PZ								12/01/94 0000	10.00	913.45	0.00	913.45	
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	NM	-	NM	-	Dry
PZ								04/11/95 0000	9.82	913.63	0.00	913.63	
PZ								05/05/95 0000	8.94	914.51	0.00	914.51	
PZ								07/10/95 0000	10.00	913.45	0.00	913.45	
PZ								08/01/95 0000	10.40	913.05	0.00	913.05	
PZ								09/11/95 0000	11.00	912.45	0.00	912.45	
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	10.48	912.97	0.00	912.97	
PZ								12/07/95 0000	9.00	914.45	0.00	914.45	
PZ								01/17/96 0000	10.10	913.35	0.00	913.35	
PZ								11/25/03 0000	NM	-	NM	-	
PZ								01/11/04 0000	10.30	913.15	0.00	913.15	
PZ								06/07/04 0000	12.23	911.22	0.00	911.22	
03U05	474911.30	1460475.84	919.60	NA	924.1	SS	0						
PZ								05/24/93 0000	13.53	910.57	0.00	910.57	
PZ								08/01/93 0000	13.56	910.54	0.00	910.54	
PZ								09/06/93 0000	13.17	910.93	0.00	910.93	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								10/07/93 0000	NM	-	NM	-	Dry
PZ								11/11/93 0000	NM	-	NM	-	Dry
PZ								12/22/93 0000	NM	-	NM	-	Dry
PZ								02/21/94 0000	NM	-	NM	-	Dry
PZ								03/24/94 0000	NM	-	NM	-	Dry
PZ								04/19/94 0000	NM	-	NM	-	Dry
PZ								05/23/94 0000	NM	-	NM	-	Dry
PZ								07/29/94 0000	NM	-	NM	-	Dry
PZ								08/22/94 0000	NM	-	NM	-	Dry
PZ								10/31/94 0000	13.70	910.40	0.00	910.40	
PZ								12/01/94 0000	NM	-	NM	-	Dry
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	12.96	911.14	0.00	911.14	
PZ								04/11/95 0000	NM	-	NM	-	Dry
PZ								05/05/95 0000	NM	-	NM	-	Dry
PZ								07/10/95 0000	NM	-	NM	-	Dry
PZ								08/01/95 0000	NM	-	NM	-	Dry
PZ								09/11/95 0000	NM	-	NM	-	Dry
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	NM	-	NM	-	Dry
PZ								12/07/95 0000	NM	-	NM	-	Dry
PZ								01/17/96 0000	NM	-	NM	-	Dry
PZ								11/25/03 0000	10.49	913.61	0.00	913.61	
PZ								01/11/04 0000	13.05	911.05	0.00	911.05	
PZ								06/07/04 0000	12.31	911.79	0.00	911.79	
05U07	474769.43	1460714.57	935.10	NA	NA	SS	0						
PZ								05/24/93 0000	3.71		0.00		
PZ								08/01/93 0000	6.68		0.00		
PZ								09/06/93 0000	7.00		0.00		

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								10/07/93 0000	7.36		0.00		
PZ								11/11/93 0000	6.10		0.00		
PZ								12/22/93 0000	NM	-	NM	-	Dry
PZ								02/21/94 0000	NM	-	NM	-	Dry
PZ								03/24/94 0000	3.00		0.00		
PZ								04/19/94 0000	3.00		0.00		
PZ								05/23/94 0000	5.00		0.00		
PZ								07/29/94 0000	6.50		0.00		
PZ								08/22/94 0000	7.13		0.00		
PZ								10/31/94 0000	6.00		0.00		
PZ								12/01/94 0000	11.64		0.00		
PZ								01/30/95 0000	4.35		0.00		
PZ								03/16/95 0000	3.31		0.00		
PZ								04/11/95 0000	3.00		0.00		
PZ								05/05/95 0000	3.43		0.00		
PZ								07/10/95 0000	5.00		0.00		
PZ								08/01/95 0000	5.30		0.00		
PZ								09/11/95 0000	5.10		0.00		
PZ								10/04/95 0000	7.00		0.00		
PZ								11/06/95 0000	5.30		0.00		
PZ								12/07/95 0000	7.00		0.00		
PZ								01/17/96 0000	5.27		0.00		
PZ								05/17/99 0000	10.58		0.00		
06U05	474752.61	1460622.86	935.90	NA	941.26	SS	0						
PZ								05/24/93 0000	8.72	932.54	0.00	932.54	
PZ								08/01/93 0000	12.46	928.80	0.00	928.80	
PZ								09/06/93 0000	12.71	928.55	0.00	928.55	
PZ								10/07/93 0000	13.27	927.99	0.00	927.99	
PZ								11/11/93 0000	13.00	928.26	0.00	928.26	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								12/22/93 0000	10.68	930.58	0.00	930.58	
PZ								02/21/94 0000	2.72	938.54	0.00	938.54	
PZ								03/24/94 0000	7.45	933.81	0.00	933.81	
PZ								04/19/94 0000	7.50	933.76	0.00	933.76	
PZ								05/23/94 0000	10.57	930.69	0.00	930.69	
PZ								07/29/94 0000	12.35	928.91	0.00	928.91	
PZ								08/22/94 0000	11.64	929.62	0.00	929.62	
PZ								10/31/94 0000	13.05	928.21	0.00	928.21	
PZ								12/01/94 0000	5.00	936.26	0.00	936.26	
PZ								01/30/95 0000	13.58	927.68	0.00	927.68	
PZ								03/16/95 0000	8.00	933.26	0.00	933.26	
PZ								04/11/95 0000	8.33	932.93	0.00	932.93	
PZ								05/05/95 0000	9.25	932.01	0.00	932.01	
PZ								07/10/95 0000	10.00	931.26	0.00	931.26	
PZ								08/01/95 0000	11.00	930.26	0.00	930.26	
PZ								09/11/95 0000	14.40	926.86	0.00	926.86	
PZ								10/04/95 0000	13.00	928.26	0.00	928.26	
PZ								11/06/95 0000	11.80	929.46	0.00	929.46	
PZ								12/07/95 0000	12.85	928.41	0.00	928.41	
PZ								01/17/96 0000	11.00	930.26	0.00	930.26	
PZ								05/17/99 0000	10.00	931.26	0.00	931.26	
PZ								11/25/03 0000	7.48	933.78	0.00	933.78	
PZ								01/11/04 0000	7.90	933.36	0.00	933.36	
PZ								06/07/04 0000	8.89	932.37	0.00	932.37	
07U05	474753.00	1460566.00	NA	NA	NA	SS	0						
PZ								05/24/93 0000	3.56		0.00		
PZ								08/01/93 0000	7.49		0.00		
PZ								09/06/93 0000	7.80		0.00		
PZ								10/07/93 0000	8.29		0.00		

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								11/11/93 0000	8.00		0.00		
PZ								12/22/93 0000	6.00		0.00		
PZ								02/21/94 0000	7.60		0.00		
PZ								03/24/94 0000	2.60		0.00		
PZ								04/19/94 0000	2.50		0.00		
PZ								05/23/94 0000	5.25		0.00		
PZ								07/29/94 0000	7.28		0.00		
PZ								08/22/94 0000	7.00		0.00		
PZ								10/31/94 0000	7.98		0.00		
PZ								12/01/94 0000	7.00		0.00		
PZ								01/30/95 0000	10.62		0.00		
PZ								03/16/95 0000	3.40		0.00		
PZ								04/11/95 0000	9.61		0.00		
PZ								05/05/95 0000	4.35		0.00		
PZ								07/10/95 0000	5.10		0.00		
PZ								08/01/95 0000	6.00		0.00		
PZ								09/11/95 0000	12.70		0.00		
PZ								10/04/95 0000	8.00		0.00		
PZ								11/06/95 0000	6.00		0.00		
PZ								12/07/95 0000	7.73		0.00		
PZ								01/17/96 0000	5.89		0.00		
PZ								05/17/99 0000	5.00		0.00		
08U04	474684.62	1460511.98	933.70	NA	938.94	SS	0						
PZ								05/24/93 0000	10.06	928.88	0.00	928.88	
PZ								08/01/93 0000	15.43	923.51	0.00	923.51	
PZ								09/06/93 0000	15.47	923.47	0.00	923.47	
PZ								10/07/93 0000	NM	-	NM	-	Dry
PZ								11/11/93 0000	13.57	925.37	0.00	925.37	
PZ								12/22/93 0000	12.78	926.16	0.00	926.16	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								02/21/94 0000	9.60	929.34	0.00	929.34	
PZ								03/24/94 0000	8.33	930.61	0.00	930.61	
PZ								04/19/94 0000	8.28	930.66	0.00	930.66	
PZ								05/23/94 0000	12.41	926.53	0.00	926.53	
PZ								07/29/94 0000	16.30	922.64	0.00	922.64	
PZ								08/22/94 0000	12.61	926.33	0.00	926.33	
PZ								10/31/94 0000	15.80	923.14	0.00	923.14	
PZ								12/01/94 0000	13.00	925.94	0.00	925.94	
PZ								01/30/95 0000	10.63	928.31	0.00	928.31	
PZ								03/16/95 0000	8.65	930.29	0.00	930.29	
PZ								04/11/95 0000	NM	-	NM	-	Dry
PZ								05/05/95 0000	10.00	928.94	0.00	928.94	
PZ								07/10/95 0000	11.80	927.14	0.00	927.14	
PZ								08/01/95 0000	13.30	925.64	0.00	925.64	
PZ								09/11/95 0000	16.60	922.34	0.00	922.34	
PZ								10/04/95 0000	16.00	922.94	0.00	922.94	
PZ								11/06/95 0000	13.39	925.55	0.00	925.55	
PZ								12/07/95 0000	14.50	924.44	0.00	924.44	
PZ								01/17/96 0000	13.30	925.64	0.00	925.64	
PZ								05/17/99 0000	11.47	927.47	0.00	927.47	
PZ								11/25/03 0000	NM	-	NM	-	
PZ								01/11/04 0000	NM	-	NM	-	No Access
PZ								06/07/04 0000	NM	-	NM	-	
08U05	474666.12	1460498.62	935.40	NA	940.93	SS	0						
PZ								05/24/93 0000	12.16	928.77	0.00	928.77	
PZ								08/01/93 0000	16.64	924.29	0.00	924.29	
PZ								09/06/93 0000	16.73	924.20	0.00	924.20	
PZ								10/07/93 0000	16.27	924.66	0.00	924.66	
PZ								11/11/93 0000	13.26	927.67	0.00	927.67	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								12/22/93 0000	15.39	925.54	0.00	925.54	
PZ								02/21/94 0000	11.48	929.45	0.00	929.45	
PZ								03/24/94 0000	11.00	929.93	0.00	929.93	
PZ								04/19/94 0000	10.40	930.53	0.00	930.53	
PZ								05/23/94 0000	14.50	926.43	0.00	926.43	
PZ								07/29/94 0000	15.18	925.75	0.00	925.75	
PZ								08/22/94 0000	12.63	928.30	0.00	928.30	
PZ								10/31/94 0000	16.78	924.15	0.00	924.15	
PZ								12/01/94 0000	14.82	926.11	0.00	926.11	
PZ								01/30/95 0000	12.60	928.33	0.00	928.33	
PZ								03/16/95 0000	10.93	930.00	0.00	930.00	
PZ								04/11/95 0000	13.76	927.17	0.00	927.17	
PZ								05/05/95 0000	11.00	929.93	0.00	929.93	
PZ								07/10/95 0000	14.00	926.93	0.00	926.93	
PZ								08/01/95 0000	15.30	925.63	0.00	925.63	
PZ								09/11/95 0000	15.40	925.53	0.00	925.53	
PZ								10/04/95 0000	17.00	923.93	0.00	923.93	
PZ								11/06/95 0000	15.36	925.57	0.00	925.57	
PZ								12/07/95 0000	17.00	923.93	0.00	923.93	
PZ								01/17/96 0000	15.00	925.93	0.00	925.93	
PZ								11/25/03 0000	8.63	932.30	0.00	932.30	
PZ								01/11/04 0000	15.47	925.46	0.00	925.46	
PZ								06/07/04 0000	11.9	929.03	0.00	929.03	
09U07	474868.01	1460442.05	923.90	NA	927.69	SS	0						
PZ								05/24/93 0000	17.94	909.75	0.00	909.75	
PZ								08/01/93 0000	NM	-	NM	-	Dry
PZ								09/06/93 0000	NM	-	NM	-	Dry
PZ								10/07/93 0000	NM	-	NM	-	Dry
PZ								11/11/93 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								12/22/93 0000	12.47	915.22	0.00	915.22	
PZ								02/21/94 0000	5.81	921.88	0.00	921.88	
PZ								03/24/94 0000	NM	-	NM	-	Dry
PZ								04/19/94 0000	NM	-	NM	-	Dry
PZ								05/23/94 0000	NM	-	NM	-	Dry
PZ								07/29/94 0000	NM	-	NM	-	Dry
PZ								08/22/94 0000	4.59	923.10	0.00	923.10	
PZ								10/31/94 0000	18.90	908.79	0.00	908.79	
PZ								12/01/94 0000	11.71	915.98	0.00	915.98	
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	NM	-	NM	-	Dry
PZ								04/11/95 0000	NM	-	NM	-	Dry
PZ								05/05/95 0000	NM	-	NM	-	Dry
PZ								07/10/95 0000	NM	-	NM	-	Dry
PZ								08/01/95 0000	NM	-	NM	-	Dry
PZ								09/11/95 0000	NM	-	NM	-	Dry
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	NM	-	NM	-	Dry
PZ								12/07/95 0000	NM	-	NM	-	Dry
PZ								01/17/96 0000	NM	-	NM	-	Dry
PZ								11/25/03 0000	19.86	907.83	0.00	907.83	
10L18	475393.00	1459295.00	NA	NA	NA	UF	0						
PZ								05/24/93 0000	26.24		0.00		
PZ								08/01/93 0000	26.47		0.00		
PZ								09/06/93 0000	25.60		0.00		
PZ								10/07/93 0000	25.55		0.00		
PZ								11/11/93 0000	26.20		0.00		
PZ								12/22/93 0000	26.20		0.00		
PZ								02/21/94 0000	25.00		0.00		

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								03/24/94 0000	25.83		0.00		
PZ								04/19/94 0000	24.74		0.00		
PZ								05/23/94 0000	NM	-	NM	-	Dry
PZ								07/29/94 0000	NM	-	NM	-	Dry
PZ								08/22/94 0000	26.10		0.00		
PZ								10/31/94 0000	26.30		0.00		
PZ								12/01/94 0000	26.48		0.00		
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	26.16		0.00		
PZ								04/11/95 0000	26.20		0.00		
PZ								05/05/95 0000	21.63		0.00		
PZ								07/10/95 0000	25.70		0.00		
PZ								08/01/95 0000	26.30		0.00		
PZ								09/11/95 0000	26.20		0.00		
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	26.30		0.00		
PZ								12/07/95 0000	27.00		0.00		
PZ								01/17/96 0000	26.30		0.00		
PZ								05/17/99 0000	26.10		0.00		
10L19	475496.00	1459449.00	NA	NA	NA	UF	0						
PZ								05/24/93 0000	19.47		0.00		
PZ								08/01/93 0000	20.18		0.00		
PZ								09/06/93 0000	20.15		0.00		
PZ								10/07/93 0000	19.07		0.00		
PZ								11/11/93 0000	19.26		0.00		
PZ								12/22/93 0000	19.45		0.00		
PZ								02/21/94 0000	19.00		0.00		
PZ								03/24/94 0000	19.00		0.00		
PZ								04/19/94 0000	19.30		0.00		

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								05/23/94 0000	19.61		0.00		
PZ								07/29/94 0000	20.00		0.00		
PZ								08/22/94 0000	19.82		0.00		
PZ								10/31/94 0000	19.87		0.00		
PZ								12/01/94 0000	19.40		0.00		
PZ								01/30/95 0000	22.16		0.00		
PZ								03/16/95 0000	19.25		0.00		
PZ								04/11/95 0000	19.34		0.00		
PZ								05/05/95 0000	15.73		0.00		
PZ								07/10/95 0000	19.60		0.00		
PZ								08/01/95 0000	19.70		0.00		
PZ								09/11/95 0000	20.30		0.00		
PZ								10/04/95 0000	20.66		0.00		
PZ								11/06/95 0000	19.70		0.00		
PZ								12/07/95 0000	19.74		0.00		
PZ								01/17/96 0000	20.00		0.00		
10L23	475571.00	1459573.00	NA	NA	NA	UF	0						
PZ								05/24/93 0000	15.95		0.00		
PZ								08/01/93 0000	16.65		0.00		
PZ								09/06/93 0000	16.66		0.00		
PZ								10/07/93 0000	16.56		0.00		
PZ								11/11/93 0000	15.71		0.00		
PZ								12/22/93 0000	16.00		0.00		
PZ								02/21/94 0000	15.30		0.00		
PZ								03/24/94 0000	15.47		0.00		
PZ								04/19/94 0000	15.83		0.00		
PZ								05/23/94 0000	16.00		0.00		
PZ								07/29/94 0000	16.52		0.00		
PZ								08/22/94 0000	16.00		0.00		

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								10/31/94 0000	16.30		0.00		
PZ								12/01/94 0000	15.90		0.00		
PZ								01/30/95 0000	19.34		0.00		
PZ								03/16/95 0000	15.83		0.00		
PZ								04/11/95 0000	16.40		0.00		
PZ								05/05/95 0000	15.12		0.00		
PZ								07/10/95 0000	16.00		0.00		
PZ								08/01/95 0000	16.20		0.00		
PZ								09/11/95 0000	19.30		0.00		
PZ								10/04/95 0000	17.00		0.00		
PZ								11/06/95 0000	16.20		0.00		
PZ								12/07/95 0000	16.30		0.00		
PZ								01/17/96 0000	16.80		0.00		
10L30	475314.21	1459214.16	861.60	864.38	864.38	UF	0						
PZ								08/01/93 0000	NM	-	NM	-	Dry
PZ								09/06/93 0000	NM	-	NM	-	Dry
PZ								10/07/93 0000	24.21	840.17	0.00	840.17	
PZ								11/11/93 0000	23.82	840.56	0.00	840.56	
PZ								12/22/93 0000	10.40	853.98	0.00	853.98	
PZ								02/21/94 0000	22.68	841.70	0.00	841.70	
PZ								03/24/94 0000	23.79	840.59	0.00	840.59	
PZ								04/19/94 0000	24.42	839.96	0.00	839.96	
PZ								05/23/94 0000	NM	-	NM	-	Dry
PZ								07/29/94 0000	NM	-	NM	-	Dry
PZ								08/22/94 0000	NM	-	NM	-	Dry
PZ								10/31/94 0000	24.80	839.58	0.00	839.58	
PZ								12/01/94 0000	24.35	840.03	0.00	840.03	
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	26.09	838.29	0.00	838.29	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								04/11/95 0000	NM	-	NM	-	Dry
PZ								05/05/95 0000	23.41	840.97	0.00	840.97	
PZ								07/10/95 0000	NM	-	NM	-	Dry
PZ								08/01/95 0000	24.90	839.48	0.00	839.48	
PZ								09/11/95 0000	NM	-	NM	-	Dry
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	24.80	839.58	0.00	839.58	
PZ								12/07/95 0000	NM	-	NM	-	Dry
PZ								01/17/96 0000	24.91	839.47	0.00	839.47	
PZ								01/11/04 0000	24.71	839.67	0.00	839.67	
PZ								06/07/04 0000	24.74	839.64	0.00	839.64	
10L31	475611.15	1459495.75	857.00	859.84	859.84	UF	0						
PZ								08/01/93 0000	22.23	837.61	0.00	837.61	
PZ								09/06/93 0000	22.13	837.71	0.00	837.71	
PZ								10/07/93 0000	22.23	837.61	0.00	837.61	
PZ								11/11/93 0000	21.10	838.74	0.00	838.74	
PZ								12/22/93 0000	21.38	838.46	0.00	838.46	
PZ								02/21/94 0000	20.62	839.22	0.00	839.22	
PZ								03/24/94 0000	20.88	838.96	0.00	838.96	
PZ								04/19/94 0000	20.77	839.07	0.00	839.07	
PZ								05/23/94 0000	21.69	838.15	0.00	838.15	
PZ								07/29/94 0000	22.14	837.70	0.00	837.70	
PZ								08/22/94 0000	21.45	838.39	0.00	838.39	
PZ								10/31/94 0000	22.00	837.84	0.00	837.84	
PZ								12/01/94 0000	10.23	849.61	0.00	849.61	
PZ								01/30/95 0000	25.21	834.63	0.00	834.63	
PZ								03/16/95 0000	21.53	838.31	0.00	838.31	
PZ								04/11/95 0000	21.65	838.19	0.00	838.19	
PZ								05/05/95 0000	10.48	849.36	0.00	849.36	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								07/10/95 0000	21.70	838.14	0.00	838.14	
PZ								08/01/95 0000	22.00	837.84	0.00	837.84	
PZ								09/11/95 0000	23.00	836.84	0.00	836.84	
PZ								10/04/95 0000	22.82	837.02	0.00	837.02	
PZ								11/06/95 0000	24.11	835.73	0.00	835.73	
PZ								12/07/95 0000	22.00	837.84	0.00	837.84	
PZ								01/17/96 0000	22.70	837.14	0.00	837.14	
PZ								05/17/99 0000	22.00	837.84	0.00	837.84	
PZ								01/11/04 0000	21.97	837.87	0.00	837.87	
PZ								06/07/04 0000	22.32	837.52	0.00	837.52	
10L32	475637.54	1459665.53	845.50	848.69	848.69	UF	0						
PZ								08/01/93 0000	11.18	837.51	0.00	837.51	
PZ								09/06/93 0000	11.00	837.69	0.00	837.69	
PZ								10/07/93 0000	NM	-	NM	-	Dry
PZ								11/11/93 0000	NM	-	NM	-	Dry
PZ								12/22/93 0000	NM	-	NM	-	Dry
PZ								02/21/94 0000	9.77	838.92	0.00	838.92	
PZ								03/24/94 0000	10.00	838.69	0.00	838.69	
PZ								04/19/94 0000	9.80	838.89	0.00	838.89	
PZ								05/23/94 0000	10.86	837.83	0.00	837.83	
PZ								07/29/94 0000	11.33	837.36	0.00	837.36	
PZ								08/22/94 0000	10.40	838.29	0.00	838.29	
PZ								10/31/94 0000	11.20	837.49	0.00	837.49	
PZ								12/01/94 0000	103.34	745.35	0.00	745.35	
PZ								01/30/95 0000	12.46	836.23	0.00	836.23	
PZ								03/16/95 0000	10.64	838.05	0.00	838.05	
PZ								04/11/95 0000	81.61	767.08	0.00	767.08	
PZ								05/05/95 0000	4.83	843.86	0.00	843.86	
PZ								07/10/95 0000	10.80	837.89	0.00	837.89	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								08/01/95 0000	11.10	837.59	0.00	837.59	
PZ								09/11/95 0000	11.10	837.59	0.00	837.59	
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	11.10	837.59	0.00	837.59	
PZ								12/07/95 0000	11.00	837.69	0.00	837.69	
PZ								01/17/96 0000	11.90	836.79	0.00	836.79	
PZ								05/17/99 0000	11.00	837.69	0.00	837.69	
PZ								01/11/04 0000	10.64	838.05	0.00	838.05	
PZ								06/07/04 0000	10.75	837.94	0.00	837.94	
MW-01	475701.63	1459639.30	843.50	845.79	845.32	UF	0						
MNW								07/02/90 0000	8.27	837.05	0.00	837.05	
MNW								01/23/91 0000	7.95	837.37	0.00	837.37	
MNW								02/18/91 0000	7.99	837.33	0.00	837.33	
MNW								03/25/91 0000	8.14	837.18	0.00	837.18	
MNW								04/29/91 0000	8.14	837.18	0.00	837.18	
MNW								05/17/91 0000	8.16	837.16	0.00	837.16	
MNW								06/18/91 0000	8.51	836.81	0.00	836.81	
MNW								07/20/91 0000	8.75	836.57	0.00	836.57	
MNW								08/19/91 0000	9.41	835.91	0.00	835.91	
MNW								09/19/91 0000	9.95	835.37	0.00	835.37	
MNW								10/02/91 0000	10.15	835.17	0.00	835.17	
MNW								11/20/91 0000	11.00	834.32	0.00	834.32	
MNW								12/16/91 0000	10.31	835.01	0.00	835.01	
MNW								03/23/92 0000	7.67	837.65	0.00	837.65	
MNW								06/15/92 0000	8.53	836.79	0.00	836.79	
MNW								12/08/92 0000	8.60	836.72	0.00	836.72	
MNW								02/16/93 0000	8.26	837.06	0.00	837.06	
MNW								05/24/93 0000	7.82	837.50	0.00	837.50	
MNW								08/01/93 0000	8.21	837.11	0.00	837.11	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								09/06/93 0000	8.05	837.27	0.00	837.27	
MNW								10/07/93 0000	8.73	836.59	0.00	836.59	
MNW								11/08/93 0000	8.54	836.78	0.00	836.78	
MNW								11/11/93 0000	8.06	837.26	0.00	837.26	
MNW								12/22/93 0000	8.15	837.17	0.00	837.17	
MNW								02/21/94 0000	7.72	837.60	0.00	837.60	
MNW								03/24/94 0000	7.33	837.99	0.00	837.99	
MNW								04/19/94 0000	7.63	837.69	0.00	837.69	
MNW								05/23/94 0000	8.34	836.98	0.00	836.98	
MNW								07/29/94 0000	8.72	836.60	0.00	836.60	
MNW								08/22/94 0000	8.34	836.98	0.00	836.98	
MNW								10/31/94 0000	8.64	836.68	0.00	836.68	
MNW								12/01/94 0000	7.80	837.52	0.00	837.52	
MNW								01/30/95 0000	8.18	837.14	0.00	837.14	
MNW								03/16/95 0000	8.00	837.32	0.00	837.32	
MNW								04/11/95 0000	8.11	837.21	0.00	837.21	
MNW								05/01/95 0000	8.30	837.02	0.00	837.02	
MNW								05/05/95 0000	12.81	832.51	0.00	832.51	
MNW								07/10/95 0000	8.30	837.02	0.00	837.02	
MNW								08/01/95 0000	8.50	836.82	0.00	836.82	
MNW								08/14/95 0000	8.68	836.64	0.00	836.64	
MNW								09/11/95 0000	8.40	836.92	0.00	836.92	
MNW								10/04/95 0000	9.32	836.00	0.00	836.00	
MNW								11/06/95 0000	9.58	835.74	0.00	835.74	
MNW								12/07/95 0000	8.55	836.77	0.00	836.77	
MNW								01/17/96 0000	8.52	836.80	0.00	836.80	
MNW								02/12/96 0000	8.18	837.14	0.00	837.14	
MNW								05/20/96 0000	8.52	836.80	0.00	836.80	
MNW								09/01/96 0000	8.50	836.82	0.00	836.82	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								11/01/96 0000	8.05	837.27	0.00	837.27	
MNW								01/27/97 0000	8.11	837.21	0.00	837.21	
MNW								05/13/97 0000	8.31	837.01	0.00	837.01	
MNW								08/19/97 0000	8.74	836.58	0.00	836.58	
MNW								11/10/97 0000	7.87	837.45	0.00	837.45	
MNW								02/23/98 0000	7.41	837.91	0.00	837.91	
MNW								06/01/98 0000	8.31	837.01	0.00	837.01	
MNW								11/10/98 0000	7.87	837.45	0.00	837.45	
MNW								05/17/99 0000	7.77	837.55	0.00	837.55	
MNW								06/28/99 0000	8.54	836.78	0.00	836.78	
MNW								06/12/00 0000	7.90	837.42	0.00	837.42	
MNW								11/25/03 0000	7.33	837.99	0.00	837.99	
MNW								12/04/03 0000	7.51	837.81	0.00	837.81	
MNW								01/11/04 0000	7.31	838.01	0.00	838.01	
MNW								06/07/04 0000	7.69	837.63	0.00	837.63	
MW-02	475514.39	1459671.58	882.30	884.22	883.69	DB	0						
MNW								07/02/90 0000	78.11	805.58	0.00	805.58	
MNW								01/23/91 0000	76.20	807.49	0.00	807.49	
MNW								02/18/91 0000	76.91	806.78	0.00	806.78	
MNW								03/25/91 0000	76.92	806.77	0.00	806.77	
MNW								04/29/91 0000	76.96	806.73	0.00	806.73	
MNW								05/17/91 0000	76.98	806.71	0.00	806.71	
MNW								06/18/91 0000	77.91	805.78	0.00	805.78	
MNW								07/20/91 0000	78.18	805.51	0.00	805.51	
MNW								08/19/91 0000	78.79	804.90	0.00	804.90	
MNW								09/19/91 0000	79.50	804.19	0.00	804.19	
MNW								10/02/91 0000	79.41	804.28	0.00	804.28	
MNW								11/20/91 0000	79.75	803.94	0.00	803.94	
MNW								12/16/91 0000	79.70	803.99	0.00	803.99	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								03/23/92 0000	77.95	805.74	0.00	805.74	
MNW								06/15/92 0000	78.88	804.81	0.00	804.81	
MNW								12/08/92 0000	81.23	802.46	0.00	802.46	
MNW								02/16/93 0000	79.47	804.22	0.00	804.22	
MNW								05/24/93 0000	79.86	803.83	0.00	803.83	
MNW								08/01/93 0000	80.45	803.24	0.00	803.24	
MNW								09/06/93 0000	79.00	804.69	0.00	804.69	
MNW								10/07/93 0000	80.42	803.27	0.00	803.27	
MNW								11/08/93 0000	80.84	802.85	0.00	802.85	
MNW								11/11/93 0000	80.44	803.25	0.00	803.25	
MNW								12/22/93 0000	37.80	845.89	0.00	845.89	
MNW								02/21/94 0000	78.98	804.71	0.00	804.71	
MNW								03/24/94 0000	76.00	807.69	0.00	807.69	
MNW								04/19/94 0000	74.71	808.98	0.00	808.98	
MNW								05/23/94 0000	79.04	804.65	0.00	804.65	
MNW								07/29/94 0000	79.63	804.06	0.00	804.06	
MNW								08/22/94 0000	80.05	803.64	0.00	803.64	
MNW								10/31/94 0000	80.90	802.79	0.00	802.79	
MNW								12/01/94 0000	81.00	802.69	0.00	802.69	
MNW								01/30/95 0000	78.94	804.75	0.00	804.75	
MNW								03/16/95 0000	78.44	805.25	0.00	805.25	
MNW								04/11/95 0000	78.92	804.77	0.00	804.77	
MNW								05/01/95 0000	79.08	804.61	0.00	804.61	
MNW								05/05/95 0000	78.67	805.02	0.00	805.02	
MNW								07/10/95 0000	79.00	804.69	0.00	804.69	
MNW								08/01/95 0000	80.60	803.09	0.00	803.09	
MNW								08/14/95 0000	80.94	802.75	0.00	802.75	
MNW								09/11/95 0000	80.50	803.19	0.00	803.19	
MNW								10/04/95 0000	80.00	803.69	0.00	803.69	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								11/06/95 0000	80.75	802.94	0.00	802.94	
MNW								12/07/95 0000	80.00	803.69	0.00	803.69	
MNW								01/17/96 0000	80.93	802.76	0.00	802.76	
MNW								02/12/96 0000	79.68	804.01	0.00	804.01	
MNW								05/20/96 0000	77.78	805.91	0.00	805.91	
MNW								09/01/96 0000	79.68	804.01	0.00	804.01	
MNW								11/01/96 0000	78.90	804.79	0.00	804.79	
MNW								01/27/97 0000	78.71	804.98	0.00	804.98	
MNW								05/13/97 0000	78.55	805.14	0.00	805.14	
MNW								08/19/97 0000	79.46	804.23	0.00	804.23	
MNW								11/10/97 0000	79.32	804.37	0.00	804.37	
MNW								02/23/98 0000	77.76	805.93	0.00	805.93	
MNW								06/01/98 0000	78.20	805.49	0.00	805.49	
MNW								11/10/98 0000	79.32	804.37	0.00	804.37	
MNW								06/28/99 0000	78.22	805.47	0.00	805.47	
MNW								06/12/00 0000	78.18	805.51	0.00	805.51	
MNW								11/25/03 0000	76.79	806.90	0.00	806.90	
MNW								12/02/03 0000	76.71	806.98	0.00	806.98	
MNW								01/11/04 0000	75.98	807.71	0.00	807.71	
MNW								06/07/04 0000	76.39	807.30	0.00	807.30	
MW-02A	475500.91	1459653.22	883.30	885.43	884.72	UF	0						
MNW								07/02/90 0000	47.77	836.95	0.00	836.95	
MNW								01/23/91 0000	47.64	837.08	0.00	837.08	
MNW								02/18/91 0000	47.67	837.05	0.00	837.05	
MNW								03/25/91 0000	47.67	837.05	0.00	837.05	
MNW								04/29/91 0000	47.68	837.04	0.00	837.04	
MNW								05/17/91 0000	47.76	836.96	0.00	836.96	
MNW								06/18/91 0000	47.81	836.91	0.00	836.91	
MNW								07/20/91 0000	47.84	836.88	0.00	836.88	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								08/19/91 0000	47.98	836.74	0.00	836.74	
MNW								09/19/91 0000	48.41	836.31	0.00	836.31	
MNW								10/02/91 0000	52.10	832.62	0.00	832.62	
MNW								11/20/91 0000	48.74	835.98	0.00	835.98	
MNW								12/16/91 0000	47.82	836.90	0.00	836.90	
MNW								03/23/92 0000	47.54	837.18	0.00	837.18	
MNW								06/15/92 0000	47.89	836.83	0.00	836.83	
MNW								12/08/92 0000	47.77	836.95	0.00	836.95	
MNW								02/16/93 0000	47.85	836.87	0.00	836.87	
MNW								05/24/93 0000	47.17	837.55	0.00	837.55	
MNW								08/01/93 0000	47.11	837.61	0.00	837.61	
MNW								09/06/93 0000	47.74	836.98	0.00	836.98	
MNW								10/07/93 0000	47.61	837.11	0.00	837.11	
MNW								11/08/93 0000	47.76	836.96	0.00	836.96	
MNW								11/11/93 0000	47.04	837.68	0.00	837.68	
MNW								12/22/93 0000	47.45	837.27	0.00	837.27	
MNW								02/21/94 0000	47.92	836.80	0.00	836.80	
MNW								03/24/94 0000	46.90	837.82	0.00	837.82	
MNW								04/19/94 0000	47.11	837.61	0.00	837.61	
MNW								05/23/94 0000	47.88	836.84	0.00	836.84	
MNW								07/29/94 0000	47.83	836.89	0.00	836.89	
MNW								08/22/94 0000	47.69	837.03	0.00	837.03	
MNW								10/31/94 0000	47.90	836.82	0.00	836.82	
MNW								12/01/94 0000	48.00	836.72	0.00	836.72	
MNW								01/30/95 0000	47.79	836.93	0.00	836.93	
MNW								03/16/95 0000	47.62	837.10	0.00	837.10	
MNW								04/11/95 0000	48.00	836.72	0.00	836.72	
MNW								05/01/95 0000	47.90	836.82	0.00	836.82	
MNW								05/05/95 0000	47.45	837.27	0.00	837.27	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								07/10/95 0000	47.65	837.07	0.00	837.07	
MNW								08/01/95 0000	47.70	837.02	0.00	837.02	
MNW								08/14/95 0000	47.93	836.79	0.00	836.79	
MNW								09/11/95 0000	48.10	836.62	0.00	836.62	
MNW								10/04/95 0000	48.00	836.72	0.00	836.72	
MNW								11/06/95 0000	48.02	836.70	0.00	836.70	
MNW								12/07/95 0000	47.82	836.90	0.00	836.90	
MNW								01/17/96 0000	48.40	836.32	0.00	836.32	
MNW								02/12/96 0000	47.84	836.88	0.00	836.88	
MNW								05/20/96 0000	47.71	837.01	0.00	837.01	
MNW								09/01/96 0000	47.90	836.82	0.00	836.82	
MNW								11/01/96 0000	47.65	837.07	0.00	837.07	
MNW								01/27/97 0000	47.59	837.13	0.00	837.13	
MNW								05/13/97 0000	47.75	836.97	0.00	836.97	
MNW								08/19/97 0000	48.00	836.72	0.00	836.72	
MNW								11/10/97 0000	47.62	837.10	0.00	837.10	
MNW								02/23/98 0000	47.56	837.16	0.00	837.16	
MNW								06/01/98 0000	47.29	837.43	0.00	837.43	
MNW								11/10/98 0000	47.62	837.10	0.00	837.10	
MNW								05/17/99 0000	47.00	837.72	0.00	837.72	
MNW								06/28/99 0000	47.21	837.51	0.00	837.51	
MNW								06/12/00 0000	47.74	836.98	0.00	836.98	
MNW								11/25/03 0000	46.78	837.94	0.00	837.94	
MNW								12/02/03 0000	46.84	837.88	0.00	837.88	
MNW								01/11/04 0000	46.81	837.91	0.00	837.91	
MNW								06/07/04 0000	47.01	837.71	0.00	837.71	
MW-03	475394.45	1459519.68	888.30	890.5	889.96	UF	0						
MNW								07/02/90 0000	53.09	836.87	0.00	836.87	
MNW								01/23/91 0000	52.93	837.03	0.00	837.03	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								02/18/91 0000	52.97	836.99	0.00	836.99	
MNW								03/25/91 0000	53.00	836.96	0.00	836.96	
MNW								04/29/91 0000	53.00	836.96	0.00	836.96	
MNW								05/17/91 0000	53.04	836.92	0.00	836.92	
MNW								06/18/91 0000	53.40	836.56	0.00	836.56	
MNW								07/20/91 0000	53.69	836.27	0.00	836.27	
MNW								08/19/91 0000	54.09	835.87	0.00	835.87	
MNW								09/19/91 0000	54.25	835.71	0.00	835.71	
MNW								10/02/91 0000	54.27	835.69	0.00	835.69	
MNW								11/20/91 0000	NM	-	NM	-	Dry
MNW								12/16/91 0000	NM	-	NM	-	Dry
MNW								03/23/92 0000	52.86	837.10	0.00	837.10	
MNW								06/15/92 0000	53.44	836.52	0.00	836.52	
MNW								12/08/92 0000	53.55	836.41	0.00	836.41	
MNW								02/16/93 0000	53.02	836.94	0.00	836.94	
MNW								05/24/93 0000	52.62	837.34	0.00	837.34	
MNW								08/01/93 0000	53.03	836.93	0.00	836.93	
MNW								09/06/93 0000	32.51	857.45	0.00	857.45	
MNW								10/07/93 0000	53.45	836.51	0.00	836.51	
MNW								11/08/93 0000	53.42	836.54	0.00	836.54	
MNW								11/11/93 0000	52.91	837.05	0.00	837.05	
MNW								12/22/93 0000	52.55	837.41	0.00	837.41	
MNW								02/21/94 0000	52.92	837.04	0.00	837.04	
MNW								03/24/94 0000	52.33	837.63	0.00	837.63	
MNW								04/19/94 0000	44.15	845.81	0.00	845.81	
MNW								05/23/94 0000	53.17	836.79	0.00	836.79	
MNW								07/29/94 0000	53.55	836.41	0.00	836.41	
MNW								08/22/94 0000	53.55	836.41	0.00	836.41	
MNW								10/31/94 0000	53.56	836.40	0.00	836.40	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								12/01/94 0000	53.16	836.80	0.00	836.80	
MNW								01/30/95 0000	53.06	836.90	0.00	836.90	
MNW								03/16/95 0000	53.00	836.96	0.00	836.96	
MNW								04/11/95 0000	53.90	836.06	0.00	836.06	
MNW								05/01/95 0000	53.19	836.77	0.00	836.77	
MNW								05/05/95 0000	52.85	837.11	0.00	837.11	
MNW								07/10/95 0000	53.00	836.96	0.00	836.96	
MNW								08/01/95 0000	53.20	836.76	0.00	836.76	
MNW								08/14/95 0000	53.63	836.33	0.00	836.33	
MNW								09/11/95 0000	53.00	836.96	0.00	836.96	
MNW								10/04/95 0000	54.00	835.96	0.00	835.96	
MNW								11/06/95 0000	NM	-	NM	-	Dry
MNW								12/07/95 0000	53.35	836.61	0.00	836.61	
MNW								01/17/96 0000	53.86	836.10	0.00	836.10	
MNW								02/12/96 0000	53.10	836.86	0.00	836.86	
MNW								05/20/96 0000	52.93	837.03	0.00	837.03	
MNW								09/01/96 0000	53.40	836.56	0.00	836.56	
MNW								11/01/96 0000	52.88	837.08	0.00	837.08	
MNW								01/27/97 0000	52.95	837.01	0.00	837.01	
MNW								05/13/97 0000	53.12	836.84	0.00	836.84	
MNW								08/19/97 0000	53.72	836.24	0.00	836.24	
MNW								11/10/97 0000	53.21	836.75	0.00	836.75	
MNW								02/23/98 0000	52.88	837.08	0.00	837.08	
MNW								06/01/98 0000	53.17	836.79	0.00	836.79	
MNW								11/10/98 0000	53.21	836.75	0.00	836.75	
MNW								05/17/99 0000	52.32	837.64	0.00	837.64	
MNW								06/28/99 0000	52.90	837.06	0.00	837.06	
MNW								06/12/00 0000	52.48	837.48	0.00	837.48	
MNW								11/25/03 0000	52.20	837.76	0.00	837.76	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								12/02/03 0000	52.29	837.67	0.00	837.67	
MNW								01/11/04 0000	52.24	837.72	0.00	837.72	
MNW								06/07/04 0000	52.42	837.54	0.00	837.54	
MW-04	475232.00	1459378.00	NA	NA	NA	UF	0						
MNW								07/02/90 0000	56.30		0.00		
MNW								01/23/91 0000	56.21		0.00		
MNW								02/18/91 0000	56.24		0.00		
MNW								03/25/91 0000	56.20		0.00		
MNW								04/29/91 0000	56.23		0.00		
MNW								05/17/91 0000	56.30		0.00		
MNW								06/18/91 0000	56.39		0.00		
MNW								07/20/91 0000	56.45		0.00		
MNW								08/19/91 0000	56.46		0.00		
MNW								09/19/91 0000	56.62		0.00		
MNW								10/02/91 0000	56.66		0.00		
MNW								11/20/91 0000	57.43		0.00		
MNW								12/16/91 0000	56.46		0.00		
MNW								03/23/92 0000	56.08		0.00		
MNW								06/15/92 0000	56.51		0.00		
MNW								12/08/92 0000	56.35		0.00		
MNW								02/16/93 0000	56.21		0.00		
MNW								05/24/93 0000	55.85		0.00		
MNW								08/01/93 0000	55.83		0.00		
MNW								09/06/93 0000	54.51		0.00		
MNW								10/07/93 0000	56.49		0.00		
MNW								11/08/93 0000	56.40		0.00		
MNW								11/11/93 0000	55.79		0.00		
MNW								12/22/93 0000	55.87		0.00		
MNW								02/21/94 0000	56.16		0.00		

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								03/24/94 0000	51.94		0.00		
MNW								04/19/94 0000	55.68		0.00		
MNW								05/23/94 0000	56.40		0.00		
MNW								07/29/94 0000	56.00		0.00		
MNW								08/22/94 0000	56.35		0.00		
MNW								10/31/94 0000	56.49		0.00		
MNW								12/01/94 0000	55.62		0.00		
MNW								01/30/95 0000	56.30		0.00		
MNW								03/16/95 0000	56.00		0.00		
MNW								04/11/95 0000	55.00		0.00		
MNW								05/01/95 0000	56.39		0.00		
MNW								05/05/95 0000	56.71		0.00		
MNW								07/10/95 0000	55.90		0.00		
MNW								08/01/95 0000	56.30		0.00		
MNW								08/14/95 0000	56.50		0.00		
MNW								09/11/95 0000	55.10		0.00		
MNW								10/04/95 0000	NM	-	NM	-	ry, Well Abandoned Fall 199
MW-05	475426.21	1459213.58	862.90	865.49	864.9	UF	0						
MNW								07/02/90 0000	26.92	837.98	0.00	837.98	
MNW								01/23/91 0000	26.27	838.63	0.00	838.63	
MNW								02/18/91 0000	26.30	838.60	0.00	838.60	
MNW								03/25/91 0000	26.61	838.29	0.00	838.29	
MNW								04/29/91 0000	26.61	838.29	0.00	838.29	
MNW								05/17/91 0000	26.68	838.22	0.00	838.22	
MNW								06/18/91 0000	27.25	837.65	0.00	837.65	
MNW								07/20/91 0000	27.52	837.38	0.00	837.38	
MNW								08/19/91 0000	27.81	837.09	0.00	837.09	
MNW								09/19/91 0000	27.90	837.00	0.00	837.00	
MNW								10/02/91 0000	27.91	836.99	0.00	836.99	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								11/20/91 0000	NM	-	NM	-	Dry
MNW								12/16/91 0000	NM	-	NM	-	Dry
MNW								03/23/92 0000	25.57	839.33	0.00	839.33	
MNW								06/15/92 0000	27.10	837.80	0.00	837.80	
MNW								12/08/92 0000	26.64	838.26	0.00	838.26	
MNW								02/16/93 0000	26.79	838.11	0.00	838.11	
MNW								05/24/93 0000	26.38	838.52	0.00	838.52	
MNW								08/01/93 0000	26.99	837.91	0.00	837.91	
MNW								09/06/93 0000	27.00	837.90	0.00	837.90	
MNW								10/07/93 0000	26.70	838.20	0.00	838.20	
MNW								11/08/93 0000	26.80	838.10	0.00	838.10	
MNW								11/11/93 0000	26.18	838.72	0.00	838.72	
MNW								12/22/93 0000	26.64	838.26	0.00	838.26	
MNW								02/21/94 0000	25.50	839.40	0.00	839.40	
MNW								03/24/94 0000	25.00	839.90	0.00	839.90	
MNW								04/19/94 0000	26.15	838.75	0.00	838.75	
MNW								05/23/94 0000	26.94	837.96	0.00	837.96	
MNW								07/29/94 0000	27.37	837.53	0.00	837.53	
MNW								08/22/94 0000	25.57	839.33	0.00	839.33	
MNW								10/31/94 0000	27.51	837.39	0.00	837.39	
MNW								12/01/94 0000	55.60	809.30	0.00	809.30	
MNW								01/30/95 0000	26.61	838.29	0.00	838.29	
MNW								03/16/95 0000	26.29	838.61	0.00	838.61	
MNW								04/11/95 0000	26.00	838.90	0.00	838.90	
MNW								05/01/95 0000	26.40	838.50	0.00	838.50	
MNW								05/05/95 0000	24.65	840.25	0.00	840.25	
MNW								07/10/95 0000	27.00	837.90	0.00	837.90	
MNW								08/01/95 0000	27.10	837.80	0.00	837.80	
MNW								08/14/95 0000	27.45	837.45	0.00	837.45	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								09/11/95 0000	27.10	837.80	0.00	837.80	
MNW								10/04/95 0000	27.81	837.09	0.00	837.09	
MNW								11/06/95 0000	NM	-	NM	-	Dry
MNW								12/07/95 0000	27.00	837.90	0.00	837.90	
MNW								01/17/96 0000	28.00	836.90	0.00	836.90	
MNW								02/12/96 0000	26.61	838.29	0.00	838.29	
MNW								05/20/96 0000	26.57	838.33	0.00	838.33	
MNW								09/01/96 0000	27.22	837.68	0.00	837.68	
MNW								11/01/96 0000	26.50	838.40	0.00	838.40	
MNW								01/27/97 0000	26.47	838.43	0.00	838.43	
MNW								05/13/97 0000	26.98	837.92	0.00	837.92	
MNW								08/19/97 0000	27.06	837.84	0.00	837.84	
MNW								11/10/97 0000	25.48	839.42	0.00	839.42	
MNW								02/23/98 0000	25.92	838.98	0.00	838.98	
MNW								06/01/98 0000	26.89	838.01	0.00	838.01	
MNW								11/10/98 0000	25.48	839.42	0.00	839.42	
MNW								05/17/99 0000	26.00	838.90	0.00	838.90	
MNW								06/28/99 0000	26.57	838.33	0.00	838.33	
MNW								06/12/00 0000	26.20	838.70	0.00	838.70	
MNW								11/25/03 0000	25.36	839.54	0.00	839.54	
MNW								12/01/03 0000	25.36	839.54	0.00	839.54	
MNW								01/11/04 0000	25.29	839.61	0.00	839.61	
MNW								06/07/04 0000	26.02	838.88	0.00	838.88	
MW-06	475555.95	1459366.56	860.00	862.36	861.82	UF	0						
MNW								07/02/90 0000	24.87	836.95	0.00	836.95	
MNW								01/23/91 0000	24.50	837.32	0.00	837.32	
MNW								02/18/91 0000	24.56	837.26	0.00	837.26	
MNW								03/25/91 0000	24.73	837.09	0.00	837.09	
MNW								04/29/91 0000	24.73	837.09	0.00	837.09	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								05/17/91 0000	24.75	837.07	0.00	837.07	
MNW								06/18/91 0000	25.11	836.71	0.00	836.71	
MNW								07/20/91 0000	25.37	836.45	0.00	836.45	
MNW								08/19/91 0000	25.98	835.84	0.00	835.84	
MNW								09/19/91 0000	26.57	835.25	0.00	835.25	
MNW								10/02/91 0000	26.77	835.05	0.00	835.05	
MNW								11/20/91 0000	27.57	834.25	0.00	834.25	
MNW								12/16/91 0000	26.92	834.90	0.00	834.90	
MNW								03/23/92 0000	24.19	837.63	0.00	837.63	
MNW								06/15/92 0000	25.15	836.67	0.00	836.67	
MNW								12/08/92 0000	25.22	836.60	0.00	836.60	
MNW								02/16/93 0000	24.83	836.99	0.00	836.99	
MNW								05/24/93 0000	24.36	837.46	0.00	837.46	
MNW								08/01/93 0000	25.55	836.27	0.00	836.27	
MNW								09/06/93 0000	22.45	839.37	0.00	839.37	
MNW								10/07/93 0000	25.31	836.51	0.00	836.51	
MNW								11/08/93 0000	25.15	836.67	0.00	836.67	
MNW								11/11/93 0000	24.61	837.21	0.00	837.21	
MNW								12/22/93 0000	23.65	838.17	0.00	838.17	
MNW								02/21/94 0000	24.33	837.49	0.00	837.49	
MNW								03/24/94 0000	23.68	838.14	0.00	838.14	
MNW								04/19/94 0000	24.00	837.82	0.00	837.82	
MNW								05/23/94 0000	24.92	836.90	0.00	836.90	
MNW								07/29/94 0000	25.24	836.58	0.00	836.58	
MNW								08/22/94 0000	24.94	836.88	0.00	836.88	
MNW								10/31/94 0000	25.26	836.56	0.00	836.56	
MNW								12/01/94 0000	24.47	837.35	0.00	837.35	
MNW								01/30/95 0000	24.75	837.07	0.00	837.07	
MNW								03/16/95 0000	24.45	837.37	0.00	837.37	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								04/11/95 0000	34.52	827.30	0.00	827.30	
MNW								05/01/95 0000	24.94	836.88	0.00	836.88	
MNW								05/05/95 0000	25.80	836.02	0.00	836.02	
MNW								07/10/95 0000	25.30	836.52	0.00	836.52	
MNW								08/01/95 0000	25.00	836.82	0.00	836.82	
MNW								08/14/95 0000	25.32	836.50	0.00	836.50	
MNW								09/11/95 0000	26.10	835.72	0.00	835.72	
MNW								10/04/95 0000	26.00	835.82	0.00	835.82	
MNW								11/06/95 0000	26.20	835.62	0.00	835.62	
MNW								12/07/95 0000	25.10	836.72	0.00	836.72	
MNW								01/17/96 0000	25.76	836.06	0.00	836.06	
MNW								02/12/96 0000	24.78	837.04	0.00	837.04	
MNW								05/20/96 0000	24.42	837.40	0.00	837.40	
MNW								09/01/96 0000	25.11	836.71	0.00	836.71	
MNW								11/01/96 0000	24.62	837.20	0.00	837.20	
MNW								01/27/97 0000	24.18	837.64	0.00	837.64	
MNW								05/13/97 0000	24.89	836.93	0.00	836.93	
MNW								08/19/97 0000	25.38	836.44	0.00	836.44	
MNW								11/10/97 0000	24.93	836.89	0.00	836.89	
MNW								02/23/98 0000	24.45	837.37	0.00	837.37	
MNW								06/01/98 0000	24.92	836.90	0.00	836.90	
MNW								11/10/98 0000	24.93	836.89	0.00	836.89	
MNW								05/17/99 0000	24.30	837.52	0.00	837.52	
MNW								06/28/99 0000	24.58	837.24	0.00	837.24	
MNW								06/12/00 0000	24.78	837.04	0.00	837.04	
MNW								11/25/03 0000	23.83	837.99	0.00	837.99	
MNW								12/03/03 0000	23.99	837.83	0.00	837.83	
MNW								01/11/04 0000	23.76	838.06	0.00	838.06	
MNW								06/07/04 0000	24.11	837.71	0.00	837.71	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MW-07	474862.82	1460008.03	919.10	921.52	920.97	1S	0						
MNW								07/02/90 0000	22.40	898.57	0.00	898.57	
MNW								01/23/91 0000	20.68	900.29	0.00	900.29	
MNW								02/18/91 0000	21.32	899.65	0.00	899.65	
MNW								03/25/91 0000	21.42	899.55	0.00	899.55	
MNW								04/29/91 0000	21.49	899.48	0.00	899.48	
MNW								05/17/91 0000	21.95	899.02	0.00	899.02	
MNW								06/18/91 0000	23.55	897.42	0.00	897.42	
MNW								07/20/91 0000	23.71	897.26	0.00	897.26	
MNW								08/19/91 0000	23.73	897.24	0.00	897.24	
MNW								09/19/91 0000	24.25	896.72	0.00	896.72	
MNW								09/30/91 0000	24.35	896.62	0.00	896.62	
MNW								11/20/91 0000	24.45	896.52	0.00	896.52	
MNW								12/16/91 0000	24.63	896.34	0.00	896.34	
MNW								03/23/92 0000	21.04	899.93	0.00	899.93	
MNW								06/15/92 0000	23.83	897.14	0.00	897.14	
MNW								12/08/92 0000	22.90	898.07	0.00	898.07	
MNW								02/16/93 0000	23.17	897.80	0.00	897.80	
MNW								05/24/93 0000	23.55	897.42	0.00	897.42	
MNW								08/01/93 0000	29.01	891.96	0.00	891.96	
MNW								09/06/93 0000	25.95	895.02	0.00	895.02	
MNW								10/07/93 0000	25.18	895.79	0.00	895.79	
MNW								11/08/93 0000	25.79	895.18	0.00	895.18	
MNW								11/11/93 0000	25.16	895.81	0.00	895.81	
MNW								12/22/93 0000	24.00	896.97	0.00	896.97	
MNW								02/21/94 0000	23.77	897.20	0.00	897.20	
MNW								03/24/94 0000	22.00	898.97	0.00	898.97	
MNW								04/19/94 0000	21.42	899.55	0.00	899.55	
MNW								05/23/94 0000	24.43	896.54	0.00	896.54	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								07/29/94 0000	25.60	895.37	0.00	895.37	
MNW								08/22/94 0000	25.37	895.60	0.00	895.60	
MNW								10/31/94 0000	25.20	895.77	0.00	895.77	
MNW								12/01/94 0000	36.11	884.86	0.00	884.86	
MNW								01/30/95 0000	23.32	897.65	0.00	897.65	
MNW								03/16/95 0000	23.00	897.97	0.00	897.97	
MNW								04/11/95 0000	23.53	897.44	0.00	897.44	
MNW								05/01/95 0000	23.85	897.12	0.00	897.12	
MNW								05/05/95 0000	24.00	896.97	0.00	896.97	
MNW								07/10/95 0000	24.40	896.57	0.00	896.57	
MNW								08/01/95 0000	25.00	895.97	0.00	895.97	
MNW								08/14/95 0000	25.61	895.36	0.00	895.36	
MNW								09/11/95 0000	27.80	893.17	0.00	893.17	
MNW								10/04/95 0000	30.25	890.72	0.00	890.72	
MNW								11/06/95 0000	26.88	894.09	0.00	894.09	
MNW								12/07/95 0000	26.10	894.87	0.00	894.87	
MNW								01/17/96 0000	25.00	895.97	0.00	895.97	
MNW								02/12/96 0000	25.00	895.97	0.00	895.97	
MNW								05/20/96 0000	22.94	898.03	0.00	898.03	
MNW								09/01/96 0000	25.35	895.62	0.00	895.62	
MNW								11/01/96 0000	23.93	897.04	0.00	897.04	
MNW								01/27/97 0000	23.79	897.18	0.00	897.18	
MNW								05/13/97 0000	23.99	896.98	0.00	896.98	
MNW								08/19/97 0000	25.33	895.64	0.00	895.64	
MNW								11/10/97 0000	24.93	896.04	0.00	896.04	
MNW								02/23/98 0000	22.71	898.26	0.00	898.26	
MNW								06/01/98 0000	24.11	896.86	0.00	896.86	
MNW								11/10/98 0000	24.93	896.04	0.00	896.04	
MNW								05/17/99 0000	23.00	897.97	0.00	897.97	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/28/99 0000	24.41	896.56	0.00	896.56	
MNW								06/12/00 0000	23.70	897.27	0.00	897.27	
MNW								11/25/03 0000	33.87	887.10	0.00	887.10	
MNW								12/03/03 0000	33.90	887.07	0.00	887.07	
MNW								01/11/04 0000	33.96	887.01	0.00	887.01	
MNW								06/07/04 0000	33.89	887.08	0.00	887.08	
MW-08	474646.43	1460245.79	929.30	931.77	931.27	1S	0						
MNW								07/02/90 0000	13.59	917.68	0.00	917.68	
MNW								01/23/91 0000	12.02	919.25	0.00	919.25	
MNW								02/18/91 0000	13.16	918.11	0.00	918.11	
MNW								03/25/91 0000	13.16	918.11	0.00	918.11	
MNW								04/29/91 0000	13.67	917.60	0.00	917.60	
MNW								05/17/91 0000	14.19	917.08	0.00	917.08	
MNW								06/18/91 0000	16.22	915.05	0.00	915.05	
MNW								07/20/91 0000	16.60	914.67	0.00	914.67	
MNW								08/19/91 0000	16.72	914.55	0.00	914.55	
MNW								09/19/91 0000	17.64	913.63	0.00	913.63	
MNW								09/30/91 0000	17.73	913.54	0.00	913.54	
MNW								11/20/91 0000	18.55	912.72	0.00	912.72	
MNW								12/16/91 0000	18.95	912.32	0.00	912.32	
MNW								03/23/92 0000	13.67	917.60	0.00	917.60	
MNW								06/15/92 0000	17.30	913.97	0.00	913.97	
MNW								12/08/92 0000	15.13	916.14	0.00	916.14	
MNW								02/16/93 0000	15.55	915.72	0.00	915.72	
MNW								05/24/93 0000	15.55	915.72	0.00	915.72	
MNW								08/01/93 0000	16.96	914.31	0.00	914.31	
MNW								09/06/93 0000	17.52	913.75	0.00	913.75	
MNW								10/07/93 0000	17.12	914.15	0.00	914.15	
MNW								11/08/93 0000	17.27	914.00	0.00	914.00	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								11/11/93 0000	16.70	914.57	0.00	914.57	
MNW								12/22/93 0000	15.19	916.08	0.00	916.08	
MNW								02/21/94 0000	14.82	916.45	0.00	916.45	
MNW								03/24/94 0000	13.16	918.11	0.00	918.11	
MNW								04/19/94 0000	13.55	917.72	0.00	917.72	
MNW								05/23/94 0000	15.76	915.51	0.00	915.51	
MNW								07/29/94 0000	17.00	914.27	0.00	914.27	
MNW								08/22/94 0000	16.41	914.86	0.00	914.86	
MNW								10/31/94 0000	16.79	914.48	0.00	914.48	
MNW								12/01/94 0000	14.34	916.93	0.00	916.93	
MNW								01/30/95 0000	14.02	917.25	0.00	917.25	
MNW								03/16/95 0000	13.00	918.27	0.00	918.27	
MNW								04/11/95 0000	14.00	917.27	0.00	917.27	
MNW								05/01/95 0000	14.74	916.53	0.00	916.53	
MNW								05/05/95 0000	13.55	917.72	0.00	917.72	
MNW								07/10/95 0000	15.30	915.97	0.00	915.97	
MNW								08/01/95 0000	16.00	915.27	0.00	915.27	
MNW								08/14/95 0000	16.44	914.83	0.00	914.83	
MNW								09/11/95 0000	16.50	914.77	0.00	914.77	
MNW								10/04/95 0000	16.98	914.29	0.00	914.29	
MNW								11/06/95 0000	17.87	913.40	0.00	913.40	
MNW								12/07/95 0000	16.56	914.71	0.00	914.71	
MNW								01/17/96 0000	15.52	915.75	0.00	915.75	
MNW								02/12/96 0000	14.60	916.67	0.00	916.67	
MNW								05/20/96 0000	13.45	917.82	0.00	917.82	
MNW								09/01/96 0000	16.56	914.71	0.00	914.71	
MNW								11/01/96 0000	13.84	917.43	0.00	917.43	
MNW								01/27/97 0000	14.04	917.23	0.00	917.23	
MNW								05/13/97 0000	15.02	916.25	0.00	916.25	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								08/19/97 0000	16.50	914.77	0.00	914.77	
MNW								11/10/97 0000	15.48	915.79	0.00	915.79	
MNW								02/23/98 0000	12.99	918.28	0.00	918.28	
MNW								06/01/98 0000	15.20	916.07	0.00	916.07	
MNW								11/10/98 0000	15.48	915.79	0.00	915.79	
MNW								05/17/99 0000	14.70	916.57	0.00	916.57	
MNW								06/28/99 0000	15.50	915.77	0.00	915.77	
MNW								06/12/00 0000	14.72	916.55	0.00	916.55	
MNW								11/25/03 0000	12.50	918.77	0.00	918.77	
MNW								12/03/03 0000	12.62	918.65	0.00	918.65	
MNW								01/11/04 0000	12.78	918.49	0.00	918.49	
MNW								06/07/04 0000	13.99	917.28	0.00	917.28	
MW-09A	474502.63	1460478.56	943.30	945.45	944.9	1S	0						
MNW								07/02/90 0000	26.62	918.28	0.00	918.28	
MNW								01/23/91 0000	23.06	921.84	0.00	921.84	
MNW								02/18/91 0000	24.21	920.69	0.00	920.69	
MNW								03/25/91 0000	24.80	920.10	0.00	920.10	
MNW								04/29/91 0000	26.54	918.36	0.00	918.36	
MNW								05/17/91 0000	26.76	918.14	0.00	918.14	
MNW								06/18/91 0000	27.88	917.02	0.00	917.02	
MNW								07/20/91 0000	28.06	916.84	0.00	916.84	
MNW								08/19/91 0000	27.43	917.47	0.00	917.47	
MNW								09/19/91 0000	27.75	917.15	0.00	917.15	
MNW								09/30/91 0000	27.75	917.15	0.00	917.15	
MNW								11/20/91 0000	27.73	917.17	0.00	917.17	
MNW								12/16/91 0000	28.00	916.90	0.00	916.90	
MNW								03/23/92 0000	25.32	919.58	0.00	919.58	
MNW								06/15/92 0000	26.23	918.67	0.00	918.67	
MNW								12/08/92 0000	25.14	919.76	0.00	919.76	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								02/16/93 0000	24.90	920.00	0.00	920.00	
MNW								05/24/93 0000	25.50	919.40	0.00	919.40	
MNW								08/01/93 0000	26.56	918.34	0.00	918.34	
MNW								09/06/93 0000	27.17	917.73	0.00	917.73	
MNW								10/07/93 0000	26.38	918.52	0.00	918.52	
MNW								11/08/93 0000	27.57	917.33	0.00	917.33	
MNW								11/11/93 0000	27.05	917.85	0.00	917.85	
MNW								12/22/93 0000	25.41	919.49	0.00	919.49	
MNW								02/21/94 0000	25.98	918.92	0.00	918.92	
MNW								03/24/94 0000	23.44	921.46	0.00	921.46	
MNW								04/19/94 0000	23.21	921.69	0.00	921.69	
MNW								05/23/94 0000	24.60	920.30	0.00	920.30	
MNW								07/29/94 0000	25.50	919.40	0.00	919.40	
MNW								08/22/94 0000	25.55	919.35	0.00	919.35	
MNW								10/31/94 0000	25.90	919.00	0.00	919.00	
MNW								12/01/94 0000	26.93	917.97	0.00	917.97	
MNW								01/30/95 0000	24.00	920.90	0.00	920.90	
MNW								03/16/95 0000	123.67	821.23	0.00	821.23	
MNW								04/11/95 0000	24.46	920.44	0.00	920.44	
MNW								05/01/95 0000	24.82	920.08	0.00	920.08	
MNW								05/05/95 0000	24.67	920.23	0.00	920.23	
MNW								07/10/95 0000	25.40	919.50	0.00	919.50	
MNW								08/01/95 0000	25.90	919.00	0.00	919.00	
MNW								08/14/95 0000	26.16	918.74	0.00	918.74	
MNW								09/11/95 0000	26.50	918.40	0.00	918.40	
MNW								10/04/95 0000	26.80	918.10	0.00	918.10	
MNW								11/06/95 0000	26.95	917.95	0.00	917.95	
MNW								12/07/95 0000	26.50	918.40	0.00	918.40	
MNW								01/17/96 0000	26.52	918.38	0.00	918.38	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								02/12/96 0000	25.16	919.74	0.00	919.74	
MNW								05/20/96 0000	24.16	920.74	0.00	920.74	
MNW								09/01/96 0000	26.54	918.36	0.00	918.36	
MNW								11/01/96 0000	24.33	920.57	0.00	920.57	
MNW								01/27/97 0000	24.18	920.72	0.00	920.72	
MNW								05/13/97 0000	24.09	920.81	0.00	920.81	
MNW								08/19/97 0000	24.86	920.04	0.00	920.04	
MNW								11/10/97 0000	24.57	920.33	0.00	920.33	
MNW								02/23/98 0000	22.35	922.55	0.00	922.55	
MNW								06/01/98 0000	23.16	921.74	0.00	921.74	
MNW								11/10/98 0000	24.57	920.33	0.00	920.33	
MNW								05/17/99 0000	22.75	922.15	0.00	922.15	
MNW								06/28/99 0000	23.46	921.44	0.00	921.44	
MNW								06/12/00 0000	22.80	922.10	0.00	922.10	
MNW								12/02/03 0000	20.58	924.32	0.00	924.32	
MNW								01/11/04 0000	20.15	924.75	0.00	924.75	
MNW								06/07/04 0000	21.15	923.75	0.00	923.75	
MW-10	474636.00	1460604.00	NA	NA	NA	1S	0						
MNW								07/02/90 0000	18.37		0.00		
MNW								01/23/91 0000	16.81		0.00		
MNW								02/18/91 0000	17.45		0.00		
MNW								03/25/91 0000	17.74		0.00		
MNW								04/29/91 0000	18.01		0.00		
MNW								05/17/91 0000	18.40		0.00		
MNW								06/18/91 0000	20.03		0.00		
MNW								07/20/91 0000	20.39		0.00		
MNW								08/19/91 0000	21.07		0.00		
MNW								09/19/91 0000	21.66		0.00		
MNW								09/30/91 0000	21.70		0.00		

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								11/20/91 0000	21.91		0.00		
MNW								12/16/91 0000	21.72		0.00		
MNW								03/23/92 0000	20.42		0.00		
MNW								06/15/92 0000	21.29		0.00		
MNW								12/08/92 0000	21.10		0.00		
MNW								02/16/93 0000	20.99		0.00		
MNW								05/24/93 0000	20.74		0.00		
MNW								08/01/93 0000	22.39		0.00		
MNW								09/06/93 0000	23.00		0.00		
MNW								10/07/93 0000	20.85		0.00		
MNW								11/08/93 0000	22.96		0.00		
MNW								11/11/93 0000	22.45		0.00		
MNW								12/22/93 0000	20.13		0.00		
MNW								02/21/94 0000	19.12		0.00		
MNW								03/24/94 0000	17.82		0.00		
MNW								04/19/94 0000	18.00		0.00		
MNW								05/23/94 0000	20.21		0.00		
MNW								07/29/94 0000	21.59		0.00		
MNW								08/22/94 0000	21.14		0.00		
MNW								10/31/94 0000	21.64		0.00		
MNW								12/01/94 0000	20.00		0.00		
MNW								01/30/95 0000	17.76		0.00		
MNW								03/16/95 0000	16.99		0.00		
MNW								04/11/95 0000	18.00		0.00		
MNW								05/01/95 0000	18.42		0.00		
MNW								05/05/95 0000	18.34		0.00		
MNW								07/10/95 0000	18.80		0.00		
MNW								08/01/95 0000	19.80		0.00		
MNW								08/14/95 0000	20.40		0.00		

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								09/11/95 0000	21.14		0.00		ELL ABANDONED FALL 19
MW-11D	474996.87	1460158.33	907.20	909.8	909.5	2S	0						
MNW								03/25/91 0000	42.50	867.00	0.00	867.00	
MNW								04/29/91 0000	41.11	868.39	0.00	868.39	
MNW								05/17/91 0000	41.08	868.42	0.00	868.42	
MNW								06/18/91 0000	41.18	868.32	0.00	868.32	
MNW								07/20/91 0000	41.01	868.49	0.00	868.49	
MNW								08/19/91 0000	41.10	868.40	0.00	868.40	
MNW								09/19/91 0000	41.21	868.29	0.00	868.29	
MNW								09/30/91 0000	41.21	868.29	0.00	868.29	
MNW								11/20/91 0000	41.24	868.26	0.00	868.26	
MNW								12/16/91 0000	41.25	868.25	0.00	868.25	
MNW								03/23/92 0000	41.80	867.70	0.00	867.70	
MNW								06/15/92 0000	41.32	868.18	0.00	868.18	
MNW								12/08/92 0000	41.75	867.75	0.00	867.75	
MNW								02/16/93 0000	41.40	868.10	0.00	868.10	
MNW								05/24/93 0000	37.88	871.62	0.00	871.62	
MNW								08/01/93 0000	41.98	867.52	0.00	867.52	
MNW								09/06/93 0000	33.72	875.78	0.00	875.78	
MNW								10/07/93 0000	39.00	870.50	0.00	870.50	
MNW								11/08/93 0000	41.63	867.87	0.00	867.87	
MNW								11/11/93 0000	41.32	868.18	0.00	868.18	
MNW								12/22/93 0000	42.00	867.50	0.00	867.50	
MNW								02/21/94 0000	41.54	867.96	0.00	867.96	
MNW								03/24/94 0000	NM	-	NM	-	Dry
MNW								04/19/94 0000	42.00	867.50	0.00	867.50	
MNW								05/23/94 0000	41.60	867.90	0.00	867.90	
MNW								07/29/94 0000	37.30	872.20	0.00	872.20	
MNW								08/22/94 0000	41.77	867.73	0.00	867.73	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								10/31/94 0000	41.90	867.60	0.00	867.60	
MNW								12/01/94 0000	39.70	869.80	0.00	869.80	
MNW								01/30/95 0000	41.47	868.03	0.00	868.03	
MNW								03/16/95 0000	41.53	867.97	0.00	867.97	
MNW								04/11/95 0000	40.00	869.50	0.00	869.50	
MNW								05/01/95 0000	41.54	867.96	0.00	867.96	
MNW								05/05/95 0000	41.74	867.76	0.00	867.76	
MNW								07/10/95 0000	38.00	871.50	0.00	871.50	
MNW								08/01/95 0000	38.80	870.70	0.00	870.70	
MNW								08/14/95 0000	41.60	867.90	0.00	867.90	
MNW								09/11/95 0000	42.00	867.50	0.00	867.50	
MNW								10/04/95 0000	41.00	868.50	0.00	868.50	
MNW								11/06/95 0000	41.70	867.80	0.00	867.80	
MNW								12/07/95 0000	43.00	866.50	0.00	866.50	
MNW								01/17/96 0000	39.61	869.89	0.00	869.89	
MNW								02/12/96 0000	42.90	866.60	0.00	866.60	
MNW								05/20/96 0000	41.67	867.83	0.00	867.83	
MNW								09/01/96 0000	41.75	867.75	0.00	867.75	
MNW								11/01/96 0000	41.46	868.04	0.00	868.04	
MNW								01/27/97 0000	41.53	867.97	0.00	867.97	
MNW								05/13/97 0000	41.46	868.04	0.00	868.04	
MNW								08/19/97 0000	41.69	867.81	0.00	867.81	
MNW								11/10/97 0000	41.31	868.19	0.00	868.19	
MNW								02/23/98 0000	41.47	868.03	0.00	868.03	
MNW								06/01/98 0000	41.66	867.84	0.00	867.84	
MNW								11/10/98 0000	41.31	868.19	0.00	868.19	
MNW								05/17/99 0000	41.17	868.33	0.00	868.33	
MNW								06/28/99 0000	41.33	868.17	0.00	868.17	
MNW								06/12/00 0000	41.46	868.04	0.00	868.04	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								11/25/03	41.09	868.41	0.00	868.41	
MNW								12/04/03 0000	41.18	868.32	0.00	868.32	
MNW								01/11/04 0000	42.68	866.82	0.00	866.82	
MNW								06/07/04 0000	41.07	868.43	0.00	868.43	
MW-11S	475006.61	1460164.38	907.10	909.27	908.81	SS	0						
MNW								07/02/90 0000	NM	-	NM	-	Dry
MNW								01/23/91 0000	8.86	899.95	0.00	899.95	
MNW								02/18/91 0000	9.46	899.35	0.00	899.35	
MNW								03/25/91 0000	8.93	899.88	0.00	899.88	
MNW								04/29/91 0000	10.78	898.03	0.00	898.03	
MNW								05/17/91 0000	NM	-	NM	-	Dry
MNW								06/18/91 0000	NM	-	NM	-	Dry
MNW								07/20/91 0000	12.48	896.33	0.00	896.33	
MNW								08/19/91 0000	12.48	896.33	0.00	896.33	
MNW								09/19/91 0000	NM	-	NM	-	Dry
MNW								09/30/91 0000	NM	-	NM	-	Dry
MNW								11/20/91 0000	NM	-	NM	-	Dry
MNW								12/16/91 0000	NM	-	NM	-	Dry
MNW								03/23/92 0000	7.37	901.44	0.00	901.44	
MNW								06/15/92 0000	NM	-	NM	-	Dry
MNW								12/08/92 0000	9.24	899.57	0.00	899.57	
MNW								02/16/93 0000	12.57	896.24	0.00	896.24	
MNW								05/24/93 0000	NM	-	NM	-	Dry
MNW								08/01/93 0000	11.34	897.47	0.00	897.47	
MNW								09/06/93 0000	12.30	896.51	0.00	896.51	
MNW								10/07/93 0000	12.40	896.41	0.00	896.41	
MNW								11/08/93 0000	NM	-	NM	-	Dry
MNW								11/11/93 0000	NM	-	NM	-	Dry
MNW								12/22/93 0000	12.40	896.41	0.00	896.41	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								02/21/94 0000	8.31	900.50	0.00	900.50	
MNW								03/24/94 0000	7.20	901.61	0.00	901.61	
MNW								04/19/94 0000	7.18	901.63	0.00	901.63	
MNW								05/23/94 0000	NM	-	NM	-	Dry
MNW								07/29/94 0000	11.21	897.60	0.00	897.60	
MNW								08/22/94 0000	NM	-	NM	-	Dry
MNW								10/31/94 0000	NM	-	NM	-	Dry
MNW								12/01/94 0000	NM	-	NM	-	Dry
MNW								01/30/95 0000	9.51	899.30	0.00	899.30	
MNW								03/16/95 0000	7.41	901.40	0.00	901.40	
MNW								04/11/95 0000	7.57	901.24	0.00	901.24	
MNW								05/01/95 0000	11.74	897.07	0.00	897.07	
MNW								05/05/95 0000	17.00	891.81	0.00	891.81	
MNW								07/10/95 0000	NM	-	NM	-	Dry
MNW								08/01/95 0000	12.50	896.31	0.00	896.31	
MNW								08/14/95 0000	NM	-	NM	-	Dry
MNW								09/11/95 0000	12.50	896.31	0.00	896.31	
MNW								10/04/95 0000	12.50	896.31	0.00	896.31	
MNW								11/06/95 0000	NM	-	NM	-	Dry
MNW								12/07/95 0000	NM	-	NM	-	Dry
MNW								01/17/96 0000	12.97	895.84	0.00	895.84	
MNW								02/12/96 0000	11.91	896.90	0.00	896.90	Dry
MNW								05/20/96 0000	8.55	900.26	0.00	900.26	
MNW								09/01/96 0000	NM	-	NM	-	Dry
MNW								11/01/96 0000	10.40	898.41	0.00	898.41	
MNW								01/27/97 0000	9.34	899.47	0.00	899.47	
MNW								05/13/97 0000	11.91	896.90	0.00	896.90	
MNW								11/10/97 0000	12.58	896.23	0.00	896.23	
MNW								02/23/98 0000	7.30	901.51	0.00	901.51	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/01/98 0000	NM	-	NM	-	Dry
MNW								11/10/98 0000	12.58	896.23	0.00	896.23	
MNW								05/17/99 0000	12.00	896.81	0.00	896.81	
MNW								06/28/99 0000	NM	-	NM	-	Dry
MNW								06/12/00 0000	NM	-	NM	-	DRY
MNW								11/25/03 0000	7.02	901.79	0.00	901.79	
MNW								12/04/03 0000	7.90	900.91	0.00	900.91	
MNW								01/11/04 0000	9.71	899.10	0.00	899.10	
MNW								06/07/04 0000	11.85	896.96	0.00	896.96	
MW-12D	474949.69	1460378.34	916.40	919.31	918.92	1S	0						
MNW								03/25/91 0000	24.38	894.54	0.00	894.54	
MNW								04/29/91 0000	24.35	894.57	0.00	894.57	
MNW								05/17/91 0000	25.10	893.82	0.00	893.82	
MNW								06/18/91 0000	27.17	891.75	0.00	891.75	
MNW								07/20/91 0000	27.34	891.58	0.00	891.58	
MNW								08/19/91 0000	27.40	891.52	0.00	891.52	
MNW								09/19/91 0000	27.60	891.32	0.00	891.32	
MNW								09/30/91 0000	27.63	891.29	0.00	891.29	
MNW								11/20/91 0000	27.77	891.15	0.00	891.15	
MNW								12/16/91 0000	27.62	891.30	0.00	891.30	
MNW								03/23/92 0000	24.96	893.96	0.00	893.96	
MNW								06/15/92 0000	27.16	891.76	0.00	891.76	
MNW								12/08/92 0000	24.93	893.99	0.00	893.99	
MNW								02/16/93 0000	24.95	893.97	0.00	893.97	
MNW								05/24/93 0000	26.04	892.88	0.00	892.88	
MNW								08/01/93 0000	27.20	891.72	0.00	891.72	
MNW								09/06/93 0000	25.55	893.37	0.00	893.37	
MNW								10/07/93 0000	26.23	892.69	0.00	892.69	
MNW								11/08/93 0000	26.36	892.56	0.00	892.56	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								11/11/93 0000	26.00	892.92	0.00	892.92	
MNW								12/22/93 0000	24.50	894.42	0.00	894.42	
MNW								02/21/94 0000	25.15	893.77	0.00	893.77	
MNW								03/24/94 0000	23.81	895.11	0.00	895.11	
MNW								04/19/94 0000	23.00	895.92	0.00	895.92	
MNW								05/23/94 0000	25.47	893.45	0.00	893.45	
MNW								07/29/94 0000	26.00	892.92	0.00	892.92	
MNW								08/22/94 0000	27.11	891.81	0.00	891.81	
MNW								10/31/94 0000	26.71	892.21	0.00	892.21	
MNW								12/01/94 0000	25.25	893.67	0.00	893.67	
MNW								01/30/95 0000	25.01	893.91	0.00	893.91	
MNW								03/16/95 0000	24.30	894.62	0.00	894.62	
MNW								04/11/95 0000	24.37	894.55	0.00	894.55	
MNW								05/01/95 0000	24.81	894.11	0.00	894.11	
MNW								05/05/95 0000	25.00	893.92	0.00	893.92	
MNW								07/10/95 0000	26.00	892.92	0.00	892.92	
MNW								08/01/95 0000	26.40	892.52	0.00	892.52	
MNW								08/14/95 0000	26.73	892.19	0.00	892.19	
MNW								09/11/95 0000	26.40	892.52	0.00	892.52	
MNW								10/04/95 0000	26.22	892.70	0.00	892.70	
MNW								11/06/95 0000	27.28	891.64	0.00	891.64	
MNW								12/07/95 0000	25.00	893.92	0.00	893.92	
MNW								01/17/96 0000	26.90	892.02	0.00	892.02	
MNW								02/12/96 0000	25.86	893.06	0.00	893.06	
MNW								05/20/96 0000	23.40	895.52	0.00	895.52	
MNW								09/01/96 0000	26.53	892.39	0.00	892.39	
MNW								11/01/96 0000	25.31	893.61	0.00	893.61	
MNW								01/27/97 0000	25.03	893.89	0.00	893.89	
MNW								05/13/97 0000	24.78	894.14	0.00	894.14	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								08/19/97 0000	26.67	892.25	0.00	892.25	
MNW								11/10/97 0000	26.59	892.33	0.00	892.33	
MNW								02/23/98 0000	24.38	894.54	0.00	894.54	
MNW								06/01/98 0000	26.10	892.82	0.00	892.82	
MNW								11/10/98 0000	26.59	892.33	0.00	892.33	
MNW								05/17/99 0000	25.17	893.75	0.00	893.75	
MNW								06/28/99 0000	26.26	892.66	0.00	892.66	
MNW								06/12/00 0000	26.01	892.91	0.00	892.91	
MNW								11/25/03 0000	29.35	889.57	0.00	889.57	
MNW								12/03/03 0000	29.50	889.42	0.00	889.42	
MNW								01/11/04 0000	29.53	889.39	0.00	889.39	
MNW								06/07/04 0000	30.00	888.92	0.00	888.92	
MW-13	474513.42	1460608.55	946.30	948.68	947.97	1S	0						
MNW								04/29/91 0000	29.83	918.14	0.00	918.14	
MNW								05/17/91 0000	30.06	917.91	0.00	917.91	
MNW								06/18/91 0000	30.70	917.27	0.00	917.27	
MNW								07/20/91 0000	30.55	917.42	0.00	917.42	
MNW								08/19/91 0000	30.80	917.17	0.00	917.17	
MNW								09/19/91 0000	31.19	916.78	0.00	916.78	
MNW								09/30/91 0000	30.96	917.01	0.00	917.01	
MNW								11/20/91 0000	30.66	917.31	0.00	917.31	
MNW								12/16/91 0000	30.87	917.10	0.00	917.10	
MNW								03/23/92 0000	28.16	919.81	0.00	919.81	
MNW								06/15/92 0000	28.56	919.41	0.00	919.41	
MNW								12/08/92 0000	27.99	919.98	0.00	919.98	
MNW								02/16/93 0000	26.85	921.12	0.00	921.12	
MNW								05/24/93 0000	29.96	918.01	0.00	918.01	
MNW								08/01/93 0000	30.63	917.34	0.00	917.34	
MNW								09/06/93 0000	31.28	916.69	0.00	916.69	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								10/07/93 0000	31.44	916.53	0.00	916.53	
MNW								11/08/93 0000	31.74	916.23	0.00	916.23	
MNW								11/11/93 0000	31.18	916.79	0.00	916.79	
MNW								12/22/93 0000	28.62	919.35	0.00	919.35	
MNW								02/21/94 0000	27.55	920.42	0.00	920.42	
MNW								03/24/94 0000	26.64	921.33	0.00	921.33	
MNW								04/19/94 0000	26.00	921.97	0.00	921.97	
MNW								05/23/94 0000	27.74	920.23	0.00	920.23	
MNW								07/29/94 0000	27.68	920.29	0.00	920.29	
MNW								08/22/94 0000	28.93	919.04	0.00	919.04	
MNW								10/31/94 0000	28.72	919.25	0.00	919.25	
MNW								12/01/94 0000	27.11	920.86	0.00	920.86	
MNW								01/30/95 0000	25.98	921.99	0.00	921.99	
MNW								03/16/95 0000	25.55	922.42	0.00	922.42	
MNW								04/11/95 0000	26.20	921.77	0.00	921.77	
MNW								05/01/95 0000	26.55	921.42	0.00	921.42	
MNW								05/05/95 0000	26.60	921.37	0.00	921.37	
MNW								07/10/95 0000	37.00	910.97	0.00	910.97	
MNW								08/01/95 0000	27.50	920.47	0.00	920.47	
MNW								08/14/95 0000	27.70	920.27	0.00	920.27	
MNW								09/11/95 0000	28.00	919.97	0.00	919.97	
MNW								10/04/95 0000	28.00	919.97	0.00	919.97	
MNW								11/06/95 0000	28.45	919.52	0.00	919.52	
MNW								12/07/95 0000	28.35	919.62	0.00	919.62	
MNW								01/17/96 0000	28.44	919.53	0.00	919.53	
MNW								02/12/96 0000	26.52	921.45	0.00	921.45	
MNW								05/20/96 0000	24.70	923.27	0.00	923.27	
MNW								09/01/96 0000	27.96	920.01	0.00	920.01	
MNW								11/01/96 0000	25.37	922.60	0.00	922.60	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								01/27/97 0000	25.51	922.46	0.00	922.46	
MNW								05/13/97 0000	25.87	922.10	0.00	922.10	
MNW								08/19/97 0000	26.92	921.05	0.00	921.05	
MNW								11/10/97 0000	26.86	921.11	0.00	921.11	
MNW								02/23/98 0000	23.89	924.08	0.00	924.08	
MNW								06/01/98 0000	25.50	922.47	0.00	922.47	
MNW								11/10/98 0000	26.86	921.11	0.00	921.11	
MNW								05/17/99 0000	24.61	923.36	0.00	923.36	
MNW								06/28/99 0000	25.26	922.71	0.00	922.71	
MNW								06/12/00 0000	24.76	923.21	0.00	923.21	
MNW								11/25/03 0000	22.77	925.20	0.00	925.20	
MNW								12/03/03 0000	23.01	924.96	0.00	924.96	
MNW								01/11/04 0000	22.43	925.54	0.00	925.54	
MNW								06/07/04 0000	23.6	924.37	0.00	924.37	
MW-14	474365.98	1460405.15	945.00	947.33	946.38	1S	0						
MNW								04/29/91 0000	14.77	931.61	0.00	931.61	
MNW								05/17/91 0000	15.30	931.08	0.00	931.08	
MNW								06/18/91 0000	18.05	928.33	0.00	928.33	
MNW								07/20/91 0000	19.27	927.11	0.00	927.11	
MNW								08/19/91 0000	19.82	926.56	0.00	926.56	
MNW								09/19/91 0000	19.23	927.15	0.00	927.15	
MNW								09/30/91 0000	20.09	926.29	0.00	926.29	
MNW								11/20/91 0000	21.03	925.35	0.00	925.35	
MNW								12/16/91 0000	21.38	925.00	0.00	925.00	
MNW								03/23/92 0000	16.22	930.16	0.00	930.16	
MNW								06/15/92 0000	19.01	927.37	0.00	927.37	
MNW								12/08/92 0000	16.75	929.63	0.00	929.63	
MNW								02/16/93 0000	16.40	929.98	0.00	929.98	
MNW								05/24/93 0000	17.85	928.53	0.00	928.53	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								08/01/93 0000	19.72	926.66	0.00	926.66	
MNW								09/06/93 0000	20.92	925.46	0.00	925.46	
MNW								10/07/93 0000	20.70	925.68	0.00	925.68	
MNW								11/08/93 0000	20.86	925.52	0.00	925.52	
MNW								11/11/93 0000	20.00	926.38	0.00	926.38	
MNW								12/22/93 0000	17.25	929.13	0.00	929.13	
MNW								02/21/94 0000	16.46	929.92	0.00	929.92	
MNW								03/24/94 0000	14.66	931.72	0.00	931.72	
MNW								04/19/94 0000	14.35	932.03	0.00	932.03	
MNW								05/23/94 0000	17.11	929.27	0.00	929.27	
MNW								07/29/94 0000	19.75	926.63	0.00	926.63	
MNW								08/22/94 0000	19.32	927.06	0.00	927.06	
MNW								10/31/94 0000	19.83	926.55	0.00	926.55	
MNW								12/01/94 0000	14.75	931.63	0.00	931.63	
MNW								01/30/95 0000	15.90	930.48	0.00	930.48	
MNW								03/16/95 0000	15.00	931.38	0.00	931.38	
MNW								04/11/95 0000	15.56	930.82	0.00	930.82	
MNW								05/01/95 0000	16.27	930.11	0.00	930.11	
MNW								05/05/95 0000	16.25	930.13	0.00	930.13	
MNW								07/10/95 0000	17.00	929.38	0.00	929.38	
MNW								08/01/95 0000	18.50	927.88	0.00	927.88	
MNW								08/14/95 0000	18.84	927.54	0.00	927.54	
MNW								09/11/95 0000	20.80	925.58	0.00	925.58	
MNW								10/04/95 0000	20.45	925.93	0.00	925.93	
MNW								11/06/95 0000	20.60	925.78	0.00	925.78	
MNW								12/07/95 0000	19.58	926.80	0.00	926.80	
MNW								01/17/96 0000	18.86	927.52	0.00	927.52	
MNW								02/12/96 0000	17.00	929.38	0.00	929.38	
MNW								05/20/96 0000	14.72	931.66	0.00	931.66	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								09/01/96 0000	19.35	927.03	0.00	927.03	
MNW								11/01/96 0000	15.76	930.62	0.00	930.62	
MNW								01/27/97 0000	15.76	930.62	0.00	930.62	
MNW								05/13/97 0000	16.24	930.14	0.00	930.14	
MNW								08/19/97 0000	18.58	927.80	0.00	927.80	
MNW								11/10/97 0000	18.54	927.84	0.00	927.84	
MNW								02/23/98 0000	14.22	932.16	0.00	932.16	
MNW								06/01/98 0000	16.34	930.04	0.00	930.04	
MNW								11/10/98 0000	18.54	927.84	0.00	927.84	
MNW								05/17/99 0000	15.55	930.83	0.00	930.83	
MNW								06/28/99 0000	16.99	929.39	0.00	929.39	
MNW								06/12/00 0000	15.81	930.57	0.00	930.57	
MNW								11/25/03 0000	12.94	933.44	0.00	933.44	
MNW								12/02/03 0000	13.30	933.08	0.00	933.08	
MNW								01/11/04 0000	12.96	933.42	0.00	933.42	
MNW								06/07/04 0000	14.31	932.07	0.00	932.07	
MW-15	474519.64	1460320.18	937.70	940.31	939.47	1S	0						
MNW								04/29/91 0000	11.91	927.56	0.00	927.56	
MNW								05/17/91 0000	12.58	926.89	0.00	926.89	
MNW								06/18/91 0000	15.94	923.53	0.00	923.53	
MNW								07/20/91 0000	16.75	922.72	0.00	922.72	
MNW								08/19/91 0000	17.75	921.72	0.00	921.72	
MNW								09/19/91 0000	18.70	920.77	0.00	920.77	
MNW								09/30/91 0000	18.80	920.67	0.00	920.67	
MNW								11/20/91 0000	19.73	919.74	0.00	919.74	
MNW								12/16/91 0000	19.70	919.77	0.00	919.77	
MNW								03/23/92 0000	13.48	925.99	0.00	925.99	
MNW								06/15/92 0000	17.00	922.47	0.00	922.47	
MNW								12/08/92 0000	13.85	925.62	0.00	925.62	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								02/16/93 0000	13.9	925.57	0.00	925.57	
MNW								05/24/93 0000	15.47	924.00	0.00	924.00	
MNW								08/01/93 0000	17.61	921.86	0.00	921.86	
MNW								09/06/93 0000	18.33	921.14	0.00	921.14	
MNW								10/07/93 0000	18.19	921.28	0.00	921.28	
MNW								11/08/93 0000	18.02	921.45	0.00	921.45	
MNW								11/11/93 0000	17.47	922.00	0.00	922.00	
MNW								12/22/93 0000	15.13	924.34	0.00	924.34	
MNW								02/21/94 0000	14.79	924.68	0.00	924.68	
MNW								03/24/94 0000	13.23	926.24	0.00	926.24	
MNW								04/19/94 0000	13.00	926.47	0.00	926.47	
MNW								05/23/94 0000	15.00	924.47	0.00	924.47	
MNW								07/29/94 0000	17.68	921.79	0.00	921.79	
MNW								08/22/94 0000	16.73	922.74	0.00	922.74	
MNW								10/31/94 0000	17.87	921.60	0.00	921.60	
MNW								12/01/94 0000	15.23	924.24	0.00	924.24	
MNW								01/30/95 0000	13.79	925.68	0.00	925.68	
MNW								03/16/95 0000	15.00	924.47	0.00	924.47	
MNW								04/11/95 0000	19.75	919.72	0.00	919.72	
MNW								05/01/95 0000	14.23	925.24	0.00	925.24	
MNW								05/05/95 0000	14.00	925.47	0.00	925.47	
MNW								07/10/95 0000	15.30	924.17	0.00	924.17	
MNW								08/01/95 0000	16.60	922.87	0.00	922.87	
MNW								08/14/95 0000	16.96	922.51	0.00	922.51	
MNW								09/11/95 0000	17.80	921.67	0.00	921.67	
MNW								10/04/95 0000	24.62	914.85	0.00	914.85	
MNW								11/06/95 0000	18.63	920.84	0.00	920.84	
MNW								12/07/95 0000	17.55	921.92	0.00	921.92	
MNW								01/17/96 0000	16.70	922.77	0.00	922.77	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								02/12/96 0000	15.08	924.39	0.00	924.39	
MNW								05/20/96 0000	13.36	926.11	0.00	926.11	
MNW								09/01/96 0000	17.47	922.00	0.00	922.00	
MNW								11/01/96 0000	13.72	925.75	0.00	925.75	
MNW								01/27/97 0000	14.14	925.33	0.00	925.33	
MNW								05/13/97 0000	14.39	925.08	0.00	925.08	
MNW								08/19/97 0000	17.00	922.47	0.00	922.47	
MNW								11/10/97 0000	16.79	922.68	0.00	922.68	
MNW								02/23/98 0000	13.25	926.22	0.00	926.22	
MNW								06/01/98 0000	15.18	924.29	0.00	924.29	
MNW								11/10/98 0000	16.79	922.68	0.00	922.68	
MNW								05/17/99 0000	14.70	924.77	0.00	924.77	
MNW								06/28/99 0000	16.09	923.38	0.00	923.38	
MNW								06/12/00 0000	14.67	924.80	0.00	924.80	
MNW								11/25/03 0000	11.90	927.57	0.00	927.57	
MNW								12/02/03 0000	11.96	927.51	0.00	927.51	
MNW								01/11/04 0000	11.99	927.48	0.00	927.48	
MNW								06/07/04 0000	13	926.47	0.00	926.47	
MW-16	474597.42	1460730.26	944.90	947.68	947.61	UF	0						
MNW								12/17/92 0000	104.20	843.41	0.00	843.41	
MNW								02/16/93 0000	111.72	835.89	0.00	835.89	
MNW								05/24/93 0000	110.57	837.04	0.00	837.04	
MNW								08/01/93 0000	111.54	836.07	0.00	836.07	
MNW								09/06/93 0000	111.25	836.36	0.00	836.36	
MNW								10/07/93 0000	111.90	835.71	0.00	835.71	
MNW								11/08/93 0000	NM	-	NM	-	Dry
MNW								11/11/93 0000	NM	-	NM	-	Dry
MNW								12/22/93 0000	110.90	836.71	0.00	836.71	
MNW								02/21/94 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								03/24/94 0000	NM	-	NM	-	Dry
MNW								04/19/94 0000	NM	-	NM	-	Dry
MNW								05/23/94 0000	NM	-	NM	-	Dry
MNW								07/29/94 0000	NM	-	NM	-	Dry
MNW								08/22/94 0000	NM	-	NM	-	Dry
MNW								10/31/94 0000	NM	-	NM	-	Dry
MNW								12/01/94 0000	NM	-	NM	-	Dry
MNW								01/30/95 0000	NM	-	NM	-	Dry
MNW								03/16/95 0000	NM	-	NM	-	Dry
MNW								04/11/95 0000	86.50	861.11	0.00	861.11	
MNW								05/01/95 0000	NM	-	NM	-	Dry
MNW								05/05/95 0000	NM	-	NM	-	Dry
MNW								07/10/95 0000	NM	-	NM	-	Dry
MNW								08/01/95 0000	NM	-	NM	-	Dry
MNW								08/14/95 0000	NM	-	NM	-	Dry
MNW								09/11/95 0000	NM	-	NM	-	Dry
MNW								10/04/95 0000	NM	-	NM	-	Dry
MNW								11/06/95 0000	NM	-	NM	-	Dry
MNW								12/07/95 0000	NM	-	NM	-	Dry
MNW								01/17/96 0000	NM	-	NM	-	Dry
MNW								02/12/96 0000	NM	-	NM	-	Dry
MNW								05/20/96 0000	NM	-	NM	-	Dry
MNW								09/01/96 0000	NM	-	NM	-	Dry
MNW								11/01/96 0000	NM	-	NM	-	Dry
MNW								01/27/97 0000	NM	-	NM	-	Dry
MNW								05/13/97 0000	NM	-	NM	-	Dry
MNW								08/19/97 0000	NM	-	NM	-	Dry
MNW								11/10/97 0000	NM	-	NM	-	Dry
MNW								02/23/98 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/01/98 0000	NM	-	NM	-	Dry
MNW								11/10/98 0000	NM	-	NM	-	Dry
MNW								05/17/99 0000	0.00	947.61	NM		
MNW								06/28/99 0000	NM	-	NM	-	Dry
MNW								06/12/00 0000	NM	-	NM	-	Dry
MNW								11/25/03 0000	NM	-	NM	-	
MNW								12/03/03 0000	NM	-	NM	-	Dry
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	
MW-16BC	474585.62	1460734.25	944.30	946.87	946.63	DB	0						
MNW								12/17/92 0000	144.63	802.00	0.00	802.00	
MNW								05/24/93 0000	145.12	801.51	0.00	801.51	
MNW								08/01/93 0000	146.39	800.24	0.00	800.24	
MNW								09/06/93 0000	146.80	799.83	0.00	799.83	
MNW								10/07/93 0000	146.79	799.84	0.00	799.84	
MNW								11/08/93 0000	147.39	799.24	0.00	799.24	
MNW								11/11/93 0000	147.17	799.46	0.00	799.46	
MNW								12/22/93 0000	200.00	746.63	0.00	746.63	
MNW								02/21/94 0000	146.35	800.28	0.00	800.28	
MNW								03/24/94 0000	145.00	801.63	0.00	801.63	
MNW								04/19/94 0000	2.00	944.63	0.00	944.63	
MNW								05/23/94 0000	145.71	800.92	0.00	800.92	
MNW								07/29/94 0000	146.54	800.09	0.00	800.09	
MNW								08/22/94 0000	146.67	799.96	0.00	799.96	
MNW								10/31/94 0000	147.08	799.55	0.00	799.55	
MNW								12/01/94 0000	146.00	800.63	0.00	800.63	
MNW								01/30/95 0000	146.74	799.89	0.00	799.89	
MNW								03/16/95 0000	146.64	799.99	0.00	799.99	
MNW								04/11/95 0000	146.70	799.93	0.00	799.93	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								05/01/95 0000	147.04	799.59	0.00	799.59	
MNW								05/05/95 0000	146.80	799.83	0.00	799.83	
MNW								07/10/95 0000	146.80	799.83	0.00	799.83	
MNW								08/01/95 0000	147.50	799.13	0.00	799.13	
MNW								08/14/95 0000	147.80	798.83	0.00	798.83	
MNW								09/11/95 0000	148.00	798.63	0.00	798.63	
MNW								10/04/95 0000	147.55	799.08	0.00	799.08	
MNW								11/06/95 0000	148.00	798.63	0.00	798.63	
MNW								12/07/95 0000	148.00	798.63	0.00	798.63	
MNW								01/17/96 0000	147.54	799.09	0.00	799.09	
MNW								02/12/96 0000	147.23	799.40	0.00	799.40	
MNW								05/20/96 0000	146.28	800.35	0.00	800.35	
MNW								09/01/96 0000	147.10	799.53	0.00	799.53	
MNW								11/01/96 0000	146.96	799.67	0.00	799.67	
MNW								01/27/97 0000	146.31	800.32	0.00	800.32	
MNW								05/13/97 0000	146.00	800.63	0.00	800.63	
MNW								08/19/97 0000	147.03	799.60	0.00	799.60	
MNW								11/10/97 0000	147.31	799.32	0.00	799.32	
MNW								02/23/98 0000	146.06	800.57	0.00	800.57	
MNW								06/01/98 0000	145.80	800.83	0.00	800.83	
MNW								11/10/98 0000	147.31	799.32	0.00	799.32	
MNW								06/28/99 0000	141.24	805.39	0.00	805.39	
MNW								06/12/00 0000	141.92	804.71	0.00	804.71	
MNW								02/16/02 0000	146.2	800.43	0.00	800.43	
MNW								11/25/03 0000	140.09	806.54	0.00	806.54	
MNW								12/04/03 0000	140.26	806.37	0.00	806.37	
MNW								01/11/04 0000	140.35	806.28	0.00	806.28	
MNW								06/07/04 0000	140.61	806.02	0.00	806.02	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MW-17	474967.50	1460237.46	911.50	913.71	913.47	2S	0						
MNW								12/17/92 0000	52.09	861.38	0.00	861.38	
MNW								05/24/93 0000	41.92	871.55	0.00	871.55	
MNW								08/01/93 0000	50.32	863.15	0.00	863.15	
MNW								09/06/93 0000	47.70	865.77	0.00	865.77	
MNW								10/07/93 0000	51.00	862.47	0.00	862.47	
MNW								11/08/93 0000	49.62	863.85	0.00	863.85	
MNW								11/11/93 0000	49.38	864.09	0.00	864.09	
MNW								12/22/93 0000	138.00	775.47	0.00	775.47	
MNW								02/21/94 0000	49.68	863.79	0.00	863.79	
MNW								03/24/94 0000	52.00	861.47	0.00	861.47	
MNW								04/19/94 0000	51.00	862.47	0.00	862.47	
MNW								05/23/94 0000	49.68	863.79	0.00	863.79	
MNW								07/29/94 0000	51.10	862.37	0.00	862.37	
MNW								08/22/94 0000	50.50	862.97	0.00	862.97	
MNW								10/31/94 0000	51.00	862.47	0.00	862.47	
MNW								12/01/94 0000	52.90	860.57	0.00	860.57	
MNW								01/30/95 0000	50.55	862.92	0.00	862.92	
MNW								03/16/95 0000	51.53	861.94	0.00	861.94	
MNW								04/11/95 0000	50.61	862.86	0.00	862.86	
MNW								05/01/95 0000	49.96	863.51	0.00	863.51	
MNW								05/05/95 0000	52.52	860.95	0.00	860.95	
MNW								07/10/95 0000	51.20	862.27	0.00	862.27	
MNW								08/01/95 0000	50.50	862.97	0.00	862.97	
MNW								08/14/95 0000	50.16	863.31	0.00	863.31	
MNW								09/11/95 0000	52.10	861.37	0.00	861.37	
MNW								10/04/95 0000	51.37	862.10	0.00	862.10	
MNW								11/06/95 0000	50.19	863.28	0.00	863.28	
MNW								12/07/95 0000	53.00	860.47	0.00	860.47	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								01/17/96 0000	50.75	862.72	0.00	862.72	
MNW								02/12/96 0000	50.52	862.95	0.00	862.95	
MNW								05/20/96 0000	49.69	863.78	0.00	863.78	
MNW								09/01/96 0000	51.08	862.39	0.00	862.39	
MNW								11/01/96 0000	50.90	862.57	0.00	862.57	
MNW								01/27/97 0000	50.56	862.91	0.00	862.91	
MNW								05/13/97 0000	49.83	863.64	0.00	863.64	
MNW								08/19/97 0000	50.67	862.80	0.00	862.80	
MNW								11/10/97 0000	49.07	864.40	0.00	864.40	
MNW								02/23/98 0000	48.62	864.85	0.00	864.85	
MNW								06/01/98 0000	47.98	865.49	0.00	865.49	
MNW								11/10/98 0000	49.07	864.40	0.00	864.40	
MNW								05/17/99 0000	48.00	865.47	0.00	865.47	
MNW								06/28/99 0000	46.82	866.65	0.00	866.65	
MNW								06/12/00 0000	44.39	869.08	0.00	869.08	
MNW								02/16/02 0000	47.35	866.12	0.00	866.12	
MNW								11/25/03 0000	48.71	864.76	0.00	864.76	
MNW								12/05/03 0000	48.45	865.02	0.00	865.02	
MNW								01/11/04 0000	51.63	861.84	0.00	861.84	
MNW								06/07/04 0000	47.76	865.71	0.00	865.71	
MW-19	475677.35	1459470.99	858.80	861.45	861.18	DB	0						
MNW								12/08/92 0000	50.29	810.89	0.00	810.89	
MNW								02/16/93 0000	58.60	802.58	0.00	802.58	
MNW								05/24/93 0000	57.98	803.20	0.00	803.20	
MNW								08/01/93 0000	59.12	802.06	0.00	802.06	
MNW								09/06/93 0000	57.30	803.88	0.00	803.88	
MNW								10/07/93 0000	59.70	801.48	0.00	801.48	
MNW								11/08/93 0000	59.78	801.40	0.00	801.40	
MNW								11/11/93 0000	59.50	801.68	0.00	801.68	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								12/22/93 0000	57.87	803.31	0.00	803.31	
MNW								02/21/94 0000	57.64	803.54	0.00	803.54	
MNW								03/24/94 0000	55.17	806.01	0.00	806.01	
MNW								04/19/94 0000	55.15	806.03	0.00	806.03	
MNW								05/23/94 0000	57.75	803.43	0.00	803.43	
MNW								07/29/94 0000	59.13	802.05	0.00	802.05	
MNW								08/22/94 0000	59.30	801.88	0.00	801.88	
MNW								10/31/94 0000	60.64	800.54	0.00	800.54	
MNW								12/01/94 0000	59.34	801.84	0.00	801.84	
MNW								01/30/95 0000	58.08	803.10	0.00	803.10	
MNW								03/16/95 0000	57.62	803.56	0.00	803.56	
MNW								04/11/95 0000	58.13	803.05	0.00	803.05	
MNW								05/01/95 0000	57.99	803.19	0.00	803.19	
MNW								05/05/95 0000	58.09	803.09	0.00	803.09	
MNW								07/10/95 0000	58.40	802.78	0.00	802.78	
MNW								08/01/95 0000	61.00	800.18	0.00	800.18	
MNW								08/14/95 0000	61.12	800.06	0.00	800.06	
MNW								09/11/95 0000	60.90	800.28	0.00	800.28	
MNW								10/04/95 0000	60.85	800.33	0.00	800.33	
MNW								11/06/95 0000	60.97	800.21	0.00	800.21	
MNW								12/07/95 0000	60.33	800.85	0.00	800.85	
MNW								01/17/96 0000	NM	-	NM	-	Dry
MNW								02/12/96 0000	59.31	801.87	0.00	801.87	
MNW								05/20/96 0000	57.00	804.18	0.00	804.18	
MNW								09/01/96 0000	59.19	801.99	0.00	801.99	
MNW								11/01/96 0000	58.35	802.83	0.00	802.83	
MNW								01/27/97 0000	58.14	803.04	0.00	803.04	
MNW								05/13/97 0000	58.14	803.04	0.00	803.04	
MNW								08/19/97 0000	59.08	802.10	0.00	802.10	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								11/10/97 0000	58.83	802.35	0.00	802.35	
MNW								02/23/98 0000	57.13	804.05	0.00	804.05	
MNW								06/01/98 0000	57.52	803.66	0.00	803.66	
MNW								11/10/98 0000	58.83	802.35	0.00	802.35	
MNW								06/28/99 0000	58.00	803.18	0.00	803.18	
MNW								06/12/00 0000	57.40	803.78	0.00	803.78	
MNW								11/25/03 0000	56.52	804.66	0.00	804.66	
MNW								12/03/03 0000	56.50	804.68	0.00	804.68	
MNW								01/11/04 0000	55.41	805.77	0.00	805.77	
MNW								06/07/04 0000	56.1	805.08	0.00	805.08	
MW-20	475435.23	1459560.73	887.50	889.87	889.4	UF	0						
MNW								05/24/93 0000	52.56	836.84	0.00	836.84	
MNW								08/01/93 0000	52.75	836.65	0.00	836.65	
MNW								09/06/93 0000	51.98	837.42	0.00	837.42	
MNW								10/07/93 0000	54.25	835.15	0.00	835.15	
MNW								11/08/93 0000	53.04	836.36	0.00	836.36	
MNW								11/11/93 0000	52.57	836.83	0.00	836.83	
MNW								12/22/93 0000	52.00	837.40	0.00	837.40	
MNW								02/21/94 0000	52.32	837.08	0.00	837.08	
MNW								03/24/94 0000	52.23	837.17	0.00	837.17	
MNW								04/19/94 0000	53.30	836.10	0.00	836.10	
MNW								05/23/94 0000	52.63	836.77	0.00	836.77	
MNW								07/29/94 0000	52.77	836.63	0.00	836.63	
MNW								08/22/94 0000	53.05	836.35	0.00	836.35	
MNW								10/31/94 0000	52.81	836.59	0.00	836.59	
MNW								12/01/94 0000	52.38	837.02	0.00	837.02	
MNW								01/30/95 0000	52.50	836.90	0.00	836.90	
MNW								03/16/95 0000	52.31	837.09	0.00	837.09	
MNW								04/11/95 0000	52.45	836.95	0.00	836.95	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								05/01/95 0000	52.61	836.79	0.00	836.79	
MNW								05/05/95 0000	52.48	836.92	0.00	836.92	
MNW								07/10/95 0000	52.20	837.20	0.00	837.20	
MNW								08/01/95 0000	52.40	837.00	0.00	837.00	
MNW								08/14/95 0000	52.85	836.55	0.00	836.55	
MNW								09/11/95 0000	54.00	835.40	0.00	835.40	
MNW								10/04/95 0000	53.81	835.59	0.00	835.59	
MNW								11/06/95 0000	53.97	835.43	0.00	835.43	
MNW								12/07/95 0000	54.34	835.06	0.00	835.06	
MNW								01/17/96 0000	52.97	836.43	0.00	836.43	
MNW								02/12/96 0000	52.55	836.85	0.00	836.85	
MNW								05/20/96 0000	52.38	837.02	0.00	837.02	
MNW								09/01/96 0000	52.69	836.71	0.00	836.71	
MNW								11/01/96 0000	52.33	837.07	0.00	837.07	
MNW								01/27/97 0000	52.44	836.96	0.00	836.96	
MNW								05/13/97 0000	52.45	836.95	0.00	836.95	
MNW								08/19/97 0000	52.95	836.45	0.00	836.45	
MNW								11/10/97 0000	53.45	835.95	0.00	835.95	
MNW								02/23/98 0000	52.31	837.09	0.00	837.09	
MNW								06/01/98 0000	52.49	836.91	0.00	836.91	
MNW								11/10/98 0000	53.45	835.95	0.00	835.95	
MNW								05/17/99 0000	52.00	837.40	0.00	837.40	
MNW								06/28/99 0000	52.19	837.21	0.00	837.21	
MNW								06/12/00 0000	52.37	837.03	0.00	837.03	
MNW								11/25/03 0000	51.68	837.72	0.00	837.72	
MNW								12/02/03 0000	51.79	837.61	0.00	837.61	
MNW								01/11/04 0000	51.66	837.74	0.00	837.74	
MNW								06/07/04 0000	51.82	837.58	0.00	837.58	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MW-21	475350.60	1459428.07	885.00	888.32	887.82	UF	0						
MNW								05/24/93 0000	NM	-	NM	-	Dry
MNW								08/01/93 0000	NM	-	NM	-	Dry
MNW								09/06/93 0000	NM	-	NM	-	Dry
MNW								10/07/93 0000	NM	-	NM	-	Dry
MNW								11/08/93 0000	NM	-	NM	-	Dry
MNW								11/11/93 0000	NM	-	NM	-	Dry
MNW								12/22/93 0000	NM	-	NM	-	Dry
MNW								02/21/94 0000	NM	-	NM	-	Dry
MNW								03/24/94 0000	NM	-	NM	-	Dry
MNW								04/19/94 0000	NM	-	NM	-	Dry
MNW								05/23/94 0000	NM	-	NM	-	Dry
MNW								07/29/94 0000	NM	-	NM	-	Dry
MNW								08/22/94 0000	NM	-	NM	-	Dry
MNW								10/31/94 0000	NM	-	NM	-	Dry
MNW								12/01/94 0000	NM	-	NM	-	Dry
MNW								01/30/95 0000	NM	-	NM	-	Dry
MNW								03/16/95 0000	NM	-	NM	-	Dry
MNW								04/11/95 0000	NM	-	NM	-	Dry
MNW								05/01/95 0000	NM	-	NM	-	Dry
MNW								05/05/95 0000	NM	-	NM	-	Dry
MNW								07/10/95 0000	NM	-	NM	-	Dry
MNW								08/01/95 0000	NM	-	NM	-	Dry
MNW								08/14/95 0000	NM	-	NM	-	Dry
MNW								09/11/95 0000	NM	-	NM	-	Dry
MNW								10/04/95 0000	NM	-	NM	-	Dry
MNW								11/06/95 0000	NM	-	NM	-	Dry
MNW								12/07/95 0000	NM	-	NM	-	Dry
MNW								01/17/96 0000	21.41	866.41	0.00	866.41	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								02/12/96 0000	NM	-	NM	-	Dry
MNW								05/20/96 0000	NM	-	NM	-	Dry
MNW								09/01/96 0000	NM	-	NM	-	Dry
MNW								11/01/96 0000	NM	-	NM	-	Dry
MNW								01/27/97 0000	NM	-	NM	-	Dry
MNW								05/13/97 0000	NM	-	NM	-	Dry
MNW								08/19/97 0000	NM	-	NM	-	Dry
MNW								11/10/97 0000	NM	-	NM	-	Dry
MNW								02/23/98 0000	NM	-	NM	-	Dry
MNW								06/01/98 0000	NM	-	NM	-	Dry
MNW								11/10/98 0000	NM	-	NM	-	Dry
MNW								05/17/99 0000	NM	-	NM	-	Dry
MNW								06/28/99 0000	NM	-	NM	-	Dry
MNW								06/12/00 0000	NM	-	NM	-	Dry
MNW								11/25/03 0000	NM	-	NM	-	
MNW								12/02/03 0000	NM	-	NM	-	Dry
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	
MW-22	475257.29	1459401.92	890.80	893.41	893.05	DB	0						
MNW								05/24/93 0000	90.05	803.00	0.00	803.00	
MNW								08/01/93 0000	91.16	801.89	0.00	801.89	
MNW								09/06/93 0000	89.30	803.75	0.00	803.75	
MNW								10/07/93 0000	88.87	804.18	0.00	804.18	
MNW								11/08/93 0000	91.84	801.21	0.00	801.21	
MNW								11/11/93 0000	91.54	801.51	0.00	801.51	
MNW								12/22/93 0000	90.20	802.85	0.00	802.85	
MNW								02/21/94 0000	89.73	803.32	0.00	803.32	
MNW								03/24/94 0000	87.10	805.95	0.00	805.95	
MNW								04/19/94 0000	87.32	805.73	0.00	805.73	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								05/23/94 0000	89.87	803.18	0.00	803.18	
MNW								07/29/94 0000	91.32	801.73	0.00	801.73	
MNW								08/22/94 0000	91.41	801.64	0.00	801.64	
MNW								10/31/94 0000	92.74	800.31	0.00	800.31	
MNW								12/01/94 0000	91.38	801.67	0.00	801.67	
MNW								01/30/95 0000	90.24	802.81	0.00	802.81	
MNW								03/16/95 0000	89.73	803.32	0.00	803.32	
MNW								04/11/95 0000	90.15	802.90	0.00	802.90	
MNW								05/01/95 0000	90.41	802.64	0.00	802.64	
MNW								05/05/95 0000	90.16	802.89	0.00	802.89	
MNW								07/10/95 0000	90.30	802.75	0.00	802.75	
MNW								08/01/95 0000	93.00	800.05	0.00	800.05	
MNW								08/14/95 0000	93.23	799.82	0.00	799.82	
MNW								09/11/95 0000	93.00	800.05	0.00	800.05	
MNW								10/04/95 0000	93.00	800.05	0.00	800.05	
MNW								11/06/95 0000	93.08	799.97	0.00	799.97	
MNW								12/07/95 0000	92.41	800.64	0.00	800.64	
MNW								01/17/96 0000	94.10	798.95	0.00	798.95	
MNW								02/12/96 0000	91.38	801.67	0.00	801.67	
MNW								05/20/96 0000	88.57	804.48	0.00	804.48	
MNW								09/01/96 0000	91.27	801.78	0.00	801.78	
MNW								11/01/96 0000	90.37	802.68	0.00	802.68	
MNW								01/27/97 0000	90.19	802.86	0.00	802.86	
MNW								05/13/97 0000	90.22	802.83	0.00	802.83	
MNW								08/19/97 0000	91.23	801.82	0.00	801.82	
MNW								11/10/97 0000	91.33	801.72	0.00	801.72	
MNW								02/23/98 0000	89.16	803.89	0.00	803.89	
MNW								06/01/98 0000	89.66	803.39	0.00	803.39	
MNW								11/10/98 0000	91.33	801.72	0.00	801.72	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/28/99 0000	90.06	802.99	0.00	802.99	
MNW								06/12/00 0000	89.40	803.65	0.00	803.65	
MNW								11/25/03 0000	88.50	804.55	0.00	804.55	
MNW								12/02/03 0000	88.40	804.65	0.00	804.65	
MNW								01/11/04 0000	87.37	805.68	0.00	805.68	
MNW								06/07/04 0000	88.09	804.96	0.00	804.96	
MW-23	475530.51	1459309.79	861.10	863.79	863.43	DB	0						
MNW								05/24/93 0000	19.77	843.66	0.00	843.66	-23 WERE 30-40 FEET ABO
MNW								08/01/93 0000	63.58	799.85	0.00	799.85	
MNW								09/06/93 0000	61.79	801.64	0.00	801.64	
MNW								10/07/93 0000	64.42	799.01	0.00	799.01	
MNW								11/08/93 0000	59.65	803.78	0.00	803.78	
MNW								11/11/93 0000	59.28	804.15	0.00	804.15	
MNW								12/22/93 0000	32.10	831.33	0.00	831.33	
MNW								02/21/94 0000	49.10	814.33	0.00	814.33	
MNW								03/24/94 0000	60.20	803.23	0.00	803.23	
MNW								04/19/94 0000	51.81	811.62	0.00	811.62	
MNW								05/23/94 0000	49.42	814.01	0.00	814.01	
MNW								07/29/94 0000	52.71	810.72	0.00	810.72	
MNW								08/22/94 0000	51.18	812.25	0.00	812.25	
MNW								10/31/94 0000	55.04	808.39	0.00	808.39	
MNW								12/01/94 0000	62.90	800.53	0.00	800.53	
MNW								01/30/95 0000	50.58	812.85	0.00	812.85	
MNW								03/16/95 0000	47.23	816.20	0.00	816.20	
MNW								04/11/95 0000	47.30	816.13	0.00	816.13	
MNW								05/01/95 0000	47.05	816.38	0.00	816.38	
MNW								05/05/95 0000	46.76	816.67	0.00	816.67	
MNW								07/10/95 0000	46.55	816.88	0.00	816.88	
MNW								08/01/95 0000	48.40	815.03	0.00	815.03	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								08/14/95 0000	48.74	814.69	0.00	814.69	
MNW								09/11/95 0000	48.70	814.73	0.00	814.73	
MNW								10/04/95 0000	48.67	814.76	0.00	814.76	
MNW								11/06/95 0000	48.93	814.50	0.00	814.50	
MNW								12/07/95 0000	48.00	815.43	0.00	815.43	
MNW								01/17/96 0000	49.20	814.23	0.00	814.23	
MNW								02/12/96 0000	47.50	815.93	0.00	815.93	
MNW								05/20/96 0000	45.91	817.52	0.00	817.52	
MNW								09/01/96 0000	47.83	815.60	0.00	815.60	
MNW								11/01/96 0000	46.79	816.64	0.00	816.64	
MNW								01/27/97 0000	46.26	817.17	0.00	817.17	
MNW								05/13/97 0000	46.81	816.62	0.00	816.62	
MNW								08/19/97 0000	28.31	835.12	0.00	835.12	
MNW								11/10/97 0000	47.87	815.56	0.00	815.56	
MNW								02/23/98 0000	46.09	817.34	0.00	817.34	
MNW								06/01/98 0000	46.37	817.06	0.00	817.06	
MNW								11/10/98 0000	47.87	815.56	0.00	815.56	
MNW								06/28/99 0000	46.94	816.49	0.00	816.49	
MNW								06/12/00 0000	46.49	816.94	0.00	816.94	
MNW								11/25/03 0000	46.15	817.28	0.00	817.28	
MNW								12/03/03 0000	46.13	817.30	0.00	817.30	
MNW								01/11/04 0000	45.28	818.15	0.00	818.15	
MNW								06/07/04 0000	45.38	818.05	0.00	818.05	
MW-24	474315.97	1460489.11	946.70	949.17	948.58	1S	0						
MNW								05/24/93 0000	20.16	928.42	0.00	928.42	
MNW								08/01/93 0000	22.51	926.07	0.00	926.07	
MNW								09/06/93 0000	22.60	925.98	0.00	925.98	
MNW								10/07/93 0000	22.49	926.09	0.00	926.09	
MNW								11/08/93 0000	22.71	925.87	0.00	925.87	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								11/11/93 0000	21.78	926.80	0.00	926.80	
MNW								12/22/93 0000	19.20	929.38	0.00	929.38	
MNW								02/21/94 0000	18.45	930.13	0.00	930.13	
MNW								03/24/94 0000	16.41	932.17	0.00	932.17	
MNW								04/19/94 0000	61.43	887.15	0.00	887.15	
MNW								05/23/94 0000	19.10	929.48	0.00	929.48	
MNW								07/29/94 0000	21.71	926.87	0.00	926.87	
MNW								08/22/94 0000	21.20	927.38	0.00	927.38	
MNW								10/31/94 0000	21.72	926.86	0.00	926.86	
MNW								12/01/94 0000	19.27	929.31	0.00	929.31	
MNW								01/30/95 0000	17.90	930.68	0.00	930.68	
MNW								03/16/95 0000	17.21	931.37	0.00	931.37	
MNW								04/11/95 0000	17.43	931.15	0.00	931.15	
MNW								05/01/95 0000	18.36	930.22	0.00	930.22	
MNW								05/05/95 0000	18.32	930.26	0.00	930.26	
MNW								07/10/95 0000	19.20	929.38	0.00	929.38	
MNW								08/01/95 0000	20.50	928.08	0.00	928.08	
MNW								08/14/95 0000	20.86	927.72	0.00	927.72	
MNW								09/11/95 0000	20.80	927.78	0.00	927.78	
MNW								10/04/95 0000	22.37	926.21	0.00	926.21	
MNW								11/06/95 0000	22.47	926.11	0.00	926.11	
MNW								12/07/95 0000	21.51	927.07	0.00	927.07	
MNW								01/17/96 0000	20.00	928.58	0.00	928.58	
MNW								02/12/96 0000	18.96	929.62	0.00	929.62	
MNW								05/20/96 0000	16.80	931.78	0.00	931.78	
MNW								09/01/96 0000	20.69	927.89	0.00	927.89	
MNW								11/01/96 0000	17.94	930.64	0.00	930.64	
MNW								01/27/97 0000	17.75	930.83	0.00	930.83	
MNW								05/13/97 0000	18.47	930.11	0.00	930.11	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								08/19/97 0000	20.54	928.04	0.00	928.04	
MNW								11/10/97 0000	20.33	928.25	0.00	928.25	
MNW								02/23/98 0000	16.48	932.10	0.00	932.10	
MNW								06/01/98 0000	18.52	930.06	0.00	930.06	
MNW								11/10/98 0000	20.33	928.25	0.00	928.25	
MNW								05/17/99 0000	18.13	930.45	0.00	930.45	
MNW								06/28/99 0000	18.51	930.07	0.00	930.07	
MNW								06/12/00 0000	18.24	930.34	0.00	930.34	
MNW								11/25/03 0000	15.49	933.09	0.00	933.09	
MNW								12/02/03 0000	15.55	933.03	0.00	933.03	
MNW								01/11/04 0000	15.39	933.19	0.00	933.19	
MNW								06/07/04 0000	16.82	931.76	0.00	931.76	
MW-25	474997.03	1460085.62	907.30	910.07	909.54	1S	0						
MNW								05/24/93 0000	15.03	894.51	0.00	894.51	
MNW								08/01/93 0000	17.80	891.74	0.00	891.74	
MNW								09/06/93 0000	16.67	892.87	0.00	892.87	
MNW								10/07/93 0000	17.11	892.43	0.00	892.43	
MNW								11/08/93 0000	16.19	893.35	0.00	893.35	
MNW								11/11/93 0000	15.66	893.88	0.00	893.88	
MNW								12/22/93 0000	14.10	895.44	0.00	895.44	
MNW								02/21/94 0000	13.98	895.56	0.00	895.56	
MNW								03/24/94 0000	12.35	897.19	0.00	897.19	
MNW								04/19/94 0000	11.51	898.03	0.00	898.03	
MNW								05/23/94 0000	14.92	894.62	0.00	894.62	
MNW								07/29/94 0000	17.00	892.54	0.00	892.54	
MNW								08/22/94 0000	15.78	893.76	0.00	893.76	
MNW								10/31/94 0000	16.50	893.04	0.00	893.04	
MNW								12/01/94 0000	14.31	895.23	0.00	895.23	
MNW								01/30/95 0000	13.55	895.99	0.00	895.99	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								03/16/95 0000	13.00	896.54	0.00	896.54	
MNW								04/11/95 0000	12.71	896.83	0.00	896.83	
MNW								05/01/95 0000	13.77	895.77	0.00	895.77	
MNW								05/05/95 0000	13.82	895.72	0.00	895.72	
MNW								07/10/95 0000	16.20	893.34	0.00	893.34	
MNW								08/01/95 0000	16.60	892.94	0.00	892.94	
MNW								08/14/95 0000	17.06	892.48	0.00	892.48	
MNW								09/11/95 0000	17.40	892.14	0.00	892.14	
MNW								10/04/95 0000	NM	-	NM	-	Dry
MNW								11/06/95 0000	18.77	890.77	0.00	890.77	
MNW								12/07/95 0000	17.48	892.06	0.00	892.06	
MNW								01/17/96 0000	15.94	893.60	0.00	893.60	
MNW								02/12/96 0000	16.30	893.24	0.00	893.24	
MNW								05/20/96 0000	13.48	896.06	0.00	896.06	
MNW								09/01/96 0000	17.02	892.52	0.00	892.52	
MNW								11/01/96 0000	14.83	894.71	0.00	894.71	
MNW								01/27/97 0000	14.30	895.24	0.00	895.24	
MNW								05/13/97 0000	15.06	894.48	0.00	894.48	
MNW								08/19/97 0000	17.23	892.31	0.00	892.31	
MNW								11/10/97 0000	15.93	893.61	0.00	893.61	
MNW								02/23/98 0000	13.53	896.01	0.00	896.01	
MNW								06/01/98 0000	16.37	893.17	0.00	893.17	
MNW								11/10/98 0000	15.93	893.61	0.00	893.61	
MNW								05/17/99 0000	14.65	894.89	0.00	894.89	
MNW								06/28/99 0000	16.60	892.94	0.00	892.94	
MNW								06/12/00 0000	17.37	892.17	0.00	892.17	
MNW								11/25/03 0000	16.34	893.20	0.00	893.20	
MNW								12/04/03 0000	16.62	892.92	0.00	892.92	
MNW								01/11/04 0000	17.05	892.49	0.00	892.49	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/07/04 0000	17.22	892.32	0.00	892.32	
MW-26	474874.01	1460250.94	916.90	919.56	919.02	1S	0						
MNW								05/24/93 0000	26.32	892.70	0.00	892.70	
MNW								08/01/93 0000	28.52	890.50	0.00	890.50	
MNW								09/06/93 0000	26.42	892.60	0.00	892.60	
MNW								10/07/93 0000	26.64	892.38	0.00	892.38	
MNW								11/08/93 0000	26.60	892.42	0.00	892.42	
MNW								11/11/93 0000	26.07	892.95	0.00	892.95	
MNW								12/22/93 0000	25.50	893.52	0.00	893.52	
MNW								02/21/94 0000	25.41	893.61	0.00	893.61	
MNW								03/24/94 0000	24.00	895.02	0.00	895.02	
MNW								04/19/94 0000	23.00	896.02	0.00	896.02	
MNW								05/23/94 0000	25.71	893.31	0.00	893.31	
MNW								07/29/94 0000	27.16	891.86	0.00	891.86	
MNW								08/22/94 0000	27.34	891.68	0.00	891.68	
MNW								10/31/94 0000	26.94	892.08	0.00	892.08	
MNW								12/01/94 0000	26.00	893.02	0.00	893.02	
MNW								01/30/95 0000	25.22	893.80	0.00	893.80	
MNW								03/16/95 0000	24.54	894.48	0.00	894.48	
MNW								04/11/95 0000	24.85	894.17	0.00	894.17	
MNW								05/01/95 0000	25.06	893.96	0.00	893.96	
MNW								05/05/95 0000	25.35	893.67	0.00	893.67	
MNW								07/10/95 0000	26.20	892.82	0.00	892.82	
MNW								08/01/95 0000	26.50	892.52	0.00	892.52	
MNW								08/14/95 0000	26.92	892.10	0.00	892.10	
MNW								09/11/95 0000	27.00	892.02	0.00	892.02	
MNW								10/04/95 0000	30.50	888.52	0.00	888.52	
MNW								11/06/95 0000	27.51	891.51	0.00	891.51	
MNW								12/07/95 0000	26.93	892.09	0.00	892.09	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								01/17/96 0000	25.76	893.26	0.00	893.26	
MNW								02/12/96 0000	26.04	892.98	0.00	892.98	
MNW								05/20/96 0000	23.64	895.38	0.00	895.38	
MNW								09/01/96 0000	26.71	892.31	0.00	892.31	
MNW								11/01/96 0000	25.52	893.50	0.00	893.50	
MNW								01/27/97 0000	25.25	893.77	0.00	893.77	
MNW								05/13/97 0000	24.90	894.12	0.00	894.12	
MNW								08/19/97 0000	20.79	898.23	0.00	898.23	
MNW								11/10/97 0000	26.69	892.33	0.00	892.33	
MNW								02/23/98 0000	24.55	894.47	0.00	894.47	
MNW								06/01/98 0000	26.65	892.37	0.00	892.37	
MNW								11/10/98 0000	26.69	892.33	0.00	892.33	
MNW								05/17/99 0000	25.00	894.02	0.00	894.02	
MNW								06/28/99 0000	26.26	892.76	0.00	892.76	
MNW								06/12/00 0000	26.08	892.94	0.00	892.94	
MNW								12/05/03 0000	29.79	889.23	0.00	889.23	
MNW								01/11/04 0000	30.03	888.99	0.00	888.99	
MNW								06/07/04 0000	30.36	888.66	0.00	888.66	
MW-27	474839.93	1460615.22	927.30	929.99	929.5	1S	0						
MNW								05/24/93 0000	30.01	899.49	0.00	899.49	
MNW								08/01/93 0000	38.52	890.98	0.00	890.98	
MNW								09/06/93 0000	38.43	891.07	0.00	891.07	
MNW								10/07/93 0000	38.38	891.12	0.00	891.12	
MNW								11/08/93 0000	38.56	890.94	0.00	890.94	
MNW								11/11/93 0000	NM	-	NM	-	Dry
MNW								12/22/93 0000	38.00	891.50	0.00	891.50	
MNW								02/21/94 0000	38.25	891.25	0.00	891.25	
MNW								03/24/94 0000	38.50	891.00	0.00	891.00	
MNW								04/19/94 0000	38.14	891.36	0.00	891.36	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								05/23/94 0000	38.30	891.20	0.00	891.20	
MNW								07/29/94 0000	38.43	891.07	0.00	891.07	
MNW								08/22/94 0000	NM	-	NM	-	Dry
MNW								10/31/94 0000	38.35	891.15	0.00	891.15	
MNW								12/01/94 0000	38.58	890.92	0.00	890.92	
MNW								01/30/95 0000	38.36	891.14	0.00	891.14	
MNW								03/16/95 0000	38.71	890.79	0.00	890.79	
MNW								04/11/95 0000	38.49	891.01	0.00	891.01	
MNW								05/01/95 0000	38.44	891.06	0.00	891.06	
MNW								05/05/95 0000	38.68	890.82	0.00	890.82	
MNW								07/10/95 0000	38.30	891.20	0.00	891.20	
MNW								08/01/95 0000	38.20	891.30	0.00	891.30	
MNW								08/14/95 0000	38.42	891.08	0.00	891.08	
MNW								09/11/95 0000	39.00	890.50	0.00	890.50	
MNW								10/04/95 0000	38.45	891.05	0.00	891.05	
MNW								11/06/95 0000	38.34	891.16	0.00	891.16	
MNW								12/07/95 0000	38.82	890.68	0.00	890.68	
MNW								01/17/96 0000	38.21	891.29	0.00	891.29	
MNW								02/12/96 0000	38.52	890.98	0.00	890.98	
MNW								05/20/96 0000	37.41	892.09	0.00	892.09	
MNW								09/01/96 0000	38.56	890.94	0.00	890.94	
MNW								11/01/96 0000	38.78	890.72	0.00	890.72	
MNW								01/27/97 0000	38.46	891.04	0.00	891.04	
MNW								05/13/97 0000	38.27	891.23	0.00	891.23	
MNW								08/19/97 0000	38.10	891.40	0.00	891.40	
MNW								11/10/97 0000	38.63	890.87	0.00	890.87	
MNW								02/23/98 0000	38.00	891.50	0.00	891.50	
MNW								06/01/98 0000	37.22	892.28	0.00	892.28	
MNW								11/10/98 0000	38.63	890.87	0.00	890.87	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								05/17/99 0000	37.21	892.29	0.00	892.29	
MNW								06/28/99 0000	37.24	892.26	0.00	892.26	
MNW								06/12/00 0000	NM	-	NM	-	Dry
MNW								11/25/03 0000	36.95	892.55	0.00	892.55	
MNW								12/04/03 0000	36.94	892.56	0.00	892.56	
MNW								01/11/04 0000	38.15	891.35	0.00	891.35	
MNW								06/07/04 0000	37.61	891.89	0.00	891.89	
MW-28	474859.00	1460597.00	NA	NA	NA	1S	0						
MNW								05/24/93 0000	30.75		0.00		
MNW								08/01/93 0000	51.71		0.00		
MNW								09/06/93 0000	52.04		0.00		
MNW								10/07/93 0000	52.70		0.00		
MNW								11/08/93 0000	52.70		0.00		
MNW								11/11/93 0000	NM	-	NM	-	Dry
MNW								12/22/93 0000	52.51		0.00		
MNW								02/21/94 0000	51.71		0.00		
MNW								03/24/94 0000	38.11		0.00		
MNW								04/19/94 0000	35.51		0.00		
MNW								05/23/94 0000	41.84		0.00		
MNW								07/29/94 0000	51.82		0.00		
MNW								08/22/94 0000	52.04		0.00		
MNW								10/31/94 0000	53.10		0.00		
MNW								12/01/94 0000	53.11		0.00		
MNW								01/30/95 0000	51.05		0.00		
MNW								03/16/95 0000	47.51		0.00		
MNW								04/11/95 0000	39.51		0.00		
MNW								05/01/95 0000	38.33		0.00		
MNW								05/05/95 0000	41.51		0.00		
MNW								07/10/95 0000	40.71		0.00		

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								08/01/95 0000	41.01		0.00		
MNW								08/14/95 0000	41.47		0.00		
MNW								09/11/95 0000	52.04		0.00		
MNW								10/04/95 0000	NM	-	NM	-	ry, Well Abandoned Fall 199
MW-29	474997.15	1460195.22	909.70	912.53	912	1S	0						
MNW								05/24/93 0000	19.55	892.45	0.00	892.45	
MNW								08/01/93 0000	24.23	887.77	0.00	887.77	
MNW								09/06/93 0000	23.36	888.64	0.00	888.64	
MNW								10/07/93 0000	23.58	888.42	0.00	888.42	
MNW								11/08/93 0000	23.59	888.41	0.00	888.41	
MNW								11/11/93 0000	23.07	888.93	0.00	888.93	
MNW								12/22/93 0000	28.00	884.00	0.00	884.00	
MNW								02/21/94 0000	27.84	884.16	0.00	884.16	
MNW								03/24/94 0000	27.15	884.85	0.00	884.85	
MNW								04/19/94 0000	24.33	887.67	0.00	887.67	
MNW								05/23/94 0000	28.41	883.59	0.00	883.59	
MNW								07/29/94 0000	30.35	881.65	0.00	881.65	
MNW								08/22/94 0000	30.37	881.63	0.00	881.63	
MNW								10/31/94 0000	30.26	881.74	0.00	881.74	
MNW								12/01/94 0000	30.00	882.00	0.00	882.00	
MNW								01/30/95 0000	30.40	881.60	0.00	881.60	
MNW								03/16/95 0000	30.25	881.75	0.00	881.75	
MNW								04/11/95 0000	27.00	885.00	0.00	885.00	
MNW								05/01/95 0000	28.45	883.55	0.00	883.55	
MNW								05/05/95 0000	23.65	888.35	0.00	888.35	
MNW								07/10/95 0000	29.00	883.00	0.00	883.00	
MNW								08/01/95 0000	30.00	882.00	0.00	882.00	
MNW								08/14/95 0000	31.16	880.84	0.00	880.84	
MNW								09/11/95 0000	31.60	880.40	0.00	880.40	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								10/04/95 0000	32.00	880.00	0.00	880.00	
MNW								11/06/95 0000	30.85	881.15	0.00	881.15	
MNW								12/07/95 0000	22.00	890.00	0.00	890.00	
MNW								01/17/96 0000	30.00	882.00	0.00	882.00	
MNW								02/12/96 0000	19.77	892.23	0.00	892.23	
MNW								05/20/96 0000	17.90	894.10	0.00	894.10	
MNW								09/01/96 0000	24.84	887.16	0.00	887.16	
MNW								11/01/96 0000	20.01	891.99	0.00	891.99	
MNW								01/27/97 0000	18.80	893.20	0.00	893.20	
MNW								05/13/97 0000	19.01	892.99	0.00	892.99	
MNW								08/19/97 0000	22.54	889.46	0.00	889.46	
MNW								11/10/97 0000	21.92	890.08	0.00	890.08	
MNW								02/23/98 0000	18.55	893.45	0.00	893.45	
MNW								06/01/98 0000	19.37	892.63	0.00	892.63	
MNW								11/10/98 0000	21.92	890.08	0.00	890.08	
MNW								05/17/99 0000	19.38	892.62	0.00	892.62	
MNW								06/28/99 0000	21.20	890.80	0.00	890.80	
MNW								06/12/00 0000	20.73	891.27	0.00	891.27	
MNW								11/25/03 0000	16.80	895.20	0.00	895.20	
MNW								12/05/03 0000	17.09	894.91	0.00	894.91	
MNW								01/11/04 0000	17.58	894.42	0.00	894.42	
MNW								06/07/04 0000	18.37	893.63	0.00	893.63	
MW-30A	474253.98	1460609.40	950.30	953.14	952.87	UF	0						
MNW								05/24/93 0000	107.97	844.90	0.00	844.90	
MNW								08/01/93 0000	112.82	840.05	0.00	840.05	
MNW								09/06/93 0000	113.75	839.12	0.00	839.12	
MNW								10/07/93 0000	120.65	832.22	0.00	832.22	
MNW								11/08/93 0000	120.48	832.39	0.00	832.39	
MNW								11/11/93 0000	120.20	832.67	0.00	832.67	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								12/22/93 0000	122.24	830.63	0.00	830.63	
MNW								02/21/94 0000	123.98	828.89	0.00	828.89	
MNW								03/24/94 0000	123.00	829.87	0.00	829.87	
MNW								04/19/94 0000	122.00	830.87	0.00	830.87	
MNW								05/23/94 0000	124.06	828.81	0.00	828.81	
MNW								07/29/94 0000	124.00	828.87	0.00	828.87	
MNW								08/22/94 0000	124.28	828.59	0.00	828.59	
MNW								10/31/94 0000	124.30	828.57	0.00	828.57	
MNW								12/01/94 0000	124.69	828.18	0.00	828.18	
MNW								01/30/95 0000	124.01	828.86	0.00	828.86	
MNW								03/16/95 0000	123.70	829.17	0.00	829.17	
MNW								04/11/95 0000	123.81	829.06	0.00	829.06	
MNW								05/01/95 0000	124.15	828.72	0.00	828.72	
MNW								05/05/95 0000	123.82	829.05	0.00	829.05	
MNW								07/10/95 0000	124.00	828.87	0.00	828.87	
MNW								08/01/95 0000	123.80	829.07	0.00	829.07	
MNW								08/14/95 0000	124.20	828.67	0.00	828.67	
MNW								09/11/95 0000	128.00	824.87	0.00	824.87	
MNW								10/04/95 0000	124.00	828.87	0.00	828.87	
MNW								11/06/95 0000	124.47	828.40	0.00	828.40	
MNW								12/07/95 0000	124.40	828.47	0.00	828.47	
MNW								01/17/96 0000	122.90	829.97	0.00	829.97	
MNW								02/12/96 0000	124.21	828.66	0.00	828.66	
MNW								05/20/96 0000	123.78	829.09	0.00	829.09	
MNW								09/01/96 0000	124.14	828.73	0.00	828.73	
MNW								11/01/96 0000	123.80	829.07	0.00	829.07	
MNW								01/27/97 0000	123.78	829.09	0.00	829.09	
MNW								05/13/97 0000	123.52	829.35	0.00	829.35	
MNW								08/19/97 0000	124.12	828.75	0.00	828.75	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								11/10/97 0000	123.97	828.90	0.00	828.90	
MNW								02/23/98 0000	123.64	829.23	0.00	829.23	
MNW								06/01/98 0000	123.74	829.13	0.00	829.13	
MNW								11/10/98 0000	123.97	828.90	0.00	828.90	
MNW								05/17/99 0000	123.25	829.62	0.00	829.62	
MNW								06/28/99 0000	123.80	829.07	0.00	829.07	
MNW								06/12/00 0000	123.64	829.23	0.00	829.23	
MNW								11/25/03 0000	123.18	829.69	0.00	829.69	
MNW								12/02/03 0000	123.19	829.68	0.00	829.68	
MNW								01/11/04 0000	123.02	829.85	0.00	829.85	
MNW								06/07/04 0000	123.11	829.76	0.00	829.76	
MW-31	474669.69	1459663.01	928.60	930.91	930.61	UF	0						
MNW								05/24/93 0000	96.82	833.79	0.00	833.79	
MNW								08/01/93 0000	96.70	833.91	0.00	833.91	
MNW								09/06/93 0000	96.69	833.92	0.00	833.92	
MNW								10/07/93 0000	96.33	834.28	0.00	834.28	
MNW								11/08/93 0000	96.83	833.78	0.00	833.78	
MNW								11/11/93 0000	96.54	834.07	0.00	834.07	
MNW								12/22/93 0000	96.00	834.61	0.00	834.61	
MNW								02/21/94 0000	96.68	833.93	0.00	833.93	
MNW								03/24/94 0000	95.42	835.19	0.00	835.19	
MNW								04/19/94 0000	96.00	834.61	0.00	834.61	
MNW								05/23/94 0000	96.75	833.86	0.00	833.86	
MNW								07/29/94 0000	0.00	930.61	0.00	930.61	
MNW								08/22/94 0000	96.77	833.84	0.00	833.84	
MNW								10/31/94 0000	96.75	833.86	0.00	833.86	
MNW								12/01/94 0000	89.23	841.38	0.00	841.38	
MNW								01/30/95 0000	96.56	834.05	0.00	834.05	
MNW								03/16/95 0000	89.38	841.23	0.00	841.23	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								04/11/95 0000	96.20	834.41	0.00	834.41	
MNW								05/01/95 0000	96.69	833.92	0.00	833.92	
MNW								05/05/95 0000	86.42	844.19	0.00	844.19	
MNW								07/10/95 0000	96.50	834.11	0.00	834.11	
MNW								08/01/95 0000	96.50	834.11	0.00	834.11	
MNW								08/14/95 0000	96.74	833.87	0.00	833.87	
MNW								09/11/95 0000	97.80	832.81	0.00	832.81	
MNW								10/04/95 0000	96.66	833.95	0.00	833.95	
MNW								11/06/95 0000	96.80	833.81	0.00	833.81	
MNW								12/07/95 0000	96.66	833.95	0.00	833.95	
MNW								01/17/96 0000	95.97	834.64	0.00	834.64	
MNW								02/12/96 0000	96.66	833.95	0.00	833.95	
MNW								05/20/96 0000	96.49	834.12	0.00	834.12	
MNW								09/01/96 0000	96.74	833.87	0.00	833.87	
MNW								11/01/96 0000	96.37	834.24	0.00	834.24	
MNW								01/27/97 0000	96.41	834.20	0.00	834.20	
MNW								05/13/97 0000	96.64	833.97	0.00	833.97	
MNW								08/19/97 0000	96.80	833.81	0.00	833.81	
MNW								11/10/97 0000	96.64	833.97	0.00	833.97	
MNW								02/23/98 0000	96.40	834.21	0.00	834.21	
MNW								06/01/98 0000	96.71	833.90	0.00	833.90	
MNW								11/10/98 0000	96.64	833.97	0.00	833.97	
MNW								05/17/99 0000	96.00	834.61	0.00	834.61	
MNW								06/28/99 0000	96.45	834.16	0.00	834.16	
MNW								06/12/00 0000	96.42	834.19	0.00	834.19	
MNW								11/25/03 0000	95.81	834.80	0.00	834.80	
MNW								12/05/03 0000	96.00	834.61	0.00	834.61	
MNW								01/11/04 0000	95.95	834.66	0.00	834.66	
MNW								06/07/04 0000	96.06	834.55	0.00	834.55	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MW-32	474745.92	1460072.69	923.50	925.89	925.5	1S	0						
MNW								08/01/93 0000	141.77	783.73	0.00	783.73	
MNW								09/06/93 0000	109.98	815.52	0.00	815.52	
MNW								10/07/93 0000	122.48	803.02	0.00	803.02	
MNW								11/08/93 0000	31.55	893.95	0.00	893.95	
MNW								11/11/93 0000	121.51	803.99	0.00	803.99	
MNW								12/22/93 0000	30.00	895.50	0.00	895.50	
MNW								02/21/94 0000	29.99	895.51	0.00	895.51	
MNW								03/24/94 0000	29.00	896.50	0.00	896.50	
MNW								04/19/94 0000	37.20	888.30	0.00	888.30	
MNW								05/23/94 0000	30.11	895.39	0.00	895.39	
MNW								07/29/94 0000	30.92	894.58	0.00	894.58	
MNW								08/22/94 0000	30.90	894.60	0.00	894.60	
MNW								10/31/94 0000	30.36	895.14	0.00	895.14	
MNW								12/01/94 0000	29.62	895.88	0.00	895.88	
MNW								01/30/95 0000	29.04	896.46	0.00	896.46	
MNW								03/16/95 0000	29.00	896.50	0.00	896.50	
MNW								04/11/95 0000	29.41	896.09	0.00	896.09	
MNW								05/01/95 0000	29.55	895.95	0.00	895.95	
MNW								05/05/95 0000	29.50	896.00	0.00	896.00	
MNW								07/10/95 0000	29.80	895.70	0.00	895.70	
MNW								08/01/95 0000	30.20	895.30	0.00	895.30	
MNW								08/14/95 0000	30.42	895.08	0.00	895.08	
MNW								09/11/95 0000	30.60	894.90	0.00	894.90	
MNW								10/04/95 0000	37.30	888.20	0.00	888.20	
MNW								11/06/95 0000	32.50	893.00	0.00	893.00	
MNW								12/07/95 0000	32.00	893.50	0.00	893.50	
MNW								01/17/96 0000	31.13	894.37	0.00	894.37	
MNW								02/12/96 0000	31.04	894.46	0.00	894.46	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								05/20/96 0000	28.91	896.59	0.00	896.59	
MNW								09/01/96 0000	30.85	894.65	0.00	894.65	
MNW								11/01/96 0000	29.68	895.82	0.00	895.82	
MNW								01/27/97 0000	29.30	896.20	0.00	896.20	
MNW								05/13/97 0000	29.72	895.78	0.00	895.78	
MNW								08/19/97 0000	30.62	894.88	0.00	894.88	
MNW								11/10/97 0000	30.48	895.02	0.00	895.02	
MNW								02/23/98 0000	28.70	896.80	0.00	896.80	
MNW								06/01/98 0000	29.71	895.79	0.00	895.79	
MNW								11/10/98 0000	30.48	895.02	0.00	895.02	
MNW								05/17/99 0000	28.66	896.84	0.00	896.84	
MNW								06/28/99 0000	29.42	896.08	0.00	896.08	
MNW								06/12/00 0000	19.21	906.29	0.00	906.29	
MNW								11/25/03 0000	44.07	881.43	0.00	881.43	
MNW								12/03/03 0000	44.28	881.22	0.00	881.22	
MNW								01/11/04 0000	45.73	879.77	0.00	879.77	
MNW								06/07/04 0000	43.45	882.05	0.00	882.05	
MW-33	474515.36	1460328.97	938.40	940.76	940.32	2S	0						
MNW								08/01/93 0000	48.99	891.33	0.00	891.33	
MNW								09/06/93 0000	44.70	895.62	0.00	895.62	
MNW								10/07/93 0000	45.00	895.32	0.00	895.32	
MNW								11/08/93 0000	58.36	881.96	0.00	881.96	
MNW								11/11/93 0000	44.40	895.92	0.00	895.92	
MNW								12/22/93 0000	72.12	868.20	0.00	868.20	
MNW								02/21/94 0000	59.16	881.16	0.00	881.16	
MNW								03/24/94 0000	71.98	868.34	0.00	868.34	
MNW								04/19/94 0000	71.86	868.46	0.00	868.46	
MNW								05/23/94 0000	59.38	880.94	0.00	880.94	
MNW								07/29/94 0000	59.27	881.05	0.00	881.05	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								08/22/94 0000	59.49	880.83	0.00	880.83	
MNW								10/31/94 0000	59.27	881.05	0.00	881.05	
MNW								12/01/94 0000	58.67	881.65	0.00	881.65	
MNW								01/30/95 0000	58.83	881.49	0.00	881.49	
MNW								03/16/95 0000	58.50	881.82	0.00	881.82	
MNW								04/11/95 0000	58.10	882.22	0.00	882.22	
MNW								05/01/95 0000	58.96	881.36	0.00	881.36	
MNW								05/05/95 0000	71.88	868.44	0.00	868.44	
MNW								07/10/95 0000	71.33	868.99	0.00	868.99	
MNW								08/01/95 0000	72.25	868.07	0.00	868.07	
MNW								08/14/95 0000	59.20	881.12	0.00	881.12	
MNW								09/11/95 0000	71.25	869.07	0.00	869.07	
MNW								10/04/95 0000	77.12	863.20	0.00	863.20	
MNW								11/06/95 0000	59.55	880.77	0.00	880.77	
MNW								12/07/95 0000	59.40	880.92	0.00	880.92	
MNW								01/17/96 0000	58.66	881.66	0.00	881.66	
MNW								02/12/96 0000	59.33	880.99	0.00	880.99	
MNW								05/20/96 0000	58.13	882.19	0.00	882.19	
MNW								09/01/96 0000	59.33	880.99	0.00	880.99	
MNW								11/01/96 0000	58.85	881.47	0.00	881.47	
MNW								01/27/97 0000	58.91	881.41	0.00	881.41	
MNW								05/13/97 0000	58.97	881.35	0.00	881.35	
MNW								08/19/97 0000	34.76	905.56	0.00	905.56	
MNW								11/10/97 0000	58.88	881.44	0.00	881.44	
MNW								02/23/98 0000	58.09	882.23	0.00	882.23	
MNW								06/01/98 0000	58.48	881.84	0.00	881.84	
MNW								11/10/98 0000	58.88	881.44	0.00	881.44	
MNW								05/17/99 0000	57.55	882.77	0.00	882.77	
MNW								06/28/99 0000	57.57	882.75	0.00	882.75	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/12/00 0000	57.48	882.84	0.00	882.84	
MNW								11/25/03 0000	59.18	881.14	0.00	881.14	
MNW								12/02/03 0000	54.22	886.10	0.00	886.10	
MNW								01/11/04 0000	59.04	881.28	0.00	881.28	
MNW								06/07/04 0000	58.31	882.01	0.00	882.01	
MW-34A	474743.01	1460055.63	924.30	926.84	925.88	DB	0						
MNW								08/01/93 0000	48.95	876.93	0.00	876.93	
MNW								09/06/93 0000	46.52	879.36	0.00	879.36	
MNW								10/07/93 0000	46.46	879.42	0.00	879.42	
MNW								11/08/93 0000	134.08	791.80	0.00	791.80	
MNW								11/11/93 0000	46.45	879.43	0.00	879.43	
MNW								12/22/93 0000	119.32	806.56	0.00	806.56	
MNW								02/21/94 0000	133.14	792.74	0.00	792.74	
MNW								03/24/94 0000	127.00	798.88	0.00	798.88	
MNW								04/19/94 0000	131.23	794.65	0.00	794.65	
MNW								05/23/94 0000	132.46	793.42	0.00	793.42	
MNW								07/29/94 0000	133.00	792.88	0.00	792.88	
MNW								08/22/94 0000	133.74	792.14	0.00	792.14	
MNW								10/31/94 0000	136.04	789.84	0.00	789.84	
MNW								12/01/94 0000	135.85	790.03	0.00	790.03	
MNW								01/30/95 0000	134.82	791.06	0.00	791.06	
MNW								03/16/95 0000	130.00	795.88	0.00	795.88	
MNW								04/11/95 0000	134.36	791.52	0.00	791.52	
MNW								05/01/95 0000	134.79	791.09	0.00	791.09	
MNW								05/05/95 0000	134.52	791.36	0.00	791.36	
MNW								07/10/95 0000	134.40	791.48	0.00	791.48	
MNW								08/01/95 0000	136.00	789.88	0.00	789.88	
MNW								08/14/95 0000	135.44	790.44	0.00	790.44	
MNW								09/11/95 0000	137.00	788.88	0.00	788.88	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								10/04/95 0000	135.31	790.57	0.00	790.57	
MNW								11/06/95 0000	135.97	789.91	0.00	789.91	
MNW								12/07/95 0000	135.45	790.43	0.00	790.43	
MNW								01/17/96 0000	134.39	791.49	0.00	791.49	
MNW								02/12/96 0000	154.59	771.29	0.00	771.29	
MNW								05/20/96 0000	133.12	792.76	0.00	792.76	
MNW								09/01/96 0000	134.33	791.55	0.00	791.55	
MNW								11/01/96 0000	133.75	792.13	0.00	792.13	
MNW								01/27/97 0000	133.34	792.54	0.00	792.54	
MNW								05/13/97 0000	132.97	792.91	0.00	792.91	
MNW								08/19/97 0000	134.06	791.82	0.00	791.82	
MNW								11/10/97 0000	134.02	791.86	0.00	791.86	
MNW								02/23/98 0000	132.78	793.10	0.00	793.10	
MNW								06/01/98 0000	132.66	793.22	0.00	793.22	
MNW								11/10/98 0000	134.02	791.86	0.00	791.86	
MNW								06/28/99 0000	132.51	793.37	0.00	793.37	
MNW								06/12/00 0000	132.43	793.45	0.00	793.45	
MNW								11/25/03 0000	NM	-	NM	-	
MNW								12/03/03 0000	NM	-	NM	-	Dry
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	
MW-35	474981.10	1460241.46	911.20	913.68	913.29	DB	0						
MNW								08/01/93 0000	121.26	792.03	0.00	792.03	
MNW								09/06/93 0000	116.03	797.26	0.00	797.26	
MNW								10/07/93 0000	116.93	796.36	0.00	796.36	
MNW								11/08/93 0000	119.05	794.24	0.00	794.24	
MNW								11/11/93 0000	119.61	793.68	0.00	793.68	
MNW								12/22/93 0000	115.83	797.46	0.00	797.46	
MNW								02/21/94 0000	117.80	795.49	0.00	795.49	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								03/24/94 0000	80.00	833.29	0.00	833.29	
MNW								04/19/94 0000	116.32	796.97	0.00	796.97	
MNW								05/23/94 0000	117.13	796.16	0.00	796.16	
MNW								07/29/94 0000	118.00	795.29	0.00	795.29	
MNW								08/22/94 0000	118.49	794.80	0.00	794.80	
MNW								10/31/94 0000	120.88	792.41	0.00	792.41	
MNW								12/01/94 0000	119.00	794.29	0.00	794.29	
MNW								01/30/95 0000	119.60	793.69	0.00	793.69	
MNW								03/16/95 0000	112.00	801.29	0.00	801.29	
MNW								04/11/95 0000	119.32	793.97	0.00	793.97	
MNW								05/01/95 0000	119.56	793.73	0.00	793.73	
MNW								05/05/95 0000	119.50	793.79	0.00	793.79	
MNW								07/10/95 0000	119.00	794.29	0.00	794.29	
MNW								08/01/95 0000	119.50	793.79	0.00	793.79	
MNW								08/14/95 0000	120.28	793.01	0.00	793.01	
MNW								09/11/95 0000	120.00	793.29	0.00	793.29	
MNW								10/04/95 0000	120.00	793.29	0.00	793.29	
MNW								11/06/95 0000	120.76	792.53	0.00	792.53	
MNW								12/07/95 0000	120.20	793.09	0.00	793.09	
MNW								01/17/96 0000	119.21	794.08	0.00	794.08	
MNW								02/12/96 0000	119.38	793.91	0.00	793.91	
MNW								05/20/96 0000	117.50	795.79	0.00	795.79	
MNW								09/01/96 0000	119.70	793.59	0.00	793.59	
MNW								11/01/96 0000	119.27	794.02	0.00	794.02	
MNW								01/27/97 0000	118.10	795.19	0.00	795.19	
MNW								05/13/97 0000	117.74	795.55	0.00	795.55	
MNW								08/19/97 0000	118.76	794.53	0.00	794.53	
MNW								11/10/97 0000	117.84	795.45	0.00	795.45	
MNW								02/23/98 0000	117.59	795.70	0.00	795.70	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/01/98 0000	117.44	795.85	0.00	795.85	
MNW								11/10/98 0000	117.84	795.45	0.00	795.45	
MNW								06/28/99 0000	117.51	795.78	0.00	795.78	
MNW								06/12/00 0000	117.14	796.15	0.00	796.15	
MNW								11/25/03 0000	116.75	796.54	0.00	796.54	
MNW								12/05/03 0000	116.50	796.79	0.00	796.79	
MNW								01/11/04 0000	116.45	796.84	0.00	796.84	
MNW								06/07/04 0000	115.55	797.74	0.00	797.74	
MW-36	475560.05	1459375.39	858.70	862.39	861.98	DB	0						
MNW								08/01/93 0000	76.46	785.52	0.00	785.52	
MNW								09/06/93 0000	66.81	795.17	0.00	795.17	
MNW								10/07/93 0000	49.56	812.42	0.00	812.42	
MNW								11/08/93 0000	56.58	805.40	0.00	805.40	
MNW								11/11/93 0000	67.01	794.97	0.00	794.97	
MNW								12/22/93 0000	47.00	814.98	0.00	814.98	
MNW								02/21/94 0000	49.18	812.80	0.00	812.80	
MNW								03/24/94 0000	50.15	811.83	0.00	811.83	
MNW								04/19/94 0000	50.68	811.30	0.00	811.30	
MNW								05/23/94 0000	53.50	808.48	0.00	808.48	
MNW								07/29/94 0000	55.80	806.18	0.00	806.18	
MNW								08/22/94 0000	55.58	806.40	0.00	806.40	
MNW								10/31/94 0000	57.90	804.08	0.00	804.08	
MNW								12/01/94 0000	56.46	805.52	0.00	805.52	
MNW								01/30/95 0000	58.18	803.80	0.00	803.80	
MNW								03/16/95 0000	58.00	803.98	0.00	803.98	
MNW								04/11/95 0000	58.31	803.67	0.00	803.67	
MNW								05/01/95 0000	58.20	803.78	0.00	803.78	
MNW								05/05/95 0000	58.20	803.78	0.00	803.78	
MNW								07/10/95 0000	58.20	803.78	0.00	803.78	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								08/01/95 0000	60.90	801.08	0.00	801.08	
MNW								08/14/95 0000	61.18	800.80	0.00	800.80	
MNW								09/11/95 0000	68.15	793.83	0.00	793.83	
MNW								10/04/95 0000	60.87	801.11	0.00	801.11	
MNW								11/06/95 0000	61.15	800.83	0.00	800.83	
MNW								12/07/95 0000	60.50	801.48	0.00	801.48	
MNW								01/17/96 0000	60.34	801.64	0.00	801.64	
MNW								02/12/96 0000	57.88	804.10	0.00	804.10	
MNW								05/20/96 0000	56.60	805.38	0.00	805.38	
MNW								09/01/96 0000	59.57	802.41	0.00	802.41	
MNW								11/01/96 0000	56.74	805.24	0.00	805.24	
MNW								01/27/97 0000	58.04	803.94	0.00	803.94	
MNW								05/13/97 0000	58.31	803.67	0.00	803.67	
MNW								08/19/97 0000	52.16	809.82	0.00	809.82	
MNW								11/10/97 0000	59.44	802.54	0.00	802.54	
MNW								02/23/98 0000	57.27	804.71	0.00	804.71	
MNW								06/01/98 0000	52.28	809.70	0.00	809.70	
MNW								11/10/98 0000	59.44	802.54	0.00	802.54	
MNW								06/28/99 0000	46.89	815.09	0.00	815.09	
MNW								06/12/00 0000	46.08	815.90	0.00	815.90	
MNW								11/25/03 0000	56.96	805.02	0.00	805.02	
MNW								12/03/03 0000	56.83	805.15	0.00	805.15	
MNW								01/11/04 0000	55.89	806.09	0.00	806.09	
MNW								06/07/04 0000	53.14	808.84	0.00	808.84	
MW-37	474864.49	1460596.71	924.30	926.58	926.23	2S	0						
MNW								11/06/95 0000	NM	-	NM	-	Dry
MNW								12/07/95 0000	NM	-	NM	-	Dry
MNW								01/17/96 0000	NM	-	NM	-	Dry
MNW								02/12/96 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								05/20/96 0000	NM	-	NM	-	Dry
MNW								09/01/96 0000	NM	-	NM	-	Dry
MNW								11/01/96 0000	NM	-	NM	-	Dry
MNW								01/27/97 0000	NM	-	NM	-	Dry
MNW								05/13/97 0000	NM	-	NM	-	Dry
MNW								08/19/97 0000	NM	-	NM	-	Dry
MNW								11/10/97 0000	NM	-	NM	-	Dry
MNW								02/23/98 0000	NM	-	NM	-	Dry
MNW								06/01/98 0000	NM	-	NM	-	Dry
MNW								11/10/98 0000	NM	-	NM	-	Dry
MNW								06/28/99 0000	NM	-	NM	-	Dry
MNW								06/12/00 0000	NM	-	NM	-	Dry
MNW								11/25/03 0000	NM	-	NM	-	
MNW								12/04/03 0000	NM	-	NM	-	Dry
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	
MW-38	474628.85	1460617.36	941.70	944.04	943.81	1S	0						
MNW								11/06/95 0000	44.62	899.19	0.00	899.19	
MNW								12/07/95 0000	44.36	899.45	0.00	899.45	
MNW								01/17/96 0000	43.71	900.10	0.00	900.10	
MNW								02/12/96 0000	43.30	900.51	0.00	900.51	
MNW								05/20/96 0000	42.24	901.57	0.00	901.57	
MNW								09/01/96 0000	43.88	899.93	0.00	899.93	
MNW								11/01/96 0000	43.27	900.54	0.00	900.54	
MNW								01/27/97 0000	42.76	901.05	0.00	901.05	
MNW								05/13/97 0000	43.13	900.68	0.00	900.68	
MNW								08/19/97 0000	44.16	899.65	0.00	899.65	
MNW								11/10/97 0000	44.35	899.46	0.00	899.46	
MNW								02/23/98 0000	42.41	901.40	0.00	901.40	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/01/98 0000	42.29	901.52	0.00	901.52	
MNW								11/10/98 0000	44.35	899.46	0.00	899.46	
MNW								05/17/99 0000	43.00	900.81	0.00	900.81	
MNW								06/28/99 0000	43.72	900.09	0.00	900.09	
MNW								06/12/00 0000	43.33	900.48	0.00	900.48	
MNW								11/25/03 0000	42.20	901.61	0.00	901.61	
MNW								12/04/03 0000	42.10	901.71	0.00	901.71	
MNW								01/11/04 0000	42.29	901.52	0.00	901.52	
MNW								06/07/04 0000	42.18	901.63	0.00	901.63	
MW-39	475248.58	1459391.74	890.00	891.99	891.72	UF	0						
MNW								11/06/95 0000	55.85	835.87	0.00	835.87	
MNW								12/07/95 0000	55.66	836.06	0.00	836.06	
MNW								01/17/96 0000	55.12	836.60	0.00	836.60	
MNW								02/12/96 0000	55.75	835.97	0.00	835.97	
MNW								05/20/96 0000	55.58	836.14	0.00	836.14	
MNW								09/01/96 0000	55.83	835.89	0.00	835.89	
MNW								11/01/96 0000	55.52	836.20	0.00	836.20	
MNW								01/27/97 0000	55.54	836.18	0.00	836.18	
MNW								05/13/97 0000	55.68	836.04	0.00	836.04	
MNW								08/19/97 0000	55.85	835.87	0.00	835.87	
MNW								11/10/97 0000	55.67	836.05	0.00	836.05	
MNW								02/23/98 0000	55.44	836.28	0.00	836.28	
MNW								06/01/98 0000	55.79	835.93	0.00	835.93	
MNW								11/10/98 0000	55.67	836.05	0.00	836.05	
MNW								05/17/99 0000	55.00	836.72	0.00	836.72	
MNW								06/28/99 0000	55.52	836.20	0.00	836.20	
MNW								06/12/00 0000	55.56	836.16	0.00	836.16	
MNW								11/25/03 0000	55.03	836.69	0.00	836.69	
MNW								12/02/03 0000	55.11	836.61	0.00	836.61	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								01/11/04 0000	55.10	836.62	0.00	836.62	
MNW								06/07/04 0000	55.24	836.48	0.00	836.48	
MW-40	474510.49	1460314.48	937.30	939.63	939.39	DB	0						
MNW								11/06/95 0000	133.90	805.49	0.00	805.49	
MNW								12/07/95 0000	134.34	805.05	0.00	805.05	
MNW								01/17/96 0000	133.77	805.62	0.00	805.62	
MNW								02/12/96 0000	133.91	805.48	0.00	805.48	
MNW								05/20/96 0000	134.03	805.36	0.00	805.36	
MNW								09/01/96 0000	133.84	805.55	0.00	805.55	
MNW								11/01/96 0000	133.53	805.86	0.00	805.86	
MNW								01/27/97 0000	133.24	806.15	0.00	806.15	
MNW								05/13/97 0000	133.33	806.06	0.00	806.06	
MNW								08/19/97 0000	133.88	805.51	0.00	805.51	
MNW								11/10/97 0000	134.29	805.10	0.00	805.10	
MNW								02/23/98 0000	133.61	805.78	0.00	805.78	
MNW								06/01/98 0000	133.46	805.93	0.00	805.93	
MNW								11/10/98 0000	134.29	805.10	0.00	805.10	
MNW								06/28/99 0000	134.13	805.26	0.00	805.26	
MNW								06/12/00 0000	134.62	804.77	0.00	804.77	
MNW								11/25/03 0000	132.91	806.48	0.00	806.48	
MNW								12/02/03 0000	133.15	806.24	0.00	806.24	
MNW								01/11/04 0000	132.82	806.57	0.00	806.57	
MNW								06/07/04 0000	133.49	805.90	0.00	805.90	
MW-41	474948.60	1460120.09	910.60	912.86	912.59	1S	0						
MNW								11/06/95 0000	21.54	891.05	0.00	891.05	
MNW								12/07/95 0000	22.00	890.59	0.00	890.59	
MNW								01/17/96 0000	19.73	892.86	0.00	892.86	
MNW								02/12/96 0000	19.16	893.43	0.00	893.43	
MNW								05/20/96 0000	15.61	896.98	0.00	896.98	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								09/01/96 0000	20.32	892.27	0.00	892.27	
MNW								11/01/96 0000	18.14	894.45	0.00	894.45	
MNW								01/27/97 0000	17.57	895.02	0.00	895.02	
MNW								05/13/97 0000	17.35	895.24	0.00	895.24	
MNW								08/19/97 0000	19.82	892.77	0.00	892.77	
MNW								11/10/97 0000	19.36	893.23	0.00	893.23	
MNW								02/23/98 0000	16.60	895.99	0.00	895.99	
MNW								06/01/98 0000	18.72	893.87	0.00	893.87	
MNW								11/10/98 0000	19.36	893.23	0.00	893.23	
MNW								05/17/99 0000	18.00	894.59	0.00	894.59	
MNW								06/28/99 0000	19.47	893.12	0.00	893.12	
MNW								06/12/00 0000	18.51	894.08	0.00	894.08	
MNW								11/25/03 0000	19.25	893.34	0.00	893.34	
MNW								12/05/03 0000	19.32	893.27	0.00	893.27	
MNW								01/11/04 0000	19.58	893.01	0.00	893.01	
MNW								06/07/04 0000	20.42	892.17	0.00	892.17	
MW-42	474874.08	1460180.20	914.50	916.5	916.2	1S	0						
MNW								11/06/95 0000	27.11	889.09	0.00	889.09	
MNW								12/07/95 0000	25.55	890.65	0.00	890.65	
MNW								01/17/96 0000	24.68	891.52	0.00	891.52	
MNW								02/12/96 0000	24.34	891.86	0.00	891.86	
MNW								05/20/96 0000	20.92	895.28	0.00	895.28	
MNW								09/01/96 0000	42.44	873.76	0.00	873.76	
MNW								11/01/96 0000	23.26	892.94	0.00	892.94	
MNW								01/27/97 0000	22.61	893.59	0.00	893.59	
MNW								05/13/97 0000	22.10	894.10	0.00	894.10	
MNW								08/19/97 0000	24.43	891.77	0.00	891.77	
MNW								11/10/97 0000	24.32	891.88	0.00	891.88	
MNW								02/23/98 0000	22.13	894.07	0.00	894.07	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/01/98 0000	23.00	893.20	0.00	893.20	
MNW								11/10/98 0000	24.32	891.88	0.00	891.88	
MNW								05/17/99 0000	22.00	894.20	0.00	894.20	
MNW								06/28/99 0000	23.71	892.49	0.00	892.49	
MNW								06/12/00 0000	22.63	893.57	0.00	893.57	
MNW								11/25/03 0000	22.97	893.23	0.00	893.23	
MNW								12/05/03 0000	23.35	892.85	0.00	892.85	
MNW								01/11/04 0000	34.52	881.68	0.00	881.68	
MNW								06/07/04 0000	26.25	889.95	0.00	889.95	
MW-43	474929.41	1460278.27	914.30	916.32	916.07	2S	0						
MNW								11/06/95 0000	41.77	874.30	0.00	874.30	
MNW								12/07/95 0000	41.47	874.60	0.00	874.60	
MNW								01/17/96 0000	41.37	874.70	0.00	874.70	
MNW								02/12/96 0000	41.77	874.30	0.00	874.30	
MNW								05/20/96 0000	41.56	874.51	0.00	874.51	
MNW								09/01/96 0000	41.83	874.24	0.00	874.24	
MNW								11/01/96 0000	41.63	874.44	0.00	874.44	
MNW								01/27/97 0000	41.47	874.60	0.00	874.60	
MNW								05/13/97 0000	41.67	874.40	0.00	874.40	
MNW								08/19/97 0000	41.89	874.18	0.00	874.18	
MNW								11/10/97 0000	41.78	874.29	0.00	874.29	
MNW								02/23/98 0000	41.75	874.32	0.00	874.32	
MNW								06/01/98 0000	41.93	874.14	0.00	874.14	
MNW								11/10/98 0000	41.78	874.29	0.00	874.29	
MNW								05/17/99 0000	47.22	868.85	0.00	868.85	
MNW								06/28/99 0000	41.64	874.43	0.00	874.43	
MNW								06/12/00 0000	41.70	874.37	0.00	874.37	
MNW								11/25/03 0000	41.47	874.60	0.00	874.60	
MNW								12/05/03 0000	41.49	874.58	0.00	874.58	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								01/11/04 0000	41.45	874.62	0.00	874.62	
MNW								06/07/04 0000	41.51	874.56	0.00	874.56	
MW-44	474794.04	1460541.96	928.90	930.98	930.66	1S	0						
MNW								11/06/95 0000	48.00	882.66	0.00	882.66	
MNW								12/07/95 0000	49.48	881.18	0.00	881.18	
MNW								01/17/96 0000	47.69	882.97	0.00	882.97	
MNW								02/12/96 0000	47.32	883.34	0.00	883.34	
MNW								05/20/96 0000	39.04	891.62	0.00	891.62	
MNW								09/01/96 0000	45.10	885.56	0.00	885.56	
MNW								11/01/96 0000	48.06	882.60	0.00	882.60	
MNW								01/27/97 0000	43.12	887.54	0.00	887.54	
MNW								05/13/97 0000	42.65	888.01	0.00	888.01	
MNW								08/19/97 0000	46.13	884.53	0.00	884.53	
MNW								11/10/97 0000	47.78	882.88	0.00	882.88	
MNW								02/23/98 0000	42.13	888.53	0.00	888.53	
MNW								06/01/98 0000	43.29	887.37	0.00	887.37	
MNW								11/10/98 0000	47.78	882.88	0.00	882.88	
MNW								06/28/99 0000	45.07	885.59	0.00	885.59	
MNW								06/12/00 0000	43.40	887.26	0.00	887.26	
MNW								11/25/03 0000	NM	-	NM	-	
MNW								12/04/03 0000	NM	-	NM	-	Dry
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	
MW-45	474707.54	1460371.90	927.70	929.9	929.64	2S	0						
MNW								11/06/95 0000	56.02	873.62	0.00	873.62	
MNW								12/07/95 0000	61.48	868.16	0.00	868.16	
MNW								01/17/96 0000	54.20	875.44	0.00	875.44	
MNW								02/12/96 0000	54.78	874.86	0.00	874.86	
MNW								05/20/96 0000	53.74	875.90	0.00	875.90	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								09/01/96 0000	55.04	874.60	0.00	874.60	
MNW								11/01/96 0000	54.56	875.08	0.00	875.08	
MNW								01/27/97 0000	54.32	875.32	0.00	875.32	
MNW								05/13/97 0000	54.81	874.83	0.00	874.83	
MNW								08/19/97 0000	55.08	874.56	0.00	874.56	
MNW								11/10/97 0000	54.72	874.92	0.00	874.92	
MNW								02/23/98 0000	54.80	874.84	0.00	874.84	
MNW								06/01/98 0000	54.79	874.85	0.00	874.85	
MNW								11/10/98 0000	54.72	874.92	0.00	874.92	
MNW								05/17/99 0000	54.83	874.81	0.00	874.81	
MNW								06/28/99 0000	55.08	874.56	0.00	874.56	
MNW								06/12/00 0000	54.96	874.68	0.00	874.68	
MNW								11/25/03 0000	55.38	874.26	0.00	874.26	
MNW								12/03/03 0000	55.62	874.02	0.00	874.02	
MNW								01/11/04 0000	55.96	873.68	0.00	873.68	
MNW								06/07/04 0000	54.53	875.11	0.00	875.11	
MW-46	474757.33	1460209.91	922.40	924.18	923.86	UF	0						
MNW								11/06/95 0000	92.50	831.36	0.00	831.36	
MNW								12/07/95 0000	NM	-	NM	-	Dry
MNW								01/17/96 0000	89.87	833.99	0.00	833.99	
MNW								02/12/96 0000	92.32	831.54	0.00	831.54	
MNW								05/20/96 0000	92.19	831.67	0.00	831.67	
MNW								09/01/96 0000	92.30	831.56	0.00	831.56	
MNW								11/01/96 0000	92.03	831.83	0.00	831.83	
MNW								01/27/97 0000	92.06	831.80	0.00	831.80	
MNW								05/13/97 0000	92.12	831.74	0.00	831.74	
MNW								08/19/97 0000	91.99	831.87	0.00	831.87	
MNW								11/10/97 0000	92.03	831.83	0.00	831.83	
MNW								02/23/98 0000	92.02	831.84	0.00	831.84	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/01/98 0000	92.27	831.59	0.00	831.59	
MNW								11/10/98 0000	92.03	831.83	0.00	831.83	
MNW								05/17/99 0000	91.68	832.18	0.00	832.18	
MNW								06/28/99 0000	91.94	831.92	0.00	831.92	
MNW								06/12/00 0000	91.99	831.87	0.00	831.87	
MNW								12/04/03 0000	NM	-	NM	-	Obstruction @38.70'
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	
MW-47	474769.62	1460063.55	922.20	925.18	925	SS	0						
MNW								11/25/03 0000	19.77	905.23	0.00	905.23	
MNW								12/03/03 0000	19.64	905.36	0.00	905.36	
MNW								01/11/04 0000	19.75	905.25	0.00	905.25	
MNW								06/07/04 0000	19.74	905.26	0.00	905.26	
MW-50	475062.59	1460107.73	899.10	902.02	901.87	1S	0						
MNW								11/25/03 0000	36.55	865.32	0.00	865.32	
MNW								12/04/03 0000	36.57	865.30	0.00	865.30	
MNW								01/11/04 0000	37.23	864.64	0.00	864.64	
MNW								06/07/04 0000	36.9	864.97	0.00	864.97	
MW-51	474892.83	1460685.09	922.70	925.43	925.16	1S	0						
MNW								11/25/03 0000	31.86	893.30	0.00	893.30	
MNW								12/04/03 0000	31.77	893.39	0.00	893.39	
MNW								01/11/04 0000	31.83	893.33	0.00	893.33	
MNW								06/07/04 0000	32.87	892.29	0.00	892.29	
MW-52	474767.91	1460081.72	921.90	924.73	924.46	2S	0						
MNW								11/25/03 0000	37.91	886.55	0.00	886.55	
MNW								12/03/03 0000	37.93	886.53	0.00	886.53	
MNW								01/11/04 0000	38.31	886.15	0.00	886.15	
MNW								06/07/04 0000	37.94	886.52	0.00	886.52	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MW-53	474883.38	1460681.58	922.70	925.34	925.1	2S	0						
MNW								11/25/03 0000	59.36	865.74	0.00	865.74	
MNW								12/04/03 0000	58.76	866.34	0.00	866.34	
MNW								01/11/04 0000	59.15	865.95	0.00	865.95	
MNW								06/07/04 0000	54.7	870.40	0.00	870.40	
MW-54	475381.64	1459132.10	858.60	861.88	861.72	UF	0						
MNW								11/25/03 0000	21.89	839.83	0.00	839.83	
MNW								12/01/03 0000	20.74	840.98	0.00	840.98	
MNW								01/11/04 0000	20.79	840.93	0.00	840.93	
MNW								06/07/04 0000	20.55	841.17	0.00	841.17	
MW-56	475631.65	1459384.09	859.40	861.95	861.75	UF	0						
MNW								11/25/03 0000	23.00	838.75	0.00	838.75	
MNW								12/03/03 0000	23.21	838.54	0.00	838.54	
MNW								01/11/04 0000	20.62	841.13	0.00	841.13	
MNW								06/07/04 0000	21.77	839.98	0.00	839.98	
MW-57	474430.33	1460856.37	945.60	948.63	948.48	UF	0						
MNW								11/25/03 0000	120.54	827.94	0.00	827.94	
MNW								12/02/03 0000	118.53	829.95	0.00	829.95	
MNW								01/11/04 0000	118.34	830.14	0.00	830.14	
MNW								06/07/04 0000	118.5	829.98	0.00	829.98	
MW-58	475686.53	1459760.00	836.70	838.93	838.67	DB	0						
MNW								11/25/03 0000	4.96	833.71	0.00	833.71	
MNW								12/04/03 0000	5.05	833.62	0.00	833.62	
MNW								01/11/04 0000	5.80	832.87	0.00	832.87	
MNW								06/07/04 0000	6.77	831.90	0.00	831.90	
MW-59	474494.87	1460031.85	929.40	932.45	932.23	SS	0						
MNW								11/25/03 0000	4.86	927.37	0.00	927.37	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								12/04/03 0000	5.11	927.12	0.00	927.12	
MNW								01/11/04 0000	5.62	926.61	0.00	926.61	
MNW								06/07/04 0000	7.43	924.80	0.00	924.80	
MW-60	474446.87	1460062.14	929.13	931.28	931.12	1S	0						
MNW								01/11/04 0000	NM	-	NM	-	Not Installed Yet
MNW								01/22/04 0000	47.35	883.77	0.00	883.77	
MNW								06/07/04 0000	47.42	883.70	0.00	883.70	
MW-61	474501.10	1460020.48	929.50	932.49	932.38	2S	0						
MNW								05/12/04 0000	64.50	867.88	0.00	867.88	
MNW								06/07/04 0000	67.9	864.48	0.00	864.48	
MW-62	474975.92	1460626.67	923.30	926.22	926.08	UF	0						
MNW								05/12/04 0000	89.70	836.38	0.00	836.38	
MNW								06/07/04 0000	89.21	836.87	0.00	836.87	
MW-64	473972.91	1461139.17	943.90	946.5	946.2	SS	0						
MNW								11/25/03 0000	12.25	933.95	0.00	933.95	
MNW								12/01/03 0000	12.09	934.11	0.00	934.11	
MNW								01/11/04 0000	12.00	934.20	0.00	934.20	
MNW								06/07/04 0000	13.2	933.00	0.00	933.00	
MW-69	474413.33	1461122.42	944.50	947.43	947.28	SS	0						
MNW								11/25/03 0000	13.11	934.17	0.00	934.17	
MNW								12/02/03 0000	NM	-	NM	-	WL Indicator Malfunction
MNW								01/11/04 0000	12.82	934.46	0.00	934.46	
MNW								06/07/04 0000	13.86	933.42	0.00	933.42	
MW-74	475034.11	1460563.70	923.00	925.3	924.99	SS							
MNW								11/25/03 0000	15.06	909.93	0.00		
MNW								12/02/03 0000	NM	-	NM	-	Dry
MNW								01/11/04 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MNW								06/07/04 0000	NM	-	NM	-	
NWS-01A	474480.76	1460019.96	929.10	931.57	931.57	L	0						
MNW								01/11/04 0000	24.52	907.05	0.00	907.05	
NWS-01A-01	474480.76	1460019.96	929.10	931.57	932.02	1S	0						
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	
NWS-01A-02	474480.76	1460019.96	929.10	931.57	931.92	2S	0						
MNW								01/11/04 0000	104.32	827.60	0.00	827.60	
MNW								06/14/04 0000	60.78	871.14	0.00	871.14	
NWS-01A-03	474480.76	1460019.96	929.10	931.57	931.90	UF	0						
MNW								01/11/04 0000	99.94	831.96	0.00	831.96	
MNW								06/07/04 0000	100.21	831.69	0.00	831.69	
NWS-01A-04	474480.76	1460019.96	929.10	931.57	931.97	DB	0						
MNW								01/11/04 0000	137.88	794.09	0.00	794.09	
MNW								06/07/04 0000	137.14	794.83	0.00	794.83	
NWS-02	473976.39	1461147.31	943.30	946.35	946.35	L	0						
MNW								01/11/04 0000	6.75	939.60	0.00	939.60	
NWS-02-01	473976.39	1461147.31	943.30	946.35	946.53	1S	0						
MNW								01/11/04 0000	20.19	926.34	0.00	926.34	
MNW								06/07/04 0000	20.28	926.25	0.00	926.25	
NWS-02-02	473976.39	1461147.31	943.30	946.35	946.50	2S	0						
MNW								01/11/04 0000	32.47	914.03	0.00	914.03	
MNW								06/07/04 0000	69.89	876.61	0.00	876.61	
NWS-02-03	473976.39	1461147.31	943.30	946.35	946.49	UF	0						
MNW								01/11/04 0000	87.33	859.16	0.00	859.16	
MNW								06/07/04 0000	114.22	832.27	0.00	832.27	

NM - No Measurement

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Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
NWS-02-04	473976.39	1461147.31	943.30	946.35	946.75	DB	0						
MNW								01/11/04 0000	39.23	907.52	0.00	907.52	
MNW								06/07/04 0000	96.44	850.31	0.00	850.31	
NWS-03	474409.70	1461130.00	944.90	946.87	946.87	L	0						
MNW								01/11/04 0000	3.12	943.75	0.00	943.75	
NWS-03-01	474409.70	1461130.00	944.90	946.87	947.20	1S	0						
MNW								01/11/04 0000	61.12	886.08	0.00	886.08	
MNW								06/07/04 0000	59.33	887.87	0.00	887.87	
NWS-03-02	474409.70	1461130.00	944.90	946.87	947.16	2S	0						
MNW								01/11/04 0000	78.48	868.68	0.00	868.68	
MNW								06/07/04 0000	78.27	868.89	0.00	868.89	
NWS-03-03	474409.70	1461130.00	944.90	946.87	947.19	UF	0						
MNW								01/11/04 0000	117.24	829.95	0.00	829.95	
MNW								06/07/04 0000	117.14	830.05	0.00	830.05	
NWS-03-04	474409.70	1461130.00	944.90	946.87	947.21	DB	0						
MNW								01/11/04 0000	131.82	815.39	0.00	815.39	
MNW								06/07/04 0000	133.17	814.04	0.00	814.04	
NWS-04	475030.00	1460581.27	922.40	925.25	925.25	L	0						
MNW								01/11/04 0000	13.71	911.54	0.00	911.54	
NWS-04-01	475030.00	1460581.27	922.40	925.25	925.73	1S	0						
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	
NWS-04-02	475030.00	1460581.27	922.40	925.25	925.72	2S	0						
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	

NM - No Measurement

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Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
NWS-04-03	475030.00	1460581.27	922.40	925.25	925.85	UF	0						
MNW								01/11/04 0000	141.04	784.81	0.00	784.81	
MNW								06/07/04 0000	129.19	796.66	0.00	796.66	
NWS-04-04	475030.00	1460581.27	922.40	925.25	925.77	DB	0						
MNW								01/11/04 0000	114.33	811.44	0.00	811.44	
MNW								06/07/04 0000	109.38	816.39	0.00	816.39	
NWS-05	475148.45	1460199.00	912.50	914.28	914.28	L	0						
MNW								01/11/04 0000	52.47	861.81	0.00	861.81	
NWS-05-01	475148.45	1460199.00	912.50	914.28	914.79	1S	0						
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	
NWS-05-02	475148.45	1460199.00	912.50	914.28	914.87	2S	0						
MNW								01/11/04 0000	NM	-	NM	-	Dry
MNW								06/07/04 0000	NM	-	NM	-	
NWS-05-03	475148.45	1460199.00	912.50	914.28	914.80	UF	0						
MNW								01/11/04 0000	76.03	838.77	0.00	838.77	
MNW								06/07/04 0000	77.17	837.63	0.00	837.63	
NWS-05-04	475148.45	1460199.00	912.50	914.28	914.83	DB	0						
MNW								01/11/04 0000	102.45	812.38	0.00	812.38	
MNW								06/07/04 0000	106.05	808.78	0.00	808.78	
NWS-05-05	475148.45	1460199.00	912.50	914.28	914.89	DB2	0						
MNW								01/11/04 0000	119.16	795.73	0.00	795.73	
MNW								06/07/04 0000	119.33	795.56	0.00	795.56	
PZ-01	475012.32	1460057.73	905.30	907.53	907.08	SS	0						
PZ								03/25/91 0000	10.32	896.76	0.00	896.76	
PZ								04/29/91 0000	11.55	895.53	0.00	895.53	
PZ								05/17/91 0000	12.60	894.48	0.00	894.48	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								06/18/91 0000	14.73	892.35	0.00	892.35	
PZ								07/20/91 0000	14.92	892.16	0.00	892.16	
PZ								08/19/91 0000	18.60	888.48	0.00	888.48	
PZ								09/19/91 0000	15.67	891.41	0.00	891.41	
PZ								09/30/91 0000	15.72	891.36	0.00	891.36	
PZ								11/20/91 0000	16.28	890.80	0.00	890.80	
PZ								12/16/91 0000	16.03	891.05	0.00	891.05	
PZ								03/23/92 0000	10.83	896.25	0.00	896.25	
PZ								06/15/92 0000	15.28	891.80	0.00	891.80	
PZ								12/08/92 0000	12.06	895.02	0.00	895.02	
PZ								02/16/93 0000	12.98	894.10	0.00	894.10	
PZ								05/24/93 0000	14.49	892.59	0.00	892.59	
PZ								08/01/93 0000	15.93	891.15	0.00	891.15	
PZ								09/06/93 0000	15.41	891.67	0.00	891.67	
PZ								10/07/93 0000	14.61	892.47	0.00	892.47	
PZ								11/08/93 0000	14.68	892.40	0.00	892.40	
PZ								11/11/93 0000	13.92	893.16	0.00	893.16	
PZ								12/22/93 0000	12.60	894.48	0.00	894.48	
PZ								02/21/94 0000	11.59	895.49	0.00	895.49	
PZ								03/24/94 0000	10.10	896.98	0.00	896.98	
PZ								04/19/94 0000	10.00	897.08	0.00	897.08	
PZ								05/23/94 0000	13.51	893.57	0.00	893.57	
PZ								07/29/94 0000	15.74	891.34	0.00	891.34	
PZ								08/22/94 0000	13.40	893.68	0.00	893.68	
PZ								10/31/94 0000	15.18	891.90	0.00	891.90	
PZ								12/01/94 0000	22.48	884.60	0.00	884.60	
PZ								01/30/95 0000	11.70	895.38	0.00	895.38	
PZ								03/16/95 0000	11.00	896.08	0.00	896.08	
PZ								04/11/95 0000	10.37	896.71	0.00	896.71	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								05/01/95 0000	12.04	895.04	0.00	895.04	
PZ								05/05/95 0000	11.00	896.08	0.00	896.08	
PZ								07/10/95 0000	14.20	892.88	0.00	892.88	
PZ								08/01/95 0000	14.80	892.28	0.00	892.28	
PZ								08/14/95 0000	15.07	892.01	0.00	892.01	
PZ								09/11/95 0000	14.30	892.78	0.00	892.78	
PZ								10/04/95 0000	16.50	890.58	0.00	890.58	
PZ								11/06/95 0000	16.26	890.82	0.00	890.82	
PZ								12/07/95 0000	15.35	891.73	0.00	891.73	
PZ								01/17/96 0000	14.72	892.36	0.00	892.36	
PZ								02/12/96 0000	13.08	894.00	0.00	894.00	
PZ								05/20/96 0000	11.00	896.08	0.00	896.08	
PZ								09/01/96 0000	15.63	891.45	0.00	891.45	
PZ								11/01/96 0000	12.19	894.89	0.00	894.89	
PZ								01/27/97 0000	11.44	895.64	0.00	895.64	
PZ								05/13/97 0000	12.53	894.55	0.00	894.55	
PZ								08/19/97 0000	13.09	893.99	0.00	893.99	
PZ								11/10/97 0000	13.06	894.02	0.00	894.02	
PZ								02/23/98 0000	11.61	895.47	0.00	895.47	
PZ								06/01/98 0000	13.83	893.25	0.00	893.25	
PZ								11/10/98 0000	13.06	894.02	0.00	894.02	
PZ								05/17/99 0000	12.63	894.45	0.00	894.45	
PZ								06/28/99 0000	14.69	892.39	0.00	892.39	
PZ								06/12/00 0000	14.11	892.97	0.00	892.97	
PZ								11/25/03 0000	10.79	896.29	0.00	896.29	
PZ								01/11/04 0000	12.24	894.84	0.00	894.84	
PZ								06/07/04 0000	13.44	893.64	0.00	893.64	
PZ-02	474931.25	1460146.14	910.70	913.49	912.86	SS	0						
PZ								03/25/91 0000	14.16	898.70	0.00	898.70	

NM - No Measurement

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Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								04/29/91 0000	14.31	898.55	0.00	898.55	
PZ								05/17/91 0000	15.66	897.20	0.00	897.20	
PZ								06/18/91 0000	18.48	894.38	0.00	894.38	
PZ								07/20/91 0000	18.70	894.16	0.00	894.16	
PZ								08/19/91 0000	19.08	893.78	0.00	893.78	
PZ								09/19/91 0000	19.37	893.49	0.00	893.49	
PZ								09/30/91 0000	19.45	893.41	0.00	893.41	
PZ								11/20/91 0000	19.73	893.13	0.00	893.13	
PZ								12/16/91 0000	19.80	893.06	0.00	893.06	
PZ								03/23/92 0000	14.77	898.09	0.00	898.09	
PZ								06/15/92 0000	18.60	894.26	0.00	894.26	
PZ								12/08/92 0000	16.01	896.85	0.00	896.85	
PZ								02/16/93 0000	17.03	895.83	0.00	895.83	
PZ								05/24/93 0000	18.19	894.67	0.00	894.67	
PZ								08/01/93 0000	19.41	893.45	0.00	893.45	
PZ								09/06/93 0000	19.82	893.04	0.00	893.04	
PZ								10/07/93 0000	19.87	892.99	0.00	892.99	
PZ								11/08/93 0000	18.68	894.18	0.00	894.18	
PZ								11/11/93 0000	18.33	894.53	0.00	894.53	
PZ								12/22/93 0000	17.00	895.86	0.00	895.86	
PZ								02/21/94 0000	16.57	896.29	0.00	896.29	
PZ								03/24/94 0000	14.48	898.38	0.00	898.38	
PZ								04/19/94 0000	13.68	899.18	0.00	899.18	
PZ								05/23/94 0000	17.31	895.55	0.00	895.55	
PZ								07/29/94 0000	19.83	893.03	0.00	893.03	
PZ								08/22/94 0000	19.71	893.15	0.00	893.15	
PZ								10/31/94 0000	19.53	893.33	0.00	893.33	
PZ								12/01/94 0000	17.00	895.86	0.00	895.86	
PZ								01/30/95 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								03/16/95 0000	15.00	897.86	0.00	897.86	
PZ								04/11/95 0000	15.00	897.86	0.00	897.86	
PZ								05/01/95 0000	15.80	897.06	0.00	897.06	
PZ								05/05/95 0000	16.00	896.86	0.00	896.86	
PZ								07/10/95 0000	18.20	894.66	0.00	894.66	
PZ								08/01/95 0000	19.00	893.86	0.00	893.86	
PZ								08/14/95 0000	19.43	893.43	0.00	893.43	
PZ								09/11/95 0000	19.80	893.06	0.00	893.06	
PZ								10/04/95 0000	20.00	892.86	0.00	892.86	
PZ								11/06/95 0000	19.97	892.89	0.00	892.89	
PZ								12/07/95 0000	20.00	892.86	0.00	892.86	
PZ								01/17/96 0000	19.00	893.86	0.00	893.86	
PZ								02/12/96 0000	17.95	894.91	0.00	894.91	
PZ								05/20/96 0000	13.79	899.07	0.00	899.07	
PZ								09/01/96 0000	19.35	893.51	0.00	893.51	
PZ								11/01/96 0000	16.79	896.07	0.00	896.07	
PZ								01/27/97 0000	16.06	896.80	0.00	896.80	
PZ								05/13/97 0000	16.47	896.39	0.00	896.39	
PZ								08/19/97 0000	19.59	893.27	0.00	893.27	
PZ								11/10/97 0000	19.09	893.77	0.00	893.77	
PZ								02/23/98 0000	15.29	897.57	0.00	897.57	
PZ								06/01/98 0000	17.94	894.92	0.00	894.92	
PZ								11/10/98 0000	19.09	893.77	0.00	893.77	
PZ								05/17/99 0000	16.87	895.99	0.00	895.99	
PZ								06/28/99 0000	18.62	894.24	0.00	894.24	
PZ								06/12/00 0000	17.80	895.06	0.00	895.06	
PZ								11/25/03 0000	15.97	896.89	0.00	896.89	
PZ								01/11/04 0000	16.90	895.96	0.00	895.96	
PZ								06/07/04 0000	18.05	894.81	0.00	894.81	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ-03A	474874.50	1460282.09	918.20	920.72	920.18	SS	0						
PZ								03/25/91 0000	16.75	903.43	0.00	903.43	
PZ								04/29/91 0000	16.42	903.76	0.00	903.76	
PZ								05/17/91 0000	16.40	903.78	0.00	903.78	
PZ								06/18/91 0000	17.65	902.53	0.00	902.53	
PZ								07/20/91 0000	18.18	902.00	0.00	902.00	
PZ								08/19/91 0000	18.90	901.28	0.00	901.28	
PZ								09/19/91 0000	19.74	900.44	0.00	900.44	
PZ								09/30/91 0000	NM	-	NM	-	Dry
PZ								11/20/91 0000	NM	-	NM	-	Dry
PZ								12/16/91 0000	NM	-	NM	-	Dry
PZ								03/23/92 0000	16.85	903.33	0.00	903.33	
PZ								06/15/92 0000	17.70	902.48	0.00	902.48	
PZ								12/08/92 0000	16.80	903.38	0.00	903.38	
PZ								02/16/93 0000	16.8	903.38	0.00	903.38	
PZ								05/24/93 0000	16.87	903.31	0.00	903.31	
PZ								08/01/93 0000	17.62	902.56	0.00	902.56	
PZ								09/06/93 0000	17.73	902.45	0.00	902.45	
PZ								10/07/93 0000	16.75	903.43	0.00	903.43	
PZ								11/08/93 0000	16.96	903.22	0.00	903.22	
PZ								11/11/93 0000	16.60	903.58	0.00	903.58	
PZ								12/22/93 0000	17.00	903.18	0.00	903.18	
PZ								02/21/94 0000	17.25	902.93	0.00	902.93	
PZ								03/24/94 0000	16.20	903.98	0.00	903.98	
PZ								04/19/94 0000	16.00	904.18	0.00	904.18	
PZ								05/23/94 0000	16.94	903.24	0.00	903.24	
PZ								07/29/94 0000	18.23	901.95	0.00	901.95	
PZ								08/22/94 0000	17.58	902.60	0.00	902.60	
PZ								10/31/94 0000	18.29	901.89	0.00	901.89	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								12/01/94 0000	17.69	902.49	0.00	902.49	
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	18.54	901.64	0.00	901.64	
PZ								04/11/95 0000	23.10	897.08	0.00	897.08	
PZ								05/01/95 0000	17.10	903.08	0.00	903.08	
PZ								05/05/95 0000	17.00	903.18	0.00	903.18	
PZ								07/10/95 0000	17.30	902.88	0.00	902.88	
PZ								08/01/95 0000	17.90	902.28	0.00	902.28	
PZ								08/14/95 0000	18.31	901.87	0.00	901.87	
PZ								09/11/95 0000	18.70	901.48	0.00	901.48	
PZ								10/04/95 0000	19.00	901.18	0.00	901.18	
PZ								11/06/95 0000	19.70	900.48	0.00	900.48	
PZ								12/07/95 0000	19.00	901.18	0.00	901.18	
PZ								01/17/96 0000	17.50	902.68	0.00	902.68	
PZ								02/12/96 0000	18.68	901.50	0.00	901.50	
PZ								05/20/96 0000	16.56	903.62	0.00	903.62	
PZ								09/01/96 0000	17.89	902.29	0.00	902.29	
PZ								11/01/96 0000	17.51	902.67	0.00	902.67	
PZ								01/27/97 0000	17.42	902.76	0.00	902.76	
PZ								05/13/97 0000	17.11	903.07	0.00	903.07	
PZ								08/19/97 0000	18.55	901.63	0.00	901.63	
PZ								11/10/97 0000	18.91	901.27	0.00	901.27	
PZ								02/23/98 0000	17.21	902.97	0.00	902.97	
PZ								06/01/98 0000	16.92	903.26	0.00	903.26	
PZ								11/10/98 0000	18.91	901.27	0.00	901.27	
PZ								05/17/99 0000	16.66	903.52	0.00	903.52	
PZ								06/28/99 0000	17.28	902.90	0.00	902.90	
PZ								06/12/00 0000	17.01	903.17	0.00	903.17	
PZ								11/25/03 0000	16.55	903.63	0.00	903.63	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								01/11/04 0000	16.05	904.13	0.00	904.13	
PZ								06/07/04 0000	16.5	903.68	0.00	903.68	
PZ-04	474923.07	1460472.73	918.80	920.85	920.61	SS	0						
PZ								03/25/91 0000	NM	-	NM	-	Dry
PZ								04/29/91 0000	NM	-	NM	-	Dry
PZ								05/17/91 0000	NM	-	NM	-	Dry
PZ								06/18/91 0000	NM	-	NM	-	Dry
PZ								07/20/91 0000	NM	-	NM	-	Dry
PZ								08/19/91 0000	NM	-	NM	-	Dry
PZ								09/19/91 0000	NM	-	NM	-	Dry
PZ								09/30/91 0000	NM	-	NM	-	Dry
PZ								11/20/91 0000	NM	-	NM	-	Dry
PZ								12/16/91 0000	NM	-	NM	-	Dry
PZ								03/23/92 0000	NM	-	NM	-	Dry
PZ								06/15/92 0000	NM	-	NM	-	Dry
PZ								12/08/92 0000	NM	-	NM	-	Dry
PZ								02/16/93 0000	NM	-	NM	-	Dry
PZ								05/24/93 0000	NM	-	NM	-	Dry
PZ								08/01/93 0000	19.43	901.18	0.00	901.18	
PZ								09/06/93 0000	10.89	909.72	0.00	909.72	
PZ								10/07/93 0000	19.83	900.78	0.00	900.78	
PZ								11/08/93 0000	19.93	900.68	0.00	900.68	
PZ								11/11/93 0000	NM	-	NM	-	Dry
PZ								12/22/93 0000	NM	-	NM	-	Dry
PZ								02/21/94 0000	20.00	900.61	0.00	900.61	
PZ								03/24/94 0000	NM	-	NM	-	Dry
PZ								04/19/94 0000	19.83	900.78	0.00	900.78	
PZ								05/23/94 0000	19.97	900.64	0.00	900.64	
PZ								07/29/94 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								08/22/94 0000	NM	-	NM	-	Dry
PZ								10/31/94 0000	NM	-	NM	-	Dry
PZ								12/01/94 0000	NM	-	NM	-	Dry
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	NM	-	NM	-	Dry
PZ								04/11/95 0000	NM	-	NM	-	Dry
PZ								05/01/95 0000	NM	-	NM	-	Dry
PZ								05/05/95 0000	NM	-	NM	-	Dry
PZ								07/10/95 0000	19.80	900.81	0.00	900.81	
PZ								08/01/95 0000	19.80	900.81	0.00	900.81	
PZ								08/14/95 0000	19.94	900.67	0.00	900.67	
PZ								09/11/95 0000	19.80	900.81	0.00	900.81	
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	NM	-	NM	-	Dry
PZ								12/07/95 0000	NM	-	NM	-	Dry
PZ								01/17/96 0000	19.71	900.90	0.00	900.90	
PZ								02/12/96 0000	NM	-	NM	-	Dry
PZ								05/20/96 0000	NM	-	NM	-	Dry
PZ								09/01/96 0000	NM	-	NM	-	Dry
PZ								11/01/96 0000	NM	-	NM	-	Dry
PZ								01/27/97 0000	NM	-	NM	-	Dry
PZ								05/13/97 0000	20.00	900.61	0.00	900.61	
PZ								08/19/97 0000	NM	-	NM	-	Dry
PZ								11/10/97 0000	19.99	900.62	0.00	900.62	
PZ								02/23/98 0000	20.02	900.59	0.00	900.59	
PZ								06/01/98 0000	NM	-	NM	-	Dry
PZ								11/10/98 0000	19.99	900.62	0.00	900.62	
PZ								06/28/99 0000	NM	-	NM	-	Dry
PZ								06/12/00 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								11/25/03 0000	16.55	904.06	0.00	904.06	
PZ								01/11/04 0000	19.40	901.21	0.00	901.21	
PZ								06/07/04 0000	19.49	901.12	0.00	901.12	
PZ-05	474834.66	1460595.88	927.40	929.78	929.48	SS	0						
PZ								03/25/91 0000	NM	-	NM	-	Dry
PZ								04/29/91 0000	NM	-	NM	-	Dry
PZ								05/17/91 0000	NM	-	NM	-	Dry
PZ								06/18/91 0000	NM	-	NM	-	Dry
PZ								07/20/91 0000	NM	-	NM	-	Dry
PZ								08/19/91 0000	NM	-	NM	-	Dry
PZ								09/19/91 0000	NM	-	NM	-	Dry
PZ								09/30/91 0000	NM	-	NM	-	Dry
PZ								11/20/91 0000	NM	-	NM	-	Dry
PZ								12/16/91 0000	NM	-	NM	-	Dry
PZ								03/23/92 0000	NM	-	NM	-	Dry
PZ								06/15/92 0000	NM	-	NM	-	Dry
PZ								12/08/92 0000	NM	-	NM	-	Dry
PZ								02/16/93 0000	NM	-	NM	-	Dry
PZ								05/24/93 0000	NM	-	NM	-	Dry
PZ								08/01/93 0000	19.56	909.92	0.00	909.92	
PZ								09/06/93 0000	10.75	918.73	0.00	918.73	
PZ								10/07/93 0000	19.61	909.87	0.00	909.87	
PZ								11/08/93 0000	19.75	909.73	0.00	909.73	
PZ								11/11/93 0000	NM	-	NM	-	Dry
PZ								12/22/93 0000	19.67	909.81	0.00	909.81	
PZ								02/21/94 0000	19.75	909.73	0.00	909.73	
PZ								03/24/94 0000	19.25	910.23	0.00	910.23	
PZ								04/19/94 0000	19.67	909.81	0.00	909.81	
PZ								05/23/94 0000	19.83	909.65	0.00	909.65	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								07/29/94 0000	19.75	909.73	0.00	909.73	
PZ								08/22/94 0000	NM	-	NM	-	Dry
PZ								10/31/94 0000	NM	-	NM	-	Dry
PZ								12/01/94 0000	19.85	909.63	0.00	909.63	
PZ								01/30/95 0000	NM	-	NM	-	Dry
PZ								03/16/95 0000	20.00	909.48	0.00	909.48	
PZ								04/11/95 0000	20.00	909.48	0.00	909.48	
PZ								05/01/95 0000	NM	-	NM	-	Dry
PZ								05/05/95 0000	18.00	911.48	0.00	911.48	
PZ								07/10/95 0000	19.80	909.68	0.00	909.68	
PZ								08/01/95 0000	19.80	909.68	0.00	909.68	
PZ								08/14/95 0000	19.88	909.60	0.00	909.60	
PZ								09/11/95 0000	19.80	909.68	0.00	909.68	
PZ								10/04/95 0000	20.00	909.48	0.00	909.48	
PZ								11/06/95 0000	NM	-	NM	-	Dry
PZ								12/07/95 0000	20.20	909.28	0.00	909.28	
PZ								01/17/96 0000	19.80	909.68	0.00	909.68	
PZ								02/12/96 0000	NM	-	NM	-	Dry
PZ								05/20/96 0000	NM	-	NM	-	Dry
PZ								09/01/96 0000	NM	-	NM	-	Dry
PZ								11/01/96 0000	NM	-	NM	-	Dry
PZ								01/27/97 0000	NM	-	NM	-	Dry
PZ								05/13/97 0000	20.27	909.21	0.00	909.21	
PZ								08/19/97 0000	NM	-	NM	-	Dry
PZ								11/10/97 0000	20.04	909.44	0.00	909.44	
PZ								02/23/98 0000	NM	-	NM	-	Dry
PZ								06/01/98 0000	NM	-	NM	-	Dry
PZ								11/10/98 0000	20.04	909.44	0.00	909.44	
PZ								05/17/99 0000	19.85	909.63	0.00	909.63	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								06/28/99 0000	NM	-	NM	-	Dry
PZ								06/12/00 0000	NM	-	NM	-	Dry
PZ								11/25/03 0000	19.40	910.08	0.00	910.08	
PZ								01/11/04 0000	19.66	909.82	0.00	909.82	
PZ								06/07/04 0000	19.81	909.67	0.00	909.67	
PZ-06A	474678.01	1460656.96	940.80	943.23	942.82	SS	0						
PZ								03/25/91 0000	4.39	938.43	0.00	938.43	
PZ								04/29/91 0000	5.80	937.02	0.00	937.02	
PZ								05/17/91 0000	5.60	937.22	0.00	937.22	
PZ								06/18/91 0000	8.28	934.54	0.00	934.54	
PZ								07/20/91 0000	6.10	936.72	0.00	936.72	
PZ								08/19/91 0000	11.40	931.42	0.00	931.42	
PZ								09/19/91 0000	12.64	930.18	0.00	930.18	
PZ								09/30/91 0000	12.87	929.95	0.00	929.95	
PZ								11/20/91 0000	14.04	928.78	0.00	928.78	
PZ								12/16/91 0000	13.70	929.12	0.00	929.12	
PZ								03/23/92 0000	8.02	934.80	0.00	934.80	
PZ								06/15/92 0000	8.98	933.84	0.00	933.84	
PZ								12/08/92 0000	7.48	935.34	0.00	935.34	
PZ								02/16/93 0000	5.56	937.26	0.00	937.26	
PZ								05/24/93 0000	7.06	935.76	0.00	935.76	
PZ								08/01/93 0000	10.49	932.33	0.00	932.33	
PZ								09/06/93 0000	11.95	930.87	0.00	930.87	
PZ								10/07/93 0000	12.55	930.27	0.00	930.27	
PZ								11/08/93 0000	13.03	929.79	0.00	929.79	
PZ								11/11/93 0000	12.67	930.15	0.00	930.15	
PZ								12/22/93 0000	7.00	935.82	0.00	935.82	
PZ								02/21/94 0000	3.47	939.35	0.00	939.35	
PZ								03/24/94 0000	3.31	939.51	0.00	939.51	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								04/19/94 0000	3.47	939.35	0.00	939.35	
PZ								05/23/94 0000	6.34	936.48	0.00	936.48	
PZ								07/29/94 0000	10.78	932.04	0.00	932.04	
PZ								08/22/94 0000	10.17	932.65	0.00	932.65	
PZ								10/31/94 0000	12.08	930.74	0.00	930.74	
PZ								12/01/94 0000	9.33	933.49	0.00	933.49	
PZ								01/30/95 0000	4.62	938.20	0.00	938.20	
PZ								03/16/95 0000	3.75	939.07	0.00	939.07	
PZ								04/11/95 0000	4.00	938.82	0.00	938.82	
PZ								05/01/95 0000	5.68	937.14	0.00	937.14	
PZ								05/05/95 0000	5.47	937.35	0.00	937.35	
PZ								07/10/95 0000	6.90	935.92	0.00	935.92	
PZ								08/01/95 0000	8.50	934.32	0.00	934.32	
PZ								08/14/95 0000	9.26	933.56	0.00	933.56	
PZ								09/11/95 0000	10.50	932.32	0.00	932.32	
PZ								10/04/95 0000	12.17	930.65	0.00	930.65	
PZ								11/06/95 0000	12.78	930.04	0.00	930.04	
PZ								12/07/95 0000	12.31	930.51	0.00	930.51	
PZ								01/17/96 0000	8.20	934.62	0.00	934.62	
PZ								02/12/96 0000	7.42	935.40	0.00	935.40	
PZ								05/20/96 0000	4.14	938.68	0.00	938.68	
PZ								09/01/96 0000	9.53	933.29	0.00	933.29	
PZ								11/01/96 0000	6.76	936.06	0.00	936.06	
PZ								01/27/97 0000	4.94	937.88	0.00	937.88	
PZ								05/13/97 0000	6.64	936.18	0.00	936.18	
PZ								08/19/97 0000	9.42	933.40	0.00	933.40	
PZ								11/10/97 0000	10.99	931.83	0.00	931.83	
PZ								02/23/98 0000	3.51	939.31	0.00	939.31	
PZ								06/01/98 0000	6.88	935.94	0.00	935.94	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								11/10/98 0000	10.99	931.83	0.00	931.83	
PZ								05/17/99 0000	6.58	936.24	0.00	936.24	
PZ								06/28/99 0000	8.34	934.48	0.00	934.48	
PZ								06/12/00 0000	6.76	936.06	0.00	936.06	
PZ								11/25/03 0000	3.15	939.67	0.00	939.67	
PZ								01/11/04 0000	3.53	939.29	0.00	939.29	
PZ								06/07/04 0000	5.85	936.97	0.00	936.97	
PZ-07	474602.29	1460545.24	941.10	NA	942.67	SS	0						
PZ								03/25/91 0000	4.80	937.87	0.00	937.87	
PZ								04/29/91 0000	5.46	937.21	0.00	937.21	
PZ								05/17/91 0000	6.35	936.32	0.00	936.32	
PZ								06/18/91 0000	9.25	933.42	0.00	933.42	
PZ								07/20/91 0000	9.18	933.49	0.00	933.49	
PZ								08/19/91 0000	11.02	931.65	0.00	931.65	
PZ								09/19/91 0000	12.05	930.62	0.00	930.62	
PZ								09/30/91 0000	12.32	930.35	0.00	930.35	
PZ								11/20/91 0000	13.31	929.36	0.00	929.36	
PZ								12/16/91 0000	12.83	929.84	0.00	929.84	
PZ								03/23/92 0000	6.92	935.75	0.00	935.75	
PZ								06/15/92 0000	9.62	933.05	0.00	933.05	
PZ								12/08/92 0000	7.07	935.60	0.00	935.60	
PZ								02/16/93 0000	6.42	936.25	0.00	936.25	
PZ								05/24/93 0000	8.17	934.50	0.00	934.50	
PZ								08/01/93 0000	10.26	932.41	0.00	932.41	
PZ								09/06/93 0000	11.50	931.17	0.00	931.17	
PZ								10/07/93 0000	12.00	930.67	0.00	930.67	
PZ								11/08/93 0000	12.43	930.24	0.00	930.24	
PZ								11/11/93 0000	11.88	930.79	0.00	930.79	
PZ								12/22/93 0000	7.00	935.67	0.00	935.67	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								02/21/94 0000	4.38	938.29	0.00	938.29	
PZ								03/24/94 0000	4.00	938.67	0.00	938.67	
PZ								04/19/94 0000	4.00	938.67	0.00	938.67	
PZ								05/23/94 0000	7.30	935.37	0.00	935.37	
PZ								07/29/94 0000	10.63	932.04	0.00	932.04	
PZ								08/22/94 0000	9.78	932.89	0.00	932.89	
PZ								10/31/94 0000	11.36	931.31	0.00	931.31	
PZ								12/01/94 0000	8.70	933.97	0.00	933.97	
PZ								01/30/95 0000	5.12	937.55	0.00	937.55	
PZ								03/16/95 0000	4.71	937.96	0.00	937.96	
PZ								04/11/95 0000	5.00	937.67	0.00	937.67	
PZ								05/01/95 0000	6.35	936.32	0.00	936.32	
PZ								05/05/95 0000	6.32	936.35	0.00	936.35	
PZ								07/10/95 0000	8.00	934.67	0.00	934.67	
PZ								08/01/95 0000	9.50	933.17	0.00	933.17	
PZ								08/14/95 0000	9.88	932.79	0.00	932.79	
PZ								09/11/95 0000	8.50	934.17	0.00	934.17	
PZ								10/04/95 0000	11.51	931.16	0.00	931.16	
PZ								11/06/95 0000	12.10	930.57	0.00	930.57	
PZ								12/07/95 0000	11.38	931.29	0.00	931.29	
PZ								01/17/96 0000	9.40	933.27	0.00	933.27	
PZ								02/12/96 0000	6.93	935.74	0.00	935.74	
PZ								05/20/96 0000	4.25	938.42	0.00	938.42	
PZ								09/01/96 0000	10.69	931.98	0.00	931.98	
PZ								11/01/96 0000	6.86	935.81	0.00	935.81	
PZ								01/27/97 0000	5.68	936.99	0.00	936.99	
PZ								05/13/97 0000	7.67	935.00	0.00	935.00	
PZ								08/19/97 0000	9.85	932.82	0.00	932.82	
PZ								11/10/97 0000	9.90	932.77	0.00	932.77	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								02/23/98 0000	4.02	938.65	0.00	938.65	
PZ								06/01/98 0000	7.27	935.40	0.00	935.40	
PZ								11/10/98 0000	9.90	932.77	0.00	932.77	
PZ								05/17/99 0000	7.00	935.67	0.00	935.67	
PZ								06/28/99 0000	8.85	933.82	0.00	933.82	
PZ								06/12/00 0000	7.57	935.10	0.00	935.10	
PZ								11/25/03 0000	3.35	939.32	0.00	939.32	
PZ								01/11/04 0000	3.78	938.89	0.00	938.89	
PZ								06/07/04 0000	6.33	936.34	0.00	936.34	
PZ-08	474666.96	1460375.71	930.40	933.31	932.98	SS	0						
PZ								03/25/91 0000	-0.24	933.22	0.00	933.22	
PZ								04/29/91 0000	8.84	924.14	0.00	924.14	
PZ								05/17/91 0000	9.35	923.63	0.00	923.63	
PZ								06/18/91 0000	12.00	920.98	0.00	920.98	
PZ								07/20/91 0000	13.84	919.14	0.00	919.14	
PZ								08/19/91 0000	13.68	919.30	0.00	919.30	
PZ								09/19/91 0000	14.60	918.38	0.00	918.38	
PZ								09/30/91 0000	14.72	918.26	0.00	918.26	
PZ								11/20/91 0000	15.80	917.18	0.00	917.18	
PZ								12/16/91 0000	16.03	916.95	0.00	916.95	
PZ								03/23/92 0000	9.83	923.15	0.00	923.15	
PZ								06/15/92 0000	13.40	919.58	0.00	919.58	
PZ								12/08/92 0000	10.50	922.48	0.00	922.48	
PZ								02/16/93 0000	11.1	921.88	0.00	921.88	
PZ								05/24/93 0000	11.96	921.02	0.00	921.02	
PZ								08/01/93 0000	13.52	919.46	0.00	919.46	
PZ								09/06/93 0000	14.13	918.85	0.00	918.85	
PZ								10/07/93 0000	14.26	918.72	0.00	918.72	
PZ								11/08/93 0000	14.14	918.84	0.00	918.84	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								11/11/93 0000	13.91	919.07	0.00	919.07	
PZ								12/22/93 0000	12.45	920.53	0.00	920.53	
PZ								02/21/94 0000	10.95	922.03	0.00	922.03	
PZ								03/24/94 0000	9.38	923.60	0.00	923.60	
PZ								04/19/94 0000	9.10	923.88	0.00	923.88	
PZ								05/23/94 0000	11.20	921.78	0.00	921.78	
PZ								07/29/94 0000	13.63	919.35	0.00	919.35	
PZ								08/22/94 0000	13.23	919.75	0.00	919.75	
PZ								10/31/94 0000	13.62	919.36	0.00	919.36	
PZ								12/01/94 0000	7.50	925.48	0.00	925.48	
PZ								01/30/95 0000	20.18	912.80	0.00	912.80	
PZ								03/16/95 0000	9.21	923.77	0.00	923.77	
PZ								04/11/95 0000	12.21	920.77	0.00	920.77	
PZ								05/01/95 0000	10.34	922.64	0.00	922.64	
PZ								05/05/95 0000	10.00	922.98	0.00	922.98	
PZ								07/10/95 0000	11.00	921.98	0.00	921.98	
PZ								08/01/95 0000	12.20	920.78	0.00	920.78	
PZ								08/14/95 0000	12.74	920.24	0.00	920.24	
PZ								09/11/95 0000	14.70	918.28	0.00	918.28	
PZ								10/04/95 0000	15.13	917.85	0.00	917.85	
PZ								11/06/95 0000	15.35	917.63	0.00	917.63	
PZ								12/07/95 0000	14.00	918.98	0.00	918.98	
PZ								01/17/96 0000	12.00	920.98	0.00	920.98	
PZ								02/12/96 0000	11.47	921.51	0.00	921.51	
PZ								05/20/96 0000	8.83	924.15	0.00	924.15	
PZ								09/01/96 0000	13.36	919.62	0.00	919.62	
PZ								11/01/96 0000	20.14	912.84	0.00	912.84	
PZ								01/27/97 0000	10.08	922.90	0.00	922.90	
PZ								05/13/97 0000	10.52	922.46	0.00	922.46	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								08/19/97 0000	12.72	920.26	0.00	920.26	
PZ								11/10/97 0000	12.90	920.08	0.00	920.08	
PZ								02/23/98 0000	8.54	924.44	0.00	924.44	
PZ								06/01/98 0000	10.61	922.37	0.00	922.37	
PZ								11/10/98 0000	12.90	920.08	0.00	920.08	
PZ								05/17/99 0000	10.76	922.22	0.00	922.22	
PZ								06/28/99 0000	11.98	921.00	0.00	921.00	
PZ								06/12/00 0000	10.33	922.65	0.00	922.65	
PZ								11/25/03 0000	8.05	924.93	0.00	924.93	
PZ								01/11/04 0000	8.18	924.80	0.00	924.80	
PZ								06/07/04 0000	8.84	924.14	0.00	924.14	
PZ-09	474527.33	1460302.34	935.90	938.49	937.66	SS	0						
PZ								04/29/91 0000	8.13	929.53	0.00	929.53	
PZ								05/17/91 0000	8.88	928.78	0.00	928.78	
PZ								06/18/91 0000	13.30	924.36	0.00	924.36	
PZ								07/20/91 0000	14.64	923.02	0.00	923.02	
PZ								08/19/91 0000	15.93	921.73	0.00	921.73	
PZ								09/19/91 0000	16.88	920.78	0.00	920.78	
PZ								09/30/91 0000	17.04	920.62	0.00	920.62	
PZ								11/20/91 0000	17.85	919.81	0.00	919.81	
PZ								12/16/91 0000	18.78	918.88	0.00	918.88	
PZ								03/23/92 0000	9.87	927.79	0.00	927.79	
PZ								06/15/92 0000	14.35	923.31	0.00	923.31	
PZ								12/08/92 0000	9.90	927.76	0.00	927.76	
PZ								02/16/93 0000	9.73	927.93	0.00	927.93	
PZ								05/24/93 0000	10.86	926.80	0.00	926.80	
PZ								08/01/93 0000	15.42	922.24	0.00	922.24	
PZ								09/06/93 0000	16.25	921.41	0.00	921.41	
PZ								10/07/93 0000	16.22	921.44	0.00	921.44	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								11/08/93 0000	15.48	922.18	0.00	922.18	
PZ								11/11/93 0000	14.92	922.74	0.00	922.74	
PZ								12/22/93 0000	11.14	926.52	0.00	926.52	
PZ								02/21/94 0000	9.65	928.01	0.00	928.01	
PZ								03/24/94 0000	7.71	929.95	0.00	929.95	
PZ								04/19/94 0000	7.00	930.66	0.00	930.66	
PZ								05/23/94 0000	9.87	927.79	0.00	927.79	
PZ								07/29/94 0000	15.23	922.43	0.00	922.43	
PZ								08/22/94 0000	12.71	924.95	0.00	924.95	
PZ								10/31/94 0000	15.80	921.86	0.00	921.86	
PZ								12/01/94 0000	10.00	927.66	0.00	927.66	
PZ								01/30/95 0000	8.18	929.48	0.00	929.48	
PZ								03/16/95 0000	18.60	919.06	0.00	919.06	
PZ								04/11/95 0000	8.00	929.66	0.00	929.66	
PZ								05/01/95 0000	8.52	929.14	0.00	929.14	
PZ								05/05/95 0000	8.44	929.22	0.00	929.22	
PZ								07/10/95 0000	10.20	927.46	0.00	927.46	
PZ								08/01/95 0000	12.50	925.16	0.00	925.16	
PZ								08/14/95 0000	13.66	924.00	0.00	924.00	
PZ								09/11/95 0000	16.80	920.86	0.00	920.86	
PZ								10/04/95 0000	NM	-	NM	-	Dry
PZ								11/06/95 0000	16.80	920.86	0.00	920.86	
PZ								12/07/95 0000	14.44	923.22	0.00	923.22	
PZ								01/17/96 0000	11.85	925.81	0.00	925.81	
PZ								02/12/96 0000	10.10	927.56	0.00	927.56	
PZ								05/20/96 0000	6.74	930.92	0.00	930.92	
PZ								09/01/96 0000	13.84	923.82	0.00	923.82	
PZ								11/01/96 0000	19.69	917.97	0.00	917.97	
PZ								01/27/97 0000	8.58	929.08	0.00	929.08	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
PZ								05/13/97 0000	6.31	931.35	0.00	931.35	
PZ								08/19/97 0000	13.01	924.65	0.00	924.65	
PZ								11/10/97 0000	11.10	926.56	0.00	926.56	
PZ								02/23/98 0000	6.97	930.69	0.00	930.69	
PZ								06/01/98 0000	10.12	927.54	0.00	927.54	
PZ								11/10/98 0000	11.10	926.56	0.00	926.56	
PZ								05/17/99 0000	8.00	929.66	0.00	929.66	
PZ								06/28/99 0000	9.95	927.71	0.00	927.71	
PZ								06/12/00 0000	9.46	928.20	0.00	928.20	
PZ								11/25/03 0000	5.53	932.13	0.00	932.13	
PZ								01/11/04 0000	5.99	931.67	0.00	931.67	
PZ								06/07/04 0000	7.44	930.22	0.00	930.22	
TPZ-01	475252.08	1460250.97	921.00	NA	924.30	1S	0						
TPZ								05/17/99 0000	43.27	881.03	0.00	881.03	
TPZ								11/25/03 0000	NM	-	NM	-	
TPZ								01/11/04 0000	NM	-	NM	-	Dry
TPZ								01/22/04 0000	43.51	880.79	0.00	880.79	
TPZ								06/07/04 0000	35.61	888.69	0.00	888.69	
TPZ-02	475073.88	1460555.19	924.60	NA	926.38	1S	0						
TPZ								05/17/99 0000	34.63	891.75	0.00	891.75	
TPZ								11/25/03 0000	35.49	890.89	0.00	890.89	
TPZ								01/11/04 0000	35.35	891.03	0.00	891.03	
TPZ								06/07/04 0000	46.08	880.30	0.00	880.30	
TPZ-03	475102.50	1460052.79	892.60	NA	895.5	1S	0						
TPZ								05/17/99 0000	10.00	885.50	0.00	885.50	
TPZ								11/25/03 0000	9.30	886.20	0.00	886.20	
TPZ								01/11/04 0000	9.37	886.13	0.00	886.13	
TPZ								06/07/04 0000	9.62	885.88	0.00	885.88	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TPZ-04	474971.08	1460247.79	911.60	NA	914.09	1S	0						
TPZ								05/17/99 0000	19.65	894.44	0.00	894.44	
TPZ								11/25/03 0000	19.00	895.09	0.00	895.09	
TPZ								01/11/04 0000	19.59	894.50	0.00	894.50	
TPZ								06/07/04 0000	19.98	894.11	0.00	894.11	
TPZ-05	474869.71	1460188.39	914.80	916.51	916.44	1S	0						
TPZ								05/17/99 0000	18.00	898.44	0.00	898.44	
TPZ								11/25/03 0000	22.52	893.92	0.00	893.92	
TPZ								01/11/04 0000	22.52	893.92	0.00	893.92	
TPZ								06/07/04 0000	22.62	893.82	0.00	893.82	
TPZ-06	475054.27	1460186.93	904.80	NA	907.77	SS	0						
TPZ								05/17/99 0000	NM	-	NM	-	Dry
TPZ								11/25/03 0000	NM	-	NM	-	
TPZ								01/11/04 0000	NM	-	NM	-	Dry
TPZ								06/07/04 0000	NM	-	NM	-	
TPZ-07	474986.69	1460453.15	914.00	NA	917.35	SS	0						
TPZ								05/17/99 0000	6.25	911.10	0.00	911.10	
TPZ								11/25/03 0000	4.93	912.42	0.00	912.42	
TPZ								01/11/04 0000	5.10	912.25	0.00	912.25	
TPZ								06/07/04 0000	5.74	911.61	0.00	911.61	
TPZ-08	474889.58	1460644.92	921.60	NA	924.45	SS	0						
TPZ								05/17/99 0000	NM	-	NM	-	Dry
TPZ								11/25/03 0000	NM	-	NM	-	
TPZ								01/11/04 0000	NM	-	NM	-	Dry
TPZ								06/07/04 0000	NM	-	NM	-	
TWSP 01-01	474995.61	1460054.38	906.90	NA	909.36	SS	0						
TWS								08/01/93 0000	10.98	898.38	0.00	898.38	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								09/06/93 0000	12.46	896.90	0.00	896.90	
TWS								10/07/93 0000	11.89	897.47	0.00	897.47	
TWS								11/11/93 0000	10.43	898.93	0.00	898.93	
TWS								12/22/93 0000	10.61	898.75	0.00	898.75	
TWS								02/21/94 0000	8.09	901.27	0.00	901.27	
TWS								03/24/94 0000	7.00	902.36	0.00	902.36	
TWS								04/19/94 0000	6.55	902.81	0.00	902.81	
TWS								05/23/94 0000	7.79	901.57	0.00	901.57	
TWS								07/29/94 0000	8.65	900.71	0.00	900.71	
TWS								08/22/94 0000	8.33	901.03	0.00	901.03	
TWS								10/31/94 0000	9.72	899.64	0.00	899.64	
TWS								12/01/94 0000	9.72	899.64	0.00	899.64	
TWS								01/30/95 0000	7.55	901.81	0.00	901.81	
TWS								03/16/95 0000	7.46	901.90	0.00	901.90	
TWS								04/11/95 0000	7.34	902.02	0.00	902.02	
TWS								05/05/95 0000	7.43	901.93	0.00	901.93	
TWS								07/10/95 0000	8.40	900.96	0.00	900.96	
TWS								08/01/95 0000	8.90	900.46	0.00	900.46	
TWS								09/11/95 0000	12.00	897.36	0.00	897.36	
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	9.36	900.00	0.00	900.00	
TWS								12/07/95 0000	9.63	899.73	0.00	899.73	
TWS								01/17/96 0000	8.87	900.49	0.00	900.49	
TWS								05/17/99 0000	8.13	901.23	0.00	901.23	
TWS								11/25/03 0000	6.80	902.56	0.00	902.56	
TWS								01/11/04 0000	5.50	903.86	0.00	903.86	
TWSP 01-02	474963.75	1460077.77	909.90	NA	912.02	SS	0						
TWS								08/01/93 0000	8.31	903.71	0.00	903.71	
TWS								09/06/93 0000	3.52	908.50	0.00	908.50	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								10/07/93 0000	7.61	904.41	0.00	904.41	
TWS								11/11/93 0000	5.58	906.44	0.00	906.44	
TWS								12/22/93 0000	5.55	906.47	0.00	906.47	
TWS								02/21/94 0000	3.34	908.68	0.00	908.68	
TWS								03/24/94 0000	3.60	908.42	0.00	908.42	
TWS								04/19/94 0000	4.47	907.55	0.00	907.55	
TWS								05/23/94 0000	8.37	903.65	0.00	903.65	
TWS								07/29/94 0000	8.54	903.48	0.00	903.48	
TWS								08/22/94 0000	8.15	903.87	0.00	903.87	
TWS								10/31/94 0000	8.55	903.47	0.00	903.47	
TWS								12/01/94 0000	8.00	904.02	0.00	904.02	
TWS								01/30/95 0000	5.00	907.02	0.00	907.02	
TWS								03/16/95 0000	4.25	907.77	0.00	907.77	
TWS								04/11/95 0000	4.30	907.72	0.00	907.72	
TWS								05/05/95 0000	6.00	906.02	0.00	906.02	
TWS								07/10/95 0000	8.00	904.02	0.00	904.02	
TWS								08/01/95 0000	7.90	904.12	0.00	904.12	
TWS								09/11/95 0000	8.00	904.02	0.00	904.02	
TWS								10/04/95 0000	6.00	906.02	0.00	906.02	
TWS								11/06/95 0000	8.00	904.02	0.00	904.02	
TWS								12/07/95 0000	8.00	904.02	0.00	904.02	
TWS								01/17/96 0000	7.90	904.12	0.00	904.12	
TWS								05/17/99 0000	8.00	904.02	0.00	904.02	
TWS								11/25/03 0000	5.61	906.41	0.00	906.41	
TWS								01/11/04 0000	4.99	907.03	0.00	907.03	
TWSP 01-03	474923.31	1460106.93	912.90	NA	915.17	SS	0						
TWS								08/01/93 0000	3.22	911.95	0.00	911.95	
TWS								09/06/93 0000	4.00	911.17	0.00	911.17	
TWS								10/07/93 0000	7.40	907.77	0.00	907.77	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								11/11/93 0000	7.63	907.54	0.00	907.54	
TWS								12/22/93 0000	9.86	905.31	0.00	905.31	
TWS								02/21/94 0000	5.73	909.44	0.00	909.44	
TWS								03/24/94 0000	5.60	909.57	0.00	909.57	
TWS								04/19/94 0000	5.49	909.68	0.00	909.68	
TWS								05/23/94 0000	7.10	908.07	0.00	908.07	
TWS								07/29/94 0000	8.51	906.66	0.00	906.66	
TWS								08/22/94 0000	8.00	907.17	0.00	907.17	
TWS								10/31/94 0000	7.60	907.57	0.00	907.57	
TWS								12/01/94 0000	6.44	908.73	0.00	908.73	
TWS								01/30/95 0000	5.82	909.35	0.00	909.35	
TWS								03/16/95 0000	5.00	910.17	0.00	910.17	
TWS								04/11/95 0000	6.00	909.17	0.00	909.17	
TWS								05/05/95 0000	6.48	908.69	0.00	908.69	
TWS								07/10/95 0000	7.00	908.17	0.00	908.17	
TWS								08/01/95 0000	7.90	907.27	0.00	907.27	
TWS								09/11/95 0000	11.50	903.67	0.00	903.67	
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	6.00	909.17	0.00	909.17	
TWS								12/07/95 0000	7.00	908.17	0.00	908.17	
TWS								01/17/96 0000	7.90	907.27	0.00	907.27	
TWS								05/17/99 0000	8.47	906.70	0.00	906.70	
TWS								11/25/03 0000	6.06	909.11	0.00	909.11	
TWS								01/11/04 0000	4.90	910.27	0.00	910.27	
TWSP 01-04	474883.37	1460136.54	915.50	NA	917.62	SS	0						
TWS								08/01/93 0000	5.66	911.96	0.00	911.96	
TWS								09/06/93 0000	4.50	913.12	0.00	913.12	
TWS								10/07/93 0000	2.71	914.91	0.00	914.91	
TWS								11/11/93 0000	4.71	912.91	0.00	912.91	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								12/22/93 0000	4.61	913.01	0.00	913.01	
TWS								02/21/94 0000	4.00	913.62	0.00	913.62	
TWS								03/24/94 0000	4.73	912.89	0.00	912.89	
TWS								04/19/94 0000	4.82	912.80	0.00	912.80	
TWS								05/23/94 0000	6.42	911.20	0.00	911.20	
TWS								07/29/94 0000	6.90	910.72	0.00	910.72	
TWS								08/22/94 0000	5.18	912.44	0.00	912.44	
TWS								10/31/94 0000	6.48	911.14	0.00	911.14	
TWS								12/01/94 0000	5.18	912.44	0.00	912.44	
TWS								01/30/95 0000	4.00	913.62	0.00	913.62	
TWS								03/16/95 0000	3.78	913.84	0.00	913.84	
TWS								04/11/95 0000	4.25	913.37	0.00	913.37	
TWS								05/05/95 0000	8.48	909.14	0.00	909.14	
TWS								07/10/95 0000	5.60	912.02	0.00	912.02	
TWS								08/01/95 0000	6.00	911.62	0.00	911.62	
TWS								09/11/95 0000	7.00	910.62	0.00	910.62	
TWS								10/04/95 0000	7.50	910.12	0.00	910.12	
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	5.68	911.94	0.00	911.94	
TWS								01/17/96 0000	5.88	911.74	0.00	911.74	
TWS								05/17/99 0000	6.00	911.62	0.00	911.62	
TWS								11/25/03 0000	6.20	911.42	0.00	911.42	
TWS								01/11/04 0000	3.85	913.77	0.00	913.77	
TWSP 01-05	474845.66	1460168.38	917.60	NA	920.92	SS	0						
TWS								08/01/93 0000	7.84	913.08	0.00	913.08	
TWS								09/06/93 0000	9.59	911.33	0.00	911.33	
TWS								10/07/93 0000	NM	-	NM	-	Dry
TWS								11/11/93 0000	10.00	910.92	0.00	910.92	
TWS								12/22/93 0000	9.00	911.92	0.00	911.92	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								02/21/94 0000	8.51	912.41	0.00	912.41	
TWS								03/24/94 0000	8.70	912.22	0.00	912.22	
TWS								04/19/94 0000	8.00	912.92	0.00	912.92	
TWS								05/23/94 0000	8.40	912.52	0.00	912.52	
TWS								07/29/94 0000	8.25	912.67	0.00	912.67	
TWS								08/22/94 0000	5.20	915.72	0.00	915.72	
TWS								10/31/94 0000	9.36	911.56	0.00	911.56	
TWS								12/01/94 0000	9.75	911.17	0.00	911.17	
TWS								01/30/95 0000	9.00	911.92	0.00	911.92	
TWS								03/16/95 0000	9.00	911.92	0.00	911.92	
TWS								04/11/95 0000	8.78	912.14	0.00	912.14	
TWS								05/05/95 0000	8.83	912.09	0.00	912.09	
TWS								07/10/95 0000	8.10	912.82	0.00	912.82	
TWS								08/01/95 0000	8.00	912.92	0.00	912.92	
TWS								09/11/95 0000	8.00	912.92	0.00	912.92	
TWS								10/04/95 0000	9.82	911.10	0.00	911.10	
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	10.00	910.92	0.00	910.92	
TWS								01/17/96 0000	7.54	913.38	0.00	913.38	
TWS								05/17/99 0000	9.00	911.92	0.00	911.92	
TWS								11/25/03 0000	9.46	911.46	0.00	911.46	
TWS								01/11/04 0000	8.21	912.71	0.00	912.71	
TWSP 01-06	474805.97	1460200.97	919.70	NA	922.26	SS	0						
TWS								08/01/93 0000	5.79	916.47	0.00	916.47	
TWS								09/06/93 0000	5.26	917.00	0.00	917.00	
TWS								10/07/93 0000	4.49	917.77	0.00	917.77	
TWS								11/11/93 0000	3.48	918.78	0.00	918.78	
TWS								12/22/93 0000	3.00	919.26	0.00	919.26	
TWS								02/21/94 0000	3.58	918.68	0.00	918.68	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								03/24/94 0000	3.46	918.80	0.00	918.80	
TWS								04/19/94 0000	3.35	918.91	0.00	918.91	
TWS								05/23/94 0000	5.00	917.26	0.00	917.26	
TWS								07/29/94 0000	5.14	917.12	0.00	917.12	
TWS								08/22/94 0000	3.75	918.51	0.00	918.51	
TWS								10/31/94 0000	5.70	916.56	0.00	916.56	
TWS								12/01/94 0000	4.51	917.75	0.00	917.75	
TWS								01/30/95 0000	3.77	918.49	0.00	918.49	
TWS								03/16/95 0000	3.80	918.46	0.00	918.46	
TWS								04/11/95 0000	4.00	918.26	0.00	918.26	
TWS								05/05/95 0000	4.00	918.26	0.00	918.26	
TWS								07/10/95 0000	5.00	917.26	0.00	917.26	
TWS								08/01/95 0000	7.60	914.66	0.00	914.66	
TWS								09/11/95 0000	8.00	914.26	0.00	914.26	
TWS								10/04/95 0000	8.68	913.58	0.00	913.58	
TWS								11/06/95 0000	3.26	919.00	0.00	919.00	
TWS								12/07/95 0000	4.00	918.26	0.00	918.26	
TWS								01/17/96 0000	7.60	914.66	0.00	914.66	
TWS								05/17/99 0000	6.00	916.26	0.00	916.26	
TWS								11/25/03 0000	3.10	919.16	0.00	919.16	
TWS								01/11/04 0000	4.04	918.22	0.00	918.22	
TWSP 01-07	474979.26	1460065.51	908.50	NA	910.94	SS	0						
TWS								09/11/95 0000	5.00	905.94	0.00	905.94	
TWS								10/04/95 0000	8.30	902.64	0.00	902.64	
TWS								11/06/95 0000	7.70	903.24	0.00	903.24	
TWS								12/07/95 0000	8.00	902.94	0.00	902.94	
TWS								01/17/96 0000	5.68	905.26	0.00	905.26	
TWS								05/17/99 0000	5.83	905.11	0.00	905.11	
TWS								11/25/03 0000	3.23	907.71	0.00	907.71	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								01/11/04 0000	4.51	906.43	0.00	906.43	
TWSP 01-08	474943.49	1460091.37	912.00	NA	914.41	SS	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	9.90	904.51	0.00	904.51	
TWS								12/07/95 0000	9.70	904.71	0.00	904.71	
TWS								01/17/96 0000	8.58	905.83	0.00	905.83	
TWS								05/17/99 0000	6.85	907.56	0.00	907.56	
TWS								11/25/03 0000	3.75	910.66	0.00	910.66	
TWS								01/11/04 0000	5.15	909.26	0.00	909.26	
TWSP 01-09	474903.24	1460121.46	914.10	NA	915.97	SS	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	9.60	906.37	0.00	906.37	
TWS								12/07/95 0000	9.00	906.97	0.00	906.97	
TWS								01/17/96 0000	6.65	909.32	0.00	909.32	
TWS								05/17/99 0000	5.00	910.97	0.00	910.97	
TWS								11/25/03 0000	3.65	912.32	0.00	912.32	
TWS								01/11/04 0000	7.00	908.97	0.00	908.97	
TWSP 01-10	474864.31	1460151.03	916.50	NA	918.68	SS	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	NM	-	NM	-	Dry
TWS								05/17/99 0000	9.42	909.26	0.00	909.26	
TWS								11/25/03 0000	8.26	910.42	0.00	910.42	
TWS								01/11/04 0000	9.70	908.98	0.00	908.98	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWSP 01-11	474834.25	1460197.78	918.20	NA	920.29	SS	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	9.45	910.84	0.00	910.84	
TWS								11/25/03 0000	4.17	916.12	0.00	916.12	
TWS								01/11/04 0000	5.40	914.89	0.00	914.89	
TWSP 01-12	474815.74	1460170.79	919.20	NA	921.57	SS	0						
TWS								09/11/95 0000	1.30	920.27	0.00	920.27	
TWS								10/04/95 0000	10.20	911.37	0.00	911.37	
TWS								11/06/95 0000	7.18	914.39	0.00	914.39	
TWS								12/07/95 0000	5.00	916.57	0.00	916.57	
TWS								01/17/96 0000	4.21	917.36	0.00	917.36	
TWS								05/17/99 0000	5.20	916.37	0.00	916.37	
TWS								11/25/03 0000	2.47	919.10	0.00	919.10	
TWS								01/11/04 0000	8.09	913.48	0.00	913.48	
TWSP 02-01	474816.94	1460263.83	921.60	NA	923.82	SS	0						
TWS								08/01/93 0000	4.25	919.57	0.00	919.57	
TWS								09/06/93 0000	5.33	918.49	0.00	918.49	
TWS								10/07/93 0000	4.85	918.97	0.00	918.97	
TWS								11/11/93 0000	3.50	920.32	0.00	920.32	
TWS								12/22/93 0000	3.51	920.31	0.00	920.31	
TWS								02/21/94 0000	3.00	920.82	0.00	920.82	
TWS								03/24/94 0000	2.60	921.22	0.00	921.22	
TWS								04/19/94 0000	2.61	921.21	0.00	921.21	
TWS								05/23/94 0000	NM	-	NM	-	Dry
TWS								07/29/94 0000	5.35	918.47	0.00	918.47	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								08/22/94 0000	4.30	919.52	0.00	919.52	
TWS								10/31/94 0000	5.00	918.82	0.00	918.82	
TWS								12/01/94 0000	5.20	918.62	0.00	918.62	
TWS								01/30/95 0000	3.57	920.25	0.00	920.25	
TWS								03/16/95 0000	3.62	920.20	0.00	920.20	
TWS								04/11/95 0000	13.80	910.02	0.00	910.02	
TWS								05/05/95 0000	3.86	919.96	0.00	919.96	
TWS								07/10/95 0000	4.40	919.42	0.00	919.42	
TWS								08/01/95 0000	5.00	918.82	0.00	918.82	
TWS								09/11/95 0000	6.80	917.02	0.00	917.02	
TWS								10/04/95 0000	7.00	916.82	0.00	916.82	
TWS								11/06/95 0000	3.40	920.42	0.00	920.42	
TWS								12/07/95 0000	4.00	919.82	0.00	919.82	
TWS								01/17/96 0000	4.96	918.86	0.00	918.86	
TWS								05/17/99 0000	4.75	919.07	0.00	919.07	
TWS								11/25/03 0000	2.77	921.05	0.00	921.05	
TWS								01/11/04 0000	3.47	920.35	0.00	920.35	
TWSP 02-02	474839.57	1460302.39	922.20	NA	924.26	SS	0						
TWS								08/01/93 0000	13.55	910.71	0.00	910.71	
TWS								09/06/93 0000	8.58	915.68	0.00	915.68	
TWS								10/07/93 0000	10.00	914.26	0.00	914.26	
TWS								11/11/93 0000	10.65	913.61	0.00	913.61	
TWS								12/22/93 0000	11.31	912.95	0.00	912.95	
TWS								02/21/94 0000	11.62	912.64	0.00	912.64	
TWS								03/24/94 0000	11.00	913.26	0.00	913.26	
TWS								04/19/94 0000	11.49	912.77	0.00	912.77	
TWS								05/23/94 0000	9.46	914.80	0.00	914.80	
TWS								07/29/94 0000	6.00	918.26	0.00	918.26	
TWS								08/22/94 0000	9.39	914.87	0.00	914.87	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								10/31/94 0000	10.40	913.86	0.00	913.86	
TWS								12/01/94 0000	10.50	913.76	0.00	913.76	
TWS								01/30/95 0000	11.60	912.66	0.00	912.66	
TWS								03/16/95 0000	11.65	912.61	0.00	912.61	
TWS								04/11/95 0000	10.30	913.96	0.00	913.96	
TWS								05/05/95 0000	10.19	914.07	0.00	914.07	
TWS								07/10/95 0000	9.00	915.26	0.00	915.26	
TWS								08/01/95 0000	9.00	915.26	0.00	915.26	
TWS								09/11/95 0000	7.80	916.46	0.00	916.46	
TWS								10/04/95 0000	11.35	912.91	0.00	912.91	
TWS								11/06/95 0000	11.11	913.15	0.00	913.15	
TWS								12/07/95 0000	12.00	912.26	0.00	912.26	
TWS								01/17/96 0000	9.00	915.26	0.00	915.26	
TWS								05/17/99 0000	10.00	914.26	0.00	914.26	
TWS								11/25/03 0000	8.54	915.72	0.00	915.72	
TWS								01/11/04 0000	9.60	914.66	0.00	914.66	
TWSP 02-03	474866.76	1460340.87	921.70	NA	923.72	SS	0						
TWS								08/01/93 0000	13.79	909.93	0.00	909.93	
TWS								09/06/93 0000	11.00	912.72	0.00	912.72	
TWS								10/07/93 0000	11.74	911.98	0.00	911.98	
TWS								11/11/93 0000	5.00	918.72	0.00	918.72	
TWS								12/22/93 0000	9.48	914.24	0.00	914.24	
TWS								02/21/94 0000	8.00	915.72	0.00	915.72	
TWS								03/24/94 0000	8.61	915.11	0.00	915.11	
TWS								04/19/94 0000	8.85	914.87	0.00	914.87	
TWS								05/23/94 0000	10.90	912.82	0.00	912.82	
TWS								07/29/94 0000	11.70	912.02	0.00	912.02	
TWS								08/22/94 0000	10.00	913.72	0.00	913.72	
TWS								10/31/94 0000	11.70	912.02	0.00	912.02	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								12/01/94 0000	10.00	913.72	0.00	913.72	
TWS								01/30/95 0000	10.00	913.72	0.00	913.72	
TWS								03/16/95 0000	9.52	914.20	0.00	914.20	
TWS								04/11/95 0000	10.42	913.30	0.00	913.30	
TWS								05/05/95 0000	10.76	912.96	0.00	912.96	
TWS								07/10/95 0000	10.60	913.12	0.00	913.12	
TWS								08/01/95 0000	10.60	913.12	0.00	913.12	
TWS								09/11/95 0000	12.10	911.62	0.00	911.62	
TWS								10/04/95 0000	13.30	910.42	0.00	910.42	
TWS								11/06/95 0000	11.70	912.02	0.00	912.02	
TWS								12/07/95 0000	12.00	911.72	0.00	911.72	
TWS								01/17/96 0000	10.42	913.30	0.00	913.30	
TWS								05/17/99 0000	10.00	913.72	0.00	913.72	
TWS								11/25/03 0000	10.61	913.11	0.00	913.11	
TWS								01/11/04 0000	10.67	913.05	0.00	913.05	
TWSP 02-04	474896.34	1460385.69	921.00	NA	923.43	SS	0						
TWS								08/01/93 0000	10.56	912.87	0.00	912.87	
TWS								09/06/93 0000	10.76	912.67	0.00	912.67	
TWS								10/07/93 0000	6.90	916.53	0.00	916.53	
TWS								11/11/93 0000	6.45	916.98	0.00	916.98	
TWS								12/22/93 0000	8.62	914.81	0.00	914.81	
TWS								02/21/94 0000	5.64	917.79	0.00	917.79	
TWS								03/24/94 0000	5.63	917.80	0.00	917.80	
TWS								04/19/94 0000	7.28	916.15	0.00	916.15	
TWS								05/23/94 0000	10.30	913.13	0.00	913.13	
TWS								07/29/94 0000	13.22	910.21	0.00	910.21	
TWS								08/22/94 0000	7.90	915.53	0.00	915.53	
TWS								10/31/94 0000	10.60	912.83	0.00	912.83	
TWS								12/01/94 0000	3.33	920.10	0.00	920.10	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								01/30/95 0000	9.00	914.43	0.00	914.43	
TWS								03/16/95 0000	8.23	915.20	0.00	915.20	
TWS								04/11/95 0000	8.80	914.63	0.00	914.63	
TWS								05/05/95 0000	8.00	915.43	0.00	915.43	
TWS								07/10/95 0000	9.20	914.23	0.00	914.23	
TWS								08/01/95 0000	9.50	913.93	0.00	913.93	
TWS								09/11/95 0000	11.00	912.43	0.00	912.43	
TWS								10/04/95 0000	11.43	912.00	0.00	912.00	
TWS								11/06/95 0000	9.20	914.23	0.00	914.23	
TWS								12/07/95 0000	11.00	912.43	0.00	912.43	
TWS								01/17/96 0000	9.50	913.93	0.00	913.93	
TWS								05/17/99 0000	9.62	913.81	0.00	913.81	
TWS								11/25/03 0000	7.62	915.81	0.00	915.81	
TWS								01/11/04 0000	8.08	915.35	0.00	915.35	
TWSP 02-05	474825.38	1460281.35	921.40	NA	924.7	SS	0						
TWS								10/04/95 0000	8.68	916.02	0.00	916.02	
TWS								11/06/95 0000	7.20	917.50	0.00	917.50	
TWS								12/07/95 0000	8.00	916.70	0.00	916.70	
TWS								01/17/96 0000	7.40	917.30	0.00	917.30	
TWS								05/17/99 0000	5.47	919.23	0.00	919.23	
TWS								11/25/03 0000	3.69	921.01	0.00	921.01	
TWS								01/11/04 0000	5.05	919.65	0.00	919.65	
TWSP 02-06	474851.13	1460320.59	921.60	NA	923.56	SS	0						
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	12.80	910.76	0.00	910.76	
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	0.00	923.56	0.00	923.56	
TWS								05/17/99 0000	10.48	913.08	0.00	913.08	
TWS								11/25/03 0000	8.00	915.56	0.00	915.56	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								01/11/04 0000	12.78	910.78	0.00	910.78	
TWSP 02-07	474881.82	1460361.41	921.40	NA	923.64	SS	0						
TWS								10/04/95 0000	12.00	911.64	0.00	911.64	
TWS								11/06/95 0000	10.50	913.14	0.00	913.14	
TWS								12/07/95 0000	11.00	912.64	0.00	912.64	
TWS								01/17/96 0000	7.16	916.48	0.00	916.48	
TWS								05/17/99 0000	10.00	913.64	0.00	913.64	
TWS								11/25/03 0000	9.80	913.84	0.00	913.84	
TWS								01/11/04 0000	9.62	914.02	0.00	914.02	
TWSP 03-01	474928.21	1460463.33	918.50	NA	920.89	SS	0						
TWS								08/01/93 0000	8.96	911.93	0.00	911.93	
TWS								09/06/93 0000	NM	-	NM	-	Dry
TWS								10/07/93 0000	NM	-	NM	-	Dry
TWS								11/11/93 0000	NM	-	NM	-	Dry
TWS								12/22/93 0000	NM	-	NM	-	Dry
TWS								02/21/94 0000	NM	-	NM	-	Dry
TWS								03/24/94 0000	10.51	910.38	0.00	910.38	
TWS								04/19/94 0000	6.42	914.47	0.00	914.47	
TWS								05/23/94 0000	NM	-	NM	-	Dry
TWS								07/29/94 0000	NM	-	NM	-	Dry
TWS								08/22/94 0000	NM	-	NM	-	Dry
TWS								10/31/94 0000	11.13	909.76	0.00	909.76	
TWS								12/01/94 0000	NM	-	NM	-	Dry
TWS								01/30/95 0000	NM	-	NM	-	Dry
TWS								03/16/95 0000	NM	-	NM	-	Dry
TWS								04/11/95 0000	NM	-	NM	-	Dry
TWS								05/05/95 0000	NM	-	NM	-	Dry
TWS								07/10/95 0000	NM	-	NM	-	Dry
TWS								08/01/95 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	11.20	909.69	0.00	909.69	
TWS								11/25/03 0000	10.31	910.58	0.00	910.58	
TWS								01/11/04 0000	10.04	910.85	0.00	910.85	
TWSP 03-02	474886.85	1460497.02	921.70	NA	924.34	SS	0						
TWS								08/01/93 0000	10.36	913.98	0.00	913.98	
TWS								09/06/93 0000	4.00	920.34	0.00	920.34	
TWS								10/07/93 0000	11.82	912.52	0.00	912.52	
TWS								11/11/93 0000	10.46	913.88	0.00	913.88	
TWS								12/22/93 0000	NM	-	NM	-	Dry
TWS								02/21/94 0000	NM	-	NM	-	Dry
TWS								03/24/94 0000	11.00	913.34	0.00	913.34	
TWS								04/19/94 0000	10.18	914.16	0.00	914.16	
TWS								05/23/94 0000	NM	-	NM	-	Dry
TWS								07/29/94 0000	NM	-	NM	-	Dry
TWS								08/22/94 0000	NM	-	NM	-	Dry
TWS								10/31/94 0000	12.20	912.14	0.00	912.14	
TWS								12/01/94 0000	NM	-	NM	-	Dry
TWS								01/30/95 0000	NM	-	NM	-	Dry
TWS								03/16/95 0000	NM	-	NM	-	Dry
TWS								04/11/95 0000	NM	-	NM	-	Dry
TWS								05/05/95 0000	NM	-	NM	-	Dry
TWS								07/10/95 0000	11.70	912.64	0.00	912.64	
TWS								08/01/95 0000	9.80	914.54	0.00	914.54	
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	9.80	914.54	0.00	914.54	
TWS								05/17/99 0000	10.47	913.87	0.00	913.87	
TWS								11/25/03 0000	11.02	913.32	0.00	913.32	
TWS								01/11/04 0000	8.27	916.07	0.00	916.07	
TWSP 04-01	474801.70	1460597.70	931.30	NA	933.61	SS	0						
TWS								08/01/93 0000	6.15	927.46	0.00	927.46	
TWS								09/06/93 0000	9.63	923.98	0.00	923.98	
TWS								10/07/93 0000	9.90	923.71	0.00	923.71	
TWS								11/11/93 0000	9.57	924.04	0.00	924.04	
TWS								12/22/93 0000	5.26	928.35	0.00	928.35	
TWS								02/21/94 0000	3.72	929.89	0.00	929.89	
TWS								03/24/94 0000	3.42	930.19	0.00	930.19	
TWS								04/19/94 0000	3.74	929.87	0.00	929.87	
TWS								05/23/94 0000	5.22	928.39	0.00	928.39	
TWS								07/29/94 0000	6.22	927.39	0.00	927.39	
TWS								08/22/94 0000	6.00	927.61	0.00	927.61	
TWS								10/31/94 0000	6.66	926.95	0.00	926.95	
TWS								12/01/94 0000	6.00	927.61	0.00	927.61	
TWS								01/30/95 0000	4.71	928.90	0.00	928.90	
TWS								03/16/95 0000	4.16	929.45	0.00	929.45	
TWS								04/11/95 0000	4.30	929.31	0.00	929.31	
TWS								05/05/95 0000	4.51	929.10	0.00	929.10	
TWS								07/10/95 0000	5.00	928.61	0.00	928.61	
TWS								08/01/95 0000	8.70	924.91	0.00	924.91	
TWS								09/11/95 0000	8.30	925.31	0.00	925.31	
TWS								10/04/95 0000	7.00	926.61	0.00	926.61	
TWS								11/06/95 0000	5.90	927.71	0.00	927.71	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								12/07/95 0000	6.50	927.11	0.00	927.11	
TWS								01/17/96 0000	8.51	925.10	0.00	925.10	
TWS								05/17/99 0000	4.63	928.98	0.00	928.98	
TWS								11/25/03 0000	3.42	930.19	0.00	930.19	
TWS								01/11/04 0000	4.17	929.44	0.00	929.44	
TWSP 04-02	474781.13	1460631.39	934.20	NA	936.44	SS	0						
TWS								08/01/93 0000	5.18	931.26	0.00	931.26	
TWS								09/06/93 0000	5.80	930.64	0.00	930.64	
TWS								10/07/93 0000	6.18	930.26	0.00	930.26	
TWS								11/11/93 0000	5.10	931.34	0.00	931.34	
TWS								12/22/93 0000	3.26	933.18	0.00	933.18	
TWS								02/21/94 0000	0.65	935.79	0.00	935.79	
TWS								03/24/94 0000	1.00	935.44	0.00	935.44	
TWS								04/19/94 0000	0.90	935.54	0.00	935.54	
TWS								05/23/94 0000	4.39	932.05	0.00	932.05	
TWS								07/29/94 0000	6.00	930.44	0.00	930.44	
TWS								08/22/94 0000	4.10	932.34	0.00	932.34	
TWS								10/31/94 0000	5.80	930.64	0.00	930.64	
TWS								12/01/94 0000	5.00	931.44	0.00	931.44	
TWS								01/30/95 0000	3.00	933.44	0.00	933.44	
TWS								03/16/95 0000	2.00	934.44	0.00	934.44	
TWS								04/11/95 0000	5.71	930.73	0.00	930.73	
TWS								05/05/95 0000	2.45	933.99	0.00	933.99	
TWS								07/10/95 0000	3.70	932.74	0.00	932.74	
TWS								08/01/95 0000	4.70	931.74	0.00	931.74	
TWS								09/11/95 0000	4.70	931.74	0.00	931.74	
TWS								10/04/95 0000	6.44	930.00	0.00	930.00	
TWS								11/06/95 0000	4.80	931.64	0.00	931.64	
TWS								12/07/95 0000	6.00	930.44	0.00	930.44	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								01/17/96 0000	4.72	931.72	0.00	931.72	
TWS								05/17/99 0000	3.61	932.83	0.00	932.83	
TWS								11/25/03 0000	1.26	935.18	0.00	935.18	
TWS								01/11/04 0000	NM	-	NM	-	Ice @1.75'
TWSP 05-01	474766.53	1460660.37	935.60	NA	938.08	SS	0						
TWS								08/01/93 0000	5.38	932.70	0.00	932.70	
TWS								09/06/93 0000	8.35	929.73	0.00	929.73	
TWS								10/07/93 0000	8.35	929.73	0.00	929.73	
TWS								11/11/93 0000	7.10	930.98	0.00	930.98	
TWS								12/22/93 0000	5.23	932.85	0.00	932.85	
TWS								02/21/94 0000	NM	-	NM	-	Dry
TWS								03/24/94 0000	2.24	935.84	0.00	935.84	
TWS								04/19/94 0000	2.53	935.55	0.00	935.55	
TWS								05/23/94 0000	5.48	932.60	0.00	932.60	
TWS								07/29/94 0000	7.42	930.66	0.00	930.66	
TWS								08/22/94 0000	4.00	934.08	0.00	934.08	
TWS								10/31/94 0000	7.51	930.57	0.00	930.57	
TWS								12/01/94 0000	5.80	932.28	0.00	932.28	
TWS								01/30/95 0000	5.00	933.08	0.00	933.08	
TWS								03/16/95 0000	3.71	934.37	0.00	934.37	
TWS								04/11/95 0000	3.30	934.78	0.00	934.78	
TWS								05/05/95 0000	3.79	934.29	0.00	934.29	
TWS								07/10/95 0000	5.00	933.08	0.00	933.08	
TWS								08/01/95 0000	9.10	928.98	0.00	928.98	
TWS								09/11/95 0000	7.70	930.38	0.00	930.38	
TWS								10/04/95 0000	8.16	929.92	0.00	929.92	
TWS								11/06/95 0000	7.00	931.08	0.00	931.08	
TWS								12/07/95 0000	7.63	930.45	0.00	930.45	
TWS								01/17/96 0000	8.86	929.22	0.00	929.22	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								05/17/99 0000	5.00	933.08	0.00	933.08	
TWS								11/25/03 0000	2.88	935.20	0.00	935.20	
TWS								01/11/04 0000	NM	-	NM	-	Ice @2.28'
TWSP 05-02	474792.61	1460693.54	934.70	934.84	934.84	SS	0						
TWS								08/01/93 0000	5.46	929.38	0.00	929.38	
TWS								09/06/93 0000	9.45	925.39	0.00	925.39	
TWS								10/07/93 0000	9.34	925.50	0.00	925.50	
TWS								11/11/93 0000	5.00	929.84	0.00	929.84	
TWS								12/22/93 0000	4.64	930.20	0.00	930.20	
TWS								02/21/94 0000	3.47	931.37	0.00	931.37	
TWS								03/24/94 0000	4.00	930.84	0.00	930.84	
TWS								04/19/94 0000	4.42	930.42	0.00	930.42	
TWS								05/23/94 0000	4.85	929.99	0.00	929.99	
TWS								07/29/94 0000	6.00	928.84	0.00	928.84	
TWS								08/22/94 0000	5.80	929.04	0.00	929.04	
TWS								10/31/94 0000	7.35	927.49	0.00	927.49	
TWS								12/01/94 0000	4.85	929.99	0.00	929.99	
TWS								01/30/95 0000	4.36	930.48	0.00	930.48	
TWS								03/16/95 0000	4.24	930.60	0.00	930.60	
TWS								04/11/95 0000	4.33	930.51	0.00	930.51	
TWS								05/05/95 0000	4.66	930.18	0.00	930.18	
TWS								07/10/95 0000	5.00	929.84	0.00	929.84	
TWS								08/01/95 0000	5.40	929.44	0.00	929.44	
TWS								09/11/95 0000	9.40	925.44	0.00	925.44	
TWS								10/04/95 0000	7.05	927.79	0.00	927.79	
TWS								11/06/95 0000	4.30	930.54	0.00	930.54	
TWS								12/07/95 0000	5.44	929.40	0.00	929.40	
TWS								01/17/96 0000	5.12	929.72	0.00	929.72	
TWS								05/17/99 0000	6.73	928.11	0.00	928.11	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								01/11/04 0000	2.66	932.18	0.00	932.18	
TWSP 05-03	474813.83	1460717.53	933.40	NA	935.84	SS	0						
TWS								08/01/93 0000	4.36	931.48	0.00	931.48	
TWS								09/06/93 0000	5.11	930.73	0.00	930.73	
TWS								10/07/93 0000	5.34	930.50	0.00	930.50	
TWS								11/11/93 0000	4.00	931.84	0.00	931.84	
TWS								12/22/93 0000	2.81	933.03	0.00	933.03	
TWS								02/21/94 0000	NM	-	NM	-	Dry
TWS								03/24/94 0000	1.50	934.34	0.00	934.34	
TWS								04/19/94 0000	1.71	934.13	0.00	934.13	
TWS								05/23/94 0000	3.18	932.66	0.00	932.66	
TWS								07/29/94 0000	5.00	930.84	0.00	930.84	
TWS								08/22/94 0000	6.68	929.16	0.00	929.16	
TWS								10/31/94 0000	4.50	931.34	0.00	931.34	
TWS								12/01/94 0000	3.35	932.49	0.00	932.49	
TWS								01/30/95 0000	2.33	933.51	0.00	933.51	
TWS								03/16/95 0000	2.00	933.84	0.00	933.84	
TWS								04/11/95 0000	2.00	933.84	0.00	933.84	
TWS								05/05/95 0000	2.20	933.64	0.00	933.64	
TWS								07/10/95 0000	3.00	932.84	0.00	932.84	
TWS								08/01/95 0000	4.00	931.84	0.00	931.84	
TWS								09/11/95 0000	-4.20	940.04	0.00	940.04	
TWS								10/04/95 0000	5.43	930.41	0.00	930.41	
TWS								11/06/95 0000	3.08	932.76	0.00	932.76	
TWS								12/07/95 0000	5.00	930.84	0.00	930.84	
TWS								01/17/96 0000	4.00	931.84	0.00	931.84	
TWS								05/17/99 0000	3.00	932.84	0.00	932.84	
TWS								11/25/03 0000	2.16	933.68	0.00	933.68	
TWS								01/11/04 0000	NM	-	NM	-	Ice

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWSP 05-04	474804.68	1460705.64	934.10	NA	936.66	SS	0						
TWS								09/11/95 0000	8.20	928.46	0.00	928.46	
TWS								10/04/95 0000	6.30	930.36	0.00	930.36	
TWS								11/06/95 0000	3.40	933.26	0.00	933.26	
TWS								12/07/95 0000	5.74	930.92	0.00	930.92	
TWS								01/17/96 0000	3.10	933.56	0.00	933.56	
TWS								05/17/99 0000	4.00	932.66	0.00	932.66	
TWS								11/25/03 0000	2.96	933.70	0.00	933.70	
TWS								01/11/04 0000	3.26	933.40	0.00	933.40	
TWSP 05-05	474770.77	1460647.97	935.20	NA	937.6	SS	0						
TWS								09/11/95 0000	9.80	927.80	0.00	927.80	
TWS								10/04/95 0000	7.55	930.05	0.00	930.05	
TWS								11/06/95 0000	6.88	930.72	0.00	930.72	
TWS								12/07/95 0000	7.00	930.60	0.00	930.60	
TWS								01/17/96 0000	6.00	931.60	0.00	931.60	
TWS								05/17/99 0000	4.63	932.97	0.00	932.97	
TWS								11/25/03 0000	2.40	935.20	0.00	935.20	
TWS								01/11/04 0000	2.81	934.79	0.00	934.79	
TWSP 06-01	474766.35	1460577.55	932.90	NA	935.2	SS	0						
TWS								08/01/93 0000	6.52	928.68	0.00	928.68	
TWS								09/06/93 0000	9.61	925.59	0.00	925.59	
TWS								10/07/93 0000	5.00	930.20	0.00	930.20	
TWS								11/11/93 0000	8.00	927.20	0.00	927.20	
TWS								12/22/93 0000	7.00	928.20	0.00	928.20	
TWS								02/21/94 0000	8.00	927.20	0.00	927.20	
TWS								03/24/94 0000	7.00	928.20	0.00	928.20	
TWS								04/19/94 0000	6.00	929.20	0.00	929.20	
TWS								05/23/94 0000	6.17	929.03	0.00	929.03	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								07/29/94 0000	9.09	926.11	0.00	926.11	
TWS								08/22/94 0000	7.00	928.20	0.00	928.20	
TWS								10/31/94 0000	7.83	927.37	0.00	927.37	
TWS								12/01/94 0000	8.00	927.20	0.00	927.20	
TWS								01/30/95 0000	7.12	928.08	0.00	928.08	
TWS								03/16/95 0000	2.66	932.54	0.00	932.54	
TWS								04/11/95 0000	6.00	929.20	0.00	929.20	
TWS								05/05/95 0000	5.00	930.20	0.00	930.20	
TWS								07/10/95 0000	5.10	930.10	0.00	930.10	
TWS								08/01/95 0000	6.00	929.20	0.00	929.20	
TWS								09/11/95 0000	7.20	928.00	0.00	928.00	
TWS								10/04/95 0000	7.88	927.32	0.00	927.32	
TWS								11/06/95 0000	7.08	928.12	0.00	928.12	
TWS								12/07/95 0000	7.68	927.52	0.00	927.52	
TWS								01/17/96 0000	6.00	929.20	0.00	929.20	
TWS								05/17/99 0000	5.00	930.20	0.00	930.20	
TWS								11/25/03 0000	4.18	931.02	0.00	931.02	
TWS								01/11/04 0000	4.30	930.90	0.00	930.90	
TWSP 06-02	474731.90	1460614.45	937.10	NA	939.28	SS	0						
TWS								08/01/93 0000	10.00	929.28	0.00	929.28	
TWS								09/06/93 0000	9.37	929.91	0.00	929.91	
TWS								10/07/93 0000	10.55	928.73	0.00	928.73	
TWS								11/11/93 0000	6.34	932.94	0.00	932.94	
TWS								12/22/93 0000	9.00	930.28	0.00	930.28	
TWS								02/21/94 0000	4.64	934.64	0.00	934.64	
TWS								03/24/94 0000	4.31	934.97	0.00	934.97	
TWS								04/19/94 0000	4.46	934.82	0.00	934.82	
TWS								05/23/94 0000	7.50	931.78	0.00	931.78	
TWS								07/29/94 0000	9.24	930.04	0.00	930.04	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								08/22/94 0000	9.15	930.13	0.00	930.13	
TWS								10/31/94 0000	9.93	929.35	0.00	929.35	
TWS								12/01/94 0000	9.12	930.16	0.00	930.16	
TWS								01/30/95 0000	6.00	933.28	0.00	933.28	
TWS								03/16/95 0000	5.00	934.28	0.00	934.28	
TWS								04/11/95 0000	5.43	933.85	0.00	933.85	
TWS								05/05/95 0000	6.00	933.28	0.00	933.28	
TWS								07/10/95 0000	6.80	932.48	0.00	932.48	
TWS								08/01/95 0000	7.70	931.58	0.00	931.58	
TWS								09/11/95 0000	9.50	929.78	0.00	929.78	
TWS								10/04/95 0000	10.00	929.28	0.00	929.28	
TWS								11/06/95 0000	9.50	929.78	0.00	929.78	
TWS								12/07/95 0000	10.00	929.28	0.00	929.28	
TWS								01/17/96 0000	7.70	931.58	0.00	931.58	
TWS								05/17/99 0000	7.33	931.95	0.00	931.95	
TWS								11/25/03 0000	4.33	934.95	0.00	934.95	
TWS								01/11/04 0000	4.23	935.05	0.00	935.05	
TWSP 06-03	474696.11	1460649.79	939.70	NA	942.16	SS	0						
TWS								08/01/93 0000	9.38	932.78	0.00	932.78	
TWS								09/06/93 0000	10.80	931.36	0.00	931.36	
TWS								10/07/93 0000	11.54	930.62	0.00	930.62	
TWS								11/11/93 0000	11.61	930.55	0.00	930.55	
TWS								12/22/93 0000	7.00	935.16	0.00	935.16	
TWS								02/21/94 0000	3.00	939.16	0.00	939.16	
TWS								03/24/94 0000	2.21	939.95	0.00	939.95	
TWS								04/19/94 0000	3.00	939.16	0.00	939.16	
TWS								05/23/94 0000	5.51	936.65	0.00	936.65	
TWS								07/29/94 0000	7.00	935.16	0.00	935.16	
TWS								08/22/94 0000	9.98	932.18	0.00	932.18	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								10/31/94 0000	11.00	931.16	0.00	931.16	
TWS								12/01/94 0000	9.00	933.16	0.00	933.16	
TWS								01/30/95 0000	5.00	937.16	0.00	937.16	
TWS								03/16/95 0000	6.00	936.16	0.00	936.16	
TWS								04/11/95 0000	3.70	938.46	0.00	938.46	
TWS								05/05/95 0000	5.00	937.16	0.00	937.16	
TWS								07/10/95 0000	7.00	935.16	0.00	935.16	
TWS								08/01/95 0000	8.10	934.06	0.00	934.06	
TWS								09/11/95 0000	10.20	931.96	0.00	931.96	
TWS								10/04/95 0000	11.43	930.73	0.00	930.73	
TWS								11/06/95 0000	11.56	930.60	0.00	930.60	
TWS								12/07/95 0000	12.00	930.16	0.00	930.16	
TWS								01/17/96 0000	8.10	934.06	0.00	934.06	
TWS								05/17/99 0000	7.00	935.16	0.00	935.16	
TWS								01/11/04 0000	NM	-	NM	-	Ice
TWSP 06-04	474715.09	1460631.85	938.60	NA	941.53	SS	0						
TWS								10/04/95 0000	9.61	931.92	0.00	931.92	
TWS								11/06/95 0000	9.80	931.73	0.00	931.73	
TWS								12/07/95 0000	10.35	931.18	0.00	931.18	
TWS								01/17/96 0000	10.27	931.26	0.00	931.26	
TWS								05/17/99 0000	6.40	935.13	0.00	935.13	
TWS								11/25/03 0000	3.85	937.68	0.00	937.68	
TWS								01/11/04 0000	3.99	937.54	0.00	937.54	
TWSP 07-01	474740.19	1460545.95	933.20	NA	935.62	SS	0						
TWS								08/01/93 0000	8.30	927.32	0.00	927.32	
TWS								09/06/93 0000	8.75	926.87	0.00	926.87	
TWS								10/07/93 0000	8.76	926.86	0.00	926.86	
TWS								11/11/93 0000	7.30	928.32	0.00	928.32	
TWS								12/22/93 0000	7.70	927.92	0.00	927.92	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								02/21/94 0000	5.00	930.62	0.00	930.62	
TWS								03/24/94 0000	4.71	930.91	0.00	930.91	
TWS								04/19/94 0000	5.23	930.39	0.00	930.39	
TWS								05/23/94 0000	7.45	928.17	0.00	928.17	
TWS								07/29/94 0000	9.22	926.40	0.00	926.40	
TWS								08/22/94 0000	6.54	929.08	0.00	929.08	
TWS								10/31/94 0000	9.65	925.97	0.00	925.97	
TWS								12/01/94 0000	7.72	927.90	0.00	927.90	
TWS								01/30/95 0000	4.63	930.99	0.00	930.99	
TWS								03/16/95 0000	3.20	932.42	0.00	932.42	
TWS								04/11/95 0000	6.72	928.90	0.00	928.90	
TWS								05/05/95 0000	6.21	929.41	0.00	929.41	
TWS								07/10/95 0000	7.00	928.62	0.00	928.62	
TWS								08/01/95 0000	8.20	927.42	0.00	927.42	
TWS								09/11/95 0000	9.70	925.92	0.00	925.92	
TWS								10/04/95 0000	10.00	925.62	0.00	925.62	
TWS								11/06/95 0000	7.00	928.62	0.00	928.62	
TWS								12/07/95 0000	8.75	926.87	0.00	926.87	
TWS								01/17/96 0000	8.16	927.46	0.00	927.46	
TWS								05/17/99 0000	7.00	928.62	0.00	928.62	
TWS								11/25/03 0000	6.18	929.44	0.00	929.44	
TWS								01/11/04 0000	6.19	929.43	0.00	929.43	
TWSP 07-02	474701.57	1460577.95	937.50	NA	939.73	SS	0						
TWS								08/01/93 0000	7.49	932.24	0.00	932.24	
TWS								09/06/93 0000	8.34	931.39	0.00	931.39	
TWS								10/07/93 0000	8.68	931.05	0.00	931.05	
TWS								11/11/93 0000	9.15	930.58	0.00	930.58	
TWS								12/22/93 0000	9.00	930.73	0.00	930.73	
TWS								02/21/94 0000	9.63	930.10	0.00	930.10	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								03/24/94 0000	5.00	934.73	0.00	934.73	
TWS								04/19/94 0000	5.23	934.50	0.00	934.50	
TWS								05/23/94 0000	7.40	932.33	0.00	932.33	
TWS								07/29/94 0000	7.70	932.03	0.00	932.03	
TWS								08/22/94 0000	9.00	930.73	0.00	930.73	
TWS								10/31/94 0000	9.14	930.59	0.00	930.59	
TWS								12/01/94 0000	9.52	930.21	0.00	930.21	
TWS								01/30/95 0000	8.00	931.73	0.00	931.73	
TWS								03/16/95 0000	5.53	934.20	0.00	934.20	
TWS								04/11/95 0000	6.37	933.36	0.00	933.36	
TWS								05/05/95 0000	8.45	931.28	0.00	931.28	
TWS								07/10/95 0000	8.00	931.73	0.00	931.73	
TWS								08/01/95 0000	7.00	932.73	0.00	932.73	
TWS								09/11/95 0000	8.42	931.31	0.00	931.31	
TWS								10/04/95 0000	8.86	930.87	0.00	930.87	
TWS								11/06/95 0000	8.80	930.93	0.00	930.93	
TWS								12/07/95 0000	9.00	930.73	0.00	930.73	
TWS								01/17/96 0000	7.00	932.73	0.00	932.73	
TWS								05/17/99 0000	7.00	932.73	0.00	932.73	
TWS								11/25/03 0000	4.52	935.21	0.00	935.21	
TWS								01/11/04 0000	3.92	935.81	0.00	935.81	
TWSP 07-03	474662.15	1460608.74	939.30	NA	943.21	SS	0						
TWS								08/01/93 0000	8.72	934.49	0.00	934.49	
TWS								09/06/93 0000	9.63	933.58	0.00	933.58	
TWS								10/07/93 0000	10.26	932.95	0.00	932.95	
TWS								11/11/93 0000	10.60	932.61	0.00	932.61	
TWS								12/22/93 0000	5.48	937.73	0.00	937.73	
TWS								02/21/94 0000	2.75	940.46	0.00	940.46	
TWS								03/24/94 0000	2.00	941.21	0.00	941.21	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								04/19/94 0000	3.40	939.81	0.00	939.81	
TWS								05/23/94 0000	6.86	936.35	0.00	936.35	
TWS								07/29/94 0000	9.00	934.21	0.00	934.21	
TWS								08/22/94 0000	9.22	933.99	0.00	933.99	
TWS								10/31/94 0000	9.92	933.29	0.00	933.29	
TWS								12/01/94 0000	9.13	934.08	0.00	934.08	
TWS								01/30/95 0000	4.63	938.58	0.00	938.58	
TWS								03/16/95 0000	6.00	937.21	0.00	937.21	
TWS								04/11/95 0000	3.72	939.49	0.00	939.49	
TWS								05/05/95 0000	5.10	938.11	0.00	938.11	
TWS								07/10/95 0000	7.00	936.21	0.00	936.21	
TWS								08/01/95 0000	8.00	935.21	0.00	935.21	
TWS								09/11/95 0000	9.50	933.71	0.00	933.71	
TWS								10/04/95 0000	9.95	933.26	0.00	933.26	
TWS								11/06/95 0000	10.43	932.78	0.00	932.78	
TWS								12/07/95 0000	10.75	932.46	0.00	932.46	
TWS								01/17/96 0000	7.97	935.24	0.00	935.24	
TWS								05/17/99 0000	7.00	936.21	0.00	936.21	
TWS								11/25/03 0000	2.98	940.23	0.00	940.23	
TWS								01/11/04 0000	3.02	940.19	0.00	940.19	
TWSP 07-04	474753.41	1460561.23	933.20	NA	935.54	SS	0						
TWS								09/11/95 0000	10.30	925.24	0.00	925.24	
TWS								10/04/95 0000	7.00	928.54	0.00	928.54	
TWS								11/06/95 0000	6.58	928.96	0.00	928.96	
TWS								12/07/95 0000	6.66	928.88	0.00	928.88	
TWS								01/17/96 0000	6.00	929.54	0.00	929.54	
TWS								05/17/99 0000	4.47	931.07	0.00	931.07	
TWS								11/25/03 0000	2.14	933.40	0.00	933.40	
TWS								01/11/04 0000	2.40	933.14	0.00	933.14	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWSP 07-05	474719.00	1460563.87	935.60	NA	937.56	SS	0						
TWS								09/11/95 0000	5.70	931.86	0.00	931.86	
TWS								10/04/95 0000	10.00	927.56	0.00	927.56	
TWS								11/06/95 0000	8.35	929.21	0.00	929.21	
TWS								12/07/95 0000	10.00	927.56	0.00	927.56	
TWS								01/17/96 0000	9.65	927.91	0.00	927.91	
TWS								05/17/99 0000	6.58	930.98	0.00	930.98	
TWS								11/25/03 0000	5.29	932.27	0.00	932.27	
TWS								01/11/04 0000	4.64	932.92	0.00	932.92	
TWSP 07-06	474681.68	1460592.83	939.30	NA	941.81	SS	0						
TWS								09/11/95 0000	8.00	933.81	0.00	933.81	
TWS								10/04/95 0000	9.28	932.53	0.00	932.53	
TWS								11/06/95 0000	10.00	931.81	0.00	931.81	
TWS								12/07/95 0000	10.10	931.71	0.00	931.71	
TWS								01/17/96 0000	10.20	931.61	0.00	931.61	
TWS								05/17/99 0000	7.73	934.08	0.00	934.08	
TWS								11/25/03 0000	6.99	934.82	0.00	934.82	
TWS								01/11/04 0000	5.71	936.10	0.00	936.10	
TWSP 08-01	474627.65	1460562.82	939.30	NA	941.63	SS	0						
TWS								08/01/93 0000	9.89	931.74	0.00	931.74	
TWS								09/06/93 0000	10.20	931.43	0.00	931.43	
TWS								10/07/93 0000	10.62	931.01	0.00	931.01	
TWS								11/11/93 0000	10.34	931.29	0.00	931.29	
TWS								12/22/93 0000	7.45	934.18	0.00	934.18	
TWS								02/21/94 0000	4.65	936.98	0.00	936.98	
TWS								03/24/94 0000	4.00	937.63	0.00	937.63	
TWS								04/19/94 0000	4.00	937.63	0.00	937.63	
TWS								05/23/94 0000	4.80	936.83	0.00	936.83	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								07/29/94 0000	9.17	932.46	0.00	932.46	
TWS								08/22/94 0000	9.00	932.63	0.00	932.63	
TWS								10/31/94 0000	9.70	931.93	0.00	931.93	
TWS								12/01/94 0000	9.00	932.63	0.00	932.63	
TWS								01/30/95 0000	4.00	937.63	0.00	937.63	
TWS								03/16/95 0000	3.00	938.63	0.00	938.63	
TWS								04/11/95 0000	5.00	936.63	0.00	936.63	
TWS								05/05/95 0000	5.75	935.88	0.00	935.88	
TWS								07/10/95 0000	6.40	935.23	0.00	935.23	
TWS								08/01/95 0000	7.90	933.73	0.00	933.73	
TWS								09/11/95 0000	10.00	931.63	0.00	931.63	
TWS								10/04/95 0000	10.73	930.90	0.00	930.90	
TWS								11/06/95 0000	10.46	931.17	0.00	931.17	
TWS								12/07/95 0000	10.00	931.63	0.00	931.63	
TWS								01/17/96 0000	7.90	933.73	0.00	933.73	
TWS								05/17/99 0000	9.00	932.63	0.00	932.63	
TWS								11/25/03 0000	4.75	936.88	0.00	936.88	
TWS								01/11/04 0000	3.39	938.24	0.00	938.24	
TWSP 08-02	474615.97	1460572.22	941.30	NA	943.49	SS	0						
TWS								08/01/93 0000	9.81	933.68	0.00	933.68	
TWS								09/06/93 0000	10.65	932.84	0.00	932.84	
TWS								10/07/93 0000	10.68	932.81	0.00	932.81	
TWS								11/11/93 0000	10.49	933.00	0.00	933.00	
TWS								12/22/93 0000	5.45	938.04	0.00	938.04	
TWS								02/21/94 0000	2.88	940.61	0.00	940.61	
TWS								03/24/94 0000	3.00	940.49	0.00	940.49	
TWS								04/19/94 0000	3.00	940.49	0.00	940.49	
TWS								05/23/94 0000	6.78	936.71	0.00	936.71	
TWS								07/29/94 0000	6.78	936.71	0.00	936.71	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								08/22/94 0000	7.30	936.19	0.00	936.19	
TWS								10/31/94 0000	8.30	935.19	0.00	935.19	
TWS								12/01/94 0000	9.20	934.29	0.00	934.29	
TWS								01/30/95 0000	4.55	938.94	0.00	938.94	
TWS								03/16/95 0000	3.66	939.83	0.00	939.83	
TWS								04/11/95 0000	5.00	938.49	0.00	938.49	
TWS								05/05/95 0000	5.86	937.63	0.00	937.63	
TWS								07/10/95 0000	6.80	936.69	0.00	936.69	
TWS								08/01/95 0000	8.00	935.49	0.00	935.49	
TWS								09/11/95 0000	9.33	934.16	0.00	934.16	
TWS								10/04/95 0000	10.00	933.49	0.00	933.49	
TWS								11/06/95 0000	10.40	933.09	0.00	933.09	
TWS								12/07/95 0000	10.50	932.99	0.00	932.99	
TWS								01/17/96 0000	8.00	935.49	0.00	935.49	
TWS								05/17/99 0000	6.52	936.97	0.00	936.97	
TWS								11/25/03 0000	5.23	938.26	0.00	938.26	
TWS								01/11/04 0000	3.51	939.98	0.00	939.98	
TWSP 09-01	474819.19	1460382.93	924.50	NA	926.75	SS	0						
TWS								08/01/93 0000	13.42	913.33	0.00	913.33	
TWS								09/06/93 0000	13.41	913.34	0.00	913.34	
TWS								10/07/93 0000	NM	-	NM	-	Dry
TWS								11/11/93 0000	NM	-	NM	-	Dry
TWS								12/22/93 0000	NM	-	NM	-	Dry
TWS								02/21/94 0000	NM	-	NM	-	Dry
TWS								03/24/94 0000	NM	-	NM	-	Dry
TWS								04/19/94 0000	NM	-	NM	-	Dry
TWS								05/23/94 0000	9.58	917.17	0.00	917.17	
TWS								07/29/94 0000	12.58	914.17	0.00	914.17	
TWS								08/22/94 0000	8.73	918.02	0.00	918.02	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								10/31/94 0000	11.77	914.98	0.00	914.98	
TWS								12/01/94 0000	14.86	911.89	0.00	911.89	
TWS								01/30/95 0000	NM	-	NM	-	Dry
TWS								03/16/95 0000	9.00	917.75	0.00	917.75	
TWS								04/11/95 0000	11.50	915.25	0.00	915.25	
TWS								05/05/95 0000	NM	-	NM	-	Dry
TWS								07/10/95 0000	11.20	915.55	0.00	915.55	
TWS								08/01/95 0000	10.00	916.75	0.00	916.75	
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	5.20	921.55	0.00	921.55	
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	9.93	916.82	0.00	916.82	
TWS								05/17/99 0000	10.00	916.75	0.00	916.75	
TWS								11/25/03 0000	13.00	913.75	0.00	913.75	
TWS								01/11/04 0000	NM	-	NM	-	Dry
TWSP 09-02	474839.49	1460417.89	924.50	NA	926.37	SS	0						
TWS								08/01/93 0000	11.44	914.93	0.00	914.93	
TWS								09/06/93 0000	12.17	914.20	0.00	914.20	
TWS								10/07/93 0000	13.57	912.80	0.00	912.80	
TWS								11/11/93 0000	NM	-	NM	-	Dry
TWS								12/22/93 0000	NM	-	NM	-	Dry
TWS								02/21/94 0000	NM	-	NM	-	Dry
TWS								03/24/94 0000	NM	-	NM	-	Dry
TWS								04/19/94 0000	13.79	912.58	0.00	912.58	
TWS								05/23/94 0000	NM	-	NM	-	Dry
TWS								07/29/94 0000	NM	-	NM	-	Dry
TWS								08/22/94 0000	NM	-	NM	-	Dry
TWS								10/31/94 0000	12.87	913.50	0.00	913.50	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								12/01/94 0000	NM	-	NM	-	Dry
TWS								01/30/95 0000	NM	-	NM	-	Dry
TWS								03/16/95 0000	NM	-	NM	-	Dry
TWS								04/11/95 0000	NM	-	NM	-	Dry
TWS								05/05/95 0000	NM	-	NM	-	Dry
TWS								07/10/95 0000	NM	-	NM	-	Dry
TWS								08/01/95 0000	13.70	912.67	0.00	912.67	
TWS								09/11/95 0000	14.00	912.37	0.00	912.37	
TWS								10/04/95 0000	14.00	912.37	0.00	912.37	
TWS								11/06/95 0000	10.50	915.87	0.00	915.87	
TWS								12/07/95 0000	11.40	914.97	0.00	914.97	
TWS								01/17/96 0000	13.50	912.87	0.00	912.87	
TWS								11/25/03 0000	11.10	915.27	0.00	915.27	
TWS								01/11/04 0000	13.30	913.07	0.00	913.07	
TWSP 09-03	474860.55	1460452.06	924.30	NA	926.13	SS	0						
TWS								08/01/93 0000	7.33	918.80	0.00	918.80	
TWS								09/06/93 0000	6.50	919.63	0.00	919.63	
TWS								10/07/93 0000	7.28	918.85	0.00	918.85	
TWS								11/11/93 0000	9.33	916.80	0.00	916.80	
TWS								12/22/93 0000	7.45	918.68	0.00	918.68	
TWS								02/21/94 0000	10.48	915.65	0.00	915.65	
TWS								03/24/94 0000	9.83	916.30	0.00	916.30	
TWS								04/19/94 0000	9.68	916.45	0.00	916.45	
TWS								05/23/94 0000	NM	-	NM	-	Dry
TWS								07/29/94 0000	9.40	916.73	0.00	916.73	
TWS								08/22/94 0000	NM	-	NM	-	Dry
TWS								10/31/94 0000	10.90	915.23	0.00	915.23	
TWS								12/01/94 0000	12.30	913.83	0.00	913.83	
TWS								01/30/95 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								03/16/95 0000	NM	-	NM	-	Dry
TWS								04/11/95 0000	10.00	916.13	0.00	916.13	
TWS								05/05/95 0000	9.74	916.39	0.00	916.39	
TWS								07/10/95 0000	10.90	915.23	0.00	915.23	
TWS								08/01/95 0000	10.50	915.63	0.00	915.63	
TWS								09/11/95 0000	13.60	912.53	0.00	912.53	
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	8.00	918.13	0.00	918.13	
TWS								12/07/95 0000	10.00	916.13	0.00	916.13	
TWS								01/17/96 0000	10.10	916.03	0.00	916.03	
TWS								05/17/99 0000	12.30	913.83	0.00	913.83	
TWS								11/25/03 0000	11.21	914.92	0.00	914.92	
TWS								01/11/04 0000	10.65	915.48	0.00	915.48	
TWSP 09-04	474830.25	1460398.56	924.40	NA	926.7	SS	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	11.60	915.10	0.00	915.10	
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	NM	-	NM	-	Dry
TWS								05/17/99 0000	12.40	914.30	0.00	914.30	
TWS								11/25/03 0000	12.30	914.40	0.00	914.40	
TWS								01/11/04 0000	12.44	914.26	0.00	914.26	
TWSP 09-05	474851.32	1460434.89	924.40	NA	926.43	SS	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	9.50	916.93	0.00	916.93	
TWS								12/07/95 0000	12.85	913.58	0.00	913.58	
TWS								01/17/96 0000	13.00	913.43	0.00	913.43	
TWS								05/17/99 0000	10.52	915.91	0.00	915.91	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								11/25/03 0000	8.41	918.02	0.00	918.02	
TWS								01/11/04 0000	12.65	913.78	0.00	913.78	
TWSP 10-01	475553.92	1459569.29	850.70	NA	853.05	UF	0						
TWS								08/01/93 0000	15.48	837.57	0.00	837.57	
TWS								09/06/93 0000	15.60	837.45	0.00	837.45	
TWS								10/07/93 0000	15.59	837.46	0.00	837.46	
TWS								11/11/93 0000	14.76	838.29	0.00	838.29	
TWS								12/22/93 0000	15.00	838.05	0.00	838.05	
TWS								02/21/94 0000	14.64	838.41	0.00	838.41	
TWS								03/24/94 0000	14.45	838.60	0.00	838.60	
TWS								04/19/94 0000	14.80	838.25	0.00	838.25	
TWS								05/23/94 0000	15.15	837.90	0.00	837.90	
TWS								07/29/94 0000	15.60	837.45	0.00	837.45	
TWS								08/22/94 0000	15.00	838.05	0.00	838.05	
TWS								10/31/94 0000	15.35	837.70	0.00	837.70	
TWS								12/01/94 0000	14.86	838.19	0.00	838.19	
TWS								01/30/95 0000	17.44	835.61	0.00	835.61	
TWS								03/16/95 0000	14.70	838.35	0.00	838.35	
TWS								04/11/95 0000	15.00	838.05	0.00	838.05	
TWS								05/05/95 0000	14.98	838.07	0.00	838.07	
TWS								07/10/95 0000	15.00	838.05	0.00	838.05	
TWS								08/01/95 0000	15.40	837.65	0.00	837.65	
TWS								09/11/95 0000	16.70	836.35	0.00	836.35	
TWS								10/04/95 0000	16.00	837.05	0.00	837.05	
TWS								11/06/95 0000	15.40	837.65	0.00	837.65	
TWS								12/07/95 0000	15.00	838.05	0.00	838.05	
TWS								01/17/96 0000	15.10	837.95	0.00	837.95	
TWS								05/17/99 0000	15.00	838.05	0.00	838.05	
TWS								11/25/03 0000	15.21	837.84	0.00	837.84	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								01/11/04 0000	15.24	837.81	0.00	837.81	
TWSP 10-02	475530.70	1459523.57	852.00	NA	854.3	UF	0						
TWS								08/01/93 0000	16.69	837.61	0.00	837.61	
TWS								09/06/93 0000	16.99	837.31	0.00	837.31	
TWS								10/07/93 0000	16.91	837.39	0.00	837.39	
TWS								11/11/93 0000	16.10	838.20	0.00	838.20	
TWS								12/22/93 0000	16.33	837.97	0.00	837.97	
TWS								02/21/94 0000	15.85	838.45	0.00	838.45	
TWS								03/24/94 0000	15.86	838.44	0.00	838.44	
TWS								04/19/94 0000	15.82	838.48	0.00	838.48	
TWS								05/23/94 0000	16.43	837.87	0.00	837.87	
TWS								07/29/94 0000	16.88	837.42	0.00	837.42	
TWS								08/22/94 0000	16.28	838.02	0.00	838.02	
TWS								10/31/94 0000	16.70	837.60	0.00	837.60	
TWS								12/01/94 0000	16.22	838.08	0.00	838.08	
TWS								01/30/95 0000	17.68	836.62	0.00	836.62	
TWS								03/16/95 0000	16.23	838.07	0.00	838.07	
TWS								04/11/95 0000	16.48	837.82	0.00	837.82	
TWS								05/05/95 0000	15.33	838.97	0.00	838.97	
TWS								07/10/95 0000	16.60	837.70	0.00	837.70	
TWS								08/01/95 0000	16.80	837.50	0.00	837.50	
TWS								09/11/95 0000	15.80	838.50	0.00	838.50	
TWS								10/04/95 0000	17.50	836.80	0.00	836.80	
TWS								11/06/95 0000	16.80	837.50	0.00	837.50	
TWS								12/07/95 0000	16.65	837.65	0.00	837.65	
TWS								01/17/96 0000	16.80	837.50	0.00	837.50	
TWS								05/17/99 0000	16.47	837.83	0.00	837.83	
TWS								11/25/03 0000	16.29	838.01	0.00	838.01	
TWS								01/11/04 0000	16.54	837.76	0.00	837.76	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWSP 10-03	475502.29	1459482.20	852.90	NA	855.79	UF	0						
TWS								08/01/93 0000	17.48	838.31	0.00	838.31	
TWS								09/06/93 0000	17.86	837.93	0.00	837.93	
TWS								10/07/93 0000	17.73	838.06	0.00	838.06	
TWS								11/11/93 0000	17.00	838.79	0.00	838.79	
TWS								12/22/93 0000	17.00	838.79	0.00	838.79	
TWS								02/21/94 0000	17.00	838.79	0.00	838.79	
TWS								03/24/94 0000	17.10	838.69	0.00	838.69	
TWS								04/19/94 0000	16.58	839.21	0.00	839.21	
TWS								05/23/94 0000	0.00	855.79	0.00	855.79	
TWS								07/29/94 0000	NM	-	NM	-	Dry
TWS								08/22/94 0000	17.09	838.70	0.00	838.70	
TWS								10/31/94 0000	17.19	838.60	0.00	838.60	
TWS								12/01/94 0000	17.52	838.27	0.00	838.27	
TWS								01/30/95 0000	17.19	838.60	0.00	838.60	
TWS								03/16/95 0000	13.50	842.29	0.00	842.29	
TWS								04/11/95 0000	NM	-	NM	-	Dry
TWS								05/05/95 0000	14.38	841.41	0.00	841.41	
TWS								07/10/95 0000	17.50	838.29	0.00	838.29	
TWS								08/01/95 0000	17.70	838.09	0.00	838.09	
TWS								09/11/95 0000	18.30	837.49	0.00	837.49	
TWS								10/04/95 0000	18.60	837.19	0.00	837.19	
TWS								11/06/95 0000	17.90	837.89	0.00	837.89	
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	17.65	838.14	0.00	838.14	
TWS								05/17/99 0000	17.53	838.26	0.00	838.26	
TWS								11/25/03 0000	NM	-	NM	-	
TWS								01/11/04 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWSP 10-04	475473.46	1459440.21	854.50	NA	856.74	UF	0						
TWS								08/01/93 0000	NM	-	NM	-	Dry
TWS								09/06/93 0000	NM	-	NM	-	Dry
TWS								10/07/93 0000	NM	-	NM	-	Dry
TWS								11/11/93 0000	18.73	838.01	0.00	838.01	
TWS								12/22/93 0000	18.50	838.24	0.00	838.24	
TWS								02/21/94 0000	18.48	838.26	0.00	838.26	
TWS								03/24/94 0000	18.42	838.32	0.00	838.32	
TWS								04/19/94 0000	18.49	838.25	0.00	838.25	
TWS								05/23/94 0000	19.10	837.64	0.00	837.64	
TWS								07/29/94 0000	NM	-	NM	-	Dry
TWS								08/22/94 0000	19.10	837.64	0.00	837.64	
TWS								10/31/94 0000	19.25	837.49	0.00	837.49	
TWS								12/01/94 0000	18.80	837.94	0.00	837.94	
TWS								01/30/95 0000	NM	-	NM	-	Dry
TWS								03/16/95 0000	19.00	837.74	0.00	837.74	
TWS								04/11/95 0000	NM	-	NM	-	Dry
TWS								05/05/95 0000	NM	-	NM	-	Dry
TWS								07/10/95 0000	19.20	837.54	0.00	837.54	
TWS								08/01/95 0000	19.30	837.44	0.00	837.44	
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	19.30	837.44	0.00	837.44	
TWS								05/17/99 0000	19.00	837.74	0.00	837.74	
TWS								11/25/03 0000	19.00	837.74	0.00	837.74	
TWS								01/11/04 0000	19.04	837.70	0.00	837.70	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWSP 10-05	475453.39	1459411.81	855.60	NA	857.73	UF	0						
TWS								08/01/93 0000	NM	-	NM	-	Dry
TWS								09/06/93 0000	NM	-	NM	-	Dry
TWS								10/07/93 0000	NM	-	NM	-	Dry
TWS								11/11/93 0000	19.90	837.83	0.00	837.83	
TWS								12/22/93 0000	19.73	838.00	0.00	838.00	
TWS								02/21/94 0000	NM	-	NM	-	Dry
TWS								03/24/94 0000	19.57	838.16	0.00	838.16	
TWS								04/19/94 0000	19.81	837.92	0.00	837.92	
TWS								05/23/94 0000	20.17	837.56	0.00	837.56	
TWS								07/29/94 0000	NM	-	NM	-	Dry
TWS								08/22/94 0000	NM	-	NM	-	Dry
TWS								10/31/94 0000	20.30	837.43	0.00	837.43	
TWS								12/01/94 0000	20.00	837.73	0.00	837.73	
TWS								01/30/95 0000	NM	-	NM	-	Dry
TWS								03/16/95 0000	-81.83	939.56	0.00	939.56	
TWS								04/11/95 0000	NM	-	NM	-	Dry
TWS								05/05/95 0000	NM	-	NM	-	Dry
TWS								07/10/95 0000	NM	-	NM	-	Dry
TWS								08/01/95 0000	20.40	837.33	0.00	837.33	
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	20.41	837.32	0.00	837.32	
TWS								05/17/99 0000	17.08	840.65	0.00	840.65	
TWS								11/25/03 0000	17.71	840.02	0.00	840.02	
TWS								01/11/04 0000	20.10	837.63	0.00	837.63	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWSP 10-06	475423.88	1459370.27	857.50	NA	859.4	UF	0						
TWS								08/01/93 0000	NM	-	NM	-	Dry
TWS								09/06/93 0000	19.00	840.40	0.00	840.40	
TWS								10/07/93 0000	NM	-	NM	-	Dry
TWS								11/11/93 0000	18.38	841.02	0.00	841.02	
TWS								12/22/93 0000	NM	-	NM	-	Dry
TWS								02/21/94 0000	NM	-	NM	-	Dry
TWS								03/24/94 0000	20.38	839.02	0.00	839.02	
TWS								04/19/94 0000	20.85	838.55	0.00	838.55	
TWS								05/23/94 0000	21.10	838.30	0.00	838.30	
TWS								07/29/94 0000	NM	-	NM	-	Dry
TWS								08/22/94 0000	NM	-	NM	-	Dry
TWS								10/31/94 0000	21.20	838.20	0.00	838.20	
TWS								12/01/94 0000	21.00	838.40	0.00	838.40	
TWS								01/30/95 0000	NM	-	NM	-	Dry
TWS								03/16/95 0000	NM	-	NM	-	Dry
TWS								04/11/95 0000	21.00	838.40	0.00	838.40	
TWS								05/05/95 0000	NM	-	NM	-	Dry
TWS								07/10/95 0000	NM	-	NM	-	Dry
TWS								08/01/95 0000	21.00	838.40	0.00	838.40	
TWS								09/11/95 0000	21.00	838.40	0.00	838.40	
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	21.00	838.40	0.00	838.40	
TWS								05/17/99 0000	21.00	838.40	0.00	838.40	
TWS								11/25/03 0000	20.97	838.43	0.00	838.43	
TWS								01/11/04 0000	20.89	838.51	0.00	838.51	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWSP 10-07	475395.53	1459329.43	859.10	NA	861.89	UF	0						
TWS								08/01/93 0000	22.10	839.79	0.00	839.79	
TWS								09/06/93 0000	22.40	839.49	0.00	839.49	
TWS								10/07/93 0000	NM	-	NM	-	Dry
TWS								11/11/93 0000	20.95	840.94	0.00	840.94	
TWS								12/22/93 0000	21.00	840.89	0.00	840.89	
TWS								02/21/94 0000	NM	-	NM	-	Dry
TWS								03/24/94 0000	20.87	841.02	0.00	841.02	
TWS								04/19/94 0000	21.10	840.79	0.00	840.79	
TWS								05/23/94 0000	0.00	861.89	0.00	861.89	
TWS								07/29/94 0000	NM	-	NM	-	Dry
TWS								08/22/94 0000	NM	-	NM	-	Dry
TWS								10/31/94 0000	23.00	838.89	0.00	838.89	
TWS								12/01/94 0000	21.68	840.21	0.00	840.21	
TWS								01/30/95 0000	NM	-	NM	-	Dry
TWS								03/16/95 0000	NM	-	NM	-	Dry
TWS								04/11/95 0000	21.65	840.24	0.00	840.24	
TWS								05/05/95 0000	NM	-	NM	-	Dry
TWS								07/10/95 0000	22.20	839.69	0.00	839.69	
TWS								08/01/95 0000	22.60	839.29	0.00	839.29	
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	22.52	839.37	0.00	839.37	
TWS								05/17/99 0000	21.75	840.14	0.00	840.14	
TWS								11/25/03 0000	22.13	839.76	0.00	839.76	
TWS								01/11/04 0000	22.14	839.75	0.00	839.75	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWSP 10-08	475369.90	1459284.43	860.30	NA	862.4	UF	0						
TWS								08/01/93 0000	22.41	839.99	0.00	839.99	
TWS								09/06/93 0000	20.99	841.41	0.00	841.41	
TWS								10/07/93 0000	NM	-	NM	-	Dry
TWS								11/11/93 0000	21.86	840.54	0.00	840.54	
TWS								12/22/93 0000	22.67	839.73	0.00	839.73	
TWS								02/21/94 0000	20.88	841.52	0.00	841.52	
TWS								03/24/94 0000	22.20	840.20	0.00	840.20	
TWS								04/19/94 0000	22.40	840.00	0.00	840.00	
TWS								05/23/94 0000	NM	-	NM	-	Dry
TWS								07/29/94 0000	NM	-	NM	-	Dry
TWS								08/22/94 0000	22.80	839.60	0.00	839.60	
TWS								10/31/94 0000	23.40	839.00	0.00	839.00	
TWS								12/01/94 0000	20.00	842.40	0.00	842.40	
TWS								01/30/95 0000	NM	-	NM	-	Dry
TWS								03/16/95 0000	NM	-	NM	-	Dry
TWS								04/11/95 0000	23.00	839.40	0.00	839.40	
TWS								05/05/95 0000	NM	-	NM	-	Dry
TWS								07/10/95 0000	NM	-	NM	-	Dry
TWS								08/01/95 0000	23.00	839.40	0.00	839.40	
TWS								09/11/95 0000	23.40	839.00	0.00	839.00	
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	23.00	839.40	0.00	839.40	
TWS								11/25/03 0000	23.21	839.19	0.00	839.19	
TWS								01/11/04 0000	23.25	839.15	0.00	839.15	
TWSP 10-09	475546.28	1459547.54	851.70	NA	854.06	UF	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	NM	-	NM	-	Dry
TWS								11/25/03 0000	15.59	838.47	0.00	838.47	
TWS								01/11/04 0000	NM	-	NM	-	Dry
TWSP 10-10	475488.83	1459461.75	853.30	NA	855.39	UF	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	NM	-	NM	-	Dry
TWS								11/25/03 0000	NM	-	NM	-	
TWS								01/11/04 0000	NM	-	NM	-	Dry
TWSP 10-11	475440.26	1459394.33	856.70	NA	858.01	UF	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	NM	-	NM	-	Dry
TWS								05/17/99 0000	20.10	837.91	0.00	837.91	
TWS								11/25/03 0000	19.91	838.10	0.00	838.10	
TWS								01/11/04 0000	20.13	837.88	0.00	837.88	
TWSP 10-12	475380.79	1459307.16	860.00	NA	861.92	UF	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	22.10	839.82	0.00	839.82	
TWS								12/07/95 0000	1.50	860.42	0.00	860.42	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX H
GROUNDWATER ELEVATION DATA

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Specific Gravity	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
TWS								01/17/96 0000	23.11	838.81	0.00	838.81	
TWS								05/17/99 0000	23.00	838.92	0.00	838.92	
TWS								11/25/03 0000	22.62	839.30	0.00	839.30	
TWS								01/11/04 0000	22.66	839.26	0.00	839.26	
TWSP 10-13	475412.49	1459301.50	860.70	NA	862.82	UF	0						
TWS								09/11/95 0000	NM	-	NM	-	Dry
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	NM	-	NM	-	Dry
TWS								01/17/96 0000	NM	-	NM	-	Dry
TWS								11/25/03 0000	22.58	840.24	0.00	840.24	
TWS								01/11/04 0000	22.66	840.16	0.00	840.16	
TWSP B-01	475034.67	1459432.14	NA	913.77	913.77	SS	0						
TWS								09/11/95 0000	0.80	912.97	0.00	912.97	
TWS								10/04/95 0000	11.00	902.77	0.00	902.77	
TWS								11/06/95 0000	NM	-	NM	-	Dry
TWS								12/07/95 0000	9.04	904.73	0.00	904.73	
TWS								05/17/99 0000	6.00	907.77	0.00	907.77	
TWSP B-02	474994.64	1459461.02	NA	910.71	910.71	SS	0						
TWS								10/04/95 0000	NM	-	NM	-	Dry
TWS								11/06/95 0000	8.22	902.49	0.00	902.49	
TWS								12/07/95 0000	12.40	898.31	0.00	898.31	
TWS								05/17/99 0000	11.48	899.23	0.00	899.23	

NM - No Measurement

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

Geologic Zone:

1S	First Shallow Bedrock Zone
2S	Second Shallow Bedrock Zone
DB	Deep Bedrock Zone
SS	Subsoil Zone
UF	Upper Freeport Zone

Type:

MNW	Monitoring Well
PZ	Piezometer
TPZ	Temporary Piezometer
TWS	Temporary Waste Sample Point

APPENDIX I

ENVIRONMENTAL DATA RESOURCES (EDR) REPORT

EDR NEPACheck®

SLDA Site
SLDA Site
Vandergrift, PA 15690

Inquiry Number: 0975395.1s

May 13, 2003

Environmental Data Resources, Inc.

***The* Source For Environmental Risk Management Data**

3530 Post Road
Southport, Connecticut 06890

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

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Map Findings Summary	2
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Historic Sites	5
Flood Plain	8
Wetlands	10
Wetlands Classification System	12
FCC & FAA Sites	16
Key Contacts and Government Records Searched	20

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EDR NEPACheck® DESCRIPTION

The National Environmental Policy Act of 1969 (NEPA) requires that Federal agencies include in their decision-making processes appropriate and careful consideration of all environmental effects and actions, analyze potential environmental effects of proposed actions and their alternatives for public understanding and scrutiny, avoid or minimize adverse effects of proposed actions, and restore and enhance environmental quality as much as possible.

The EDR NEPACheck provides information which may be used, in conjunction with additional research, to determine whether a proposed site or action will have significant environmental effect.

The report provides maps and data for the following items (where available). Search results are provided in the Map Findings Summary on page 2 of this report.

Section	Regulation
Natural Areas Map	
• Federal Lands Data:	
- Officially designated wilderness areas	47 CFR 1.1307(1)
- Officially designated wildlife preserves, sanctuaries and refuges	47 CFR 1.1307(2)
- Wild and scenic rivers	40 CFR 6.302(e)
- Fish and Wildlife	40 CFR 6.302
• Threatened or Endangered Species, Fish and Wildlife, Critical Habitat Data (where available)	47 CFR 1.1307(3); 40 CFR 6.302
Historic Sites Map	
• National Register of Historic Places	47 CFR 1.1307(4); 40 CFR 6.302
• State Historic Places (where available)	
Flood Plain Map	
• National Flood Plain Data (where available)	47 CFR 1.1307(6); 40 CFR 6.302
Wetlands Map	
• National Wetlands Inventory Data (where available)	47 CFR 1.1307(7); 40 CFR 6.302
FCC & FAA Map	
• FCC antenna/tower sites, AM Radio Towers, FAA Markings and Obstructions, AM Radio Interference Zones, Airports, Topographic gradient	47 CFR 1.1307(8)
Key Contacts and Government Records Searched	

MAP FINDINGS SUMMARY

The databases searched in this report are listed below. Database descriptions and other agency contact information is contained in the Key Contacts and Government Records Searched section on page 20 of this report.

TARGET PROPERTY ADDRESS

SLDA SITE
SLDA SITE
VANDERGRIFT, PA 15690

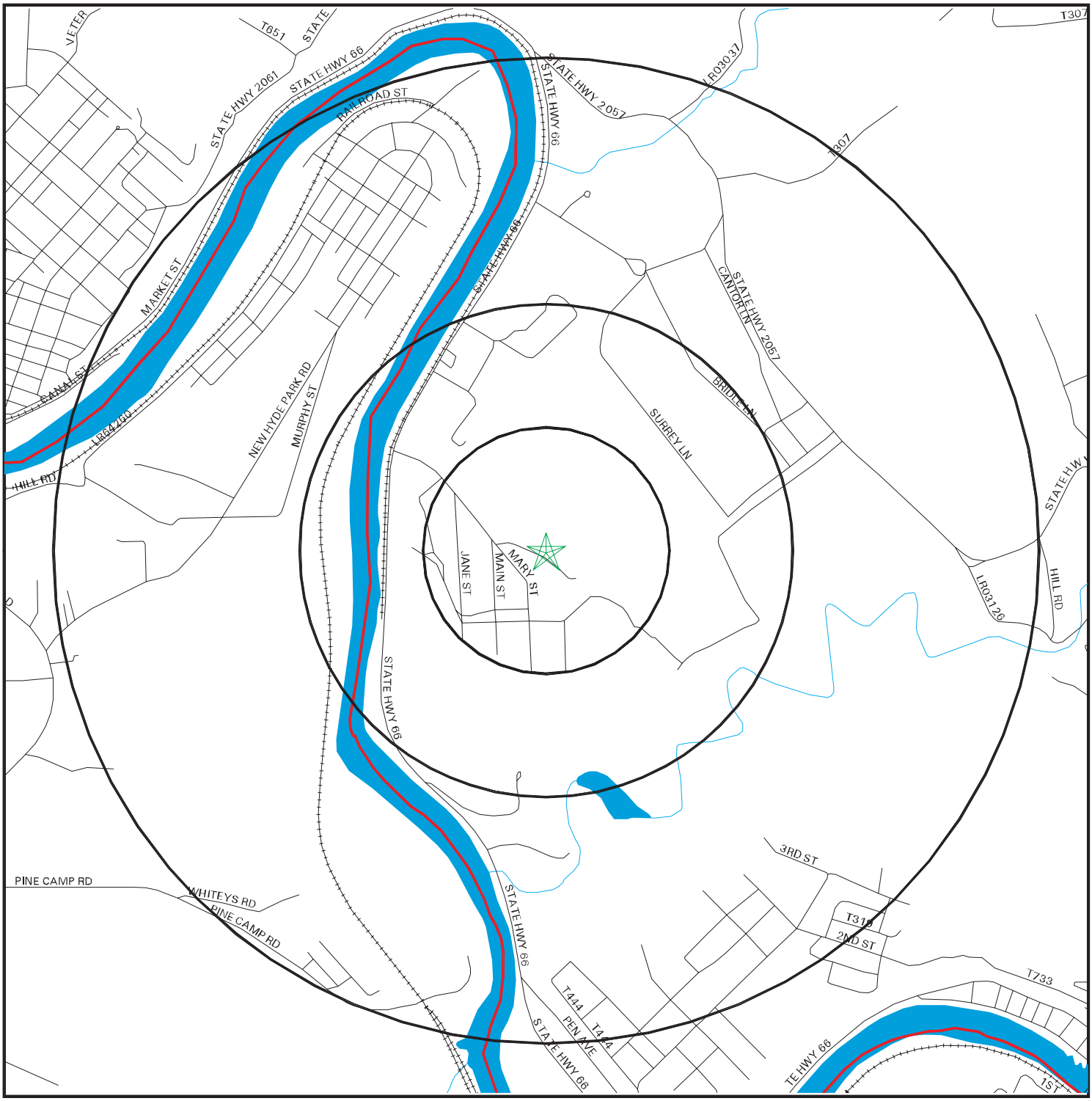
Inquiry #: 0975395.1s
Date: 5/13/3

TARGET PROPERTY COORDINATES

Latitude (North):	40.621899 - 40˚ 37' 18.8''
Longitude (West):	79.581703 - 79˚ 34' 54.1''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	619965.3
UTM Y (Meters):	4497541.5

Applicable Regulation from 47 CFR/FCC Checklist	Database	Search Distance (Miles)	Within Search	Within 1/8 Mile
NATURAL AREAS MAP				
1.1307a (1) Officially Designated Wilderness Area	US Federal Lands	1.00	NO	NO
1.1307a (2) Officially Designated Wildlife Preserve	US Federal Lands	1.00	NO	NO
1.1307a (2) Officially Designated Wildlife Preserve	PA Stewardship	1.00	NO	NO
1.1307a (3) Threatened or Endangered Species or Critical Habitat	County Endangered Species	County	YES	N/A
HISTORIC SITES MAP				
1.1307a (4) Listed or eligible for National Register	National Register Hist. Places	1.00	NO	NO
1.1307a (4) Listed or eligible for National Register	PA Historic Sites	1.00	NO	NO
	APPAL_TRAIL	1.00	NO	NO
FLOODPLAIN MAP				
1.1307 (6) Located in a Flood Plain	FLOODPLAIN	1.00	YES	NO
WETLANDS MAP				
1.1307 (7) Change in surface features (wetland fill)	NWI	1.00	YES	NO
FCC & FAA SITES MAP				
	FCC Cellular	1.00	NO	NO
	FCC Antenna	1.00	NO	NO
	FCC Tower	1.00	NO	NO
	FCC AM Tower	1.00	NO	NO
	FAA DOF	1.00	NO	NO
	Airports	1.00	NO	NO
	Power Lines	1.00	YES	YES

Natural Areas Map



0 1/4 1/2 1 Miles

- Target Property
- Roads
- County Boundary
- Waterways
- Water
- Locations
- Federal Areas
- Federal Linear Features
- State Areas
- State Linear Features

TARGET PROPERTY:	SLDA Site	CUSTOMER:	URS Corporation
ADDRESS:	SLDA Site	CONTACT:	Joanne McMullan
CITY/STATE/ZIP:	Vandergrift PA 15690	INQUIRY #:	0975395.1s
LAT/LONG:	40.6219 / 79.5817	DATE:	May 13, 2003

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NATURAL AREAS MAP FINDINGS

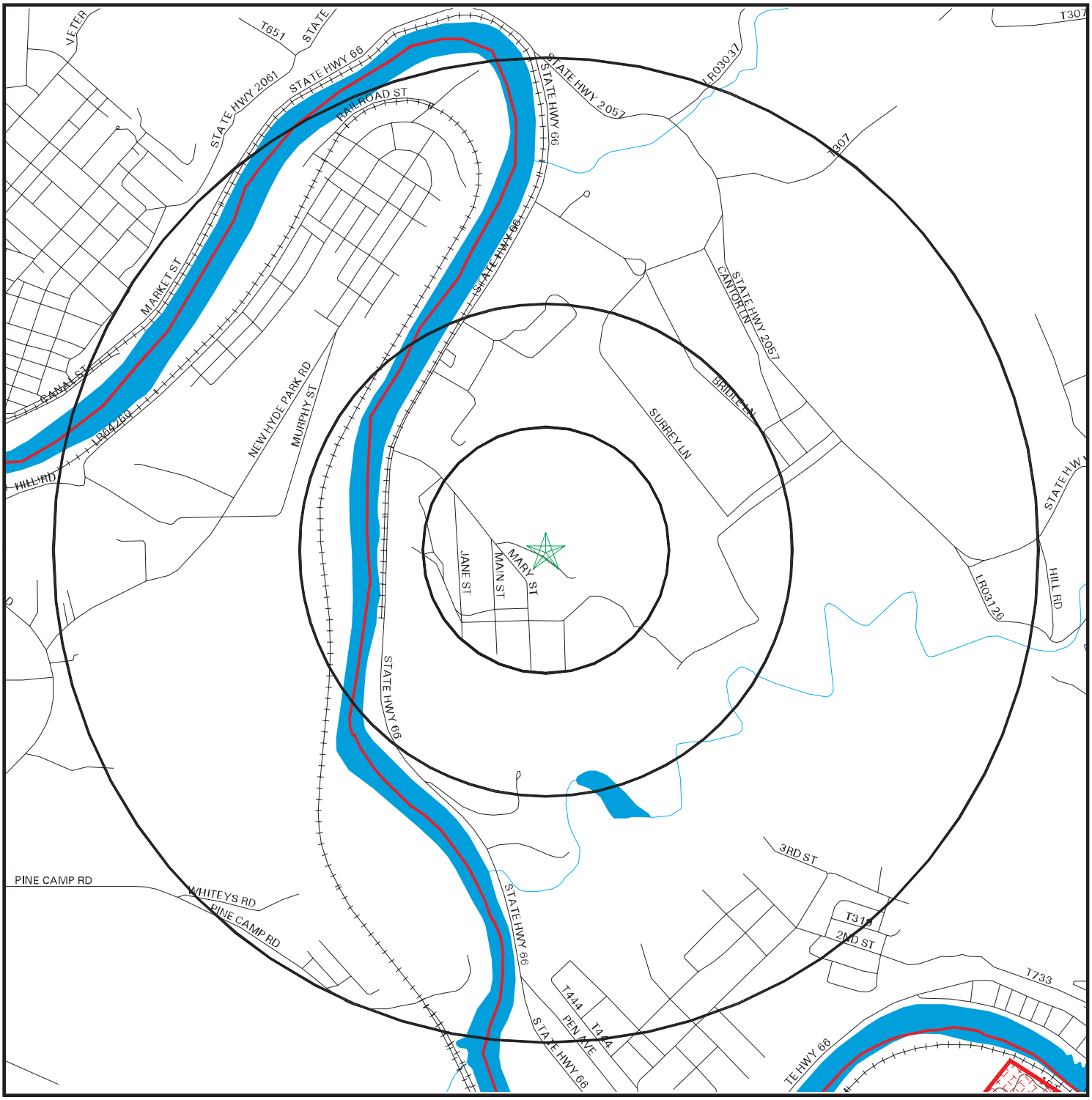
Endangered Species Listed for: ARMSTRONG County, PA.
Source: EPA Endangered Species Protection Program Database
MAMMAL: BAT, INDIANA

Endangered Species Listed for: WESTMORELAND County, PA.
Source: EPA Endangered Species Protection Program Database
MAMMAL: BAT, INDIANA

Map ID Direction Distance Distance (ft.)	EDR ID Database

No mapped sites were found in EDR's search of available government records within the search radius around the target property.

Historic Sites Map



- Target Property
- Streets
- County Boundary
- Waterways
- Water
- Historic Sites
- Federal Historic Areas
- State Historic Areas
- Scenic Trail

0 1/4 1/2 1 Miles

N

TARGET PROPERTY:	SLDA Site	CUSTOMER:	URS Corporation
ADDRESS:	SLDA Site	CONTACT:	Joanne McMullan
CITY/STATE/ZIP:	Vandergrift PA 15690	INQUIRY #:	0975395.1s
LAT/LONG:	40.6219 / 79.5817	DATE:	May 13, 2003

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HISTORIC SITES MAP FINDINGS

Map ID Direction Distance Distance (ft.)	EDR ID Database

No mapped sites were found in EDR's search of available government records within the search radius around the target property.

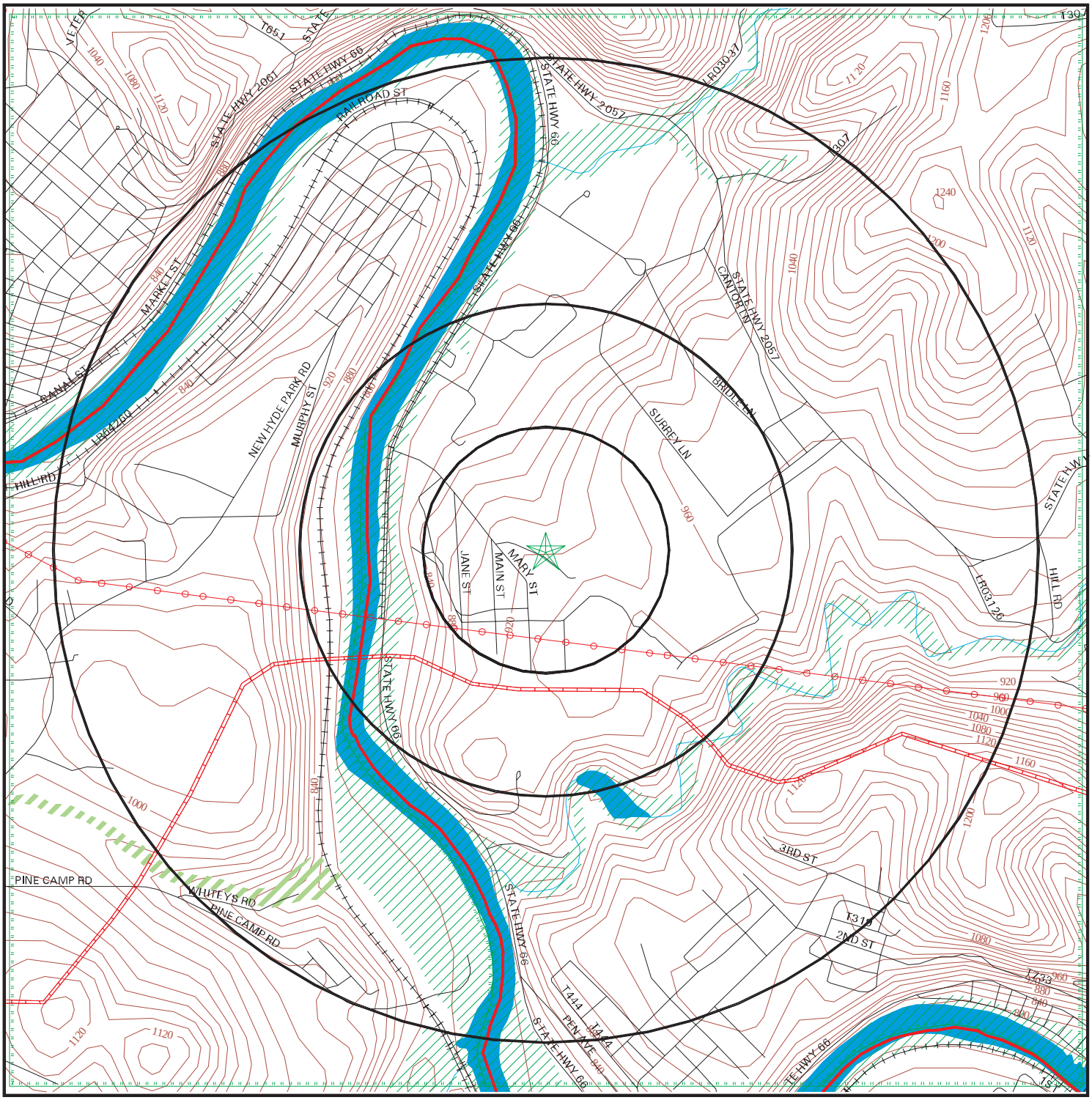
UNMAPPABLE HISTORIC SITES

Due to poor or inadequate address information, the following sites were not mapped:

		Status **EDR ID** **Database**
Name:	LEECHBURG HISTORIC DISTRICT	Unmappable
City:	LEECHBURG	PA10000550
County:	ARMSTRONG	PA Historic Sites
Address:	MARKET ST	
Date Added:	Not Reported	
Eligible Date:	12/28/1993	

Name:	PARKS FARM	Unmappable
City:	PARKS TWP	PA10000554
County:	ARMSTRONG	PA Historic Sites
Address:	LEECHBURG AIRPORT ROAD	
Date Added:	Not Reported	
Eligible Date:	05/07/1991	

Flood Plain Map



Major Roads
Contour Lines
Waterways
County Boundary
Power Lines
Pipe Lines
Fault Lines
Water
100-year flood zone
500-year flood zone
Electronic FEMA data available
Electronic FEMA data not available

0 1/4 1/2 1 Miles

TARGET PROPERTY:	SLDA Site	CUSTOMER:	URS Corporation
ADDRESS:	SLDA Site	CONTACT:	Joanne McMullan
CITY/STATE/ZIP:	Vandergrift PA 15690	INQUIRY #:	0975395.1s
LAT/LONG:	40.6219 / 79.5817	DATE:	May 13, 2003

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FLOOD PLAIN MAP FINDINGS

Source: FEMA Q3 Flood Data

County	FEMA flood data electronic coverage
ARMSTRONG, PA	YES
WESTMORELAND, PA	YES

Flood Plain panel at target property: 4213110001B

Additional Flood Plain panel(s) in search area:

4213060005B
4200970001B
42129C0039D
42129C0038D
42129C0101D
42129C0102D

National Wetlands Inventory Map

Major Roads
Contour Lines
Waterways
County Boundary
Power Lines
Pipe Lines
Fault Lines
Water
Wetlands
Electronic NWI data available
Electronic NWI data not available

0 1/4 1/2 1 Miles

TARGET PROPERTY:	SLDA Site	CUSTOMER:	URS Corporation
ADDRESS:	SLDA Site	CONTACT:	Joanne McMullan
CITY/STATE/ZIP:	Vandergrift PA 15690	INQUIRY #:	0975395.1s
LAT/LONG:	40.6219 / 79.5817	DATE:	May 13, 2003

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WETLANDS MAP FINDINGS

Source: Fish and Wildlife Service NWI data

NWI hardcopy map at target property: Vandergrift
Additional NWI hardcopy map(s) in search area:
Leechburg

Map ID Direction Distance Distance (ft.)	Code and Description*	Database
1 West 1/4-1/2 mi 1770	R2UBZ [R] Riverine, [2] Lower Perennial, [UB] Unconsolidated Bottom, [Z] Intermittently Exposed/Permanent	NWI
2 NE 1/4-1/2 mi 2311	PUBZ [P] Palustrine, [UB] Unconsolidated Bottom, [Z] Intermittently Exposed/Permanent	NWI
3 South 1/4-1/2 mi 2446	PUBZ [P] Palustrine, [UB] Unconsolidated Bottom, [Z] Intermittently Exposed/Permanent	NWI
4 ENE 1/2-1 mi 3678	PUBZ [P] Palustrine, [UB] Unconsolidated Bottom, [Z] Intermittently Exposed/Permanent	NWI
5 NW 1/2-1 mi 4483	R2UBZ [R] Riverine, [2] Lower Perennial, [UB] Unconsolidated Bottom, [Z] Intermittently Exposed/Permanent	NWI

*See Wetland Classification System for additional information.

WETLANDS CLASSIFICATION SYSTEM

National Wetland Inventory Maps are produced by the U.S. Fish and Wildlife Service, a sub-department of the U.S. Department of the Interior. In 1974, the U.S. Fish and Wildlife Service developed a criteria for wetland classification with four long range objectives:

- to describe ecological units that have certain homogeneous natural attributes,
- to arrange these units in a system that will aid decisions about resource management,
- to furnish units for inventory and mapping, and
- to provide uniformity in concepts and terminology throughout the U.S.

High altitude infrared photographs, soil maps, topographic maps and site visits are the methods used to gather data for the productions of these maps. In the infrared photos, wetlands appear as different colors and these wetlands are then classified by type. Using a hierarchical classification, the maps identify wetland and deepwater habitats according to:

- system
- subsystem
- class
- subclass
- modifiers

(as defined by Cowardin, et al. U.S. Fish and Wildlife Service FWS/OBS 79/31. 1979.)

The classification system consists of five systems:

1. marine
2. estuarine
3. riverine
4. lacustrine
5. palustrine

The marine system consists of deep water tidal habitats and adjacent tidal wetlands. The riverine system consists of all wetlands contained within a channel. The lacustrine systems includes all nontidal wetlands related to swamps, bogs & marshes. The estuarine system consists of deepwater tidal habitats and where ocean water is diluted by fresh water. The palustrine system includes nontidal wetlands dominated by trees and shrubs and where salinity is below .5% in tidal areas. All of these systems are divided in subsystems and then further divided into class.

National Wetland Inventory Maps are produced by transferring gathered data on a standard 7.5 minute U.S.G.S. topographic map. Approximately 52 square miles are covered on a National Wetland Inventory map at a scale of 1:24,000. Electronic data is compiled by digitizing these National Wetland Inventory Maps.

SYSTEM **MARINE**

SUBSYSTEM **1 - SUBTIDAL** **2 - INTERTIDAL**

	1 - SUBTIDAL					2 - INTERTIDAL			
CLASS	RB-ROCK BOTTOM	UB-UNCONSOLIDATED BOTTOM	AB-AQUATIC BED	RF-REEF	OW-OPEN WATER / Unknown Bottom	AB-AQUATIC BED	RF-REEF	RS-ROCKY SHORE	US-UNCONSOLIDATED SHORE
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 5 Unknown Submergent	1 Coral 3 Worm		1 Algal 3 Rooted Vascular 5 Unknown Submergent	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

SYSTEM **E - ESTUARINE**

SUBSYSTEM **1 - SUBTIDAL**

CLASS	RB-ROCK BOTTOM	UB-UNCONSOLIDATED BOTTOM	AB-AQUATIC BED	RF-REEF	OW-OPEN WATER / Unknown Bottom
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	2 Mollusk 3 Worm	

SUBSYSTEM **2 - INTERTIDAL**

CLASS	AB-AQUATIC BED	RF-REEF	SB - STREAMBED	RS-ROCKY SHORE	US-UNCONSOLIDATED SHORE	EM-EMERGENT	SS-SCRUB SHRUB	FO-FORESTED
Subclass	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	2 Mollusk 3 Worm	1 Cobble- Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble	1 Cobble- Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen

SYSTEM — **R - RIVERINE**

SUBSYSTEM	**1 - TIDAL**	**2 - LOWER PERENNIAL**	**3 - UPPER PERENNIAL**	**4 - INTERMITTENT**	**5 - UNKNOWN PERENNIAL**
CLASS	RB-ROCK BOTTOM	UB-UNCONSOLIDATED BOTTOM	*SB-STREAMBED	AB-AQUATIC BED	RS-ROCKY SHORE	US-UNCONSOLIDATED SHORE	**EM-EMERGENT	OW-OPEN WATER/ Unknown Bottom
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

* STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM.
**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS.

SYSTEM — **L - LACUSTRINE**

SUBSYSTEM — **1 - LIMNETIC**

CLASS	RB-ROCK BOTTOM	UB-UNCONSOLIDATED BOTTOM	AB-AQUATIC BED	OW-OPEN WATER/ Unknown Bottom
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	

SUBSYSTEM — **2 - LITTORAL**

CLASS	RB-ROCK BOTTOM	UB-UNCONSOLIDATED BOTTOM	AB-AQUATIC BED	RS-ROCKY SHORE	US-UNCONSOLIDATED SHORE	EM-EMERGENT	OW-OPEN WATER/ Unknown Bottom
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

SUBSYSTEM

P - PALUSTRINE

CLASS	RB--ROCK BOTTOM	UB--UNCONSOLIDATED BOTTOM	AB-AQUATIC BED	US--UNCONSOLIDATED SHORE	ML--MOSS-LICHEN	EM--EMERGENT	SS--SCRUB-SHRUB	FO--FORESTED	OW-OPEN WATER/ Unknown Bottom
Subclass	1 Bedrock 2 Rubble 3 Mud 4 Organic	1 Cobble-Gravel 2 Sand	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6Deciduous 7 Evergreen	

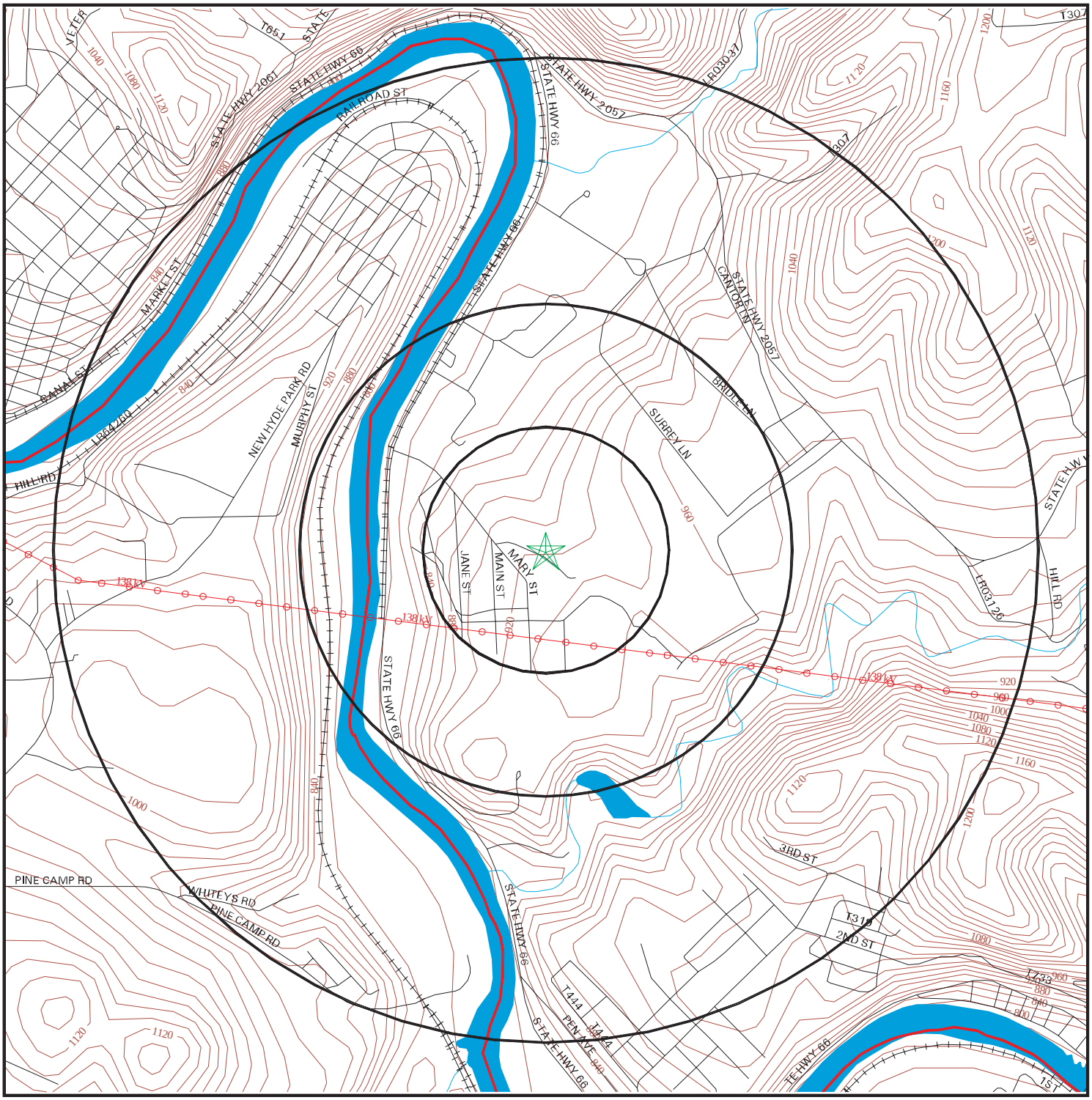
MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME				WATER CHEMISTRY			SOIL	SPECIAL MODIFIERS
Non-Tidal	**Tidal**	**Coastal**	**Halinity**	**Inland**	**Salinity**	**pH**	**Modifiers for all Fresh Water**	
A Temporarily Flooded B Saturated C Seasonally Flooded D Seasonally Flooded/ Well Drained E Seasonally Flooded/ Saturated F Semipermanently Flooded G Intermittently Exposed	H Permanently Flooded J Intermittently Flooded K Artificially Flooded W Intermittently Flooded/Temporary Y Saturated/Semipermanent/ Seasonal Z Intermittently Exposed/Permanent U Unknown	K Artificially Flooded L Subtidal M Irregularly Exposed N Regularly Flooded P Irregularly Flooded	*S Temporary-Tidal *R Seasonal-Tidal *T Semipermanent -Tidal V Permanent -Tidal U Unknown *These water regimes are only used in tidally influenced, freshwater systems.	1 Hyperhaline 2 Euhaline 3 Mixohaline (Brackish) 4 Polyhaline 5 Mesohaline 6 Oligohaline 0 Fresh	7 Hypersaline 8 Eusaline 9 Mixosaline 0 Fresh	a Acid t Circumneutral i Alkaline	g Organic n Mineral	b Beaver d Partially Drained/Ditched f Farmed h Diked/Impounded r Artificial Substrate s Spoil x Excavated

Source: U.S. Department of the Interior
Fish and Wildlife Service
National Wetlands Inventory

FCC & FAA Sites Map



Streets
Contour Lines
County Boundary
Waterways
Power Lines
Water
Sites
Omni Directional AM Interference
Directional AM Interference

0 1/4 1/2 1 Miles

TARGET PROPERTY:	SLDA Site	CUSTOMER:	URS Corporation
ADDRESS:	SLDA Site	CONTACT:	Joanne McMullan
CITY/STATE/ZIP:	Vandergrift PA 15690	INQUIRY #:	0975395.1s
LAT/LONG:	40.6219 / 79.5817	DATE:	May 13, 2003

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FCC & FAA SITES MAP FINDINGS
TOWERS

Map ID Direction Distance Distance (ft.)	EDR ID Database

No Sites Reported.

FCC & FAA SITES MAP FINDINGS
AIRPORTS

EDR ID
Database

No Sites Reported.

FCC & FAA SITES MAP FINDINGS
POWERLINES

EDR ID
Database

POW0015006
POWERLINES

Msid:	MSX1017721- 1	Voltage:	138
Rangeflg:	0	Hi_range:	0
Type:	AC	Status:	AC
Corridor:	N	Ownr_id:	ALLEGH
Own_name:	Allegheny Energy Inc.	Opr_id:	ALLEGPWR
Ownr_flg:	S	Coname:	Allegheny Power
Physaddres:	10435 Downsville Pike	Physcity:	Hagerstown
Physstate:	Maryland	Physlposta:	21740
Mailaddres:	Not Reported	Mailcity:	Not Reported
Mailstate:	Not Reported	Mailpostal:	Not Reported
Phone:	301-790-3400	Fax:	Not Reported

KEY CONTACTS & GOVERNMENT RECORDS SEARCHED

Various Federal laws and executive orders address specific environmental concerns. NEPA requires the responsible offices to integrate to the greatest practical extent the applicable procedures required by these laws and executive orders. EDR provides key contacts at agencies charged with implementing these laws and executive orders to supplement the information contained in this report.

NATURAL AREAS
Officially designated wilderness areas
Government Records Searched in This Report

FED_LAND: Federal Lands
Source: USGS
Telephone: 703-648-5094
Federal data from Bureau of Land Management, National Park Service, Forest Service, Fish and Wildlife Service, and Bureau of Indian Affairs.
- National Parks
- Forests
- Monuments
- Wildlife Sanctuaries, Preserves, Refuges
- Federal Wilderness Areas.
- Indian Reservations
Date of Government Version: 09/01/1997

Federal Contacts for Additional Information

National Park Service, Northeast Region
200 custom Street, Fifth Floor
Philadelphia, PA 19106
215-597-7013

USDA Forest Service, Eastern
310 West Wisconsin Avenue
Milwaukee, WI 53203
414-297-3693

BLM - Eastern States Office
7450 Boston Blvd.
Springfield, VA 22153
703-440-1713

Fish & Wildlife Service, Region 5
Div. Of Personnel Mgmt. 300 Westgate Center Drive
Hadley, MA 01035-9589
413-253-8313

Officially designated wildlife preserves, sanctuaries and refuges
Government Records Searched in This Report

FED_LAND: Federal Lands
Source: USGS
Telephone: 703-648-5094
Federal data from Bureau of Land Management, National Park Service, Forest Service, Fish and Wildlife Service, and Bureau of Indian Affairs.
- National Parks
- Forests
- Monuments
- Wildlife Sanctuaries, Preserves, Refuges
- Federal Wilderness Areas.
- Indian Reservations
Date of Government Version: 09/01/1997

PA Stewardship: Pennsylvania Conservation Stewardship
Coverage showing stewardship of managed conservation lands throughout the Commonwealth.
Includes federal, state, county and privately owned lands including National and State
Parks, Wildlife Refuges and Forests, county parks, and private conservancy lands.
Source: Pennsylvania State University, Environmental Resources Research Institute.
Telephone: 814-863-0291

Federal Contacts for Additional Information

Fish & Wildlife Service, Region 5
Div. Of Personnel Mgmt. 300 Westgate Center Drive
Hadley, MA 01035-9589
413-253-8313

State Contacts for Additional Information

Fish and Boat Commission 717-657-4515

Wild and scenic rivers

Government Records Searched in This Report

FED_LAND: Federal Lands
Source: USGS
Telephone: 703-648-5094
Federal data from Bureau of Land Management, National Park Service, Forest Service, Fish and Wildlife Service, and Bureau of Indian Affairs.
- National Parks
- Forests
- Monuments
- Wildlife Sanctuaries, Preserves, Refuges
- Federal Wilderness Areas.
- Indian Reservations
Date of Government Version: 09/01/1997

Federal Contacts for Additional Information

Fish & Wildlife Service, Region 5
Div. Of Personnel Mgmt. 300 Westgate Center Drive
Hadley, MA 01035-9589
413-253-8313

Endangered Species

Government Records Searched in This Report

Endangered Species Protection Program Database
A listing of endangered species by county.
Source: Environmental Protection Agency
Telephone: 703-305-5239

Federal Contacts for Additional Information

Fish & Wildlife Service, Region 5
Div. Of Personnel Mgmt. 300 Westgate Center Drive
Hadley, MA 01035-9589
413-253-8313

State Contacts for Additional Information

Natural Diversity Inventory, The Nature Conservancy 717-948-3962

KEY CONTACTS & GOVERNMENT RECORDS SEARCHED

LANDMARKS, HISTORICAL, AND ARCHEOLOGICAL SITES
Historic Places

Government Records Searched in This Report

National Register of Historic Places:

The National Register of Historic Places is the official federal list of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering, and culture. These contribute to an understanding of the historical and cultural foundations of the nation. The National Register includes:

- All prehistoric and historic units of the National Park System;
- National Historic Landmarks, which are properties recognized by the Secretary of the Interior as possessing national significance; and
- Properties significant in American, state, or local prehistory and history that have been nominated by State Historic Preservation Officers, federal agencies, and others, and have been approved for listing by the National Park Service.

Date of Government Version: 03/15/2000

PA Historic Sites: National Register Listing
Listing of hsitoric sites included on the National Register for Pennsylvania.
Source: Pennsylvania Historical and Museum Commission. Bureau for Historic Preservation
Telephone: 717-705-4035

Federal Contacts for Additional Information

Park Service; Advisory Council on Historic Preservation
1849 C Street NW
Washington, DC 20240
Phone: (202) 208-6843

State Contacts for Additional Information

Pennsylvania Historical & Museum Commission 717-787-2891

Indian Religious Sites

Federal Contacts for Additional Information

Department of the Interior- Bureau of Indian Affairs
Office of Public Affairs
1849 C Street, NW
Washington, DC 20240-0001
Office: 202-208-3711
Fax: 202-501-1516

National Association of Tribal Historic Preservation Officers
1411 K Street NW, Suite 700
Washington, DC 20005
Phone: 202-628-8476
Fax: 202-628-2241

State Contacts for Additional Information

A listing of local Tribal Leaders and Bureau of Indian Affairs Representatives can be found at:
http://www.doi.gov/bia/areas/agency.html

Scenic Trails

Government Records Searched in This Report
APPAL_TRAIL: Appalachian Trail
Source: Appalachian Trail Conference
Telephone: (304) 535-6331
Appalachian Trail centerline.

State Contacts for Additional Information
Appalachian Trail Conference
799 Washington Street P.O. Box 807
Harpers Ferry, WV 25425-0807
(304) 535-6331

North County Trail Association
49 Monroe Center Suite 200B
Grand Rapids, Michigan 49503
616-454-5506

Potomac Heritage Partnership
1623 28th Street, NW
Washington, D.C. 20007
202-338-6222

FLOOD PLAIN, WETLANDS AND COASTAL ZONE

Flood Plain Management
Government Records Searched in This Report
Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

Federal Contacts for Additional Information
Federal Emergency Management Agency 877-3362-627

State Contacts for Additional Information
Pennsylvania Emergency Management Agency 717-651-2199

Wetlands Protection
Government Records Searched in This Report
NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

Federal Contacts for Additional Information
Fish & Wildlife Service 813-570-5412

State Contacts for Additional Information
Fish & Boat Commission 717-657-4515

KEY CONTACTS & GOVERNMENT RECORDS SEARCHED

Coastal Zone Management

Government Records Searched in This Report

CAMA Management Areas
Dept. of Env., Health & Natural Resources
919-733-2293

Federal Contacts for Additional Information

Office of Ocean and Coastal Resource Management
N/ORM, SSMC4
1305 East-West Highway
Silver Spring, Maryland 20910
301-713-3102

State Contacts for Additional Information

Dept. of Environmental Program, Coastal Zone Management Program 717-787-5259

FCC & FAA SITES MAP

For NEPA actions that come under the authority of the FCC, the FCC requires evaluation of Antenna towers and/or supporting structures that are to be equipped with high intensity white lights which are to be located in residential neighborhoods, as defined by the applicable zoning law.

Government Records Searched in This Report

Cellular

Federal Communications Commission
Mass Media Bureau
2nd Floor - 445 12th Street SW
Washington DC 20554 USA
Telephone (202) 418-2700

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Tower

Federal Communications Commission
Mass Media Bureau
2nd Floor - 445 12th Street SW
Washington DC 20554 USA
Telephone (202) 418-2700

Portions copyright (C) 1999 Percon Corporation. All rights reserved.

Antenna Registration

Federal Communications Commission
Mass Media Bureau
2nd Floor - 445 12th Street SW
Washington DC 20554 USA
Telephone (202) 418-2700

Portions copyright (C) 1999 Percon Corporation. All rights reserved.

AM Tower

Federal Communications Commission
Mass Media Bureau
2nd Floor - 445 12th Street SW
Washington DC 20554 USA
Telephone (202) 418-2700

KEY CONTACTS & GOVERNMENT RECORDS SEARCHED

FAA Digital Obstacle File
National Oceanic and Atmospheric Administration
Telephone: 301-436-8301
Describes known obstacles of interest to aviation users in the US. Used by the Federal Aviation Administration (FAA) and the National Oceanic and Atmospheric Administration to manage the National Airspace System.

Airport Landing Facilities
Federal Aviation Administration
Telephone (800) 457-6656
Private and public use landing facilities.

Electric Power Transmission Line Data
PennWell Corporation
Telephone: (800) 823-6277
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Excessive Radio Frequency Emission
For NEPA actions that come under the authority of the FCC, Commission actions granting construction permits, licenses to transmit or renewals thereof, equipment authorizations or modifications in existing facilities, require the determination of whether the particular facility, operation or transmitter would cause human exposure to levels of radio frequency in excess of certain limits.

Federal Contacts for Additional Information
Office of Engineering and Technology
Federal Communications Commission
445 12th Street SW
Washington, DC 20554
Phone: 202-418-2470

OTHER CONTACT SOURCES

STREET AND ADDRESS INFORMATION

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APPENDIX J

REMEDIAL INVESTIGATION PHOTOGRAPHS

SLDA Remedial Investigation Photographs

Photo 1: Air Sampling Location No. 1 located in the southeastern end of the site.

Photo 2: Air Sampling Location No. 1

SLDA Remedial Investigation Photographs

Photo 3: Sampling team wearing Level B personal protective equipment during advancement of trench borings at Trench 10.

Photo 4: Advancement of trench borings at Trench 10. Note work zone air monitoring.

SLDA Remedial Investigation Photographs

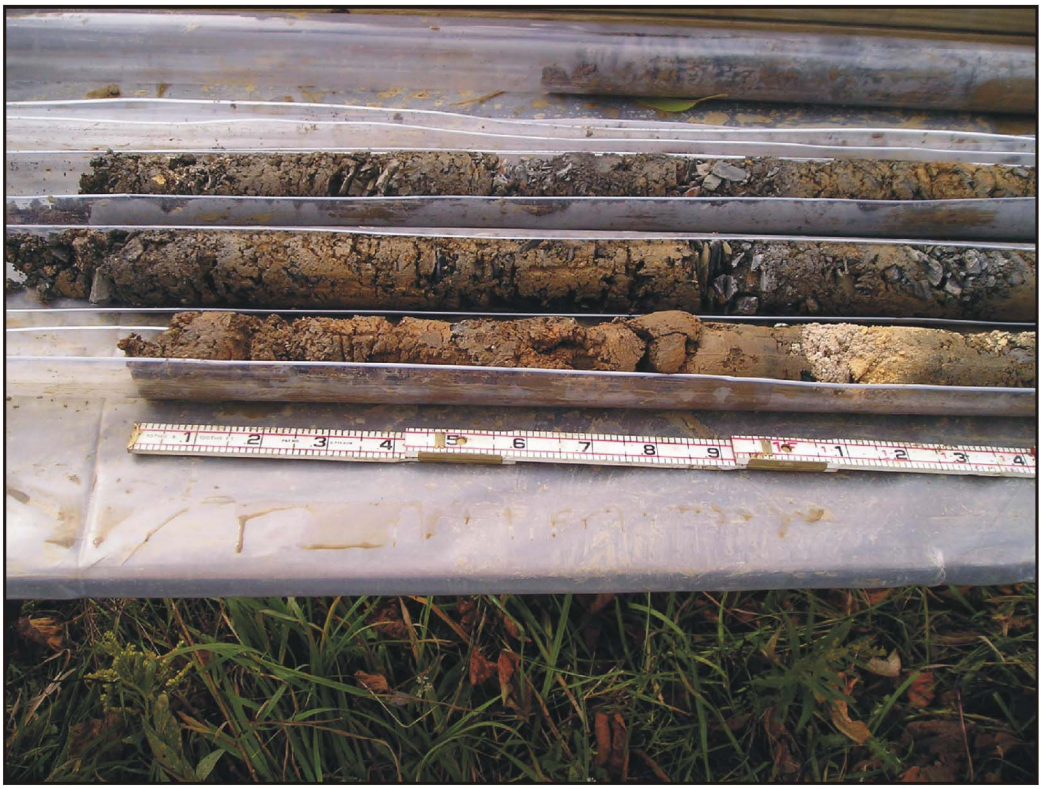

Photo 5: Soil samples retrieved during soil boring program.

Photo 6: Soil sample collection activities.

SLDA Remedial Investigation Photographs

Photo 7: Field screening soils with microR, FIDLER and PID meters during soil boring program.

Photo 8: Photograph of Geoprobe® and operator used to advance soil borings.

SLDA Remedial Investigation Photographs

Photo 9: Photograph illustrating drill crew augering and sampling at monitoring well MW-58.

Photo 10: Drilling activities at monitoring well MW-56. Note the field screening table and work zone air monitoring pump.

SLDA Remedial Investigation Photographs

Photo 11: Drilling into Trench 7 with Geoprobe® in Level B personal protective equipment.

Photo 12: Certified Health Physicist supervising field screening efforts at edge of exclusion zone.

SLDA Remedial Investigation Photographs

Photo 13: Low flow groundwater sampling activities at well MW-58.

Photo 14: Installation of Flexible Liner Underground Technology (FLUTe) system at well NWS-05.

SLDA Remedial Investigation Photographs

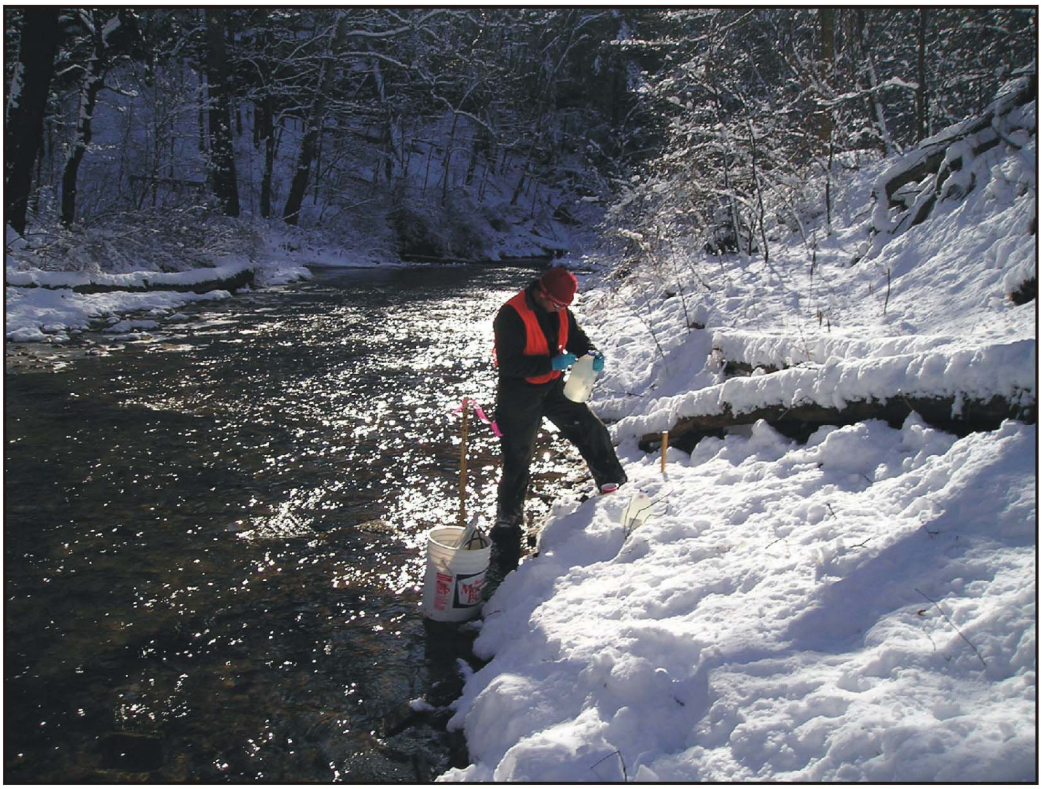

Photo 15: Surface water sampling activities at Carnahan Run.

APPENDIX K

MONITORING WELL DEVELOPMENT RECORDS

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation WELL NO.: _____

PROJECT NO.: 11173233.00000

STAFF: _____

DATE(S): _____

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	_____	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	_____	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	_____	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	_____	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	_____	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	_____	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	_____	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
pH											
SPEC. COND. (mS/cm)											
TEMPERATURE (°C)											
TURBIDITY (NTU)											
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE											

COMMENTS:

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-50

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier, Kevin McGovern and Kevin Shanahan

DATE(S): 11/19/2003 - 11/23/2003

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	37.60
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	2.50
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	35.1
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	6.0
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	29.8
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	10 (dry)

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	4.0	8.0	9.0								
pH	8.43	7.54	6.61								
SPEC. COND. (mS/cm)	0.360	0.388	0.391								
TEMPERATURE (°C)	12.6	11.6	11.2								
TURBIDITY (NTU)	51.0	745.0	999.0								
DO (mg/l)	0.44	0.58	0.47								
WATER LEVEL (ft TOC)											
APPEARANCE	Slightly Cloudy										

COMMENTS: Bailed, Dry after 10 gallons removed.
Let Well Recharge Between 12:00 - 3:00
Water Level at 35.97'. Removed 1 gallon.
On 11/21, Well dry after 0.25 gallons.
On 11/23/03. 0.25' of water in well

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-51

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier & Kevin McGovern

DATE(S): 11/22/2003 and 11/23/2003

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	37.50
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	31.90
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	5.6
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.0
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	4.8
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	36.0

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	4.0	8.0	12.0	16.0	16*	20.0	24.0	28.0	32.0	36.0	
pH	9.75	9.41	9.05	8.97	9.76	9.25	8.61	8.52	8.52	8.39	
SPEC. COND. (mS/cm)	0.282	0.279	0.137	0.261	0.250	0.265	0.255	0.257	0.268	0.258	
TEMPERATURE (°C)	12.5	12.5	13.8	13.0	12.5	12.2	12.2	12.7	12.4	12.6	
TURBIDITY (NTU)	999.0	180.0	327.0	306.0	108.3	256.0	188.0	69.1	58.1	48.0	
DO (mg/l)	4.99	10.85	10.26	10.10	NA	NA	NA	NA	NA	NA	
WATER LEVEL (ft TOC)	NA	NA	NA	NA	31.87	NA	NA	NA	NA	NA	
APPEARANCE	Lt. Gray Opaque	Pale Gray	Pale Gray	Pale Gray	Cloudy	Cloudy	Cloudy	Pale	Pale	Clear	

COMMENTS: * - Continued to develop on 11/23 by KJM, DTW = 31.87' BTOC
NA - Not Acquired
Well Is Developed

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-52

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier

DATE(S): 11/6/2003

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	44.42
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	37.99
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	6.4
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.1
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	5.5
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	40.0

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0
pH	6.51	6.40	6.37	6.50	6.50	6.54	6.57	6.50	6.51	6.53	6.53
SPEC. COND. (mS/cm)	0.550	0.455	0.436	0.434	0.432	0.454	0.397	0.424	0.425	0.435	0.426
TEMPERATURE (°C)	11.8	11.1	11.1	11.4	11.7	11.7	11.6	11.5	11.2	11.2	11.3
TURBIDITY (NTU)	357.0	999.0	999.0	621.0	780.0	567.0	122.0	187.0	135.0	108.0	35.0
DO (mg/l)	0.53	1.84	4.39	3.12	2.13	2.83	13.24	2.31	5.31	12.84	2.42
TIME	9:00	9:15	9:45	10:23							

COMMENTS: Well is Developed

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-53

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier & Kevin McGovern

DATE(S): 11/22/2003 and 11/23/2003

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	61.03
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	13.48
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	47.6
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	8.1
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	40.4
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	11.0

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	4.0	8.0	10*	11.0							
pH	9.73	9.01	7.45	NA							
SPEC. COND. (mS/cm)	0.317	0.375	0.405	NA							
TEMPERATURE (°C)	13.3	12.3	12.5	NA							
TURBIDITY (NTU)	150.0	>999	>999	>999							
DO (mg/l)	10.00	9.93	7.42	7.42							
WATER LEVEL (ft TOC)	NA	NA	58.97	Dry							
APPEARANCE	Slightly Cloudy	Light Gray/ Opaque	Brown	Brown							

COMMENTS: * - Continued to develop on 11/23 by KJM, DTW = 58.97' BTOC
NA - Not Acquired
Bailed to Within 1' of Bottom After 10 Gallons Removed
Bailed Dry After 11 Gallons Removed

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-54

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier, Kevin Shanahan & Kevin McGovern

DATE(S): 11/19/2003 - 11/24/2003

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	22.79
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	21.80
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	1.0
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.2
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	0.8
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.5

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1.0	2.0 (11/22)	2.0 (11/23)	2.5 (11/24)							
pH	5.78	9.95	6.67	6.43							
SPEC. COND. (mS/cm)	0.509	0.259	0.389	0.490							
TEMPERATURE (°C)	13.8	15.1	13.0	13.3							
TURBIDITY (NTU)	>999	>999	>999	175.0							
DO (mg/l)	0.69	4.15	3.21	NA							
WATER LEVEL (ft TOC)	21.80			21.52							
APPEARANCE			Brown	Brown							

COMMENTS: Bailed dry after 1 gallon removed, let well recharge between 08:30 & 15:00 to 22.22' BTOC, bailed out 0.5 gallons
11/21: Added 3 gallons of potable water to well, bailed 3.5 gallons, no parameters recorded
11/22: Added 3 gallons of potable water to well, recovered 3 gallons. No parameters recorded
11/24: Dry after 0.5 gallons purged @ 08:20, 22.30' BTOC @ 09:30, 22.15' BTOC @ 16:04

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-56

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier, Kevin Shanahan & Kevin McGovern

DATE(S): 11/19/2003 - 11/24/2003

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	28.23
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	23.65
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	4.6
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.8
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	3.9
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	24.0

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1.0	3.0	5.0	10.0	13.0	16.0	16*	16**	20.0	23.0	24.0
pH	5.78	5.79	5.67	6.49	7.05	6.64	6.51	6.73	6.47	6.58	6.47
SPEC. COND. (mS/cm)	0.426	0.433	0.437	0.402	0.377	0.353	0.369	0.354	0.386	0.404	0.343
TEMPERATURE (°C)	13.1	12.8	12.3	13.4	11.7	12.3	12.1	13.0	12.9	12.9	13.2
TURBIDITY (NTU)	>999	>999	>999	>999	>999	>999	>999	15.2	903.0	263.0	12.5
DO (mg/l)	0.82	0.63	0.63	11.40	4.04	2.33	NA	NA	NA	NA	NA
WATER LEVEL (ft TOC)	23.65	NA	24.05	NA	NA	NA	NA	22.68	NA	NA	NA
APPEARANCE	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy		Brown	Brown/ Muddy	Pale	Clear

COMMENTS: Bailed down to 8" from bottom after 3 gallons removed. Let recharge from 09:00 to 14:45 to 24.05' BTOC.
5 gallons removed on 11/19, 5 more gallons removed on 11/21 & 6 more gallons removed on 11/22 (16 total gallons from 11/19 to 11/22
* - 11/23
** - 11/24
Well is developed on 11/24/03 @ 09:35

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-57

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier, Kevin Shanahan & Kevin McGovern

DATE(S): 11/19/2003 - 11/24/2003

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	125.75
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	117.00
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	8.8
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.5
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	7.4
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	3.5

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1.0	2.0	2.5 (11/23)	3.5 (11/24)							
pH	7.49	7.10	NA	7.89							
SPEC. COND. (mS/cm)	0.424	0.302	NA	0.919							
TEMPERATURE (°C)	13.1	11.3	NA	12.2							
TURBIDITY (NTU)	>999	>999	>999	492.0							
DO (mg/l)	0.62	0.49	NA	NA							
WATER LEVEL (ft TOC)	117.00	--	124.35	120.75							
APPEARANCE	Muddy Gray	Muddy Gray	Brown	Brown							

COMMENTS: Used centrifugal pump (Monsoon) to removed 1.5 gallons of muddy gray water. Pumped to dryness.
Let recharge 24 hours, turn on pump and removed 0.5 gallons on 11/20.
11/21: Added 8 gallons of potable water to well, pumped out 8 gallons. No parameters recorded.
11/22: Added 4 gallons of potable water to well, pumped out 4 gallons. No parameters recorded.
11/23: Removed <1.0 gallons @ 09:38, no parameters collected, Bailed 0.5 gallons @ 11:10.
11/24: Bailed Approx. 1 gallon, dry @ 10:34.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-58

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier

DATE(S): 11/10/2003 and 11/21/2003

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	35.05
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	6.47
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	28.6
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	4.9
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	24.3
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	48.0

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial	4.0	8.0	12.0	15.0	20.0	24.0	28.0	32.0	36.0	40.0
pH	6.67	6.87	6.69	6.54	6.48	6.10	6.16	6.24	6.20	6.38	6.36
SPEC. COND. (mS/cm)	0.486	0.472	0.489	0.476	0.475	0.493	0.491	0.497	0.492	0.495	0.492
TEMPERATURE (°C)	10.1	10.3	9.5	9.3	9.3	9.5	10.1	10.2	10.1	9.9	10.5
TURBIDITY (NTU)	139.0	658.0	999.0	999.0	757.0	999.0	999.0	>1000	*413.0	403.0	271.0
DO (mg/l)	0.44	0.80	0.61	0.74	0.66	0.49	0.85	0.55	0.67	0.69	0.84
WATER LEVEL (ft TOC)	6.47	23.50	28.30	32.50	34.00	32.20	34.00	NR	NR	NR	NR
APPEARANCE	Grey Opaque	Grey Opaque	Grey Opaque	Grey Opaque	Grey Opaque	Lighter Grey	Lighter Grey	Lighter Grey	Lighter Grey	Lighter Grey	Lighter Grey

COMMENTS: NR = Not Recorded
Well bailed down to 34' after 15 gallons removed
Let Well Recharge Between 10:10 - 10:20 to 26.7'
Let Well Recharge Between 10:46 - 11:20 to 12.4'
Let Well Recharge Between 12:18 - 13:50 to 8.85'
*Turbidity meter on Horiba U-10 not working properly, switched to LaMotte 2020 turbidity meter.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-58 (Continued)

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier

DATE(S): 11/10/2003 and 11/21/2003

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	35.05
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	6.47
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	28.6
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	4.9
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	24.3
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	61.0

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	44.0	48.0	52.0	58.0	61.0						
pH	6.31	6.45	7.55	7.90	7.59						
SPEC. COND. (mS/cm)	0.489	0.490	0.438	0.451	0.425						
TEMPERATURE (°C)	11.0	10.4	13.5	12.5	13.0						
TURBIDITY (NTU)	379.0	137.0	372.0	53.8	48.8						
DO (mg/l)	0.72	0.91	2.58	11.35	6.77						
WATER LEVEL (ft TOC)	NR	NR	NR	NR	NR						
APPEARANCE	Cloudy	Slightly Cloudy	Clear	Clear	Clear						

COMMENTS: NR = Not Recorded
Able to bail down to 34' after 15 gallons removed
Let Well Recharge Between 10:10 - 10:20 to 26.7'
Let Well Recharge Between 10:46 - 11:20 to 12.4'
Let Well Recharge Between 12:18 - 13:50 to 8.85'
Turbidity meter on Horiba U-10 not working properly, switched to LaMotte 2020 turbidity meter.
Stopped development due to 55-gallon drum (purgewater receptacle) at capacity.
On 11/21/03, used Grunfos Centrifugal pump for volumes 52.0, 58.0, and 61.0 gallons.
Well is developed.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-59

PROJECT NO.: 11173233.00000

STAFF: Sheldon Nozik & Kevin McGovern

DATE(S): 11/9/2003 & 11/23/03

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	14.30	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	5.42	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	8.9	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.5	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	7.5	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	23.3	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	4.0	8.0	12.0	15.0	18.0	20.0	20 (11/23)	23*	23.1	23.2	23.3
pH	5.16	4.99	5.02	5.19	5.36	5.36	6.16	6.73	NA	NA	NA
SPEC. COND. (mS/cm)	0.353	0.240	0.235	0.211	0.218	0.188	0.108	0.147	NA	NA	NA
TEMPERATURE (°C)	11.6	12.7	12.8	13.9	12.6	12.6	11.7	11.3	NA	NA	NA
TURBIDITY (NTU)	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	31.6	487.0	153.0	52.6	27.4
DO (mg/l)	10.90	NA	NA	NA	NA	NA	2.85	11.10	NA	NA	NA
WATER LEVEL (ft TOC)	Dry	Dry	Dry	Dry	Dry	Dry	4.76	NA	NA	NA	NA
APPEARANCE	Very Turbid	Brown	Light Brown	Light Brown	Light Brown	Cloudy	Clear	Cloudy	Pale	Clear	Clear

COMMENTS: Well had approximately 0.5' of sediment prior to initializing development.
Dry after 4 gallons.
* - Purged to bottom, still pumping but at slower rate due to air intake.
11/23: Well developed @ 10:14, after 23.3 gallons purged.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-64

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier & Kevin Shanahan

DATE(S): 11/19/2003 & 11/20/03

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	21.00
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	12.20
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	8.8
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.5
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	7.5
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	44.0

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	2.0	8.0	12.0	16.0	20.0	24 (11/20)	28.0	32.0	36.0	40.0	44.0
pH	6.09	6.00	5.87	5.48	5.96	6.20	6.01	5.33	5.08	5.04	4.88
SPEC. COND. (mS/cm)	0.237	0.153	0.146	0.133	0.144	0.147	0.123	0.099	0.094	0.092	0.090
TEMPERATURE (°C)	13.1	14.1	12.5	12.3	12.0	12.7	11.8	11.7	11.8	11.6	11.3
TURBIDITY (NTU)	>999	>999	>999	>999	>999	>999	>999	>999	492.0	171.0	2.0
DO (mg/l)	0.57	0.30	0.34	0.51	NA	0.84	0.62	0.49	0.76	0.67	NA
WATER LEVEL (ft TOC)											
APPEARANCE	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Pale Brown	Pale Brown	Pale Brown	Cloudy	Slight Cloudy	Clear

COMMENTS: Bailing Water, good recharge
Quit bailing after 16 gallons let recharge between 11:00 & 15:40 to 12.3' BTOC
Used peristaltic pump to remove 24 gallons on 11/20/03
Well developed after 44 gallons purged

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-69

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier & Kevin Shanahan

DATE(S): 11/18/2003 - 11/22/03

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	22.74
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	13.50
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.2
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.6
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	7.9
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	88.0

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0	44.0
pH	5.91	5.42	5.15	5.00	4.86	4.92	4.84	4.81	4.78	4.77	6.81
SPEC. COND. (mS/cm)	0.269	0.125	0.082	0.073	0.057	0.054	0.045	0.047	0.042	0.043	0.066
TEMPERATURE (°C)	12.5	11.8	11.7	11.6	11.6	11.8	11.7	11.6	11.7	11.7	11.9
TURBIDITY (NTU)	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999
DO (mg/l)	5.12	6.30	0.11	7.90	8.60	10.70	7.60	9.40	7.00	9.70	0.58
WATER LEVEL (ft TOC)											
APPEARANCE	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy	Brown/ Muddy

COMMENTS: Took 4 hour break after purging 40 gallons

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: MW-69

PROJECT NO.: 11173233.00000

STAFF: Tim Burmeier & Kevin Shanahan

DATE(S): 11/18/2003 - 11/22/03

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	22.74	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	13.50	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.2	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.6	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	7.9	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	88.0	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	48.0	52.0	56.0	60.0	64.0	72 (11/19)	76.0	80 (11/22)	84.0	88.0	
pH	5.35	5.41	5.19	5.08	5.02	NA	NA	7.87	6.73	6.63	
SPEC. COND. (mS/cm)	0.470	0.450	0.460	0.043	0.043	NA	NA	0.037	0.034	0.035	
TEMPERATURE (°C)	11.7	11.4	11.6	11.6	11.5	NA	NA	11.4	11.6	11.7	
TURBIDITY (NTU)	>999	>999	>999	>999	>999	NA	NA	293.0	27.2	15.9	
DO (mg/l)	1.40	0.37	0.39	0.39	0.40	NA	NA	5.98	6.25	9.93	
WATER LEVEL (ft TOC)	NA	NA	NA	NA	NA	13.08	NA	NA	NA	NA	NA
APPEARANCE		Slightly Clearing	Slightly Clearing	Slightly Clearing	Slightly Clearing	Slightly Clearing	Slightly Clearing	Slightly Clearing	Clear	Clear	Clear

COMMENTS: Took 4 hour break after purging 40 gallons
11/19: Water Quality Meter Not Functioning
11/22: Well Developed After 88 Gallons Purged

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-01A-2 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 11/26, 12/1, 12/2, 12/3/03

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial (1 gl)	1.8	2.8	4.3	5.3	5.8	6.2	6.75	7.50	7.75	
pH	8.23	7.85	5.55	8.19	8.48	8.50	6.41	6.60	6.46	6.40	
SPEC. COND. (mS/cm)	249	258	NA	266	255	265	250	310	307	290	
TEMPERATURE (°C)	12.1	9.6	5.3	9.0	8.0	8.3	8.4	9.4	9.2	9.4	
TURBIDITY (NTU)	65.0	43.9	19.9?	42.4	122.0	142.0	38.0	47.0	37.0	44.0	
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	lt. brn	lt. brn	cloudy	clear	clear	clear	clear	clear	clear	clear	
PURGE CYCLES	1	2	3	4	5	6	7	8	9	10	

COMMENTS:

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 2 is the second shallow bedrock interval 54-64 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-01A-3 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 11/26, 12/1, 12/2, 12/3/03

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial (0.5 gl)	1.5	2.0	3.0	3.75	4.75	5.00	5.50	5.75		
pH	7.57	6.92	7.79	6.60	7.50	7.68	NA	6.14	6.11		
SPEC. COND. (mS/cm)	120	121	142	NA	114	160	136	140	143		
TEMPERATURE (°C)	10.7	10.4	9.1	5.5	8.9	6.1	9.4	8.8	9.2		
TURBIDITY (NTU)	4?	8.69?	16.7	26.0	143.0	143.0	40.0	40.0	39.0		
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	grayish	cloudy gray	cloudy gray	slightly cloudy	slightly cloudy	slightly cloudy	clear	clear	clear		
PURGE CYCLES	1	2	3	4	5	6	7	8	9		

COMMENTS:

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 3 is the UF coal mine void interval 97 -104 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-01A-4 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 11/26, 12/1, 12/2, 12/3/03

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial (0.25 gl)	1.0	1.75	2.25	2.75	2.80	3.00	3.10	3.35		
pH	8.23	8.39	8.45	8.28	8.42	6.79	6.98	6.95	6.89		
SPEC. COND. (mS/cm)	113	750	820	126	114	112	106	107	104		
TEMPERATURE (°C)	10.2	7.3	9.1	8.5	8.4	9.4	8.8	8.5	8.5		
TURBIDITY (NTU)	95.0	34.9	NA	143.0	197.0	54.0	42.0	38.0	49.0		
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	drk gray	cloudy gray	cloudy gray	cloudy gray	cloudy gray	clear	clear	clear	clear		
PURGE CYCLES	1	2	3	4	5	6	7	8	9		

COMMENTS:

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 4 is the deep bedrock interval 155 - 170 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-02-1 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/2, 12/3/03

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial (2 gl)	3.0	3.75	4.20	5.50	6.50	7.25	7.75	8.75	9.75	10.75
pH	9.19	8.98	8.60	8.66	8.54	8.58	6.95	6.85	6.84	6.74	6.73
SPEC. COND. (mS/cm)	196	203	204	203	200	208	243	231	230	228	228
TEMPERATURE (°C)	9.5	8.0	9.2	9.1	9.6	10.0	10.6	10.4	10.1	9.6	9.4
TURBIDITY (NTU)	261.0	542.0	85.9	42.4	130.0	117.0	55.0	56.0	57.0	NA	NA
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	lt. brn	cloudy	cloudy	clear	clear	clear	clear	clear	clear	clear	clear
PURGE CYCLES	1	2	3	4	5	6	7	8	9	10	11

COMMENTS:

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 1 is the first shallow bedrock interval 45 -55 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-02-2 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/2, 12/3/03

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial (2 gl)	3.0	3.75	4.00	5.50	6.50	8.75	9.50	10.50	11.00	11.50
pH	9.03	8.84	8.65	8.66	8.63	8.63	6.75	6.92	6.87	6.75	6.68
SPEC. COND. (mS/cm)	206	200	202	205	202	205	232	227	228	231	232
TEMPERATURE (°C)	9.5	9.4	9.6	9.6	9.8	10.0	10.5	10.3	10.1	10.0	9.7
TURBIDITY (NTU)	462.0	460.0	85.2	82.9	113.0	140.0	67.0	65.0	NA	122.0	143.0
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	lt. brn	lt. brn	clear	clear	clear	clear	clear	clear	clear	clear	clear
PURGE CYCLES	1	2	3	4	5	6	7	8	9	10	11

COMMENTS:

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 2 is the second shallow bedrock interval 75 -85 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-02-3 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/2, 12/3/03

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial (2 gl)	2.5	2.60	3.00	3.25	4.45	5.45	5.60	6.00		
pH	8.98	9.20	9.18	8.88	8.92	7.16	7.15	7.11	6.97		
SPEC. COND. (mS/cm)	213	310	192	206	208	235	230	196	234		
TEMPERATURE (°C)	9.6	9.3	NA	9.6	9.6	10.4	10.4	9.8	9.8		
TURBIDITY (NTU)	227.0	>1000	>1000	110.0	121.0	47.0	47.0	NA	62.0		
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	cloudy	cloudy	cloudy	slightly gray	slightly gray	slightly gray	slightly gray	slightly gray	slightly gray		
PURGE CYCLES	1	2	3	4	5	6	7	8	9		

COMMENTS:

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 3 is the UF coal seam (no void) interval 118 -125 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-02-4 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/2, 12/3/03

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial (2 gl)	2.5	3.25	3.75	4.00						
pH	9.20	8.46	8.77	8.66	7.32						
SPEC. COND. (mS/cm)	210	315	311	310	256						
TEMPERATURE (°C)	9.5	9.3	9.5	9.9	10.3						
TURBIDITY (NTU)	770.0	520.0	301.0	114.0	46.0						
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	gray	lt. gray	cloudy	cloudy	clear						
PURGE CYCLES	1	2	3	4	5						

COMMENTS:

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 4 is the deep bedrock interval 145 -155 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-02-1 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/18, 12/19/03

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1.0	2.8	3.50	5.00	6.00	7.00					
pH	6.90	8.87	8.23	7.88	7.65	9.04					
SPEC. COND. (mS/cm)	185	214	233	238	220	236					
TEMPERATURE (°C)	10.0	9.5	9.7	9.6	7.1	9.8					
TURBIDITY (NTU)	340.0	55.0	19.0	7.8	5.1	14.0					
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE											
PURGE CYCLES	1	2	3	4	5	6					

COMMENTS: DTW: 23.2' on 12/18/03
DTW: 20.2' on 12/19/03

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 1 is the first shallow bedrock interval 45 -55 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-02-2 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/18, 12/19/03

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1.0	1.3	1.50	2.75	3.75	4.00					
pH	8.93	9.46	9.33	9.00	8.35	9.36					
SPEC. COND. (mS/cm)	171	154	156	178	196	170					
TEMPERATURE (°C)	9.2	9.6	9.1	9.0	9.0	9.1					
TURBIDITY (NTU)	50.0	40.0	55.0	100.0	18.0	50.0					
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE											
PURGE CYCLES											

COMMENTS: DTW: 38.45' on 12/18/03
DTW: 27.40' on 12/19/03

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 2 is the second shallow bedrock interval 75 -85 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-02-3 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/18, 12/19/03

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0.2	0.3	0.50								
pH	8.64	8.96	8.86								
SPEC. COND. (mS/cm)	256	235	200								
TEMPERATURE (°C)	9.7	6.5	9.8								
TURBIDITY (NTU)	>1000	>1000	200.0								
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE											
PURGE CYCLES	1	2	3								

COMMENTS: DTW: 111.65' on 12/18/03
DTW: 107.34' on 12/19/03

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 3 is the UF coal seam (no void) interval 118 -125 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-02-4 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/18, 12/19/03

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	0.8	0.8	0.90	0.92	1.90						
pH	8.46	9.04	8.32	8.95	8.49						
SPEC. COND. (mS/cm)	335	344	355	345	342						
TEMPERATURE (°C)	9.6	9.1	9.1	7.6	10.1						
TURBIDITY (NTU)	55.0	230.0	140.0	450.0	55.0						
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE											
PURGE CYCLES	1	2	3	4	5						

COMMENTS: DTW: 77.24' on 12/18/03
DTW: 31.24' on 12/19/03

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 4 is the deep bedrock interval 145 -155 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-03-1 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/18, 12/19/03

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	1.0	3.3	4.00	5.00	6.20	7.25	8.50				
pH	8.03	7.51	7.52	7.56	8.52	7.66	7.52				
SPEC. COND. (mS/cm)	193	213	260	232	200	258	275				
TEMPERATURE (°C)	7.6	9.2	8.5	8.5	8.9	9.1	8.3				
TURBIDITY (NTU)	8.4	16.0	15.0	9.8	14.0	0.0	0.0				
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE											
PURGE CYCLES	1	2	3	4	5	6	7				

COMMENTS: DTW: 19.00' on 12/18/03
DTW: 20.23' on 12/19/03

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 1 is the first shallow bedrock interval 53 -63 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-03-2 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/18, 12/19/03

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0.5	2.2	3.00	3.80	4.50	5.00	5.50				
pH	7.90	7.42	7.47	7.44	8.23	7.57	7.46				
SPEC. COND. (mS/cm)	196	199	255	196	196	201	200				
TEMPERATURE (°C)	9.4	9.1	7.4	9.3	9.6	9.3	9.1				
TURBIDITY (NTU)	28.0	60.0	27.0	2.8	0.0	0.0	0.0				
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE											
PURGE CYCLES											

COMMENTS: DTW: 72.80' on 12/18/03
DTW: 62.34' on 12/19/03

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 2 is the second shallow bedrock interval 70-80 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-03-3 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/18, 12/19/03

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	0.5	0.8	1.00	1.20	1.30	1.32	1.40				
pH	7.26	7.08	7.10	7.07	7.35	7.18	7.07				
SPEC. COND. (mS/cm)	716	866	883	845	790	474	980				
TEMPERATURE (°C)	9.3	9.2	8.6	8.6	9.0	8.8	9.1				
TURBIDITY (NTU)	19.0	25.0	26.0	3.2	2.7	0.0	0.0				
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE											
PURGE CYCLES	1	2	3	4	5	6	7				

COMMENTS: DTW: 117.43' on 12/18/03
DTW: 117.36' on 12/19/03

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 3 is the UF coal seam (void) interval 113 -118 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-03-4 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/18, 12/19/03

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0.20	0.23	0.25	0.30	0.40	0.41	0.43				
pH	7.62	7.31	7.60	7.42	7.65	7.43	7.35				
SPEC. COND. (mS/cm)	843	1449	1490	1422	1241	964	1941				
TEMPERATURE (°C)	9.2	9.4	8.8	9.1	9.5	9.2	8.7				
TURBIDITY (NTU)	140.0	250.0	260.0	100.0	28.0	70.0	32.0				
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE											
PURGE CYCLES											

COMMENTS: DTW: 132.62' on 12/18/03
DTW: 131.71' on 12/19/03

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 4 is the deep bedrock interval 145 -155 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-04-2 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 11/26, 12/2,

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial (2 gl)	2.50									
pH	8.51	8.55									
SPEC. COND. (mS/cm)	303	299									
TEMPERATURE (°C)	9.7	10.6									
TURBIDITY (NTU)	250.0	360.0									
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	slightly cloudy	slightly cloudy									
PURGE CYCLES	1	2									

COMMENTS:

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 2 is the second shallow bedrock interval 50 -60 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-04-3 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 11/26, 12/2,

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial (1.25 gl)	1.5									
pH	8.29	7.99									
SPEC. COND. (mS/cm)	315	287									
TEMPERATURE (°C)	10.2	9.7									
TURBIDITY (NTU)	21.3	8.3									
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	cloudy	cloudy									
PURGE CYCLES	1	2									

COMMENTS:

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 3 is the UF coal (no void) interval 80 -87 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-04-4 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 11/26, 12/2,

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial (2 gl)	2.25	2.65	2.75							
pH	8.00	8.52	NA	7.08							
SPEC. COND. (mS/cm)	666	642	530	611							
TEMPERATURE (°C)	9.1	9.7	9.9	10.7							
TURBIDITY (NTU)	60.0	360.0	204.0	228.0							
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	cloudy	cloudy	slightly cloudy	slightly cloudy							
PURGE CYCLES	1	2	3	4							

COMMENTS:

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 4 is the Deep Bedrock interval 135 -150 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-05-1 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/19/03, 1/6/04

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1.00										
pH	7.55										
SPEC. COND. (mS/cm)	346										
TEMPERATURE (°C)	9.6										
TURBIDITY (NTU)	77.2										
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE	Clear										
PURGE CYCLES	1										

COMMENTS: DTW: DRY on 12/19/03
DTW: 59.08' on 1/6/04

Purging completed with nitrogen.
Well went dry after purging 1.0 gallon on 1/6/04

Port 1 is the first shallow bedrock interval 25-35 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-05-2 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/19/03, 1/6/04

1. TOTAL CASING AND SCREEN LENGTH (FT.) = NA
2. WATER LEVEL BELOW TOP OF CASING (FT.) =
3. NUMBER OF FEET STANDING WATER (#1 - #2) =
4. VOLUME OF WATER/FOOT OF CASING (GAL.) =
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4) =
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5) =
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.) =

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0.05										
pH	7.22										
SPEC. COND. (mS/cm)	375										
TEMPERATURE (°C)	6.8										
TURBIDITY (NTU)	26.0										
DO (mg/l)											
WATER LEVEL (ft TOC)											
APPEARANCE											
PURGE CYCLES	1										

COMMENTS: DTW: 120.55 on 12/19/03
DTW: 109.09' on 1/6/04

Purging completed with nitrogen.
Well went dry after purging 0.05 gallon on 1/6/04

Port 2 is the second shallow bedrock interval 42-52 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-05-3 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/19/03, 1/6/04

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0.25	1.00	1.50	1.52	2.00	2.25	3.00	3.25	3.60	3.75	
pH	7.02	7.27	7.28	7.36	6.86	6.92	7.43	7.65	7.45	7.53	
SPEC. COND. (mS/cm)	320	352	325	320	319	343	348	315	290	286	
TEMPERATURE (°C)	9.2	7.9	8.9	8.8	9.2	6.7	8.0	7.3	8.4	8.2	
TURBIDITY (NTU)	5.3	7.0	5.1	30.0	5.2	8.3	103.6	31.7	0.0	0.0	
DO (mg/l)	7.62	6.47	NR	7.88	NR	NR	NR	NR	NR	NR	
WATER LEVEL (ft TOC)											
APPEARANCE	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	
PURGE CYCLES	1	2	3	4	5	6	7	8	9	10	

COMMENTS:
DTW: 76.51' on 12/19/03
DTW: 76.97' on 1/6/04 @ 08:45
DTW: 76.18' on 1/6/04 @ 16:52
Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 3 is the UF coal (Void) interval 71-76 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-05-4 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/19/03, 1/6/04

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0.05	0.50	0.52	0.55	0.75	0.80	1.20	1.25	1.60	2.00	
pH	6.78	7.05	7.09	7.06	7.01	6.84	7.19	7.27	7.18	7.23	
SPEC. COND. (mS/cm)	659	628	644	696	752	697	709	739	771	789	
TEMPERATURE (°C)	10.1	7.9	8.4	9.0	5.1	8.7	7.9	8.1	7.9	8.1	
TURBIDITY (NTU)	65.0	45.0	25.0	50.0	8.9	6.2	0.0	0.0	0.0	0.0	
DO (mg/l)	2.72	2.18	1.52	NR	NR	NR	NR	NR	NR	NR	
WATER LEVEL (ft TOC)											
APPEARANCE	Slightly Cloudy	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	
PURGE CYCLES	1	2	3	4	5	6	7	8	9	10	

COMMENTS:
DTW: 103.42' on 12/19/03
DTW: 102.52' on 1/6/04 @ 08:45
DTW: 102.57' on 1/6/04 @ 16:55
Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 4 is the deep bedrock interval 112-122 ft BGS.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: SLDA Remedial Investigation

WELL NO.: NWS-05-5 (FLUTe)

PROJECT NO.: 11173233.00000

STAFF: S. NOZIK

DATE(S): 12/19/03, 1/6/04

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	

WELL ID.	VOL. (GAL/FT)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0.05	0.20	0.23	0.30	0.35	0.40	0.41	0.42			
pH	7.02	7.23	7.41	7.20	7.35	7.61	7.61	7.61			
SPEC. COND. (mS/cm)	748	750	760	796	791	780	789	784			
TEMPERATURE (°C)	8.6	8.5	8.5	6.8	9.2	8.2	8.7	8.6			
TURBIDITY (NTU)	40.0	24.0	20.0	7.3	8.8	0.0	0.0	0.0			
DO (mg/l)	6.34	NR	2.08	NR	NR	NR	NR	NR			
WATER LEVEL (ft TOC)											
APPEARANCE	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear			
PURGE CYCLES	1	2	3	4	5	6	7	8			

COMMENTS: DTW: 117.18' on 12/19/03
DTW: 119.42' on 1/6/04 @ 16:55

Purging completed with nitrogen.
At least 10 minute intervals between purge cycles.

Port 5 is an addtional deep bedrock interval 145-155 ft BGS.

APPENDIX L

LOW FLOW GROUNDWATER PURGING/SAMPLING LOGS

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-1

Date: 12/04/03 **Sampling Personnel:** BG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 7.51 **Depth to Well Bottom (ft):** 20.11 **Well Diameter:** 4 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 6.5 gallons

Sample ID: WG-MW-01 **Sample Time:** 8:47 **QA/QC:** WG-FD-04

Sample Parameters:

Comments: PUMP ON 0826

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
0827	8.21	12.17	332	4.62	>1100	71.9		7.62	
0830	6.71	12.67	325	0.97	44.7	97.9		7.65	
0833	6.41	12.70	322	0.93	10.30	104.1		7.63	
0836	6.25	12.72	329	0.72	5.97	107.3		7.63	
0839	6.15	12.73	333	0.72	1.14	112.1		7.63	
0842	6.09	12.75	335	0.72	1.65	115.6		7.65	
0845	6.06	12.75	332	0.69	1.19	119.4		7.65	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-2

Date: 12/02/03 **Sampling Personnel:** BG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:** 86'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 76.71 **Depth to Well Bottom (ft):** 88.52 **Well Diameter:** 4 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 8 GAL

Sample ID: WG-MW-2 **Sample Time:** 1412 **QA/QC:** MS/MSD 02

Sample Parameters:

Comments: PUMP ON 1352

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
1354	4.68	10.22	1205	NA	41.9	92.7		77.10	
1357	5.01	10.91	1243	NA	7.75	56.8		77.10	
1400	5.18	11.08	1248	NA	1.8	44.7		77.12	
1403	5.28	11.10	1251	NA	1.07	37.1		77.13	
1406	5.36	11.21	1261	NA	1.00	29.7		77.16	
1409	5.41	11.26	1267	NA	1.07	25.7		77.20	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-2A

Date: 12/02/03 **Sampling Personnel:** BG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:** 50'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 46.84 **Depth to Well Bottom (ft):** 51.41 **Well Diameter:** 4 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 14 GAL

Sample ID: WO-MW-2A **Sample Time:** 1545 **QA/QC:**

Sample Parameters:

Comments: PUMP ON 1515

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
1516	5.53	10.41	280	NA	7.75	129.5		47.02	
1519	5.58	10.85	252	NA	7.53	142.9		47.02	
1522	5.84	10.94	210	NA	6.90	134.6		47.04	
1525	5.96	10.97	182	NA	2.20	136.9		47.05	
1528	5.99	10.97	169	NA	1.10	142.4		47.3	
1532	5.79	11.01	161	NA	1.40	150.4		47.51	MOTOR UNPLUGGED
1537	5.96	11.03	158	NA	1.30	153.0		47.83	
1540	5.98	11.03	158	NA	0.9	154.4		48.14	
1543	5.98	11.05	158	NA	0.5	156.5		48.31	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-3

Date: [illegible] **Sampling Personnel:** [illegible] **Company:** URS Corporation

Purging/ Sampling Device: MONSOON/BAILER **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** [illegible] **Depth to Well Bottom (ft):** 53.40 **Well Diameter:** 4 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 0.4 GAL.

Sample ID: WG-MW-3 **Sample Time:** 12/3/03 0845 – 12/05/03 1400 **QA/QC:**

Sample Parameters: PUMP ON DAYS - VERY LITTLE RECHARGE NO MEASURABLE
Comments: DRY @ 0.4 GAL

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-5

Date: 12/1/03 **Sampling Personnel:** JG/SG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:** 27'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 25.36 **Depth to Well Bottom (ft):** 27.51 **Well Diameter:** 4 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 5 GAL

Sample ID: WW-MW-5 12/01/03 **Sample Time:** 1650 **QA/QC:**

Sample Parameters:

Comments: pump shut 1624

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
1625	6.14	12.36	374	NA	122	128.9			26.44
1629	6.05	12.20	376	NA	72.5	129.4			26.39
1632	5.98	11.85	373	NA	48.8	128.7			26.36
1635	6.02	11.39	371	NA	50.2	127.9		26.28	
1639	6.02	11.66	371	NA	28.7	129.0		26.24	
1642	6.02	11.95	374	NA	25.3	128.1		26.21	
1646	5.99	13.10	383	NA	23.3	131.2		26.65	
1649	5.99	12.94	379	NA	21.2	133.4		26.88	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-6

Date: 12/03/03 **Sampling Personnel:** BG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:** 28

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 23.99 **Depth to Well Bottom (ft):** 28.65 **Well Diameter:** 4 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 12

Sample ID: W6-MW-6 **Sample Time:** 1210 **QA/QC:**

Sample Parameters:

Comments: PUMP ON 1141, ORANGE, VERY TURBID AT BEGINNING

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1143	6.65	11.58	667	NA	>1100	-13.1		24.01	
1146	6.63	11.93	609	NA	210	-21.6		23.9	
1149	6.56	11.97	648	NA	80	-14.3		23.9	
1152	6.49	11.99	623	NA	40	1.8		23.9	
1155	6.42	12.02	614	NA	21	11.6		23.96	
1158	6.35	12.05	610	NA	14	14.8		24.01	
1201	6.35	12.05	604	NA	5.9	18.1		24.01	
1204	6.32	12.11	598	NA	5.3	24.4		24.02	
1207	6.30	12.10	602	NA	5.0	24.7		24.02	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-07

Date: 12/03/03 **Sampling Personnel:** EL/CM **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 33.90 **Depth to Well Bottom (ft):** 35.35 **Well Diameter:** 4" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 895 mL **Estimated Purge Volume (liters):**

Sample ID: WG-MW-07 12/03/03 **Sample Time:** 1540 **QA/QC:** NONE

Sample Parameters: Primary BAD

Comments: Pump on @ 1532 - Pump off @ 1535 - on @ 1540 - SAMPLE

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1533	7.54	11.16	367	7.40	27.6	98.6	500	34.40	
1535	- WELL IS DRY - PUMP OFF -								
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-8

Date: 12/03/03 **Sampling Personnel:** EL/CM **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 12.62 **Depth to Well Bottom (ft):** 35.90 **Well Diameter:** 4" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 14.4 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-08 12/03/03 **Sample Time:** 1125 **QA/QC:**

Sample Parameters:

Comments: Pump on @ 1100

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1101	7.52	11.35	232	1.63	200	-48.9	500	12.88	
1104	7.35	11.61	238	0.29	17	-71.2	500	13.91	
1107	7.39	11.83	233	0.35	20	-74.2	500	14.24	
1110	7.42	11.71	233	0.20	16	-84.8	500	14.68	
1113	7.44	11.97	234	0.20	5.5	-89.2	500	14.91	
1116	7.45	11.99	230	0.23	3.8	-95.5	500	15.08	
1119	7.48	11.99	230	0.25	2.3	-84.2	500	15.22	
1122	7.51	11.92	230	0.23	3.0	-92.8	500	15.34	
1125	7.53	12.11	225	0.20	2.1	-100.9	500	15.40	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-09

Date: 12/02/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 20.58 **Depth to Well Bottom (ft):** 37.30 **Well Diameter:** 4" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 10.3 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-09 12/03/03 **Sample Time:** 1020 **QA/QC:**

Sample Parameters: Primary Add

Comments: Pump on @ 0947

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
0950	7.41	10.96	173	1.82	110	60.2	500	20.88	
0953	7.11	11.25	180	0.47	39	58.0	500	21.55	
0956	6.93	11.41	178	0.44	32	61.4	800	22.07	
0959	6.85	11.52	174	0.34	32	62.4	500	22.41	
1002	6.83	11.57	177	0.33	25	63.0	500	22.52	
1005	6.79	11.63	174	0.25	24	64.9	800	23.04	
1008	6.74	11.72	167	0.22	12	74.0	800	24.23	
1011	6.72	11.70	165	0.22	14	76.4	900	24.61	
1014	6.69	11.83	165	0.20	12	78.7	800	25.43	
1017	6.67	11.77	161	0.22		77.7	800	26.41	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-11S

Date: 12/04/03 **Sampling Personnel:** BG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON / BAILER **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 7.90 **Depth to Well Bottom (ft):** 11.98 **Well Diameter:** **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 4 GAL

Sample ID: WG-MW-11S **Sample Time:** 1410 – 12/05/03 1300 **QA/QC:** SPLIT

Sample Parameters:

Comments: PUMP ON 1351, FLOW CELL LEAKING, DO IS SUSPECT

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1353	7.53	10.15	70	10.42	74.4	210.9		8.47	
1356	6.45	10.85	70	8.15	11.9	254.7		9.48	
1359	6.11	10.78	71	6.16	32.0	265.5		10.04	
1402	5.99	10.83	73	5.37	37.0	253.7		10.43	
1405	5.94	10.87	75	5.13	31.0	243.8		10.68	
1408	5.86	10.88	76	4.93	30.0	241.7		10.80	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-11D

Date: 12/04/03 **Sampling Personnel:** BG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 41.18 **Depth to Well Bottom (ft):** 43.60 **Well Diameter:** **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 1 GAL

Sample ID: W6-MW-11D **Sample Time:** 1420 **QA/QC:**

Sample Parameters:

Comments: PUMP ON 1255, PUMP OFF 1258 - DRY 1002 12/04/03 - DRY - NO SAMPLE COLLECTED

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1256	8.66	10.07	482	4.80	50.6	86.8		NA	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-12

Date: 12/05/03 **Sampling Personnel:** [illegible] **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:** [illegible]

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 29.50 **Depth to Well Bottom (ft):** 34.35 **Well Diameter:** 2" **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 3.0L **Estimated Purge Volume (liters):** ~30L

Sample ID: WG-MW-12D" **Sample Time:** 17 0850 **QA/QC:** [illegible]

Sample Parameters: [illegible] 6

Comments: [illegible]

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
0824	7.07	10.75	299	2.65	35	93.7	750	29.73	
0827	7.08	11.02	243	0.40	8.7	117.7	750	29.73	
0830	6.82	11.08	240	0.20	2.8	121.0	750	29.73	
0833	6.72	11.10	238	0.26	1.5	121.3	750	29.73	
0836	[illegible]	11.12	235	0.31	1.4	121.2	750	29.73	
0839	6.58	11.13	235	[illegible]	0.75	120.1	750	29.73	
0842	6.56	11.16	237	[illegible]	0.95	119.5	750	29.73	
0845	6.53	11.15	235	0.25		119.0	750	29.73	
0848	6.52	11.15	234	0.24	0.20	121.4	750	29.73	
						119.4			
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-13

Date: 12/03/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 23.01 **Depth to Well Bottom (ft):** 38.53 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 9.6 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-13 12/03/03 **Sample Time:** 0925 **QA/QC:** NONE

Sample Parameters: Pump on @ 0849 - Primary RAD

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
0851	9.03	10.02	234	1.16	350	[illegible]	500	23.64	
0854	8.06	11.14	227	0.36	29.0	-69.3	500	23.80	
0857	7.68	11.41	229	0.29	10.0	-81.0	800	23.99	
0900	7.58	11.43	226	0.36	3.4	-87.6	500	23.95	
0903	7.54	11.37	226	0.31	3.3	-91.8	800	24.00	
0906	7.50	11.43	224	0.31	2.4	-97.2	800	24.10	
0909	7.47	11.49	222	0.28	2.6	-102.7	800	24.46	
0912	7.45	11.50	223	0.27	1.4	-104.4	800	24.30	
0915	7.44	11.48	222	0.32	0.5	-104.0	500	24.17	
0918	7.43	11.51	221	0.29	0.95	-105.2	500	24.40	
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-14

Date: 12/02/03 **Sampling Personnel:** GM/EG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:** ~29'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 13.30 **Depth to Well Bottom (ft):** 32.25 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 12.0 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-14 12/02/03 **Sample Time:** 1000 **QA/QC:** NONE

Sample Parameters: Primary BAD

Comments: Pump on @ 0932

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
0933	7.15	10.68	201	1.67	13.8	-17.7	1500	14.76	
0936	6.83	11.85	191	0.37	10.2	-27.6	1000	15.90	
0939	6.70	11.93	194	0.43	4.95	-28.7	350	15.72	
0942	6.64	11.94	195	0.23	3.27	-32.1	225	15.59	
0945	6.61	11.90	195	0.20	1.97	-33.8	250	15.30	
0948	6.58	11.93	196	0.18	1.33	-34.1	250	15.18	
0951	6.56	11.91	196	0.14	1.10	-34.6	250	15.20	
0954	6.56	11.95	196	0.13	0.64	-34.7	250	15.30	
0957	6.55	11.99	198	0.11	0.59	-35.5	250	15.31	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-15

Date: 12/02/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:** ~31'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 11.96 **Depth to Well Bottom (ft):** 31.32 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: WG-MW-15 12/02/03 **Sample Time:** 1412 **QA/QC:** NONE

Sample Parameters: Primary RAD - Secondary RAD

Comments: Pump on @ 1345

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	* FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1346	7.43	11.78	151	0.96	71.00	-1.5	500	13.10	
1349	6.97	11.97	140	0.43	552	6.7	500	14.93	
1352	6.87	12.34	148	0.45	123	12.3	500	15.10	
1355	6.84	12.01	149	0.47	97.6	20.6	500	15.35	
1358	6.92	12.20	167	0.26	24.4	11.9	500	15.80	
1401	6.92	12.21	171	0.21	11.5	9.7	500	15.89	
1404	6.92	12.29	162	0.19	10.2	11.3	500	16.68	
1407	6.87	12.21	163	0.20	8.29	9.1	500	16.91	
1410	6.92	12.22	173	0.17	6.24	11.4	500	17.21	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

* Flow rate [illegible] to control!

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-16

Date: 12/03/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: NOT SAMPLED **Tubing Type:** HDPE **Pump Inlet:** —

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** DRY **Depth to Well Bottom (ft):** 112.21 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** /

Sample ID: **Sample Time:** **QA/QC:**

Sample Parameters:
Comments: NO SAMPLE COLLECTED

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
		WELL							
				TS					
						DRY			
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-16EC

Date: 12/04/03 **Sampling Personnel:** CM/EC **Company:** URS Corporation

Purging/ Sampling Device: Grundfos 2" **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 140.26 **Depth to Well Bottom (ft):** 200.33 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 37 l **Estimated Purge Volume (liters):**

Sample ID: WG-MW-16EC **Sample Time:** ~~13~~ 1519 **QA/QC:**

Sample Parameters: Primary PAH

Comments: Pump on @ 1448

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1450	8.86	11.66	695	0.66	700	-10.4	850	149.20	
1453	8.89	11.68	682	0.51	310	-72.5	850	150.62	
1456	8.99	11.77	667	0.42	258	-110.13	850	152.2	
1459	8.99	13.35	678	0.31	207	-129.8	850	156.70	
1502	8.95	15.29	677	0.22	80	-146.0	~~850~~ 500	162.74	
1505	8.95	15.10	679	0.25	70	-150.9	500	166.13	
1508	8.96	15.27	679	0.36	70	-152.7	500	169.96	
1511	8.98	16.41	695	0.30	80	-156.3	500	174.05	
1514	8.96	16.99	693	0.32	--	-158.8	500	176.55	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

pump in well

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-17

Date: 12/05/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 48.45 **Depth to Well Bottom (ft):** 54.06 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: WG-MW-17 **Sample Time:** **QA/QC:**

Sample Parameters: 0955 12/06/03 - DRY - NO SAMPLE COLLECTED

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1532 ~~1533~~	8.65	7.40	621	[illegible]	[illegible]	[illegible]	250	49.50	
1536	8.02	10.51	602	7.05	53	47.5	250	50.20	
1539	7.62	11.04	602	8.22	23	86.7	250	51.89	
1542	7.52	11.23	602	7.42	437	88.2	250	—	
1545	7.54	11.28	602	6.77	[illegible]	71.4	250	—	
1547	DRY	—							
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-19

Date: 12/03/03 **Sampling Personnel:** BG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 56.50 **Depth to Well Bottom (ft):** 108.85 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 4.5 gallons

Sample ID: WG-MW-19 **Sample Time:** 15:35 **QA/QC:**

Sample Parameters:

Comments: -pump on 15:09

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)*	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
15:10	6.49	9.53	482	10.89	4.10	-47.9		59.38	
15:13	7.16	10.97	763	0.51	152	-89.5		59.47	
15:16	7.18	11.25	668	0.40	37.9	-68.0		59.50	
15:19	7.08	11.52	596	0.33	11.5	-54.3		59.44	
15:22	7.05	11.66	573	0.32	6.94	-50.8		59.46	
15:25	7.07	11.75	560	0.28	3.8	-49.2		59.44	
15:28	7.11	11.78	536	0.24	2.2	-50.5		59.46	
15:31	7.15	11.82	517	0.26	1.9	-53.0		59.46	
15:33	7.19	11.86	519	0.22	1.8	-57.0		59.46	
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

* DO not calibrated. Values for reference only.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-20

Date: 12/02/03 **Sampling Personnel:** [illegible] **Company:** URS Corporation

Purging/ Sampling Device: Bailer **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 51.79 **Depth to Well Bottom (ft):** 55.02 **Well Diameter:** 2" **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: WG-MW-20 **Sample Time:** 1600 **QA/QC:**

Sample Parameters:

Comments: PUMP ON 1302
DRY @ 1308 10/02/03 - STILL DRY - NO SAMPLE COLLECTED

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
1303	2.04	9.77	2236	NA	456	[illegible]		53.41	
1306	2.02	10.57	2405	NA	228	541.9		55.00	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-21

Date: 12/02/03 **Sampling Personnel:** JG/BG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** **Depth to Well Bottom (ft):** **Well Diameter:** **Screen Length (ft):**

Casing: **Vol. In 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: **Sample Time:** **QA/QC:**

Sample Parameters:

Comments: DRY - NO SAMPLE

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-22

Date: 12/2/03 **Sampling Personnel:** JG/BB **Company:** URS Corporation

Purging/ Sampling Device: Monsoon/BAILER **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 88.4 **Depth to Well Bottom (ft):** 114.56 **Well Diameter:** 2 **Screen Length (ft):** 10

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 6.5 GAL

Sample ID: WG-MW-22 12/02/03 **Sample Time:** 1045 **QA/QC:**

Sample Parameters:

Comments: PUMP ON 0935
COULD NOT CLEAR PUMP - SUCKED DRY WITH BAILER,
LITTLE SHEEN ON PURGE WATER, SOME PARTICLES, stringed or

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
0936	4.79	10.28	945	NA	>1100	21.2		88.43	
0945	5.41	11.31	978	NA	24.4	-7.6		88.43	
0948	5.49	11.59	981	NA	5.53	-10.9		88.43	
0952	5.56	11.61	991	NA	3.24	-14.4		88.46	
0955	5.59	11.75	996	NA	1.39	-15.9		88.46	
0958	5.63	11.81	999	NA	0.47	-15.2		88.45	
1002	5.68	11.74	999	NA	1.07	-14.5		88.46	
1005	5.70	11.73	1001	NA	0.41	-16.7		88.45	
1008	5.74	11.76							PUMP OFF - CLOGGED
1019	5.82	10.58	976	NA		-23.0			PUMP ON
1020									PUMP OFF CLOGGED
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-23

Date: 12/03/03 **Sampling Personnel:** JG/BG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:** 45'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 46.13 **Depth to Well Bottom (ft):** 69.89 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: WG-MW-23 **Sample Time:** 1007 **QA/QC:** MS/MSD-03

Sample Parameters:

Comments: PUMP ON 0934

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
0935	9.08	10.51	310	NA	199	-48.9		—	
0938	7.41	11.02	320	NA	31.5	-31.0		53.70	
0942	6.97	10.95	319	NA	13.0	-19.4		53.93	
0945	6.80	10.57	312	NA	12.3	-14.5		54.40	
0950	6.61	9.26	299	NA	18.0	3.4		54.48	
0953	6.54	8.48	292	NA	8.1	10.4		54.8	
0956	6.52	8.86	291	NA	6.9	10.3		55.01	
0959	6.50	8.93	293	NA	3.9	11.2		55.09	
1002	6.49	8.81	292	NA	3.4	11.6		55.18	
1005	6.48	8.52	289	NA	3.8	12.5		55.30	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-24

Date: 12/02/03 **Sampling Personnel:** GW/EL **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:** ~31' btoc

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 15.55 **Depth to Well Bottom (ft):** 32.02 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 10.16 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-24 12/02/03 **Sample Time:** 0855 **QA/QC:** DUPLICATE "WG-FD-03"

Sample Parameters: Primary Bldg

Comments: Pump on @ 0828

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
0830	8.29	9.93	217	9.38	210	-68.7	1500	15.98	
0832 - Pump off - FLOW CELL LEAKING!!									
ON 0835	7.78	10.96	211	0.62	12.8	-71.6	900	16.21	
0838	7.60	11.12	211	0.16	5.05	-74.6	1200	16.43	
0841	7.51	10.98	212	0.25	2.08	-97.0	750	16.08	
0844	7.43	11.13	208	0.11	1.36	-104.9	1500	16.28	
0847	7.39	11.16	208	0.09	0.41	-107.1	500	16.78	
0850	7.37	11.18	206	0.07	0.39	-110.2	1200	16.88	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

* DIFFICULT TO MAINTAIN STEADY FLOW RATE

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-25

Date: 12/04/03 **Sampling Personnel:** BG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 16.62 **Depth to Well Bottom (ft):** 38.69 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 4 GAL

Sample ID: WG-MW-25 **Sample Time:** 1506 **QA/QC:** SPLIT

Sample Parameters:

Comments: PUMP ON 1445, FLOW CELL LEAKING, D.O. IS SUSPECT

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1447	6.07	10.97	189	2.23	70	20.6		18.05	
1450	6.28	11.13	188	0.40	32	12.7		21.21	
1453	6.31	11.63	188	0.23	7.46	23.8		24.26	
1456	6.37	11.73	189	0.33	4.71	28.8		26.22	
1459	6.44	11.97	189	0.75	4.17	38.5		26.88	
1502	6.50	11.97	190	0.95	4.69	43.8		26.72	
1505	6.52	12.01	190	1.11	5.02	46.1		26.60	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-26

Date: 12/03/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 29.79 **Depth to Well Bottom (ft):** 38.37 **Well Diameter:** 2" **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: WC-MW-26 **Sample Time:** 1329 **QA/QC:** ~~DUP~~ DUPLICATE "WC-MWFD-07"

Sample Parameters: RAO

Comments: DUP 1200

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1257	9.74	9.75	457	1.42	>1100	-74.3	500	30.00	
1300	8.69	10.98	403	0.39	57.9	-67.3	500	30.04	
1303	8.58	11.04	399	0.35	32.4	-60.5	500	30.04	
1306	8.25	11.07	370	0.37	29.0	-41.4	500	30.04	
1309	8.02	11.09	360	0.37	21.5	-38.9	500	30.04	
1312	7.83	11.12	346	0.38	13.7	-36.2	500	30.04	
1315	7.69	11.12	338	0.34	14.5	-33.5	500	30.04	
1318	7.53	11.13	328	0.35	14.4	-30.9	500	30.04	
1321	7.42	11.17	326	0.32	8.92	-27.7	500	30.09	
1324	7.37	11.27	313	0.27	7.55	-28.1	500	30.09	
1327	7.35	11.09	299	0.21	5.94	-27.2	500	30.09	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-27

Date: 12/04/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 36.41 **Depth to Well Bottom (ft):** 38.20 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 1.13 L **Estimated Purge Volume (liters):**

Sample ID: NO SAMPLE COLLECTED **Sample Time:** **QA/QC:**

Sample Parameters:

Comments: Pump on @ 0935, Returned to well 12/04/03 @ 1700 - DRY; 12/05/03 0800 - DRY.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
0938	7.18	10.36	810	3.27	132	27.7	200	—	below top of pump
0940	DRY -	Purged	3.0	L.					
				NO	SAMPLE		COLLECTED.		
				WELL	IS	DRY	AFTER		
						PURGE			
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	5%		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-29

Date: 12/05/03 **Sampling Personnel:** BG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 17.09 **Depth to Well Bottom (ft):** 39.12 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: WG-MW-29 **Sample Time:** 1100 **QA/QC:** SPLIT

Sample Parameters:

Comments: PUMP ON 1033, FLOW CELL [illegible]

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1034	6.10	10.95	206	0.95	46.3	140.6		26.29	
1037	6.15	11.33	207	1.62	11.6	126.9		29.52	
1040	6.19	11.40	208	1.92	6.02	122.5		30.74	
1043	6.19	11.35	208	1.30	28.3	118.0		30.20	
1046	6.18	11.33	208	1.31	240	116.0		30.55	
1049	6.19	11.33	[illegible]	[illegible]	688	[illegible]		30.81	
1052	6.19	11.30	209	3.09	781	[illegible]		30.74	
1055	[illegible]	[illegible]	[illegible]	[illegible]	764	[illegible]		30.71	
1058	6.19	11.36	208	3.29	716	122.1		30.72	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-30A

Date: 12/02/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: Monsoon Submersible **Tubing Type:** HDPE **Pump Inlet:** ~129'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 123.19 **Depth to Well Bottom (ft):** 130.25 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 4.73 L **Estimated Purge Volume (liters):**

Sample ID: WG-MW-30A **Sample Time:** 07:55 **QA/QC:**

Sample Parameters: Primary RAD Completed sampling 12/04/2003 0755

Comments: Pump [illegible]

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
0901	8.95	9.74	2560	0.96	>1100	-128.6	350		
0904	8.71	10.51	2575	0.99	71100	-105.1	850		
* WELL DRY @ 0906 - 1/06 PURGED = 4.0 L									
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-31

Date: 12/05/03 **Sampling Personnel:** RG/JG **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 96.00 **Depth to Well Bottom (ft):** 101.63 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: WG-MW-31 **Sample Time:** 0835 12/06/03 **QA/QC:** NONE

Sample Parameters:

Comments: PUMP ON 1449, DRY @ 1454 – NO PARAMETERS.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-3Z

Date: 12/03/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: HYDROLIFT, by hand ~~MONSOON~~ **Tubing Type:** HDPE **Pump Inlet:** ~57'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 44.28 **Depth to Well Bottom (ft):** 57.66 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 8.25 (2.23 · 1) **Estimated Purge Volume (liters):**

Sample ID: WG-MW-3Z 12/03/03 **Sample Time:** 1325 **QA/QC:** NONE

Sample Parameters:

Comments: ON @ 1304

~~*~~ UNABLE TO LOWER PUMP OR BAILER PAST OBSTRUCTION @ ~27' BTOC. Purged + sampled well using ½"x5/8" HDPE tubing w/ check valve.

PURGE PARAMETERS

Purged Vol. (gal)

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	~~FLOW RATE (ml/min.)~~	DEPTH TO WATER (ft btor)	Comments
1305	7.37	7.60	387	3.06	>1100	70.7	0.5	NA	
1316	7.00	10.91	397	0.99	>1100	64.7	2.5	NA	
1312 – WELL IS DRY. STOPPED PURGE. will wait for recharge, sample									
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-33

Date: 12/02/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 54.22 **Depth to Well Bottom (ft):** 83.96 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 15.3 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-33 12/02/03 **Sample Time:** 1325 **QA/QC:** NONE

Sample Parameters: Primary RAD

Comments: Pump on @ 1300

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
1302	7.81	10.72	546	0.89	<19.1	-42.4	500	60.02	
1305	7.70	11.56	511	0.23	15.6	-6.2	1500	63.30	
1308	7.14	11.85	407	0.24	10.79	15.6	1000	64.80	
1311	6.96	11.92	384	0.22	11.10	6.3	1200	66.79	
1314	6.89	11.60	375	0.21	10.34	3.2	900	67.01	
1317	6.87	11.76	369	0.18	11.15	1.4	500	69.89	
1320	6.85	11.89	377	0.18	8.08	1.5	1000	70.49	
1323	6.87	11.92	398	0.20	7.15	1.2	1200	71.00	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-34A

Date: 12/03/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: NOT SAMPLED **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** DRY **Depth to Well Bottom (ft):** 100.48 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: **Sample Time:** **QA/QC:**

Sample Parameters:
Comments: NO SAMPLE, WELL IS DRY

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

NO PURGE

WELL IS DRY

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-35

Date: 12/05/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: Grundfos **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 116.50 **Depth to Well Bottom (ft):** 167.09 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: WG-MW-35 **Sample Time:** [illegible] **QA/QC:** DUPLICATE WG-FD-08

Sample Parameters: Primary RAD

Comments: [illegible]

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1441	10.23	11.28	868	4.38	120	33.0	500	121.00	
1449	11.65	11.87	1010	0.59	107.5	-19.6	500	125.1	
1451	11.74	13.07	1145	0.41	142	[illegible]	500	128.5	
1454	11.69	14.46	118[illegible]	0.31	117	-72.5	500	132.75	
1457	11.60	14.05	1140	0.29	127	-92.5	500	134.28	
[illegible]	[illegible]	14.[illegible]	107[illegible]	[illegible]	94.7	[illegible]	500	138.0	
1400	[illegible]	14.6[illegible]	10[illegible]	0.33	6[illegible]	[illegible]	500	140.86	
1502	11.59	14.[illegible]	[illegible]	0.4[illegible]	[illegible]	[illegible]	500	142.74	
1500	10.[illegible]	16.0[illegible]	858	0.37	37.3	-174.6	500	143.2	
1500	10.0[illegible]	16.[illegible]	807	0.24	[illegible]	-172.5	500	-146.[illegible]	
[illegible]	10.85	16.[illegible]	[illegible]	0.[illegible]	39.9	[illegible]	[illegible]	-147.[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	0.32	38.7	-205.5	[illegible]	[illegible]	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-36

Date: 12/03/03 **Sampling Personnel:** DG/JG **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 56.83 **Depth to Well Bottom (ft):** 83.20 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 3 GAL

Sample ID: WG-MW-36 **Sample Time:** 12:44 **QA/QC:**

Sample Parameters:

Comments: PUMP ON 1215

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2* (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1217	6.77	11.07	350	4.05	177	41.2		—	
1220	6.72	11.39	382	0.96	310	23.6		63.01	
1223	6.73	11.40	377	0.54	128	22.8		63.56	
1226	6.72	11.19	370	0.43	101.8	26.4		64.02	
1229	6.72	11.07	361	0.43	69.7	28.0		64.02	
1233	6.70	12.01	342	0.63	21.9	37.3		65.55	
1236	6.74	12.33	325	1.15	7.73	43.7		66.38	
1239	6.77	12.15	318	1.56	6.93	51.1		66.5	
1242	6.77	12.01	317	1.81	7.21	52.8		67.3	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

* Do not calibrated. Values written as a reference only

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-37

Date: 12/04/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: — **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** DRY **Depth to Well Bottom (ft):** 69.05 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** / **Estimated Purge Volume (liters):** /

Sample ID: — **Sample Time:** **QA/QC:**

Sample Parameters: WELL NOT SAMPLED, DRY.
Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

NOT SAMPLED DRY

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-38

Date: 12/04/03 **Sampling Personnel:** CM/EZ **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 42.10 **Depth to Well Bottom (ft):** 62.12 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 12.4 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-38 **Sample Time:** 0910 **QA/QC:** NONE

Sample Parameters: Primary MW

Comments: Pump on @ 0840

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
0844	7.85	11.20	243	0.32	449	-161.5	500	42.20	
0847	7.77	11.21	243	0.27	28.6	-159.5	500	42.20	
0850	7.70	11.25	242	0.20	6.54	-157.6	500	42.21	
0853	7.69	11.27	242	0.26	3.92	-156.1	500	42.22	
856	7.66	11.27	241	0.19	2.38	-157.0	500	42.23	
0859	7.65	11.28	243	0.23	0.80	-157.7	500	42.23	
0902	7.65	11.26	240	0.27	0.57	-157.2	500	42.25	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-39

Date: 12/02/03 **Sampling Personnel:** JG/BG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:** 57.5'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 55.11 **Depth to Well Bottom (ft):** 58.20 **Well Diameter:** 2 **Screen Length (ft):** 10

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 8 GAL

Sample ID: WG-MW-39 12/02/03 **Sample Time:** 0850 **QA/QC:** MS/MSD

Sample Parameters:

Comments: PUMP ON 0818
SAMPLED FOR MS/MSD - WG-MW-39 12/02/03 MS-01 /SD-01

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
0819	2.78	10.53	2264	NA	>1100	299.5		55.13	
0822	2.76	11.39	2215	NA	>1100	278.5		55.14	
0825	2.68	11.33	1870	NA	311	260.4		55.14	
0828	2.70	11.32	1401	NA	284	249.0		55.12	
0831	2.73	11.30	1125	NA	116	242.7		55.12	
0834	2.78	11.43	856	NA	81.7	241.4		55.12	
0837	2.86	11.43	625	NA	62.0	239.7		55.12	
0840	2.92	11.43	458	NA	58.5	244.0		55.12	
0843	2.99	11.42	390	NA	58.9	249.4		55.12	
0846	3.01	11.43	392	NA	54.3	249.8		55.12	
0849	3.00	11.43	391	NA	52.1	248.3		55.12	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-40

Date: 12/02/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: ~~Monsoon~~ Grundfos II **Tubing Type:** HDPE **Pump Inlet:** ~190

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 133.15 **Depth to Well Bottom (ft):** 191.74 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 36.1 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-40 12/02/03 **Sample Time:** 1605 **QA/QC:** NONE

Sample Parameters: Primary RAD

Comments: Pump on @ 1538

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
1540	8.62	11.34	689	0.63	15.3	-131.0	800	134.34	
1543	8.68	13.80	697	0.22	12.1	-174.3	800	136.86	
1546	8.71	13.79	700	0.28	11.4	-186.2	800	136.82	
1549	8.71	13.68	705	0.24	10.53	-203.4	800	136.52	
1552	8.71	14.43	701	0.25	10.40	-212.8	800	136.45	
1555	8.74	14.62	700	0.22	8.28	-205.2	800	136.55	
1558	8.74	14.20	703	0.25	10.46	-210.3	800	136.52	
1601	8.70	14.61	708	0.29	10.22	-203.1	800	136.41	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-41

Date: 12/05/03 **Sampling Personnel:** RG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 19.32 **Depth to Well Bottom (ft):** 36.80 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: [illegible] **Sample Time:** 0952 **QA/QC:** SPLIT

Sample Parameters:

Comments: PUMP ON 0931 [illegible]

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
0932	6.91	10.44	306	4.65	17.4	-26.6		23.35	
0935	6.26	10.99	300	1.85	5.24	26.0		24.55	
0938	6.27	10.15	293	[illegible]	2.3	37.8		24.72	
0941	6.23	11.64	299	[illegible]	1.9	[illegible]		27.21	
0944	6.30	11.43	[illegible]	[illegible]	2.0	[illegible]		[illegible]	
0947	6.32	11.84	288	[illegible]	[illegible]	[illegible]		[illegible]	
0950	[illegible]	11.72	284	[illegible]	2.2	[illegible]		[illegible]	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

BOTTLES, pump in well

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-42

Date: 12/05/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 23.35 **Depth to Well Bottom (ft):** 41.65 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: WG-MW-42 **Sample Time:** 1352 on 12/5/03 **QA/QC:**

Sample Parameters:

Comments: [illegible] 1050 - DRY DURING SAMPLING

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1052	12.42	10.38	4080	5.06	25	73.5	500	25.57	
1055	12.67	10.87	4201	4.30	10.[illegible]	16.2	250	27.90	
1058	12.71	11.[illegible]	4217	4.09	5.59	89.9	250	30.15	
1101	12.72	11.44	4170	4.09	4.74	89.5	250	32.38	
1104	12.72	11.49	4095	4.17	5.11	[illegible]	250	33.80	
1107	12.69	11.50	3927	4.[illegible]	5.16	[illegible]	250	34.[illegible]	
1110	12.63	11.61	3750	3.45	[illegible]	[illegible]	250	35.02	
1113	12.65	11.66	3602	2.51	1.42	84.4	250	35.25	
1116	12.65	11.66	[illegible]	2.31	1.42	[illegible]	250	35.73	
1119	12.64	11.96	3832	2.11	1.45	86.1	[illegible]	36.73	
11.62	[illegible]	11.67	370[illegible]	1.7[illegible]	1.82	[illegible]	[illegible]	37.4[illegible]	
11.2[illegible]	[illegible]	11.41	3[illegible]	3.81	1.[illegible]	90.4	250	39.71	
Tolerance:	±0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

12/8/03 @ 1510 attempted water level Not measureable. Attempted pumping No water recovered
12/9/03 @ 0915 1/2 gallon Added to sample set.
12/9/03 @ 1352 - Added 1/4 gallon completed sample set

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Pump

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-43

Date: 12/05/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 41.49 **Depth to Well Bottom (ft):** 46.72 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 3.4 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-43 **Sample Time:** **QA/QC:**

Sample Parameters:

Comments: 2nd 0940

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
0942	6.75	8.54	514	2.58	23.5	41.2	250	42.45	
0945	6.84	10.36	498	1.50	17.4	60.6	250	43.56	
0948	6.79	10.70	468	1.38	9.6	75.3	250	44.35	
0951	6.82	11.15	576	1.45	6.4	80.2	250	—	*WATER LEVEL IS
0954	6.88	11.59	583	1.43	7.3	83.9	250	—	BELOW TOP OF PUMP
0956	WELL DRY - PUMP OFF								
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

12/8/03 @ 1545 Recovered 1/4 gal. for sample

12/9/03 @ 0855 Recovered 1/2 gallon / completed sample set.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-44

Date: 12/04/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: — **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** DRY **Depth to Well Bottom (ft):** 17.58 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: — **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: — **Sample Time:** — **QA/QC:** —

Sample Parameters: NOT SAMPLED - WELL IS DRY

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

NOT SAMPLED DRY

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-45

Date: 12/03/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: Masson **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 55.62 **Depth to Well Bottom (ft):** 67.11 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 7.1 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-45 12/03/03 **Sample Time:** 16:30 **QA/QC:**

Sample Parameters: PRIMARY ICAP

Comments: Pump on @ 1556

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1558	7.90	10.63	574	1.30	16.3	-100.8	500	58.73	
1601	7.91	11.87	560	0.68	45.1	-90.7	500	61.55	
1604	7.90	11.86	562	0.64	68.2	-98.6	500	62.80	
1607	7.90	12.02	564	1.17	87.7	-93.2	500	62.50	
1610	7.89	12.16	566	1.17	59.7	-88.1	500	62.65	
1613	7.90	12.30	572	0.85	48.7	-88.9	500	— BELOW TOP OF PUMP	
1616	8.00	12.40	578	0.29	45.2	-120.2	500	—	
1617	DRY — PUMP OFF								
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-46

Date: 12/04/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: — **Tubing Type:** HDPE **Pump Inlet:** —

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** DRY **Depth to Well Bottom (ft):** 38.70 (HARD BOTTOM) **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: — **Sample Time:** — **QA/QC:** —

Sample Parameters: NOT SAMPLED, WELL IS DRY

Comments: –

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
					WELL NOT SAMPLED				
						DRY!			
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-47

Date: 12/03/03 **Sampling Personnel:** CW/EL **Company:** URS Corporation

Purging/ Sampling Device: _____ **Tubing Type:** HDPE **Pump Inlet:** _____

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 19.64 **Depth to Well Bottom (ft):** 20.10 **Well Diameter:** _____ **Screen Length (ft):** _____

Casing: _____ **Vol. in 1 Well Casing (liters):** 283 ml **Estimated Purge Volume (liters):** _____

Sample ID: _____ **Sample Time:** _____ **QA/QC:** _____

Sample Parameters: NO SAMPLE COLLECTED

Comments: - INSUFFICIENT WATER

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

NOT PURGED

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-50

Date: 12/04/03 **Sampling Personnel:** [illegible] **Company:** URS Corporation

Purging/ Sampling Device: MONSOON/BAILER **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 36.57 **Depth to Well Bottom (ft):** 37.65 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 0.3 GAL

Sample ID: WG-MW-50 **Sample Time:** 1415 **QA/QC:**

Sample Parameters:

Comments: PUMP ON 1232 - NO PURGE WATER. BAILED DRY @ 1238. NO PARAMETERS. 10/05/03 - DRY - NO SAMPLE COLLECTED

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-51

Date: 12/04/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: Mon Sump **Tubing Type:** HDPE **Pump Inlet:** 37.5

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 31.77 **Depth to Well Bottom (ft):** 37.50 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 3.5 l **Estimated Purge Volume (liters):**

Sample ID: WG-MW-51 **Sample Time:** 1218 **QA/QC:** DUPLICATE "WG-FD-03"

Sample Parameters: Primary RAD

Comments: Pump off @ 1147

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1150	8.39	9.98	292	1.50	500	4.3	750	31.90	
1153	8.36	10.94	294	0.36	30.0	-41.0	750	31.90	
1156	7.86	11.21	329	0.25	10.0	-94.2	750	31.90	
1159	7.66	11.26	332	0.36	7.5	-109.8	750	31.90	
1202	7.53	11.27	333	0.39	4.0	-120.4	750	31.90	
1205	7.45	11.40	333	0.19	5.5	-130.9	750	31.90	
1208	7.45	11.36	332	0.24	6.3	-133.2	750	31.90	
1211	7.43	11.34	334	0.26	8.9	-138.7	750	31.90	
1214	7.39	11.34	336	0.22	4.6	-144.2	750	31.90	
1217	7.38	11.35	337	0.30	3.5	-146.6	750	31.90	
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-52

Date: 12/03/03 **Sampling Personnel:** CK/CM **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:** ~44'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 37.93 **Depth to Well Bottom (ft):** 44.44 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 4 l **Estimated Purge Volume (liters):**

Sample ID: "WG-MW-52 12/03/03" **Sample Time:** 1455 **QA/QC:** YES ?

Sample Parameters: Primary PAD

Comments: Pump on @ 1431

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1432	7.55	9.97	468	2.60	218	-74.5	250	38.04	
1436	7.30	10.82	456	0.72	111	-73.0	250	38.10	
1438	7.27	11.12	455	0.91	5.87	-57.1	500	38.29	
1441	7.19	11.22	455	0.10	8.12	-56.0	500	38.68	
1444	7.12	11.25	453	0.07	2.53	-51.8	500	38.46	
1447	7.07	11.28	452	0.06	1.06	-48.7	500	38.44	
1450	7.07	11.23	452	0.06	0.95	-46.0	500	38.51	
1453	7.07	11.24	451	0.06	0.85	-46.5	500	38.42	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

BOTTLES - BAILER @ well

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-53

Date: 12/04/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 58.76 **Depth to Well Bottom (ft):** 61.02 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 1.4 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-53 **Sample Time:** 1245 **QA/QC:**

Sample Parameters:

Comments: Pump on @ 1137 12/06/03 1020 — DRY — NO SAMPLE COLLECTED

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1138	8.00	8.76	677	4.50	>1100	58.0	150	—	DW below pump
1141	7.70	9.77	680	2.57	7/100	49.2	100	—	"
1142	DRY - Pump off		well is dry.		Purged ~2	5.0 liters.			
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-54

Date: 12/1/3 **Sampling Personnel:** BL/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON/BAILER **Tubing Type:** HDPE **Pump Inlet:** 22'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 20.74 **Depth to Well Bottom (ft):** 22.73 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 0.2 GAL

Sample ID: MW-54 12/1/03 **Sample Time:** 12/1/03 1515 – 12/05/03 0845 **QA/QC:**

Sample Parameters:

Comments: Pump off @ 15:11
15:16 ; well went dry

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
15:12	6.72	11.14	186	NA	NA	123	[illegible]	1	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-56

Date: 12/03/03 **Sampling Personnel:** BG/SG **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 23.21 **Depth to Well Bottom (ft):** 28.22 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 6 gallons

Sample ID: WG-MW-56 **Sample Time:** 1350 **QA/QC:**

Sample Parameters:

Comments: Pump on 1310

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1311	5.89	11.02	312	2.92	525	73.5		24.4	
1314	5.68	11.94	308	1.73	213	98.8		24.91	
1317	5.58	12.31	338	1.72	70.1	93.8		25.30	
1321	5.55	12.41	356	1.63	31.7	87.7		25.41	
1324	5.55	12.47	368	1.28	21.3	76.6		25.46	
1327	5.53	12.56	378	1.01	19.7	70.9		NA	NO WATER LEVEL -
1330	5.54	12.41	384	0.73	NA	64.9		NA	INDICATOR STUCK IN WELL.
1333	5.56	12.39	390	0.45	408	63.5		NA	
1336	5.57	12.38	390	0.62	553	63.9		NA	
1339	5.56	12.57	391	0.82	110	63.5		NA	
1342	5.56	12.53	391	0.90	30	64.1		NA	
1345	5.55	12.62	394	0.87	17	64.4		NA	
1348	5.54	12.55	395	0.82	16	65.0		NA	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

*D.O. NOT CALIBRATED, VALUES AS REFERENCE ONLY.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-57

Date: 12/02/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:** 123.4

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 118.53 **Depth to Well Bottom (ft):** 123.53 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** 3.08 **Estimated Purge Volume (liters):**

Sample ID: WG-MW-57 12/02/03 **Sample Time:** 1125 **QA/QC:** No

Sample Parameters: PRIMARY LEAD - COMPLETED SAMPLING @ 12/04/03 @ 0745

Comments: Pump on @ 1110

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
1112	6.80	10.19	2457	3.22	875	-0.9	500	121.5	
1115	7.39	10.59	2618	1.31	350	-9.0	250	BELOW TOP OF PUMP	
1117 → WELL IS DRY - REMOVING PUMP, WILL let recharge and collect sample									
casing bailer.									
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-58

Date: 12/04/03 **Sampling Personnel:** BL/JG **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 5.05 **Depth to Well Bottom (ft):** 37.11 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 3.5 gallons

Sample ID: WG-MW-58 **Sample Time:** 1018 **QA/QC:** SPLIT

Sample Parameters:

Comments: PUMP ON 0949, FLOW CELL IS LEAKING - DO READINGS ARE SUSPECT.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
0950	5.61	10.21	445	2.90	NA	156.2		8.62	
0953	6.15	10.37	447	2.26	NA	13[illegible]		9.60	
0956	6.32	10.25	447	2.12	NA	119.2		9.31	
0959	6.43	10.29	447	2.09	NA	97.2		9.29	
1002	6.49	10.44	448	1.88	NA	40.4		9.23	
1005	6.50	10.42	446	1.65	NA	-11.9		9.22	
1008	6.50	10.44	442	1.39	NA	-25.8		9.10	
1011	6.50	10.50	431	1.15	NA	-32.0		9.09	
1014	6.47	10.52	423	0.96	NA	-33.1		9.04	
1017	6.44	10.56	416	0.89	NA	-29.9		9.03	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-59

Date: 12/05/03 **Sampling Personnel:** BG/JG **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 5.11 **Depth to Well Bottom (ft):** 14.33 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 4 GAL

Sample ID: W6-MW-59 **Sample Time:** 1610 **QA/QC:**

Sample Parameters:

Comments: PUMP ON 1407, AIR BUBBLES IN TUBING, [illegible] CELL LEAKING DISC @ 1419

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1408	5.90	8.78	139	3.41	>1100	207.8		6.23	
1411	5.26	8.40	137	2.91	>1100	204.9		8.[illegible]	[illegible]
1414	4.99	9.73	139	4.21	>1100	197.8		11.3[illegible]	[illegible]
1417	4.88	10.69	[illegible]	[illegible]	>1100	[illegible]		[illegible]	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-64

Date: 12/1/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** HDPE **Pump Inlet:** ~20'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 12.09 **Depth to Well Bottom (ft):** 22.03 **Well Diameter:** 2 **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: ~~MW-64~~ WG-MW-64 12/01/03 **Sample Time:** 1315 **QA/QC:** DUPLICATE ~~"DUP-12/01/03"~~ → WG-FD-01

Sample Parameters: Primary BAD

Comments: TOTAL 4 GAL Plastic w/ HNO_3

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
1256	3.28	11.58	177	5.98	1071	115.9	800	12.55	Leaking flow cell
1259	6.98	11.91	107	6.86	599	149.9	1000	13.03	
1302	6.30	12.02	119	8.98	335	167.5	1000	13.71	
1305	6.31	12.31	109	6.23	350	152.1	1000	13.82	
1308	6.35	12.51	115	6.31	545	159.7	1100	13.95	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

DIFFICULT TO MAINTAIN STEADY FLOW RATE.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-67

Date: 12/01/03 **Sampling Personnel:** CM/EL **Company:** URS Corporation

Purging/ Sampling Device: Masson **Tubing Type:** HDPE **Pump Inlet:** ~~25.77~~ ~21.0'

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** — * **Depth to Well Bottom (ft):** 22.74 **Well Diameter:** 2" PVC **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: WG-MW-67 12/01/03 **Sample Time:** 1602 **QA/QC:** "WG-FD-02" FIELD DUP

Sample Parameters: Primary RAD TOTAL 4 GAL's

Comments:
Pump on @ 1540

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	** FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	Comments
1541	6.59	11.13	50.0	6.94	>1100	213.0	~850	—	* unable to round 5 L/c
1544	6.34	11.38	50.0	6.29	514	222.7	~850	—	indicator is malfunctioning
1547	6.02	11.04	50.0	5.86	611	226.2	~850	—	
1550	~~1650~~ (11)	6.07	11.05	50.0	5.72	346	231.8	~850	—	
1553	1603 (9)	5.98	11.47	45.0	5.79	298	234.9	~850	—	
1556	5.99	11.43	42.0	5.68	251	236.3	~850	—	
1559	5.81	11.44	41.0	5.63	210	237.4	~850	—	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

** very difficult to maintain steady flow rate!
RATE FLUCTUATES FROM ~250 ml/min → 1500 ml/min.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: RI 11173233.00000 Site: SLDA Well I.D.: MW-01

Date: 6/8/04 Sampling Personnel: KJM + DC Company: WS

Purging/ Sampling Device: MONSOON Tubing Type: 3/8" ID LDPE Pump/Tubing Inlet Location: ≈19' from TOR

Measuring Point: TOR Initial Depth to Water: 7.69' Depth to Well Bottom: 20.20' Well Diameter: 4" Screen Length: 10'

Casing Type: SS Volume in 1 Well Casing (liters): 30.9 Estimated Purge Volume (~~liters~~ GAL): 8

Sample ID: WG-MW-01 Sample Time: 10:50 QA/QC: NONE

Sample Paramaters: PROPC

Other Information: DID NOT ADJUST FLOW RATE

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (~~mmhos~~ mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0950	6.42	13.82	0.273	2.32	6.08	170.2	350	7.69
00:09	6.38	12.78	0.285	1.28	6.45	156.6	450	7.69
10:14	6.38	12.40	0.285	1.26	3.29	144.5	500	"
10:19	6.39	12.21	0.286	1.26	2.19	135.7	500	"
10:24	6.40	12.16	0.290	1.29	1.27	125.9	600	"
10:29	6.40	12.10	0.290	1.26	0.40	116.0	550	"
10:34	6.40	12.20	0.291	1.21	0.40	112.3	450	"
10:40	6.40	11.81	0.289	1.47	0.35	104.5	1100	"
10:45	"	11.76	0.285	1.45	0.00	99.9	1100	"
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: RI 11173233.00000 Site: SLDA Well I.D.: MW-2

Date: 6/10/04 Sampling Personnel: JC Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location:

Measuring Point: TOC Initial Depth to Water: 76.30' Depth to Well Bottom: 93.05 Well Diameter: 4" Screen Length:

Casing Type: SCH 40 PVC Volume in 1 Well Casing (liters): 41.4/11 GAL Estimated Purge Volume (liters): ~49L/13gal

Sample ID: ~~[illegible]~~ WG-MW-02 Sample Time: 1800 QA/QC: N/A

Sample Paramaters:

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
1640 ~~1640~~	5.56	13.07	1.194	1.83	13	101.8	390	76.56	PUMP BREAK DOWN
1705	6.20	12.62	1.292	0.81	17	16.0	830	76.56	
1710	6.53	12.58	1.283	0.62	17	2.9	720	76.49	
1720	5.79	13.10	1.283	0.39	8.4	7.3	500	76.50	
1730	6.05	13.41	1.287	0.29	4.7	2.5	410	76.50	
1740	6.02	13.53	1.294	0.23	2.8	2.4	400	76.50	
1750	6.00	13.78	1.295	0.20	1.7	5.3	400	76.54	
1755	6.00	13.39	1.298	0.19	2.0	3.2	400	76.54	
1800	6.02	13.25	1.297	0.17	1.2	3.8	400	76.56	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-02A

Date: 6/11/04 Sampling Personnel: KGM+DC Company: URS Corporation

Purging/ Sampling Device: Monsoon Tubing Type: 3/8" LDPE Pump Inlet: ≈50.5'

Measuring Point: TOC Initial Depth to Water (ft): 47.00 Depth to Well Bottom (ft): 51.55 Well Diameter: 4" Screen Length (ft):

Casing: SCH 40 PVC Vol. in 1 Well Casing (liters): 11.2/3.0 gal Estimated Purge Volume (liters): ~ 11L/3 gal

Sample ID: WG-MW-02A Sample Time: 0840/6/2-04 QA/QC:

Sample Parameters: See 0840 TIME FOR PARAMETERS

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
0945	8.17	12.43	0.444	4.01	12	-51.9	1000	47.20	
0950	6.68	11.72	0.431	0.82	7.3	-71.3	400	47.6	
1000	6.25	12.48	0.396	1.40	4.2	88.7	500	48.05	
1010	6.54	12.81	0.385	1.77	2.9	89.5	300	48.45	
1020	6.13	12.28	0.382	1.82	1.4	95.6	500	49.50	
1030	6.50	12.63	0.381	1.6	1.6	93.2	280	50.10	
1040	6.28	13.01	0.393	1.31	0.24	93.6	800	50.42	
1050	6.31	13.66	0.384	1.34	0.54	74.0		50.73	Well Pumped DRY
/	—	— Well Recharge			TIME	—	—		
1430		"			"			49.75	
6/12/04 0835		"			"			47.78	
0840	7.87	12.00	0.509 mS/cm	6.00	3.9	75.1	300	47.78	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: RI 11173233.00000 Site: SLDA Well I.D.: MW-03

Date: 6/10/04 Sampling Personnel: JC + KTM Company: URS

Purging/ Sampling Device: MONSOON Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location: 53'

Measuring Point: TOC Initial Depth to Water: 52.35' Depth to Well Bottom: 53.65' Well Diameter: 4" Screen Length:

Casing Type: Sch 40 PVC Volume in 1 Well Casing (liters): 3.2 / 0.86 GAL Estimated Purge Volume (liters): 3 L / 0.8 gal

Sample ID: ~~WG-MW-03~~ NO SAMPLE Sample Time: N/A QA/QC: N/A

Sample Paramaters:

Other Information: ~~Ex.~~ Purged to dryness (Could not sample well after recharge within 24 Hour period.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1438	2.89	12.16	1.837	7.86	2.2	448.8		52.65
1443	–	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	STOPPED	PUMPING		53.19
1835		Recharge			NO WATER			53.02
6/11/04 09:11		Recharge		DATA				52.70
1115			"	"				52.65
1445			"	"				52.61
		No sample collected						
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: IA 11173233.00000 Site: SLDA Well I.D.: MW-05

Date: 6/9/04 Sampling Personnel: KTM + DC Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location:

Measuring Point: TOC Initial Depth to Water: 26.05 Depth to Well Bottom: 27.52 Well Diameter: 4" Screen Length: 10'

Casing Type: SS-Sigeon / SCH 40 PVC Nipson Volume in 1 Well Casing (liters): 3.63 / 25.97 gal Estimated Purge Volume (liters): 15.54 / 4 gal

Sample ID: WG-MW-05 Sample Time: 1800 QA/QC:

Sample Paramaters: PROPCs

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1620	5.53	16.42	0.546 mS/cm	2.20	40	130.9	700	26.14
1625	5.31	13.42	0.504 mS/cm	1.00	14	150.9	700	26.41
1635	5.31	14.23	0.521 mS/cm	0.74	3.3	154.9	400	26.85
1645	5.34	17.56	0.658 mS/cm	1.04	4.4	154.8	200	26.95
1650		went DRY but moderate to good recharge						
1715		Recharging						26.85
1730		"	"					26.54
1745		"	"					26.26
1800	6.30	sampled			19			
1800	6.30	16.31	0.559	6.12	19	144.7	—	26.20
18:02		STOPPED PUMP TO LET RECHARGE						DRY
18:07								26.60
18:19		FINISHED SAMPLING						26.51
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: NI 11173233.00000 Site: SLDA Well I.D.: MW-06

Date: 6/9/04 Sampling Personnel: KAM + DC Company: UNS

Purging/ Sampling Device: MONSOON Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location: ≈27.5'

Measuring Point: TOC Initial Depth to Water: 24.14 Depth to Well Bottom: 28.85' Well Diameter: 4" Screen Length: 10'

Casing Type: SCH 40 PVC Volume in 1 Well Casing (liters): 11.6/3.1 GAL Estimated Purge Volume (liters): 26.6 L/7 gal

Sample ID: WG-MW-06 Sample Time: 1220 QA/QC: yes (MS/MSD)

Sample Paramaters: PNOPC

Other Information: Very orange, slight order

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1125	6.41	15.62	0.744 ms/cm	2.27	500	-78.9	600	24.21
1135	6.21	14.89	0.748 ms/cm	0.31	110	-67.7	360	24.22
1145	6.24	14.75	0.759 ms/cm	0.29	70	-57.1	700	24.21
1155	6.21	13.27	0.719 ms/cm	0.15	19	-57.6	700	24.21
1205	6.23	15.10	0.764 ms/cm	0.19	27	-57.9	200	24.21
1215	6.30	16.30	0.768 ms/cm	0.21	40	-45.9	200	24.21
1220	—	SAMPLE	—	—	—	—	—	→
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-07

Date: 6/10/04 Sampling Personnel: T. Urban / J. Doerr Company: URS Corporation

Purging/ Sampling Device: HDPE Bailer Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 33.78' Depth to Well Bottom (ft): 35.45 Well Diameter: 4" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 3.6 Estimated Purge Volume (liters): 8

Sample ID: See other page Sample Time: See other page QA/QC: None

Sample Parameters:

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1130	7.90	13.3	0.336	4.63	5.33	50.7	—	—	
1131	7.74	12.7	0.320	5.21	7.47	52.7			
1132	7.65	12.9	0.312	4.71	20.0	54.6			
1133	7.57	12.1	0.312	4.64	108	55.1			
1135	7.54	12.1	0.315	5.03	162	53.3			
1136	7.52	12.2	0.321	5.45	181	51.6			
1138	7.47	12.0	0.332	5.21	215	49.5		34.25	
1141	7.45	12.7	0.341	4.46	186	44.5			2 gal purged
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-07

Date: 6/10/04 Sampling Personnel: T. Urban / J. Doerr Company: URS Corporation

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump Inlet: 34.75

Measuring Point: BTOR Initial Depth to Water (ft): 34.25' Depth to Well Bottom (ft): 35.45 Well Diameter: 4" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 3.6 Estimated Purge Volume (liters): 8

Sample ID: WG-MW-07 Sample Time: 1350 QA/QC: None

Sample Parameters: Primary ROPC's

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1335	7.81	12.6	0.355	4.25	60	32.9	1600	34.25	
1338	7.56	12.3	0.350	3.28	50	34.4	200	34.61	
1341	7.38	12.7	0.354	3.51	40	36.7	1100	34.24	
1343	7.29	12.6	0.359	3.00	26	38.7	900	34.39	
1346	7.26	12.4	0.363	2.74	13	37.4	850	34.42	
1349	7.27	12.4	0.366	2.68	10	34.5	800	34.48	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well I.D.: MW-08

Date: 6/7/04 Sampling Personnel: T. Urban/J. Doerr Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump/Tubing Inlet Location: 34'

Measuring Point: BTOR Initial Depth to Water: 14.18 Depth to Well Bottom: 35.97 Well Diameter: 4" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 53.8 Estimated Purge Volume (liters): 30

Sample ID: WG-MW-08 Sample Time: 1300 QA/QC: None

Sample Paramaters: Primary TOPCs

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1225	7.92	15.8	0.201	4.18	45	-20	750	14.38
1230	7.73	12.1	0.195	0.14	36	-50	1100	15.52
1235	7.69	12.2	0.196	0.11	23	-56	850	16.35
1240	7.67	12.3	0.194	0.10	18	-62	750	16.63
1245	7.67	12.3	0.193	0.10	13	-67	800	16.90
1250	7.71	12.4	0.193	0.10	9.7	-75	750	17.10
1255	7.69	12.5	0.192	0.08	7.5	-79	600	17.20
1300	7.70	12.8	0.193	0.08	7.2	-79	500	17.21
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well I.D.: MW-09A

Date: 6/9/04 Sampling Personnel: T. Urban/J. Doerr Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump/Tubing Inlet Location: 35'

Measuring Point: BTOR Initial Depth to Water: 21.18' Depth to Well Bottom: 37.28' Well Diameter: 4" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 39.8 Estimated Purge Volume (liters): 28

Sample ID: WG-MW-09A Sample Time: 1045 QA/QC: None

Sample Paramaters: Primary ROPCs

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1005	7.63	13.4	0.148	2.34	11	14.7	600	22.09
1010	7.37	13.4	0.145	1.83	11	12.7	400	22.45
1015	7.25	13.0	0.144	2.25	14	8.1	1400	22.95
1020	7.18	12.3	0.140	2.25	15	8.5	900	24.62
1025	7.17	12.6	0.141	2.11	13	6.9	600	25.85
1030	7.10	13.5	0.140	1.70	10	8.1	400	26.61
1035	7.15	12.1	0.140	2.33	9.6	8.6	1100	27.80
1040	7.20	12.3	0.139	2.29	8.9	3.7	1000	28.65
1045	7.21	12.4	0.138	2.24	9.3	3.2	900	29.57
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-11S

Date: 6/11/04 Sampling Personnel: Urban/Doerr Company: URS Corporation

Purging/Sampling Device: HDPE Bailer Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 11.99' Depth to Well Bottom (ft): 12.07' Well Diameter: 2" Screen Length (ft): 5'

Casing: PVC Vol. in 1 Well Casing (liters): .05 Estimated Purge Volume (liters): N/A

Sample ID: N/A Sample Time: N/A QA/QC: N/A

Sample Parameters: Not enough water to purge / bail

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-11D

Date: 6/11/04 Sampling Personnel: Urban / Doerr Company: URS Corporation

Purging/ Sampling Device: HDPE Bailer Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 41.06 Depth to Well Bottom (ft): 43.67' Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. In 1 Well Casing (liters): 1.6 Estimated Purge Volume (liters): 4

Sample ID: NO SAMPLE Sample Time: QA/QC: N/A

Sample Parameters:

Comments: .18' recharge in 3 hrs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1055	7.35	11.4	0.516	3.04	5.03	91.6			
1057	7.30	11.4	0.521	1.88	25.5	86.8			
1059	7.21	11.3	0.520	2.90	31.8	90.4			
1101	7.27	11.1	0.518	5.31	100	89.3			
1102	7.38	11.1	0.517	4.95	62.7	84.5			
1104	7.39	11.0	0.518	5.98	359	83.4		43.31	dry
1410								43.13	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: SLDA Well I.D.: MW-12D

Date: 6/12/04 Sampling Personnel: DC + KTM Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: Sch. 40 HDPE Pump/Tubing Inlet Location:

Measuring Point: TOC Initial Depth to Water: 30.29 Depth to Well Bottom: 34.35 Well Diameter: 2" Screen Length:

Casing Type: stainless steel Volume in 1 Well Casing (liters): 2.54/0.69 GAL Estimated Purge Volume (liters):

Sample ID: FWG-MW-12D Sample Time: 1155 QA/QC: DUP

Sample Paramaters: see sample Time 1155 for PARAMETERS PROPC

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (~~µmhos~~) mS/cm	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1035	7.79	11.87	0.341 mS/cm	1.83	75	123.4	900m	30.44
1040	7.16	11.36	0.292 mS/cm	0.87	14.7	107.4	500	30.39
1050	7.53	11.49	0.257 mS/cm	0.48	10.9	75.7	500	30.38
1100	7.79	11.92	0.258	0.54	.55	68.3	400	30.38
1110	6.86	12.11	0257	0.34	.31	63.7	300	30.38
1120	7.02	11.78	0.257	0.44	.01	74.2	200	30.38
1130	6.96	11.64	0.248	0.42	0.14	8.74	500	30.38
1140	7.00	11.43	0.231	0.44	0.23	80.1	550	30.47
1150	6.99	11.52	0.227	0.47	0.0	75.4	500	30.35
1155	6.99	11.62	0.226	0.45	0.1	72.4	500	30.36
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well I.D.: MW-13

Date: 6/8/04 Sampling Personnel: T. Urban / J. Doerr Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump/Tubing Inlet Location: 36

Measuring Point: BTOR Initial Depth to Water: 23.83' Depth to Well Bottom: 38.59' Well Diameter: 2" Screen Length: 10

Casing Type: PVC Volume in 1 Well Casing (liters): 9.1 Estimated Purge Volume (liters): 35

Sample ID: WG-MW-13 Sample Time: 1745 QA/QC: None

Sample Paramaters: Primary ROPCs

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1710	7.45	14.2	0.177	3.60	130	-10	1200	24.55
1715	7.56	12.6	0.177	2.54	55	-19	900	24.43
1720	7.57	12.2	0.177	0.70	17	-44	900	24.52
1725	7.57	12.0	0.177	0.29	4.7	-65	900	24.61
1730	7.60	11.8	0.176	0.20	2.1	-79	900	24.72
1735	7.60	11.8	0.174	0.17	0.60	-94	1100	24.90
1740	7.60	11.7	0.174	0.14	0.00	-95	1100	25.00
1745	7.60	11.7	0.174	0.12	0.45	-93	1100	25.11
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well I.D.: MW-14

Date: 6/8/04 Sampling Personnel: T. Urban / J. Doerr Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump/Tubing Inlet Location: 30'

Measuring Point: BTOR Initial Depth to Water: 14.72 Depth to Well Bottom: 32.37 Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 10.8 Estimated Purge Volume (liters): 20

Sample ID: WG-MW-14 Sample Time: 1650 QA/QC: None

Sample Paramaters: Primary ROPCs

Other Information: rust color water initially

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1620	7.04	13.0	0.155	0.77	7999	-17	800	14.72
1625	6.91	11.2	0.153	0.14	80	-27	900	16.18
1630	6.73	11.1	0.154	0.09	21	-29	900	16.25
1635	6.73	11.0	0.155	0.07	8.1	-34	850	16.25
1640	6.75	11.2	0.155	0.06	38	-36	800	16.22
1645	6.74	11.0	0.155	0.06	8.1	-37	800	16.30
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well I.D.: MW-15

Date: 6/9/04 Sampling Personnel: T. Urban / J. Doerr Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump/Tubing Inlet Location: 29'

Measuring Point: BTOR Initial Depth to Water: 12.23 Depth to Well Bottom: 31.39' Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 11.8 Estimated Purge Volume (liters): 20

Sample ID: WG-MW-15 Sample Time: 845 QA/QC: MS/MSD

Sample Paramaters: Primary ROPCs

Other Information: MS/MSD

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0800	9.50	13.3	0.333	1.72	330	2.9	800	14.52
0805	6.92	12.6	0.105	0.64	290	70.9	450	14.84
0810	6.77	12.5	0.096	0.62	150	67.8	500	15.05
0815	6.68	12.7	0.096	0.42	95	60.0	400	15.22
0820	6.71	12.9	0.100	0.40	65	50.3	300	15.15
0825	6.75	12.6	0.109	0.37	50	37.4	500	15.51
0830	6.75	12.9	0.112	0.38	36	32.0	500	15.55
0835	6.82	12.9	0.118	0.38	27	20.4	500	15.64
0840	6.84	12.4	0.117	0.27	21	10.8	800	16.60
0845	6.81	12.3	0.114	0.28	21	9.3	800	16.95
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-16

Date: 6/12/04 Sampling Personnel: Urban / Doerr Company: URS Corporation

Purging/ Sampling Device: _____ Tubing Type: _____ Pump Inlet: _____

Measuring Point: _____ Initial Depth to Water (ft): DRY Depth to Well Bottom (ft): 113.45 Well Diameter: _____ Screen Length (ft): _____

Casing: _____ Vol. in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: N/A Sample Time: _____ QA/QC: _____

Sample Parameters: _____

Comments: _____

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft, 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-16BC

Date: 6/12/04 Sampling Personnel: Urban / Doerr Company: URS Corporation

Purging/ Sampling Device: Grunfos Tubing Type: LLDPE Pump Inlet: 190'

Measuring Point: BTOR Initial Depth to Water (ft): 140.54 Depth to Well Bottom (ft): 206.06 Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 40.4L Estimated Purge Volume (liters): 16

Sample ID: WG-MW-16BC Sample Time: 1040 QA/QC: None

Sample Parameters: Primary ROPCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1010	8.93	14.9	0.572	1.28	3.2	-106	1100	140.54	
1015	9.19	13.8	0.571	0.49	10	-121	500	152.82	
1020	9.21	15.2	0.573	0.37	9.9	-130	350	153.70	
1025	9.21	14.1	0.578	0.35	8.8	-132	450	155.42	
1030	9.22	15.0	0.574	0.35	8.6	-134	225	156.20	
1035	9.19	14.2	0.576	0.39	10.0	-133	700	158.95	
1040	9.19	14.5	0.573	0.32	6.6	-134	900	162.74	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-17

Date: 6/11/04 Sampling Personnel: T. Urban / J. Doerr Company: URS Corporation

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump Inlet: 52'

Measuring Point: BTOR Initial Depth to Water (ft): 47.59' Depth to Well Bottom (ft): 54.10' Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 4.0 Estimated Purge Volume (liters): 6

Sample ID: N/A Sample Time: N/A QA/QC: None

Sample Parameters: N/A.

Comments: .14' recharge in 6 hrs NOT SAMPLED

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
810	8.81	12.7	0.537	5.67	2.53	74.6	1400	47.59	
813	8.01	12.0	0.520	6.86	2.15	91.2	700	49.50	
816	7.66	11.9	0.514	6.95	1.38	96.8	600	50.16	
819	7.49	12.0	0.514	6.45	1.07	92.9	400	Below	top of pump
821	7.47	12.1	0.514	5.30	0.87	87.7	350	"	" " "
824	7.48	12.2	0.514	4.75	0.61	81.1	300	"	" " "
827	7.50	12.4	0.515	4.76	0.42	78.4	200	"	" " "
830	7.51	12.5	0.515	4.70	*	67.0	*	"	" " "
						* - dry (flow stops before obtained)			
								51.35	
1415								51.21	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: RI 11173233.00000 Site: SLDA Well I.D.: MW-19

Date: 6/8/04 Sampling Personnel: KSM + DC Company: UNS

Purging/ Sampling Device: MONSOON Tubing Type: 3/8" ID LDPE Pump/Tubing Inlet Location: ~103'

Measuring Point: TOC Initial Depth to Water: 56.10 Depth to Well Bottom: 107.65 Well Diameter: 2" Screen Length: 10'

Casing Type: SCH 40 PVC Volume in 1 Well Casing (liters): 31.8 / 8.7 GAL Estimated Purge Volume ~~(liters)~~: 12 GAL

Sample ID: WG-MW-19 Sample Time: 13:10 QA/QC: NONE

Sample Paramaters: PHOPC

Other Information: PURGED FROM MW FROM 1100 → 700, SLIGHT ODOR

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. ~~(µmhos)~~ mS/cm	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
12:23	8.08	12.91	0.558	0.57	5.6	168.7	1000	58.30
12:28	8.00	12.87	0.508	0.33	2.0	-180-	1100	60.19
12:33	7.96	13.14	0.484	0.25	0.86	-166.7	700	59.86
12:38	7.98	13.12	0.457	0.21	0.65	-148.3	800	59.70
12:43	7.99	13.12	0.436	0.18	0.50	-155.2	840	61
12:48	7.98	13.09	0.430	0.15	0.6	-160.6	840	59.80
12:53	7.97	13.08	0.433	0.13	0.75	-162.9	840	[redacted] ← 60.00
12:58	7.95	13.35	0.437	0.11	0.85	-160.0	840	59.90
13:03	7.94	13.11	0.448	0.11	0.45	-156.4	840	59.98
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: ACI 1173233.00000 Site: SLOP Well I.D.: MW-20

Date: 6/10/04 Sampling Personnel: PC + KTM Company:

Purging/ Sampling Device: MONSOON Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location:

Measuring Point: TOC Initial Depth to Water: 51.82 Depth to Well Bottom: 55.05 Well Diameter: 2" Screen Length: 10

Casing Type: SCH 40 PVC Volume in 1 Well Casing (liters): 2.0/0.5 GAL Estimated Purge Volume (liters): 1 gal

Sample ID: WG-MW-26 Sample Time: N/A QA/QC: N/A

Sample Paramaters:

Other Information: No sample collected due to slow recharge and insufficient water after 24 Hour period.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
1505	2.71	12.17	2.196	6.25	230	476.6	-	52.60	OBSTRUCTED @ 52.60
1510	2.51	12.82	2.305	6.54	221	476.8	-	52.60	" "
1520	2.76	12.95	2.135	7.62	235	475.6	-	53.55	
1523	N/A	went	Dry / Check and monitor water				-	53.50	
1530	N/A	recharge	DATA				-	53.55	
1831		"	"				-	53.47	
6/11/04 09:07		"	"				-	53.40	
1110		"	"				-	53.40	
1440		"	"				-	53.39	
		No sample collected							
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: NI 11173233.00000 Site: SLDA Well I.D.: 21

Date: 6/10/04 Sampling Personnel: KGM & DC Company: WMS

Purging/ Sampling Device: Monsoon Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location: N/A

Measuring Point: TOC Initial Depth to Water: DRY Depth to Well Bottom: 58.69 Well Diameter: 2" Screen Length:

Casing Type: SCH 40 PVC Volume in 1 Well Casing (liters): 0 Estimated Purge Volume (liters): 0

Sample ID: N/A Sample Time: N/A QA/QC: NONE

Sample Paramaters:

Other Information: WELL DRY DID NOT SAMPLE

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: RI 11173233.00000 Site: SLDA Well I.D.: MW-22

Date: 6/10/04 Sampling Personnel: DC/KM Company: URS

Purging/Sampling Device: Monsoon Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location: 98'

Measuring Point: TOC Initial Depth to Water: 88.00' Depth to Well Bottom: 113.75 Well Diameter: 2" Screen Length: 10'

Casing Type: SCH 40 PVC Volume in 1 Well Casing (liters): 15.9/4.4 GAL Estimated Purge Volume (liters): 67

Sample ID: WG-MW-22 Sample Time: 1310 QA/QC: N/A

Sample Paramaters: PROPC$_3$

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1155	6.28	14.41	0.894	0.90	7.9	-58.7	500	88.00
1200	6.61	13.03	0.889	0.30	5.7	-83.2	1000	88.02
1210	6.69	13.82	0.914	1.03	3.4	-62.8	1000	88.02
1220	6.43	12.49	0.911	0.14	0.95	-57.3	1200	88.05
1230	6.20	12.70	0.918	0.10	1.3	-63.0	1200	88.06
1240	6.57	13.17	0.929	0.10	3.4	-66.8	800	88.06
1250	6.30	13.47	0.934	0.11	1.9	-60.7	600	88.06
1200	6.49	13.69	0.939	0.11	3.6	-62.8	800	88.04
1305	6.46	13.93	0.946	0.09	2.3	-68.3	500	88.04
1310	6.47	13.99	0.942	0.12	6.7	-69.9	300	88.04
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: KI 11173233.00000 Site: SLDA Well I.D.: MW-23

Date: 6/8/04 6/9/04 Sampling Personnel: KTM + DC Company: UNS

Purging/ Sampling Device: Monsoon Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location: ~65'

Measuring Point: TOC Initial Depth to Water: 45.33' 56.82' Depth to Well Bottom: 69.49 Well Diameter: 2" Screen Length: 10'

Casing Type: Sch 40 PVC Volume in 1 Well Casing (liters): 14.9/4.1 gal Estimated Purge Volume (liters): 6 gal.

Sample ID: ~~MW~~ NG-MW-23 Sample Time: 1825 QA/QC: ~~MS/MSD 01~~

Sample Paramaters:

Other Information: Stopped Sampling @ 19:05 DTW @ ~~bott~~ Bottom Screen

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
1733	7.18	14.23	0.330 mS/cm	1.20	4.3	82.4	800	47.40	6/8/04
1738	7.32	14.12	0.330 mS/cm	0.38	1.2	33.8	300	50.40	
1748	7.46	14.68	0.336 mS/cm	0.30	0.8	-3.7	400	52.51	
1752 ~~1700~~	7.30	14.25	0.333 mS/cm	0.25	1.2	-4.9	700	55.95	
1800	~~7.30~~ 11	14.91	0.339	0.36	1.9	1.3	400	58.40	
1810	7.33	14.60	0.338 mS/cm	0.44	1.4	-13.6	600	60.05	
1815	7.29	16.19	0.347 mS/cm	0.37	1.2	-12.6	150	61.04	
1820	7.28	15.56	0.339 mS/cm	0.30	0.4	-10.5	200	62.35	
0835	6.01	14.18	0.354 mS/cm	6.04	20	168	420	59.15	6/9/04
0840	6.54	13.60	0.338 mS/cm	5.72	5.1	138.6	400	60.05	
0850	6.75	14.96	0.339 mS/cm	5.62	1.0	97.4	400	61.43	
0900	6.95	15.27	0.358 mS/cm	6.89	1.2	105.3	375	61.80	
0910	6.89	14.90	0.349 mS/cm	6.22	0.1	80.4	700	63.05	
0915	6.79	15.24	0.347 mS/cm	5.18	0.0	83.0	300	64.08	
0920	6.76	16.39	0.358 mS/cm	5.	0.15	79.5	500	64.01	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well I.D.: MW-24 2

Date: 6/8/04 Sampling Personnel: T. Urban / J. Doerr Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump/Tubing Inlet Location: 35'

Measuring Point: BTOR Initial Depth to Water: 16.97 Depth to Well Bottom: 37.16' Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 12.5 Estimated Purge Volume (liters): 19.0

Sample ID: WG-MW-24 Sample Time: 1055 QA/QC: FD-01

Sample Paramaters: Primary ROPCs

Other Information: field duplicate

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1030	7.92	12.7	0.167	4.77	90	-17	1200	17.30
1035	7.51	11.5	0.165	1.62	600	-29	1300	17.31
1037	7.72	11.2	0.165	0.99	22	-44	1100	17.32
1040	7.68	11.1	0.166	0.60	14	-54	1100	17.35
1043	7.59	11.0	0.168	0.36	4.9	-67	1100	17.36
1045	7.54	11.1	0.169	0.29	2.3	-71	1000	17.36
1048	7.55	11.1	0.169	0.26	1.7	-76	800	17.38
1051	7.55	11.3	0.168	0.22	2.8	-79	1000	17.37
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-25

Date: 6/9/04 Sampling Personnel: T. Urban / J. Doerr Company: URS Corporation

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump Inlet: 36'

Measuring Point: BTOR Initial Depth to Water (ft): 17.48' Depth to Well Bottom (ft): 38.75' Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 13.1 Estimated Purge Volume (liters): 28

Sample ID: WG-MW-25 Sample Time: 1615 QA/QC: None

Sample Parameters: Primary ROPCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1530	10.7	15.9	0.281	2.63	12.3	-47	300	18.50	
1535	9.5	11.8	0.247	1.52	11.5	11.8	900	22.15	
1540	8.9	12.9	0.253	1.20	8.10	22.2	300	23.77	
1545	8.5	11.8	0.242	1.39	5.74	25.7	450	27.19	
1550	8.3	12.4	0.242	1.13	6.10	24.1	400	27.80	
1555	8.0	11.3	0.230	0.92	4.67	22.6	1100	29.16	
1600	7.9	11.5	0.220	1.05	12.5	12.9	900	30.50	
1605	7.7	12.2	0.225	1.18	10.69	11.0	550	31.40	
1610	7.7	12.9	0.231	0.95	7.21	8.5	400	31.70	
1615	7.7	12.8	0.232	1.05	5.19	12.2	600	31.82	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-26

Date: 6/10/04 Sampling Personnel: T. Urban / J. Doerr Company: URS Corporation

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump Inlet: 36'

Measuring Point: BTOR Initial Depth to Water (ft): 30.55' Depth to Well Bottom (ft): 38.38' Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 4.8 Estimated Purge Volume (liters): 8

Sample ID: WG-MW-26 Sample Time: 1735 QA/QC: MS/MSD

Sample Parameters: Primary ROPCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1710	8.03	14.3	0.330	1.70	47.8	40.8	900	30.55	
1713	7.43	12.7	0.328	0.33	11.5	36.2	450	30.60	
1716	7.25	12.8	0.326	0.27	6.08	36.9	450	30.60	
1719	7.19	12.8	0.319	0.26	6.06	33.7	450	30.60	
1721	7.16	12.7	0.309	0.23	6.19	32.0	450	30.61	
1724	7.14	12.6	0.301	0.24	5.37	31.3	450	30.61	
1727	7.13	12.5	0.296	0.22	5.89	30.7	450	30.60	
1730	7.12	12.6	0.288	0.23	4.13	30.0	450	30.60	
1733	7.11	12.5	0.284	0.19	3.65	30.0	450	30.60	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-27

Date: 6/11/04 Sampling Personnel: Urban/Doerr Company: URS Corporation

Purging/Sampling Device: HDPE bailer Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 37.70 Depth to Well Bottom (ft): 38.82 Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): .7 Estimated Purge Volume (liters): 1

Sample ID: NO SAMPLE Sample Time: QA/QC: N/A

Sample Parameters:

Comments: Recharge 0.06' in 1.5 hrs = 0.04'/hr

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1350	7.65	12.1	0.687	5.70	100	142	-	-	
1352	7.59	11.5	0.694	6.36	679	144			
1354	7.58	11.4	0.695	7.15	>999	141		38.50	dry
1620								38.44	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-29

Date: 6/11/04 Sampling Personnel: Urban/Doerr Company: URS Corporation

Purging/Sampling Device: Monsoon Tubing Type: LLDPE Pump Inlet: 39

Measuring Point: BTOR Initial Depth to Water (ft): 19.05' Depth to Well Bottom (ft): 41.20' Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 13.7 Estimated Purge Volume (liters): 14

Sample ID: WG-MW-29 Sample Time: 930 QA/QC: QA Split

Sample Parameters: Primary ROPCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
850	7.91	11.9	0.255	4.49	10.55	81.7	600	19.05	
855	7.11	11.3	0.239	1.28	18.45	101.8	400	21.52	
900	6.94	11.5	0.232	1.21	20.2	10.5	250	22.10	
905	7.05	11.5	0.230	1.28	8.71	92.5	350	22.95	
910	7.03	11.6	0.230	1.01	5.03	81.5	250	22.95	
915	7.00	11.4	0.227	0.95	3.15	75.0	450	23.91	
920	6.96	11.4	0.226	0.73	3.28	68.2	500	24.12	
925	6.93	11.4	0.225	0.78	5.34	67.8	400	24.45	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft, 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.80000 Site: USACE-SLDA Well I.D.: MW-30A

Date: 6/8/04 Sampling Personnel: J. Doerr/T. Urban Company: URS

Purging/Sampling Device: HDPE Bailer Tubing Type: N/A Pump/Tubing Inlet Location: N/A

Measuring Point: BTOR Initial Depth to Water: 123.10' Depth to Well Bottom: 130.05' Well Diameter: 2" Screen Length: 9'

Casing Type: PVC Volume in 1 Well Casing (liters): 4.3 Estimated Purge Volume (liters): 4.5

Sample ID: Sample Time: QA/QC: No

Sample Paramaters: Primary ROPCs

Other Information:

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
	955	7.53	12.6	2.10	2.50	60	-115	—	—
	1000	7.28	12.0	2.25	2.20	65	-125	—	—
	1005	7.23	12.3	2.36	4.25	350	-118	—	—
	1006	7.20	11.9	2.39	3.72	550	-121	—	—
	1010	7.15	11.8	2.44	7.21	2999	-115	—	DRY
	1515								123.98
	6/11/04								
	1500	monsoon	pumps	~.5	Liters	+ quits	- no	parameters	
		taken, but		well	purged	dry.			
	6/12/04								
bail	840	7.41	11.5	2.379	4.60	65	-98	~~123.19~~	123.19'
	845	6.86	11.5	2.367	4.56	300	-89	—	
	847	6.53	11.3	2.400	3.59	400	-88		
	848	6.46	11.3	2.398	4.17	550	-87		
	849	6.43	11.3	2.414	4.04	850	-87		
	Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-30A

Date: 6/12/04 Sampling Personnel: Urban / Doerr Company: URS Corporation

Purging/ Sampling Device: HDPE Bailer Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): Depth to Well Bottom (ft): 130.05' Well Diameter: 2" Screen Length (ft): 9'

Casing: PVC Vol. In 1 Well Casing (liters): Estimated Purge Volume (liters):

Sample ID: WG-MW-30A Sample Time: 0759 6/14/04 QA/QC: None

Sample Parameters: Primary ROPCs

Comments: 1st bailer 759 6/14/04

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
851	6.40	11.4	2.430	5.30	>999	-83	—		
855	6.41	11.5	2.437	5.40	>999	-78	-	DRY	1 gal. purged
6/13/04									
1800	6.27	12.4	2.670	2.14	160	-94	-	123.12	
1805	6.10	12.0	2.755	3.16	200	-95			
1806	6.06	12.0	2.775	3.36	300	-96			
1808	6.06	12.0	2.773	4.14	900	-97			
1810	6.06	11.7	2.871	3.63	>999	-91			
1812	6.06	12.4	2.875	5.99	>999	-85		129.05	Dry bailed 2 gals
								~~123.23~~	used bailer to initiate sampling
6/14/02								123.23	1 1/2 bailer
0756								125.12	~~1 1/2 bailer~~
0846								124.54	1 bailer
0948								125.42	
1030									
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

1 bailer

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

1136

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-31

Date: 6/12/04 Sampling Personnel: DC Company: URS Corporation

Purging/ Sampling Device: Monsoon / Bailer Tubing Type: 3/8" LDPE Pump Inlet: ≈100'

Measuring Point: TOC Initial Depth to Water (ft): 96.05' Depth to Well Bottom (ft): 101.60' Well Diameter: 2" Screen Length (ft): 10'

Casing: SCH 40 PVC Vol. in 1 Well Casing (liters): 3.4/0.9 GAL Estimated Purge Volume (liters): 4.8

Sample ID: WG-MW-31 Sample Time: 6/13/04, 08:50 QA/QC: NONE

Sample Parameters: Primary NOPC

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1855	6.83	16.80	2.627	1.91	900	-24.8	200	97.30	
1900	6.84	13.21	2.666	0.46	999	-33.7	200		OBSTRUCTION @ TOP OF PUMP 99"
1910	6.63	14.67	2.129	0.37	400	-39.9	180		" "
1920	7.17	15.09	2.003	0.48	390	-58.4	200		" "
1923		Pump DRY							
6/13/04 0835		Recharge DATA						96.30	
10:30									Collected / Bailer for sample
12:02									Collected / Bailer for sample
13:30									" "
15:00									" "
16:30									" "
									Finished sampling at 16:30
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-32

Date: 6/13/04 Sampling Personnel: Urban/Doerr Company: URS Corporation

Purging/Sampling Device: foot valve Tubing Type: LLDPE Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 43.13' Depth to Well Bottom (ft): 62.61' Well Diameter: 2" Screen Length (ft): 20'

Casing: PVC Vol. in 1 Well Casing (liters): 12.0 Estimated Purge Volume (liters): 64

Sample ID: WG-MW-32 Sample Time: 1705 QA/QC: None

Sample Parameters: Primary ROPCs

Comments: water very turbid, Rust color

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
855	7.00	13.4	0.438	3.08	>999	237	–		
856	6.86	13.1	0.428	4.40	>999	229	–		after 1 gal
0858	6.96	13.68	0.383	10.58	>999	285	–	61.00	~~0.1~~ after 2 gal
908	6.94	14.14	0.425	5.82	>999	175	–	54.35	
912	6.91	13.5	0.414	5.28	>999	172	–		after 3 gal
0914	6.92	13.4	0.418	5.24	902	162.7	–		4 gal. purged
922					~~320~~			56.75'	
929	6.89	14.0	0.421	3.71	820	119	–		
0932	6.99	14.12	0.415	4.59	223	109.2		60.50	6 gal
0941								56.00'	
0942	6.94	12.43	0.412	5.22	68.9	95.4	–	60.05	8 gal
958	7.00	14.08	0.407	4.27	63.3	27.7		56.30'	11 gals
1703	7.00	21.2	0.413	2.86	30	33.5			
1700					23				
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = [illegible] 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233-00000 Site: USACE-SLDA Well I.D.: MW-33

Date: 6/9/04 Sampling Personnel: T. Urban/J. Doerr Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump/Tubing Inlet Location: 82

Measuring Point: BTOR Initial Depth to Water: 58.34 Depth to Well Bottom: 83.89' Well Diameter: 2" Screen Length: 30'

Casing Type: PVC Volume in 1 Well Casing (liters): 15.8 Estimated Purge Volume (liters): 16

Sample ID: WG-MW-33 Sample Time: 0950 QA/QC: None

Sample Paramaters: Primary ROPCs

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0910	7.79	13.4	0.463	0.61	70	-64.7	800	59.45
0915	7.92	13.7	0.462	0.28	70	-101	400	60.81
0920	7.62	14.4	0.445	0.26	55	-82	360	61.72
0925	7.54	14.0	0.441	0.29	45	-72.7	550	62.21
0930	7.43	14.3	0.425	0.39	28	-63.8	500	62.80
0935	7.38	14.6	0.415	0.58	23	-58.1	400	63.19
0940	7.35	14.0	0.409	0.75	22	-55.0	800	63.88
0945	7.29	14.1	0.386	0.73	13	-50.6	600	64.35
0950	7.25	14.1	0.380	0.70	10	-44.1	500	65.00
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 Inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-34A

Date: 6/8/04 Sampling Personnel: Urban / Doerr Company: URS Corporation

Purging/ Sampling Device: Tubing Type: Pump Inlet:

Measuring Point: BTOR Initial Depth to Water (ft): DRY Depth to Well Bottom (ft): 100.8 Well Diameter: 2 Screen Length (ft):

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters):

Sample ID: N/A Sample Time: N/A QA/QC:

Sample Parameters:

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
								DRY	No SAMPLE
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 67 ml/ft, 1 inch diameter well = 154 ml/ft, 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-35

Date: 6/12/04 Sampling Personnel: Doerr/Urban Company: URS Corporation

Purging/Sampling Device: Grontos Tubing Type: LLDPE Pump Inlet: 165.5

Measuring Point: BTOR Initial Depth to Water (ft): 115.81 Depth to Well Bottom (ft): 167.50 Well Diameter: 2" Screen Length (ft): 20'

Casing: PVC Vol. in 1 Well Casing (liters): 31.9 Estimated Purge Volume (liters): 32

Sample ID: WG-MW-35 Sample Time: 1240 QA/QC: None

Sample Parameters: Primary ROPCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1137	12.01	14.5	0.981	3.88	14	-77	500	120.90	
1142	11.90	13.2	0.834	1.45	27	-98	300	122.92	
1147	12.13	12.2	0.945	1.49	21	-115	600	125.91	
1152	12.13	12.4	0.951	1.55	34	-126	400	127.70	
1157	12.06	12.9	0.914	1.39	39	-131	450	128.92	
1202	11.95	13.5	0.858	1.33	55	-136	600	130.18	
1207	11.60	13.8	0.778	1.07	60	-141	400	131.15	
1212	11.30	14.0	0.756	0.91	50	-146	350	131.28	
1217	11.03	14.1	0.713	0.84	31	-150	450	132.70	
1222	10.83	14.3	0.708	0.81	20	-152	600	133.79	
1227	10.57	14.4	0.699	0.60	19	-154	400	134.29	
1232	10.56	15.3	0.700	0.62	8.5	-158	550	136.85	
1237	10.52	15.4	0.700	0.59	9.81	-158	400	137.10	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft, 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: RI 11173233.00000 Site: SLDA Well I.D.: MW-36

Date: 6/9/04 Sampling Personnel: KJM + DC Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location: ≈ 80'

Measuring Point: TOC Initial Depth to Water: 53.30 Depth to Well Bottom: 82.34' Well Diameter: 2" Screen Length:

Casing Type: SCH 40 PVC Volume in 1 Well Casing (liters): ~~28.9~~ 17.9/4.9 GAL Estimated Purge Volume (liters): 16.4

Sample ID: WG-MW-36 Sample Time: 1400 QA/QC: N/A

Sample Paramaters:

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
1015	6.94	17.24	0.408 mS/cm	4.32	50	138	600	54.45	
1020	6.64	14.73	0.386 mS/cm	2.59	2.3	82.0	300	58.15	
1030	6.58	16.10	0.392 mS/cm	2.99	1.5	70.7	700	60.91	
1040	6.56	16.31	0.396 mS/cm	2.53	0.9	68.2	200	63.52	
1050	6.52	16.05	0.393 mS/cm	2.32	0.8	67.7	280	64.55	(meter blocked)
1355	~~[illegible]~~	6.99	15.29	0.403 mS/cm	6.00	5.7	71.0	–	– PURGED DRY
1400		Sampled							
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-37

Date: 6/8/04 **Sampling Personnel:** Urban / Doerr **Company:** URS Corporation

Purging/ Sampling Device: N/A **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** DRY **Depth to Well Bottom (ft):** 69.06 **Well Diameter:** 2" **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: N/A **Sample Time:** **QA/QC:**

Sample Parameters:

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
								DRY	No Sample
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well I.D.: MW-38

Date: 6/9/04 Sampling Personnel: T. Urban / J. Doerr Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump/Tubing Inlet Location: 60'

Measuring Point: BTOR Initial Depth to Water: 41.96 Depth to Well Bottom: 62.17 Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 12.5 Estimated Purge Volume (liters): 38

Sample ID: WG-MW-38 Sample Time: 1200 QA/QC: None

Sample Paramaters: Primary ROPCs

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1130	7.96	13.0	0.208	0.53	18	106.8	1600	42.10
1135	7.87	12.3	0.208	0.30	9.9	121.8	1200	43.07
1140	7.86	12.3	0.208	0.14	6.3	124.4	1200	43.10
1145	7.85	12.3	0.208	0.11	2.5	-128	1100	43.10
1150	7.84	12.3	0.207	0.11	1.6	-129	1200	43.10
1155	7.86	12.4	0.207	0.10	0.90	-129	1100	43.11
1200	7.85	12.3	0.207	0.10	0.55	-130	1200	43.10
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: PTI 11173233.00000 Site: SLOA Well I.D.: MW-39

Date: 6/10/04 Sampling Personnel: ~~SLOA~~ KJM / DC Company: UNS

Purging/ Sampling Device: MONSOON Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location: 57.5'

Measuring Point: TOC Initial Depth to Water: 55.24' Depth to Well Bottom: 58.28' Well Diameter: 2" Screen Length: 10

Casing Type: SCH 40 PVC Volume in 1 Well Casing (liters): 1.87/0.5 GAL Estimated Purge Volume (liters): ≈40

Sample ID: WG-MW-39 Sample Time: 1110 QA/QC: (D) MS/MSD

Sample Paramaters:

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1009	3.70	13.04	2743	999.99	210	305.3	900	55.19
1014	3.68	11.57	2281	"	21	299.7	400	55.25
1019	3.55	12.37	1.033	3.02	5.9	249.5	400	55.25
1025	3.63	13.00	0.876	4.90	2.4	275.5	500	55.25
1035	3.93	12.50	0.350	7.04	2.9	296.5	400	55.20
1045	4.04	12.25	0.301	6.81	1.2	286.4	2000	55.20
1050	4.09	11.96	0.292	4.77	1.3	286.4	800	55.20
1100	4.10	13.03	0.278	6.72	1.0	280.4	800	55.20
1105	4.11	11.91	0.280	6.04	.6	290.3	400	55.20
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-40

Date: 6/12/04 Sampling Personnel: Urban/Dacrr Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LLDPE Pump Inlet: 194

Measuring Point: BTOR Initial Depth to Water (ft): 133.52' Depth to Well Bottom (ft): 196.12' Well Diameter: 2" Screen Length (ft): 20'

Casing: PVC Vol. in 1 Well Casing (liters): 38.6 Estimated Purge Volume (liters): ~40

Sample ID: WG-MW-40 Sample Time: 1530 QA/QC: ~~QA Split~~

Sample Parameters: Primary RoPCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1445	8.99	16.8	0.583	1.27	5.51	-87	1000	138.85	
1450	7.64	12.9	0.578	0.27	16.2	-56	1200	136.65	
1455	8.00	12.7	0.578	0.22	13.0	-71	1200	136.86	
1500	8.82	14.1	0.577	0.16	2.22	-122	1200	137.15	
1505	8.92	14.5	0.580	0.15	1.45	-137	1200	137.29	
1510	8.94	14.7	0.578	0.14	1.10	-144	1200	137.37	
1515	8.95	14.8	0.579	0.12	0.73	-150	1200	137.41	
1520	8.98	14.7	0.579	0.11	0.60	-156	1200	137.53	
1525	9.00	14.8	0.578	0.11	0.37	-160	1200	137.60	
1530	8.98	14.8	0.579	0.11	0.45	-162	1200	137.74	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 67 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-41

Date: 6/11/04 **Sampling Personnel:** DC / KJM **Company:** URS Corporation

Purging/ Sampling Device: Monsoon **Tubing Type:** 3/8" LDPE **Pump Inlet:**

Measuring Point: TOC **Initial Depth to Water (ft):** 20.80 **Depth to Well Bottom (ft):** 41.55 **Well Diameter:** 2" **Screen Length (ft):**

Casing: SCH 40 PVC **Vol. in 1 Well Casing (liters):** 12.80/ **Estimated Purge Volume (liters):**

Sample ID: WG-MW-41 **Sample Time:** ~~1400~~/1230 6/12/04 **QA/QC:** QA (split)

Sample Parameters:

Comments: Collected sample @ 1400. AFTER sample was collected QA split sample from MW-41 was requested. During resample well went dry. Prior to resample original sample from MW-41 was discarded.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1320	7.28	11.39	0.379	4.27	10.1	94.5	620	21.92	
1325	7.80	11.37	0.377	4.27	41.9	88.1	500	24.65	
1330	7.24	11.41	0.279	4.36	3.75	85.7	600	26.03	
1340	7.29	11.72	0.387	4.35	2.29	87.7	800	27.60	
1350	7.27	11.29	0.380	4.49	.75	85.0	400	29.50	
1355	7.21	11.61	0.381	3.50	.70	85.5	610	30.54	
1400	7.28	11.53	0.387	2.68	0.0	81.6	400	31.75	
6/12/04 0950		RECHARGE		DATA				33.68	
1225		"		"				33.12	
1230	1.25	1985	71.19	54.60	12.8	570.0	200	33.00	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-42

Date: 6/11/04 **Sampling Personnel:** KTM + DC **Company:** URS Corporation

Purging/ Sampling Device: MONSOON **Tubing Type:** 3/8" LDPE **Pump Inlet:** ≈40'

Measuring Point: TOC **Initial Depth to Water (ft):** ~~[illegible]~~ 26.56' **Depth to Well Bottom (ft):** 41.65' **Well Diameter:** 2" **Screen Length (ft):**

Casing: SCH 40 PVC **Vol. in 1 Well Casing (liters):** 9.3/2.6 GAL **Estimated Purge Volume (liters):**

Sample ID: NO SAMPLE ~~UG MW-42~~ **Sample Time:** ~~1705 through~~ **QA/QC:**

Sample Parameters:

Comments: Began sampling @ 1705. Sample point well (MW-42) went dry. Will continue to collect sample within 24 HR period.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1615	12.44	12.26	2.725	9.23	12	-46.2	900	27.00	
1620	12.79	11.74	2.933	8.91	10	-71.6	600	32.05	
1630	12.59	11.96	3.012	6.87	9.2	-77.3	300	34.35	
1640	12.69	11.95	2.856	6.45	1.8	-76.1	400	36.44	
1650	12.59	12.09	2.994	6.19	.75	-74.5	300	38.35	
1700	12.66	12.47	3.043	7.55	3.3	-71.7	620	38.90	OBSTRUCTED
1705	12.64	12.52	3.087	5.47	3.5	-72.4	>100	—	" "
6/12/04 1005			Recharge DATA					40.08	
		No Sample collected							
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-43

Date: 6/11/04 Sampling Personnel: Urban / Doerr Company: URS Corporation

Purging/ Sampling Device: HDPE Bailer Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 41.51 Depth to Well Bottom (ft): 46.92' Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 3.3 Estimated Purge Volume (liters): 6

Sample ID: WG-MW-43 Sample Time: 1130 QA/QC: N/A

Sample Parameters:

Comments: 1135 well is dry ~1.4 gallons collected in 24 hr period

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1120	7.42	11.4	0.541	3.00	2.19	107	—	—	
1122	7.25	11.3	0.402	2.30	8.38	103	—	—	
1124	7.16	11.3	0.424	3.51	63.6	102			
1125	7.13	11.2	0.447	2.81	16.2	102			
1126	7.15	11.2	0.467	3.04	15.8	103			
1128	7.16	11.2	0.476	3.15	14.4	103			
1420								45.61	½ gal collected
6/12									
810							→	45.80	~¼ gal collected
1100							→	46.25	~½ gal collected
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-44

Date: 6/8/04 **Sampling Personnel:** Urban/Doerr **Company:** URS Corporation

Purging/ Sampling Device: N/A **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** Dry **Depth to Well Bottom (ft):** 17.47 **Well Diameter:** 2" **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: N/A **Sample Time:** **QA/QC:**

Sample Parameters:
Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
								Dry	No Sample
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-45

Date: 6/9/04 Sampling Personnel: T. Urban/J. Doerr Company: URS Corporation

Purging/Sampling Device: Monsoon Tubing Type: LLDPE Pump Inlet: 65'

Measuring Point: BTOR Initial Depth to Water (ft): 54.97' Depth to Well Bottom (ft): 67.88' Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 7.5 Estimated Purge Volume (liters): 15

Sample ID: ~~WG-MW-45~~ N/A Sample Time: Not Sampled QA/QC: None

Sample Parameters: Primary ROPCs

Comments: had to adjust flow constantly; Recharge was not sufficient to sample; stability not established.

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
6/9	1725	8.56	15.0	0.420	1.19	54.3	42.5	1600	55.81	
	1728	8.52	15.3	0.421	1.00	39.8	37.0	500	58.00	
	1731	8.48	14.5	0.417	1.04	31.3	12.2	450	58.25	
	1733	8.55	14.8	0.415	1.44	22.2	-3.5	375	58.64	
	1736	8.91	14.7	0.412	1.98	22.3	-20.0	700	59.40	
	1739	8.98	14.5	0.414	2.07	28.0	-37.1	1100	60.81	
	1742	8.63	13.8	0.413	1.41	25.2	-40.5	900	62.01	
	1745	8.43	13.8	0.409	1.63	45.4	-36.0	700	Below	Pump
	1748	8.31	14.0	0.407	1.83	–	-27.2	–	"	"
									Pump	quits before
	6/10/04									Turb & flow
	1105								58.89	obtained
	1110	7.87	13.3	0.405	4.77	20.6	101	1100	59.89	
	1113	7.95	12.8	0.374	6.19	31.8	92.5	900	62.55	
	1116	7.93	13.1	0.384	6.47	105	84.3	800	Below Pump	1117 pump stops ↓ dry
	Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

6/10/04 → purged 1.5 gallons

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-46

Date: 6/8/04 **Sampling Personnel:** Urban / Doerr **Company:** URS Corporation

Purging/ Sampling Device: N/A **Tubing Type:** HDPE **Pump Inlet:**

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** N/A **Depth to Well Bottom (ft):** N/A **Well Diameter:** 2" **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):**

Sample ID: N/A **Sample Time:** **QA/QC:**

Sample Parameters: Well obstructed at 39.34' BTOR

Comments: well should be ~96 ft deep

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
									No Sample
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: SLDA Well I.D.: MW-47

Date: 6/10/04 Sampling Personnel: Urban / Doerr Company: URS

Purging/ Sampling Device: N/A Tubing Type: N/A Pump/Tubing Inlet Location: N/A

Measuring Point: BTOR Initial Depth to Water: 19.74' Depth to Well Bottom: 20.09' Well Diameter: 2" Screen Length:

Casing Type: PVC Volume in 1 Well Casing (liters): .22 Estimated Purge Volume (liters):

Sample ID: N/A Sample Time: N/A QA/QC: N/A

Sample Paramaters: N/A

Other Information: Not enough water to purge / bail. Basically Dry.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-50

Date: 6/11/04 Sampling Personnel: Urban / Doerr Company: URS Corporation

Purging/ Sampling Device: HDPE Bailer Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 36.90' Depth to Well Bottom (ft): 37.62' Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): .4 Estimated Purge Volume (liters): .5

Sample ID: N/A Sample Time: N/A QA/QC: N/A

Sample Parameters: N/A

Comments: not enough water to sample
.4' of recharge in 3.5 hrs.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1405	7.54	[illegible]	0.813	4.50	84.4	141	—	—	dry
1735								37.20	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Well #: MW-51

Project: 11173233.00000 Site: USACE-SLDA Company: URS Corporation

Date: 6/12/04 Sampling Personnel: Urban/Doerr

Purging/Sampling Device: Monsoon Tubing Type: LLDPE Pump Inlet: 36.5

Measuring Point: BTOR Initial Depth to Water (ft): 33.83' ~~35.04~~ Depth to Well Bottom (ft): 37.57' Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 2.3 Estimated Purge Volume (liters): 16

Sample ID: WG-MW-51 Sample Time: 1725 QA/QC: QA split

Sample Parameters: Primary RoPCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1630	7.87	14.7	0.271	4.30	53.6	-89.7	700	—	W.L. Below Top
1633	7.82	13.9	0.250	4.96	191	-92.5	400	—	of Pump
1636	7.76	13.0	0.257	3.58	77.7	-100	650	—	
1639	7.77	12.3	0.250	2.82	115	-108	400	—	
1642	7.82	12.4	0.246	2.08	128	-112	300	—	
1645	7.88	12.3	0.249	3.53	254	-120	400	—	Moved pump
1648	7.89	12.0	0.251	2.44	381	-131	400	—	to 37'
1651	7.97	11.9	0.253	1.26	>999	-140	350		moved pump
1707	7.89	12.4	0.262	6.80	193	-69	700		to 35.5' &
1710	7.85	12.6	0.262	6.39	195	-65	200		allow to recharge
1713	7.81	12.7	0.262	5.50	160	-62	250		
1716	7.79	12.7	0.262	5.11	124	-61	240		
1719	7.76	12.9	0.263	4.83	73.8	-57	225		
1722	7.74	13.0	0.263	4.66	58.5	-54	225		
1725	7.73	13.1	0.263	4.45	36.4	-53	225		
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 67 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-52

Date: 6/10/04 Sampling Personnel: Urban / Doerr Company: URS Corporation

Purging/ Sampling Device: Monsoon Tubing Type: LL DPE Pump Inlet: 2' above bottom

Measuring Point: TOR Initial Depth to Water (ft): 37.95 Depth to Well Bottom (ft): 44.45 Well Diameter: 2" Screen Length (ft): 10'

Casing: PVC Vol. in 1 Well Casing (liters): 4.0 Estimated Purge Volume (liters): 15

Sample ID: W6-MW-52 Sample Time: 1550 QA/QC: None

Sample Parameters:
Comments: 1517 - Stop pump to allow full recharge before sampling

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1500	7.82	15.3	0.361	2.51	8.2	-1.4	500	38.08	
1503	7.55	13.7	0.366	1.00	8.6	-19.5	500	38.08	
1506	7.35	13.8	0.367	0.27	5.4	-36.9	350	38.02	
1509	7.30	14.5	0.367	0.24	2.7	-41.8	250	38.04	
1512	7.28	13.7	0.371	0.21	1.3	-41.5	900	38.16	
1515	7.29	13.07	0.367	0.16	1.0	-44	900	Stop pump	
1518	7.25	12.80	0.366	0.13	0.50	-44	900	Blew pump	
~~1519~~	RECHARGE —								
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** MW-53

Date: 6/12/04 **Sampling Personnel:** Urban / Doerr **Company:** URS Corporation

Purging/ Sampling Device: HDPE Bailer **Tubing Type:** ~~HDPE~~ N/A **Pump Inlet:** N/A

Measuring Point: Below Top of Riser **Initial Depth to Water (ft):** 54.61' **Depth to Well Bottom (ft):** 61.10' **Well Diameter:** 2" **Screen Length (ft):** 10'

Casing: PVC **Vol. in 1 Well Casing (liters):** 4.0 **Estimated Purge Volume (liters):** 8

Sample ID: N/A **Sample Time:** N/A **QA/QC:** N/A

Sample Parameters: N/A

Comments: ~1.0' recharge in 16 hrs.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1612	8.72	12.2	0.639	2.40	10.16	46	—	—	
1614	8.19	11.6	0.622	2.63	303	52			
1615	7.85	11.5	0.621	2.03	>999	50			
1616	7.79	11.3	0.623	3.03	>999	48.6			
1617	7.74	11.3	0.632	2.98	>999	47.2			
1618	7.68	11.3	0.639	3.17	>999	45.4			
1619	7.63	11.3	0.640	4.96	>999	37.3			
1620	7.64	11.2	0.638	5.21	>999	20.2			
1621	7.60	11.2	0.648	4.95	>999	-8.5		60.41	Dry
6/13/04									
830	→							59.35	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: RI 11173233.00000 Site: SLDA Well I.D.: MW-54

Date: 6/9/04 Sampling Personnel: DC + KM Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location:

Measuring Point: TOC Initial Depth to Water: 20.28 Depth to Well Bottom: 22.77 Well Diameter: 2" Screen Length: 5'

Casing Type: 2" SCH 40 PVC Volume in 1 Well Casing (liters): N/A Estimated Purge Volume (liters):

Sample ID: N/A Sample Time: N/A QA/QC: N/A

Sample Paramaters: N/A

Other Information: Obstruction at 19.97" (Pump) Purged well dry and continued to check well recharge to determine possible sample collection. No sample collected due to slow recharge and insufficient water after 24 period.

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
	1839	6.19	17.66	0.360 mS/cm	7.73 mg/l	110	149.4	600	20.28
	1844	6.00	15.90	0.338	5.99	240	158.5	100	(OBSTRUCTION @ 19.97") Purged DRY
6/10/04	0944			Recharge monitoring DATA					20.89
	1335			"		"			20.80
	1845			"		"			20.80
				"		"			
			NO sample collected						
Tolerance:		0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: NI 11173233.00000 Site: SLDA Well I.D.: MW-56

Date: 6/8/02 Sampling Personnel: LTM / DC Company: WMS

Purging/ Sampling Device: Monsoon Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location: 22.5'

Measuring Point: TOC Initial Depth to Water: 22.03' Depth to Well Bottom: 28.25' Well Diameter: 2" Screen Length: 10'

Casing Type: SCH 40 PVC Volume in 1 Well Casing (liters): 3.84/1.06 GAL Estimated Purge Volume (liters): 37.7

Sample ID: WG-MW-56 Sample Time: 1600 QA/QC: NONE

Sample Paramaters: 8 NOPC

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
1416	7.84	15.29	0.308 mS/cm	43.9	1100	96.6	800	22.90	
1421	6.34	13.22	0.304 mS/cm	28.9	>999	89.7	560	23.56	
1426	6.26	17.72	0.305 mS/cm	2.31	>999	75.2	240	24.38	
1431	6.28	14.92	0.301 mS/cm	2.10	500	67.6	960	24.85	
1441	6.30	12.83	0.298 mS/cm	2.20	>999	55.5	410	25.45	
1455	6.31	15.82	0.320 mS/cm	2.64	700	66.9	300	BELOW →	TOP OF PUMP CAN NOT READ
1510	6.12	15.76	0.323 mS/cm	2.42	110	77.8	225	"	"
1525	6.22	16.06	0.322 mS/cm	2.08	40	67.7	210	"	"
1540	5.71	16.73	0.328 mS/cm	1.68	20	63.2	225	"	"
1545	6.17	16.62	0.326 mS/cm	1.70	16	76.1	220	"	"
1550	6.17	16.18	0.323 mS/cm	1.68	19	63.8	220	"	"
1555	6.18	16.71	0.328 mS/cm	1.58	18	61.8	210	"	"
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

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LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 41173233.00000 Site: USACE-SLDA Well I.D.: MW-57

Date: 6/8/04 Sampling Personnel: Doerr/Urban Company: URS

Purging/ Sampling Device: HDPE bailer Tubing Type: N/A Pump/Tubing Inlet Location: N/A

Measuring Point: BTOR Initial Depth to Water: 119.44' Depth to Well Bottom: 123.60 Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 3.2 Estimated Purge Volume (liters): 4.0

Sample ID: NO SAMPLE Sample Time: NA QA/QC: NO

Sample Paramaters: ~~Primary~~ ROPC

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
925	8.11	13.7	3.32	2.05	450	-130	—	
930	7.84	12.2	3.17	1.82	>999	-114	—	
932	7.75	11.9	3.31	2.01	7999	-102	—	
934	7.68	11.9	3.32	1.72	>999	-95	—	
935	7.65	11.9	3.32	2.52	>999	-86	—	DRY
1520							→	121.04
		NO	SAMPLE	COLLECTED				
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: RI 11173233.00000 Site: SLDA Well I.D.: MW-58

Date: 6/9/04 Sampling Personnel: KJM & DC Company: UMS

Purging/ Sampling Device: MONSOON Tubing Type: 3/8" LDPE Pump/Tubing Inlet Location: 35'

Measuring Point: TOC Initial Depth to Water: 6.80' Depth to Well Bottom: 36.85' Well Diameter: 2" Screen Length: 10'

Casing Type: SCH 40 PVC Volume in 1 Well Casing (liters): 18.5/5.1 GAL Estimated Purge Volume (liters): 13.6

Sample ID: WG-MW-58 Sample Time: 1535 QA/QC: QA SPLIT

Sample Paramaters:

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1445	7.33	13.05	0.505 mS/cm	1.47	45	5.1	850	9.00
1450	6.51	12.63	0.481 mS/cm	0.22	33	6.7	400	9.55
1500	6.38	12.20	0.468 mS/cm	0.19	14	-35.2	380	10.02
1510	6.21	12.44	0.457 mS/cm	0.19	4.9	-37.9	380	9.98
1520	6.10	12.44	0.447 mS/cm	0.19	1.8	-27.6	380	10.05
1525	6.07	12.75	0.446 mS/cm	0.18	1.1	-23.2	375	10.05
1530	6.06	12.52	0.443 mS/cm	0.19	0.95	-20.8	375	10.06
		Sample						
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-59

Date: 6/9/04 Sampling Personnel: T. Urban / J. Doerr Company: URS Corporation

Purging/ Sampling Device: HDPE Bailer Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 7.82 Depth to Well Bottom (ft): 14.34 Well Diameter: 2" Screen Length (ft): 5

Casing: PVC Vol. in 1 Well Casing (liters): 4.0 Estimated Purge Volume (liters): 11

Sample ID: WG-MW-59 Sample Time: 0830 (6/10/04) QA/QC: None

Sample Parameters: Primary RCRCs

Comments: Sample collected at ½ hr intervals

Sampling completed @ 11:00

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
6/9	1430	6.55	12.1	0.152	1.40	>999	69	N/A		
	1432	6.25	13.6	0.194	2.12	>999	15	N/A		
	1433	6.00	12.2	0.153	2.41	>999	42	N/A		
	1435	6.00	12.0	0.152	2.71	>999	50	N/A		
	1436	5.99	12.2	0.167	2.83	>999	40	N/A		
	1437	6.02	11.5	0.167	3.13	>999	47	↓		
	1438	6.02	11.1	0.168	2.64	>999	44	↓		
	1439	6.06	11.0	0.165	3.91	>999	39	↓		
	1440	6.12	10.9	0.159	5.81	>999	35		14.01	after 3 gal
	6/10/04									↳ Dry
	0825					87.5			7.89	
	0833					76.7				
	0836					79.4				
	0920					73.1				Recharged
	Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

MS-01
MSD-Blank

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-60

Date: 6/9/04 Sampling Personnel: T. Urban / J. Doerr Company: URS Corporation

Purging/ Sampling Device: HDPE Bailer Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 47.43 Depth to Well Bottom (ft): 49.15 Well Diameter: 2" Screen Length (ft): 10

Casing: PVC Vol. in 1 Well Casing (liters): 1.1 Estimated Purge Volume (liters): ~~3~~ 1

Sample ID: N/A Sample Time: N/A QA/QC: N/A

Sample Parameters: NOT SAMPLED - Recharge too slow

Comments: .39' recharge in 18.5 hrs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1450	13.11	13.2	10.0	5.50	100	-1.2	—	—	
1453	13.3	12.2	10.2	6.83	55	-171	—	—	
1456	13.3	12.2	10.3	6.47	50	-162	—	—	after
1458	13.3	11.8	10.2	6.70	50	-155	—	48.79	DRY ¼ gal
6/10/04									bailed
0940								48.40	
									NO SAMPLE
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-61

Date: 6/9/04 Sampling Personnel: T. Urban / J. Doerr Company: URS Corporation

Purging/ Sampling Device: HDPE Bailer Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 67.89' Depth to Well Bottom (ft): 68.09' Well Diameter: 2" Screen Length (ft): 10

Casing: PVC Vol. in 1 Well Casing (liters): .12 Estimated Purge Volume (liters): N/A

Sample ID: N/A Sample Time: N/A QA/QC: None

Sample Parameters: Basically DRY - not enough water to bail

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: MW-62

Date: 6/11/04 Sampling Personnel: URBAN / DOERR Company: URS Corporation

Purging/ Sampling Device: 1" DPE BAILER Tubing Type: N/A Pump Inlet: N/A

Measuring Point: BTOR Initial Depth to Water (ft): 89.41 Depth to Well Bottom (ft): 90.57 Well Diameter: 2" Screen Length (ft): 7'

Casing: PVC Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): 400 ml

Sample ID: N/A Sample Time: N/A QA/QC:

Sample Parameters: NOT SAMPLED

Comments: very poor recharge - not enough water to sample

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
6/11	1615	6.25	11.5	1.765	2.11	>999	65.9	—	—	
6/12	815	—	—	—	—	—	—	—	89.96	
										NO SAMPLE
Tolerance:		0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft, 1 inch diameter well = 154 ml/ft, 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE - SLDA Well I.D.: MW-64

Date: 6/8/04 Sampling Personnel: T. Urban/J. Doerr Company: URS

Purging/ Sampling Device: Monsoon Tubing Type: LLDPE Pump/Tubing Inlet Location: 20'

Measuring Point: BTOR Initial Depth to Water: 13.28 Depth to Well Bottom: 22.03 Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 5.5 Estimated Purge Volume (liters): 26

Sample ID: WG-MW-64 Sample Time: 1445 QA/QC: FD-02

Sample Paramaters: Primary ROPCs

Other Information:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1420	6.79	13.7	0.133	4.88	999	75	700	13.40
1425	6.07	10.5	0.092	5.74	200	104	1200	13.55
1430	6.01	10.5	0.089	5.78	75	105	1200	13.55
1435	6.05	10.4	0.087	6.03	40	99.5	1100	13.56
1438	6.03	10.4	0.087	6.24	29	98.8	1100	13.56
1441	6.02	10.3	0.085	6.22	20	99.3	1200	13.56
1444	6.01	10.2	0.085	6.21	18	100.	1200	13.56
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE SLDA Well I.D.: MW-69

Date: 6/8/04 Sampling Personnel: Doerr / Urban Company: URS

Purging/ Sampling Device: Monsoon pump Tubing Type: LLDPE Pump/Tubing Inlet Location: 2' above bottom

Measuring Point: BTOR Initial Depth to Water: 14.00 Depth to Well Bottom: 22.79 Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 5.4 Estimated Purge Volume (liters): 35

Sample ID: WG-MW-69 Sample Time: 1340 QA/QC: FD-03

Sample Paramaters: Primary ROPCs

Other Information: rust color water · waited an hour to see if turbidity would settle. Sample @ 1340. 1st sample bottle replaced with lower turb. water sample

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1200	7.84	12.2	0.030	7.59	>999	78	1100	14.05
1203	7.02	10.7	0.027	7.17	~~>999~~	111	1200	14.05
1206	7.00	10.1	0.026	6.99	600	126	1100	14.05
1209	6.05	9.9	0.026	6.92	650	128	1100	14.04
1212	5.86	9.8	0.026	6.84	500	139	1100	14.04
1215	5.70	9.8	0.027	6.76	340	146	400	14.04
1218	5.64	10.3	0.027	6.10	150	150	800	14.02
1221	5.64	9.9	0.027	6.64	270	151	900	14.02
1224	5.57	10.0	0.026	6.30	260	157	750	14.02
1227	5.54	10.2	0.027	6.16	130	159	750	14.02
1230	5.52	10.1	0.027	5.94	160	161	650	14.02
1233	5.51	9.9	0.026	6.07	280	163	1100	14.02
* 1340	—	—	—	—	220	—	—	—
1350					65	~~65~~		
1355					45	~~45~~		
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

M:moeller/EXCEL/Low flow purge log
Blank
11:57 AM

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-01A-01

Date: 6/10/04 Sampling Personnel: S. NOZIK Company: URS Corporation

Purging/ Sampling Device: FLUTe SYSTEM Nb2 Tubing Type: N/A Pump Inlet: N/A

Measuring Point: Top of Tube Initial Depth to Water (ft): 150.41 Depth to Well Bottom (ft): 158 Well Diameter: Screen Length (ft):

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): 0

Sample ID: No Sample Sample Time: QA/QC:

Sample Parameters:

Comments: Essentially Dry

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
6/10	1422								150.41	Dry
~~6/11~~	~~0850~~									
Tolerance:		0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-01A-02

Date: 6/10/04 Sampling Personnel: S. NOZIK Company: URS Corporation

Purging/ Sampling Device: FLUTe SYSTEM No2 Tubing Type: Pump Inlet:

Measuring Point: TOP of Tube Initial Depth to Water (ft): 62.54 Depth to Well Bottom (ft): 2SB Well Diameter: Screen Length (ft): 10

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): 17 / 4.5 gal

Sample ID: WG-NWS-01A-02 Sample Time: 1630 QA/QC: NONE

Sample Parameters: PRIMARY RDPCs 2- 1 gallon plastic w/ HNO_3

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1424	6.33	13.72	273	1.34	0.45	131	600	62.54	0.25 gal
1427	6.37	11.82	279	1.14	1.6	123.1	600		0.5 gal
1430	6.37	13.29	283	1.33	–	115.1	500		0.75 gal
1437	6.54	11.89	288	1.71	1.2	103.6	500		1.0 gal
1450	6.63	12.38	321	1.29	0.95	-48.7	500		1.25 gal
1455	6.57	12.60	287	1.22	0	-47.0	500		1.5 gal
1500	6.60	12.57	286	1.27	0.9	-43.0	500		1.75 gal
1513	6.83	12.23	305	0.95	2.2	-92.7	500		2.0 gal
1515	7.01	11.99	286	1.34	0.9	-73.8	500		3.0 gal
1530	7.03	12.10	295	0.96	0.75	-93.5	500		3.6 gal
1535	6.85	11.87	286	1.41	2.8	-67.9	500		4.0 gal
1604	7.08	11.96	310	1.32	3.9	-107.3	600		4.25 gal
1606	6.91	11.63	285	1.26	0.1	-81.8	600		4.5 gal
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-01A-03

Date: 6/10/04 Sampling Personnel: S. NOZIK Company: URS Corporation

Purging/ Sampling Device: FLUTe SYSTEM NO2 Tubing Type: Pump Inlet:

Measuring Point: Top of Tube Initial Depth to Water (ft): 98.59 Depth to Well Bottom (ft): UF Well Diameter: Screen Length (ft):

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): 8 liters

Sample ID: WG-NWS-01A-03 Sample Time: 1632 QA/QC: NONE

Sample Parameters: PRIMARY ROPCs 2 - 1 Gallon Plastic w/HNO3

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1440	6.21	12.52	1248	1.0	1.1	87.1	600	98.59	0.25 gal
1445	6.08	12.58	1246	1.23	6.8	40	500		0.25 gal
1505	6.37	12.08	1365	1.29	2.8	-24.2	500		0.5 gal
1507	6.57	11.88	1795	1.34	—	-73.8	500		0.75 gal
1520	6.47	12.40	1559	1.37	1.8	-48.2	500		1.5 gal
1537	6.44	12.04	1457	1.76	2.9	-36.0	500		1.6 gal
1540	6.21	11.92	1472	—	5.5	—	500		1.75 gal
1609	6.42	11.96	1405	1.46	1.5	-57.1	500		1.8 gal
1612	6.31	12.03	1394	2.10	0.9	-49.5	500		2.0 gal
1621	6.43	13.25	1394	1.15	4.8	-79.4	500		2.1 gal
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-01A-04

Date: 6/10/04 Sampling Personnel: J. NOZIK Company: URS Corporation

Purging/ Sampling Device: FLUTe SYSTEM NO2 Tubing Type: Pump Inlet:

Measuring Point: Top of Tube Initial Depth to Water (ft): 137.93 Depth to Well Bottom (ft): DB Well Diameter: Screen Length (ft):

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): 1.9

Sample ID: WG-NWS-01A-04 Sample Time: 0853 6/11/04 QA/QC:

Sample Parameters: Primary ROPCs 2 1 gal. Plastic w/HNO3

Comments: Very slow recharge - initiated sampling 6/11/04 @ 0853

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
6/10	1447	6.42	12.43	992	1.37	3.5	-4.9	600	137.93	
	1510									DRY
	1525	7.0	12.53	1058	1.15	8.9	-111.9	600		< 0.25 gal
	1559	7.10	13.25	1063	1.15	14	-140.2	600		0.25 gal
	1615	6.69	11.98	980	2.45	6	-91.6	600		< 0.3 gal
	1638	6.97	13.40	956	1.35	9.6	-119.8	600		0.3 gal
	1658	7.28	14.92	501	7.21	15	-114.3	600		< 0.4 gal
	1708	7.33	13.09	941	1.32	6.4	-116.8	600		0.4 gal
	1715	7.59	12.98	948	1.26	11	-145.2	700		< 0.5 gal
	1739	7.8	13.21	950	0.82	13	-152.6	600		0.5 gal
6/11										
	0852							138.04		
	0856							154.85		
	0900							150.0		
	0909							145.0		
	Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

0916 143.7
0930 141.76
0935 141.24

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-02-01

Date: 6/9/04 Sampling Personnel: S. Nozik Company: URS Corporation

Purging/ Sampling Device: FLUTe System NO_2 Tubing Type: Pump Inlet:

Measuring Point: Top of tube Initial Depth to Water (ft): 21.50 Depth to Well Bottom (ft): 158 Well Diameter: Screen Length (ft):

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): 7.5 / 2 gal

Sample ID: No Sample Sample Time: QA/QC:

Sample Parameters:

Comments: No sample collected due to elevated pH

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1127	8.0	15.70	194	1.09	0	55.1	6	21.50	
1130	9.85	13.56	232	1.08	2.3	-2.9	6		0.5 g
1133	10.06	13.99	281	1.56	2.5	-26.3	6		0.75 g
1137	10.40	12.83	296	1.95	2.3	-35.8	6		1.0 g
1140	10.40	12.14	271	3.06	2.3	-39.5	6		1.25 g
1200	10.45	13.17	223	1.24	0.45	-60.1	6		1.5 g
1205	10.69	14.84	302	1.62	—	-72.4	6		1.55 g
1218	10.49	13.46	216	1.35	0.45	-57.2	6		2.0 g
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** NWS-02-02

Date: 6/9/04 **Sampling Personnel:** S. NOZIK **Company:** URS Corporation

Purging/ Sampling Device: FLUTe System NO_2 **Tubing Type:** _____ **Pump Inlet:** _____

Measuring Point: Top of Tube **Initial Depth to Water (ft):** 69.72 **Depth to Well Bottom (ft):** 2SB **Well Diameter:** _____ **Screen Length (ft):** _____

Casing: _____ **Vol. in 1 Well Casing (liters):** _____ **Estimated Purge Volume (liters):** 3.7L / 1.0g

Sample ID: No Sample **Sample Time:** _____ **QA/QC:** _____

Sample Parameters: _____

Comments: No sample collected due to elevated pH

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1142	9.67	12.94	210	1.37	75	-33.6	6	69.72	
1145	10.05	13.51	248	1.46	6.6	-54.9	6		0.3g
1148	10.07	12.59	238	3.24	21	-58.5	6		0.75g
1206	10.45	13.64	276	1.13	7.6	-66.4	6		0.8g
1222	11.04	13.62	369	1.70	7.0	-78.1			1.0g
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-02-23

Date: 6/9/04 Sampling Personnel: S. NOZIK Company: URS Corporation

Purging/ Sampling Device: FLUTe System NO_2 Tubing Type: Pump Inlet:

Measuring Point: Top of tube Initial Depth to Water (ft): 114.26 Depth to Well Bottom (ft): UF Well Diameter: Screen Length (ft):

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): <1L / 0.25g

Sample ID: NO Sample Sample Time: QA/QC:

Sample Parameters:

Comments: No sample collected due to elevated pH and conductivity

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1150	12.12	14.08	2270	0.89	45	-53.1	6	114.26	<0.25 gal
1200	11.97	15.85	3589	6.0	45	-61.8	5		0.25 g
1225									dry
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-02-04

Date: 6/9/04 Sampling Personnel: S. Nozik Company: URS Corporation

Purging/ Sampling Device: FLUTe System NO_2 Tubing Type: _____ Pump Inlet: _____

Measuring Point: Top of Tube Initial Depth to Water (ft): 96.72 Depth to Well Bottom (ft): DB Well Diameter: _____ Screen Length (ft): _____

Casing: _____ Vol. in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): 1.1 L / 0.3g

Sample ID: No Sample Sample Time: _____ QA/QC: _____

Sample Parameters: _____

Comments: No sample collected due to elevated pH and conductivity

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1156	12.03	13.59	2390	1.02	2.7	-66.0	5	96.72	0.25g
1213	12.05	13.72	2390	1.76	0	-69.0	5		0.3 g
1226									dry
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-03-01

Date: 6/9/04 Sampling Personnel: S. Nozik Company: URS Corporation

Purging/ Sampling Device: FLOTe System NO_2 Tubing Type: Pump Inlet:

Measuring Point: Top of tube Initial Depth to Water (ft): 59.39 Depth to Well Bottom (ft): 1SB Well Diameter: Screen Length (ft):

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): 3 L / 0.8 g

Sample ID: No Sample Sample Time: QA/QC:

Sample Parameters:

Comments: No sample collected due to insufficient water

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1514	8.05	12.49	260	1.28	4.1	-21.2	6	59.39	<0.5 g
1518	8.06	13.08	208	2.0	20	-18.4	6		0.75 g
1530	8.05	13.83	277	1.47	—	-84.1	6		0.8 g
1545									dry
1600									dry
1625									dry
1751								dry	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-03-02

Date: 6/9/04 Sampling Personnel: S. Nozik Company: URS Corporation

Purging/ Sampling Device: FLUTe System NO_2 Tubing Type: Pump Inlet:

Measuring Point: Top of Tube Initial Depth to Water (ft): 78.28 Depth to Well Bottom (ft): 2SB Well Diameter: Screen Length (ft):

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): 4.5 L / 1.2g

Sample ID: No Sample Sample Time: QA/QC:

Sample Parameters:

Comments: No Sample Collected due to insufficient water

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1505	8.66	14.92	204	1.18	0.50	-43.5	6	78.28	< 0.25g
1508	8.34	13.58	185	1.77	0.0	-55.4	6		0.25g
1510	8.21	12.84	190	1.82	0.0	-89.8	6		1g
1533	8.12	13.92	190	1.54	21	-87.9	6		1.2g
1546									dry
1601									dry
1626									dry
1801								dry	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-03-03

Date: 6/9/04 Sampling Personnel: S. Nozik Company: URS Corporation

Purging/ Sampling Device: FLUTe System No2 Tubing Type: Pump Inlet:

Measuring Point: Top of Tube Initial Depth to Water (ft): 117.16 Depth to Well Bottom (ft): UF Well Diameter: Screen Length (ft):

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): 4.5 L / 1.2 g

Sample ID: WG-NWS-03-03 Sample Time: 1642 QA/QC: QA split

Sample Parameters: Primary ROPCs 2 1 gallon plastic plus 3 1000 ml plastic

Comments:

Begin filling 1st container @ 1642
Sample set completed at 1745

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1522	7.73	12.34	858	1.3	0.5	-20.1	5	117.16	0.25 g
1536	7.59	13.43	1296	1.12	0.5	-13.9	5		0.5 g
1548	7.69	13.84	1746	1.12	2.3	-81.8	5		0.75 g
1602	7.36	13.12	1502	1.28	5.2	-78.5	5		1.0 g
1620	7.60	13.87	1438	1.06	0	-101.8	5		1.2 g
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** NWS-03-04

Date: 6/9/04 **Sampling Personnel:** S. Nozik **Company:** URS Corporation

Purging/ Sampling Device: FLUTE System No2 **Tubing Type:** _____ **Pump Inlet:** _____

Measuring Point: Top of Tube **Initial Depth to Water (ft):** 133.15 **Depth to Well Bottom (ft):** DB **Well Diameter:** _____ **Screen Length (ft):** _____

Casing: _____ **Vol. in 1 Well Casing (liters):** _____ **Estimated Purge Volume (liters):** <1.0 L / <0.3 g

Sample ID: No Sample **Sample Time:** _____ **QA/QC:** _____

Sample Parameters: _____

Comments: No sample collected due to insufficient water

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1527	7.88	12.73	1636	1.30	22	-62.6	6	133.15	<0.25 g
1540	8.03	13.07	2046	2.15	26	-126.3	6		<0.25 g
1605	7.88	14.90	1938	1.48	—	-149.6	5		<0.3 g
1627	7.92	14.37	1787	3.41	19	-139.5	6		<0.3 g
1755								133.17	
									Total volume
									evacuated was
									less than 0.3 gal.
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-04-01

Date: 6/11/04 Sampling Personnel: S. NOZIK Company: URS Corporation

Purging/ Sampling Device: FLUTe SYSTEM Tubing Type: _____ Pump Inlet: _____

Measuring Point: Top of Tube Initial Depth to Water (ft): DRY Depth to Well Bottom (ft): 15B Well Diameter: _____ Screen Length (ft): _____

Casing: _____ Vol. in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: NO SAMPLE Sample Time: _____ QA/QC: _____

Sample Parameters: NO SAMPLE

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1100								DRY	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-04-02

Date: 6/11/04 Sampling Personnel: S. Nozik Company: URS Corporation

Purging/ Sampling Device: FLUTe System Tubing Type: _____ Pump Inlet: _____

Measuring Point: Top of Tube Initial Depth to Water (ft): DRY Depth to Well Bottom (ft): 8.58 Well Diameter: _____ Screen Length (ft): _____

Casing: _____ Vol. in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: NO SAMPLE Sample Time: _____ QA/QC: _____

Sample Parameters: _____

Comments: _____

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1100								DRY	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-04-03

Date: 6/11/04 Sampling Personnel: S. NOZIK Company: URS Corporation

Purging/ Sampling Device: FLUTe SYSTEM NO_2 Tubing Type: _____ Pump Inlet: _____

Measuring Point: Top of Tube Initial Depth to Water (ft): 129.14 Depth to Well Bottom (ft): UF Well Diameter: _____ Screen Length (ft): _____

Casing: _____ Vol. in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: NO SAMPLE Sample Time: _____ QA/QC: _____

Sample Parameters: _____

Comments: _____

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
									129.14	
6/11	1100									
	1107	7.24	12.12	347	1.3	15.3	92.3	500		
	1110	~~7.02~~	11.53	358	1.25	9.91	43			
	1116								DRY	< 0.25g
	1402								DRY	
	1712								DRY	
6/12										
	0856								dry	
Tolerance:		0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-04-04

Date: 6/11-6/12/04 Sampling Personnel: S. Nozik Company: URS Corporation

Purging/Sampling Device: FLUTe SYSTEM NO_2 Tubing Type: _____ Pump Inlet: _____

Measuring Point: Top of Tube Initial Depth to Water (ft): 109.33 Depth to Well Bottom (ft): DB Well Diameter: _____ Screen Length (ft): _____

Casing: _____ Vol. in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: NO SAMPLE Sample Time: _____ QA/QC: _____

Sample Parameters: No sample due to insufficient water

Comments: extremely slow recharge

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
6/11	1100								109.33	
	1112	7.19	11.37	717	1.48	4.27	18.4	400		
	1114	7.37	11.39	715	1.15	248	1.48	400		<0.25 gal.
	1120								DRY	
	1410	7.42	11.74	802	1.5	17.4	74.3	400		<0.25 gal.
	1415								DRY	
	1712	7.56	12.42	826	1.6	6.86	19.8	400		<0.5 gal
6/12	0855								120.17	No parameters
	1149								DRY	
	1420								DRY	TOTAL Purged
	1530								DRY	<0.5 gal.
										NO SAMPLE
Tolerance:		0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-05-01

Date: 6/8/04 Sampling Personnel: _____ Company: URS Corporation

Purging/ Sampling Device: FLUTe SYSTEM Tubing Type: _____ Pump Inlet: _____

Measuring Point: Top of Tube Initial Depth to Water (ft): DRY Depth to Well Bottom (ft): 15B Well Diameter: _____ Screen Length (ft): _____

Casing: _____ Vol. in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: NO SAMPLE Sample Time: _____ QA/QC: _____

Sample Parameters: NO SAMPLE

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1600								DRY	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-05-02

Date: 6/8/04 Sampling Personnel: _____ Company: URS Corporation

Purging/ Sampling Device: FLUTe SYSTEM Tubing Type: _____ Pump Inlet: _____

Measuring Point: Top of Tube Initial Depth to Water (ft): DRY Depth to Well Bottom (ft): 2SB Well Diameter: _____ Screen Length (ft): _____

Casing: _____ Vol. In 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: NO SAMPLE Sample Time: _____ QA/QC: _____

Sample Parameters: NO SAMPLE

Comments: _____

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1600								DRY	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 **Site:** USACE-SLDA **Well #:** NWS-05-03

Date: 6/8/04 **Sampling Personnel:** S. NOZIK **Company:** URS Corporation

Purging/ Sampling Device: NO_2 FLUTE System **Tubing Type:** **Pump Inlet:**

Measuring Point: Top of Tube **Initial Depth to Water (ft):** 77.17 **Depth to Well Bottom (ft):** UF **Well Diameter:** **Screen Length (ft):**

Casing: **Vol. in 1 Well Casing (liters):** **Estimated Purge Volume (liters):** 0.8 g / 3.0 L

Sample ID: NO SAMPLE **Sample Time:** **QA/QC:**

Sample Parameters:

Comments: No sample due to insufficient water

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
6/8	1615	6.71	16	312	5.16	–	160			0.5 g
	1625	6.87	13.67	320	8.15	–	146.3			0.75 g
	1724	9.66	13.82	364	2.10	8.7	62.2			0.8 g
	1745									dry
	1758									dry
	1820									dry
6/9	0842									dry
Tolerance:		0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-05-04

Date: 6/8/04 Sampling Personnel: S. Nozik Company: URS Corporation

Purging/ Sampling Device: NO_2 . FLUTe System Tubing Type: Pump Inlet:

Measuring Point: Top of Tube Initial Depth to Water (ft): 106.05 Depth to Well Bottom (ft): PB Well Diameter: Screen Length (ft):

6/9 105.02 0:845

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters): 6.8 L / 1.8 g

Sample ID: WG-NWS-05-04 Sample Time: 0918 QA/QC: None

Sample Parameters: PRIMARY RQPCs

Comments: samples obtained directly from FLUTe tubing

5 purge cycles to fill 1st gallon

1st gall. filled @ 1000

2nd gall filled @ 1045

PURGE PARAMETERS

	TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
6/8	1628	6.72	14.16	681	1.4	–	172.5		106.05	0.2 g
	1730	9.11	16.07	664	1.35	80	54	6		0.25 g
	1748	8.28	15.46	677	1.49	0.85	-68.4	6		1.0 g
	1753	7.82	16.27	654	1.40	1.4	-73.4	6		1.2 g
	1800	7.78	14.91	663	1.49	0.1	-72.7	6		1.25 g ~~100ml/10sec~~
	1810	7.37	13.71	707	1.20	0.75	-66.0	6		1.5 g 100ml/10sec
	1830	7.32	14.4	702	1.96	0.15	-77.6	6		1.7 g
6/9	845	7.70	14.4	750	1.68	0.9	76.0	6	103.02	1.75 g
	856	7.39	13.88	749	1.32	4.3	18.8	6		1.8 g
	915	7.58	16.0	741	2.47	2.2	-64.4	4		
Tolerance:		0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 11173233.00000 Site: USACE-SLDA Well #: NWS-05-05

Date: 6/8/04 Sampling Personnel: S. Nozik Company: URS Corporation

Purging/ Sampling Device: NO_2 FLUTE System Tubing Type: Pump Inlet:

Measuring Point: Top of Tube Initial Depth to Water (ft): 119.34 Depth to Well Bottom (ft): DB 2 Well Diameter: Screen Length (ft):

Casing: Vol. in 1 Well Casing (liters): Estimated Purge Volume (liters):

Sample ID: NO SAMPLE Sample Time: QA/QC:

Sample Parameters:

Comments: No Sample due to insufficient water

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (µmhos)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (ft btor)	Comments
1635	10.36	13.52	1266	2.16	–	61.3			0.15g
1734									dry
1800									dry
1820									dry
6/9 0846									dry
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

APPENDIX M

TEMPORARY WASTE SAMPLING POINT (TWSP) PURGE LOGS

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-01
PROJECT NO.:	11173234.00000	START:	1107
STAFF:	Robert Murphy/ Tom Urban	STOP:	1115
DATE(S):	12/8/03 and 12/9/03	SAMPLE:	12/9/03 @ 1615

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	13.25	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	4.15	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.10	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.55	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.55	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2									
pH	6.21	6.39									
SPEC. COND. (umhos)	197	169									
TEMPERATURE ^{0}C	7.70	11.88									
TURBIDITY	100	>999									
DISSOLVED OXYGEN (mg/L)	2.11	4.90									
ORP (mV)	52.7	45.0									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.7 Oxygen

Hard bottom, water is reddish brown color. Slow recharge.
12/8/03 Sampled 1.0 gallon.
12/9/03 @ 8:18 sampled 0.5 gallon.
12/9/03 @ 16:15 sampled 0.5 gallon. Sample set complete.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-02
PROJECT NO.:	11173234.00000	START:	1020
STAFF:	Robert Murphy/ Tom Urban	STOP:	1035
DATE(S):	12/08/03	SAMPLE:	1450

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	12.76	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.57	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.19	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.56	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.56	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2									
pH	6.88	6.90									
SPEC. COND. (umhos)	821	662									
TEMPERATURE ^{0}C	7.87	7.15									
TURBIDITY	27	40									
DISSOLVED OXYGEN (mg/L)	2.16	2.51									
ORP (mV)	-78.6	-73.4									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 20 LEL 0 PID 0 CO 20.6 Oxygen

Well dry after removing 2.0 gallons, water goes from clear to black.
Retruned and sampled well at 14:50.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-03
PROJECT NO.:	11173234.00000	START:	1635
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1648
DATE(S):	12/7/03 and 12/8/03	SAMPLE:	12/8/03 @ 9:50

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	13.03	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	4.60	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	8.43	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.43	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.43	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2									
pH	5.64	6.32									
SPEC. COND. (umhos)	295	190									
TEMPERATURE ^{0}C	10.61	7.98									
TURBIDITY	20	7.2									
DISSOLVED OXYGEN (mg/L)	0.40	5.87									
ORP (mV)	51.8	235.0									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.8 Oxygen

Hard bottom, water clear, bailed dry at 2.0 gallons.
12/8/03 @ 910 sampled 1.75 gallons.
12/8/03 @ 950 completed sample set.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-04
PROJECT NO.:	11173234.00000	START:	1624
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1636
DATE(S):	12/06/03	SAMPLE:	1642

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	13.15	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.74	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.41	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.60	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.60	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2									
pH	6.99	6.91									
SPEC. COND. (umhos)	876	1014									
TEMPERATURE ^{0}C	9.31	9.58									
TURBIDITY	85	110									
DISSOLVED OXYGEN (mg/L)	2.30	0.85									
ORP (mV)	-61.3	-71.9									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 45 LEL 0 PID 0 CO 20.1 Oxygen

Soft bottom, water black at bottom of well, recharge water slightly grey.

Also collected WL-FD-06 from this location.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-05
PROJECT NO.:	11173234.00000	START:	1541
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1552
DATE(S):	12/6/03 and 12/7/03	SAMPLE:	12/7/03 @ 15:31

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	12.51	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	8.78	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	3.73	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.63	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.63	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	1									
pH	7.57	8.43									
SPEC. COND. (umhos)	1842	4076									
TEMPERATURE ^{0}C	10.60	10.64									
TURBIDITY	290	45									
DISSOLVED OXYGEN (mg/L)	0.44	0.22									
ORP (mV)	-64.9	-95.7									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 8 LEL 0 PID 0 CO 20.1 Oxygen

Hard bottom, brown color, bailed dry after 1.0 gallons.
Moderate recharge.
12/7/03 @ 1510 removed 1.2 gallons.
12/7/03 @ 1531 completed sample set.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-06
PROJECT NO.:	11173234.00000	START:	1422
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1430
DATE(S):	12/06/03	SAMPLE:	1435

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	12.33	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	2.98	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.35	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.59	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.59	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2.5									
pH	7.64	8.07									
SPEC. COND. (umhos)	787	1229									
TEMPERATURE ^{0}C	8.60	11.20									
TURBIDITY	19	400									
DISSOLVED OXYGEN (mg/L)	0.77	0.09									
ORP (mV)	-78.0	-122.3									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.8 Oxygen

Light grey color, good recharge

Also collected WL-FD-05 from this location.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-07
PROJECT NO.:	11173234.00000	START:	1037
STAFF:	Robert Murphy/ Tom Urban	STOP:	1050
DATE(S):	12/08/03	SAMPLE:	1055

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	13.12	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.27	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.85	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	6.50	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	6.50	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	7.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	7									
pH	6.49	6.58									
SPEC. COND. (umhos)	241	289									
TEMPERATURE ^{0}C	8.05	9.09									
TURBIDITY	75	55									
DISSOLVED OXYGEN (mg/L)	1.75	2.43									
ORP (mV)	77.9	-31.9									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.7 Oxygen

Hard bottom, water is reddish brown color, fast recharge.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-08
PROJECT NO.:	11173234.00000	START:	1000
STAFF:	Robert Murphy/ Tom Urban	STOP:	1015
DATE(S):	12/8/03 and 12/9/03	SAMPLE:	12/9/03 @ 8:17

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	13.35	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.86	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.49	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	6.26	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	6.26	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	7.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	7									
pH	6.84	6.37									
SPEC. COND. (umhos)	209	203									
TEMPERATURE ^{0}C	8.73	9.86									
TURBIDITY	13	>999									
DISSOLVED OXYGEN (mg/L)	3.60	3.10									
ORP (mV)	212.3	53.6									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.8 Oxygen

Water very black at bottom of well, slow recharge.
Sampled 0.9 gallons
12/8/03 @ 14:20 Sampled 0.25 gallon.
12/9/03 @ 8:17 Sampled 0.85 gallon. Completed Sample set.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-09
PROJECT NO.:	11173234.00000	START:	16:10
STAFF:	Robert Murphy/ Tom Urban	STOP:	16:30
DATE(S):	12/7/03-12/15/03	SAMPLE:	12/15/03 @ 14:30

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	12.61	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.40	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.21	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	6.08	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	6.08	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	6.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	6.5									
pH	7.33	7.06									
SPEC. COND. (umhos)	663	653									
TEMPERATURE ^{0}C	9.03	10.04									
TURBIDITY	4.2	22									
DISSOLVED OXYGEN (mg/L)	1.62	2.02									
ORP (mV)	20.2	-12.6									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.8 Oxygen

12/7/2003	Bottom hard, bailed dry at 6.5 gallons.	########	14:30	2/3 gallon removed.	
	Water Clear, Began filling sample set.			Completed sample set.	
12/8/2003	9:05	5/6 gallon removed.			
12/8/2003	14:15	Negligible volume removed.			
12/9/2003	8:15	1/10 gallon removed			
12/9/2003	16:12	Negligible volume removed.			
########	8:19	1/10 gallon removed.			

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-10
PROJECT NO.:	11173234.00000	START:	15:54
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	16:04
DATE(S):	12/6/03-12/19/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	10.59	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	8.23	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	2.36	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.56	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.56	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.75	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	1.75									
pH	6.74	6.51									
SPEC. COND. (umhos)	304	269									
TEMPERATURE ^{0}C	10.77	10.15									
TURBIDITY	180	110									
DISSOLVED OXYGEN (mg/L)	3.29	3.54									
ORP (mV)	55.1	69.9									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 3 LEL 0 PID 0 CO 20.1 Oxygen

12/6/2003		Bottom hard, bailed dry at 1.75 gallons.	########	8:14	Negligible volume removed.	12/19/2003 8:18	No vol. Removed.
		Began filling sample set.	########	14:26	1/10 gallon removed.		Stopped sampling.
12/7/2003	15:46	1/10 gallon removed.	########	8:04	Negligible volume removed.		1/2 gallon total
12/8/2003	8:59	1/20 gallon removed.	########	17:10	Negligible volume removed.		recovery.
12/8/2003	14:10	Negligible volume removed.	########	15:28	Negligible volume removed.		Sample volume
12/9/2003	8:12	Negligible volume removed.	########	8:27	Negligible volume removed.		deemed insufficient
12/9/2003	16:10	Negligible volume removed.					for lab analysis

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WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-11
PROJECT NO.:	11173234.00000	START:	1525
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1539
DATE(S):	12/6/03 and 12/7/03	SAMPLE:	12/7/03 @ 14:50

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	11.55	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.72	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	7.83	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	5.17	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	5.17	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	5.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	5.5									
pH	8.71	6.15									
SPEC. COND. (umhos)	379	675									
TEMPERATURE ^{0}C	9.27	9.20									
TURBIDITY	80	23									
DISSOLVED OXYGEN (mg/L)	2.46	1.28									
ORP (mV)	-96.8	-15.8									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.5 Oxygen

Slight reddish brown color, becomes grey black, turbid. Bailed dry at 5.5 gallons.
12/7/03 @ 14:50 , returned and filled sample bottles.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-01-12
PROJECT NO.:	11173234.00000	START:	14:48
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	15:00
DATE(S):	12/6/03-12/19/03	SAMPLE:	12/19/03 @ 8:15

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	10.04	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	2.53	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	7.51	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	4.96	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	4.96	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	5.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	5.5									
pH	12.23	9.53									
SPEC. COND. (umhos)	308	583									
TEMPERATURE ^{0}C	7.51	10.36									
TURBIDITY	45	>999									
DISSOLVED OXYGEN (mg/L)	0.79	1.50									
ORP (mV)	-256.0	-62.3									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.5 Oxygen

12/6/2003		Bottom hard, bailed dry at 5.5 gallons.	########	8:12	Negligible volume removed.	12/19/2003 8:15	No vol. Removed.
		Began filling sample set.	########	14:23	1/2 gallon removed.		Stopped sampling.
12/7/2003	15:25	1/4 gallon removed.	########	8:01	~3 ounces removed.		1 1/3 gallon total
12/8/2003	8:55	1/10 gallon removed.	########	17:09	Negligible volume removed.		recovery.
12/8/2003	14:12	Negligible volume removed.	########	15:25	1/10 gallon removed.		
12/9/2003	8:07	Negligible volume removed.	########	8:25	Negligible volume removed.		
12/9/2003	16:03	Negligible volume removed.					

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-02-01
PROJECT NO.:	11173234.00000	START:	1122
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1131
DATE(S):	12/06/03	SAMPLE:	1219

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	14.26	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	2.83	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	11.43	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.94	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.94	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2.5									
pH	6.18	6.21									
SPEC. COND. (umhos)	244	272									
TEMPERATURE ^{0}C	9.71	12.38									
TURBIDITY	260	>999									
DISSOLVED OXYGEN (mg/L)	2.01	1.02									
ORP (mV)	-2.0	46.5									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 3 LEL 0 PID 0 CO 20.4 Oxygen

Initial orange color turns to black, bailed dry after removing 2.5 gallons.
Moderate recharge.
Also collected a QA Split from this location.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-02-02
PROJECT NO.:	11173234.00000	START:	10:16
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	10:39
DATE(S):	12/6/03-12/19/03	SAMPLE:	12/19/03 @ 8:10

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	16.11	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	8.41	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	7.70	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.31	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.31	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	1.5									
pH	6.89	6.92									
SPEC. COND. (umhos)	663	482									
TEMPERATURE ^{0}C	11.89	10.95									
TURBIDITY	12	>999									
DISSOLVED OXYGEN (mg/L)	0.23	1.23									
ORP (mV)	-94.9	-10.6									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 25 LEL 0 PID 0 CO 20.4 Oxygen

12/6/2003	Black/Dark grey color, bailed dry @ 1.5 gallons		12/9/2003	16:00	Negligible volume removed.	12/19/2003 8:10	No vol. Removed.
	Very slight sheen.		########	8:08	Negligible volume removed.		Stopped sampling.
12/7/2003	12:37	1/10 gallon removed.	########	14:12	1/2 gallon removed.		1 1/2 gallon total
12/8/2003	8:47	1/10 gallon removed.	########	7:58	1/20 gallon removed.		recovery.
12/8/2003	14:07	Negligible volume removed.	########	17:06	Negligible volume removed.		
12/8/2003	16:32	Negligible volume removed.	########	15:19	1/10 gallon removed.		
12/9/2003	8:02	Negligible volume removed.	########	8:22	~8 ounces removed.		

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-02-03
PROJECT NO.:	11173234.00000	START:	1626
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1635
DATE(S):	12/05/03	SAMPLE:	1638

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	16.67	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	9.80	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	6.87	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.17	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.17	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2									
pH	6.55	8.54									
SPEC. COND. (umhos)	500	574									
TEMPERATURE ^{0}C	10.78	12.13									
TURBIDITY	85	>999									
DISSOLVED OXYGEN (mg/L)	1.36	0.72									
ORP (mV)	-55.9	-256.4									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 40 LEL 0 PID 0 CO 19.4 Oxygen

Hard Bottom, slight sulfur odor, black color.

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WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-02-04
PROJECT NO.:	11173234.00000	START:	1434
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1504
DATE(S):	12/05/03	SAMPLE:	1510

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	16.48	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	8.34	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	8.14	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.38	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.38	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.00	8"	2.60

$V=0.0408 \times (\text{CASING DIAMETER IN INCHES})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2									
pH	6.32	6.59									
SPEC. COND. (umhos)	210	201									
TEMPERATURE ^{0}C	9.95	10.10									
TURBIDITY	370	55									
DISSOLVED OXYGEN (mg/L)	1.55	1.53									
ORP (mV)	-59.0	-32.9									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.9 Oxygen

Medium to soft bottom.

Also collected WL-FD-04 at this location.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-02-05
PROJECT NO.:	11173234.00000	START:	1041
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1100
DATE(S):	12/06/03	SAMPLE:	1505

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	14.09	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	4.45	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.64	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	6.36	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	6.36	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	7.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	7									
pH	6.83	6.50									
SPEC. COND. (umhos)	215	231									
TEMPERATURE ^{0}C	10.82	11.44									
TURBIDITY	210	1100									
DISSOLVED OXYGEN (mg/L)	0.69	0.74									
ORP (mV)	-21.4	-52.8									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.5 Oxygen

Orange color, turned black during purging.

Sampled 1 gallon, returned @ 1145 sampled 0.5 gallon, returned @ 1500 and completed sample set.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-02-06
PROJECT NO.:	11173234.00000	START:	16:49
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	17:00
DATE(S):	12/5/03-12/19/03	SAMPLE:	12/19/03 @ 8:05

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	13.48	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	8.09	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	5.39	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	3.56	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	3.56	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	4.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	4									
pH	7.45	7.38									
SPEC. COND. (umhos)	316	354									
TEMPERATURE ^{0}C	11.20	10.93									
TURBIDITY	39.7	139									
DISSOLVED OXYGEN (mg/L)	1.05	1.86									
ORP (mV)	-12.2	-85.6									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.8 Oxygen

12/5/2003		Hard bottom, water turns black after 3 gallons removed. 1/2 gallon added to sample containers	12/9/2003	8:00	~3 ounces removed.	12/18/2003	8:22	Negligble vol. Removed.
			12/9/2003	15:53	Negligible volume removed.	12/19/2003	8:05	No vol. Removed.
12/6/2003	9:13	1/4 gallon removed.	########	8:05	Negligible volume removed.			Stopped sampling.
12/7/2003	12:35	No volume removed.	########	14:05	1/10 gallon removed			1 1/8 gallon total
12/8/2003	9:46	~4 ounces removed.	########	7:56	No volume removed.			recovery.
12/8/2003	14:07	Negligible volume removed.	########	17:06	Negligible volume removed.			
12/8/2003	16:30	Negligible volume removed.	########	15:18	No volume removed.			

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WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-02-07
PROJECT NO.:	11173234.00000	START:	1525
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1555
DATE(S):	12/05/03	SAMPLE:	1600

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	16.99	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	9.80	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	7.19	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	4.75	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	4.75	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	5.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	5									
pH	6.49	6.62									
SPEC. COND. (umhos)	577	539									
TEMPERATURE ^{0}C	11.20	12.18									
TURBIDITY	21	150									
DISSOLVED OXYGEN (mg/L)	1.37	2.28									
ORP (mV)	-63.0	-85.0									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 3 LEL 0 PID 0 CO 20.0 Oxygen

Hard bottom, slight sheen and sulfur odor.

Also collected MS/MSD at this location.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-03-01
PROJECT NO.:	11173234.00000	START:	1052
STAFF:	Robert Murphy/ TKevin Shanahan	STOP:	1101
DATE(S):	12/5/03-12/10/03	SAMPLE:	12/10/03 @ 1150

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	11.20	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	10.20	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	1.00	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.17	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.17	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0.25	8"	2.60

$V=0.0408 \times (\text{CASING DIAMETER IN INCHES})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	0.25									
pH	5.16	5.69									
SPEC. COND. (umhos)	162	173									
TEMPERATURE ^{0}C	10.60	10.60									
TURBIDITY	650	>999									
DISSOLVED OXYGEN (mg/L)	4.08	5.75									
ORP (mV)	202.6	118.0									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 19.9 Oxygen

12/5/2003	Bailed Dry @ 11:01		12/8/2003	8:37	1/4 gallon removed.
	Begin filling sample containers.		12/8/2003	13:50	1/10 gallon removed.
12/5/2003	14:02	1/10 gallon removed.	12/8/2003	16:16	Negligible volume removed.
12/6/2003	10:00	1/10 gallon removed.	12/9/2003	7:53	1/5 gallon removed.
12/6/2003	15:25	1/20 gallon removed.	12/9/2003	15:48	1/8 gallon removed
12/7/2003	12:26	1/5 gallon removed.	########	7:58	1/4 gallon removed.
12/7/2003	14:35	1/20 gallon removed.	########	11:50	Completed Sample Set.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-03-02
PROJECT NO.:	11173234.00000	START:	1037
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1048
DATE(S):	12/5/2003-12/7/03	SAMPLE:	12/7/2003 @ 1430

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	12.62	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	10.44	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	2.18	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.37	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.37	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0.60	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	0.6									
pH	6.75	6.81									
SPEC. COND. (umhos)	1546	1073									
TEMPERATURE ^{0}C	10.44	11.37									
TURBIDITY	>999	>999									
DISSOLVED OXYGEN (mg/L)	1.35	2.15									
ORP (mV)	-88.8	-68.8									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 13 LEL 0 PID 0 CO 19.1 Oxygen

12/5/2003		Soft Bottom, grey color, slight sheen, poor recharge-bailed dry.
12/5/2003	13:49	Begin filling sample containers. 1/4 gallon removed.
12/6/2003	9:57	1/2 gallon removed.
12/6/2003	12:10	1/4 gallon removed.
12/6/2003	15:20	1/4 gallon removed.
12/7/2003	12:15	1/2 gallon removed.
12/7/2003	14:30	Complete sample set.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-04-01
PROJECT NO.:	11173234.00000	START:	953
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1000
DATE(S):	12/05/03	SAMPLE:	1005

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	15.98	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.71	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	12.27	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.09	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.09	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	3.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	3									
pH	6.61	6.69									
SPEC. COND. (umhos)	334	383									
TEMPERATURE ^{0}C	9.05	11.31									
TURBIDITY	500	NM									
DISSOLVED OXYGEN (mg/L)	1.50	0.90									
ORP (mV)	-26.5	-70.8									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.4 Oxygen

NM - Not Measured

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WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-04-02
PROJECT NO.:	11173234.00000	START:	933
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	940
DATE(S):	12/05/03	SAMPLE:	945

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	18.51	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	1.75	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	16.76	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.85	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.85	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	4.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	4									
pH	6.85	6.86									
SPEC. COND. (umhos)	205	212									
TEMPERATURE ^{0}C	7.07	11.41									
TURBIDITY	85	500									
DISSOLVED OXYGEN (mg/L)	1.59	1.55									
ORP (mV)	-49.3	-87.0									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.4 Oxygen

Light brown color. Soft Bottom.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-05-01
PROJECT NO.:	11173234.00000	START:	1620
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1632
DATE(S):	12/04/03	SAMPLE:	1646

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	15.68	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.24	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	12.44	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.11	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.11	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	3.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	3									
pH	6.66	6.79									
SPEC. COND. (umhos)	169	166									
TEMPERATURE ^{0}C	7.66	11.40									
TURBIDITY	150	>999									
DISSOLVED OXYGEN (mg/L)	2.08	0.53									
ORP (mV)	26.6	-94.0									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.9 Oxygen

Color: Reddish brown initially, grey brown after 1.5 gallons.

Collected WL-FD-03 at this location.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-05-02
PROJECT NO.:	11173234.00000	START:	1606
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1615
DATE(S):	12/04/03	SAMPLE:	1640

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	10.27	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	2.58	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	7.69	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.31	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.31	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2									
pH	6.37	6.41									
SPEC. COND. (umhos)	307	256									
TEMPERATURE ^{0}C	9.57	9.95									
TURBIDITY	180	150									
DISSOLVED OXYGEN (mg/L)	2.00	3.30									
ORP (mV)	16.3	-3.2									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.2 Oxygen

Hard bottom, black color.
Slow recharge.

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WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-05-03
PROJECT NO.:	11173234.00000	START:	1449
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1500
DATE(S):	12/04/03	SAMPLE:	1505

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	15.33	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	2.33	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	13.00	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.21	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.21	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	3.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	3									
pH	6.56	6.66									
SPEC. COND. (umhos)	272	272									
TEMPERATURE ^{0}C	8.75	10.92									
TURBIDITY	45	600									
DISSOLVED OXYGEN (mg/L)	2.12	1.74									
ORP (mV)	-71.0	-108.7									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 30 LEL 0 PID 0 CO 20.8 Oxygen

Slight chemical-like odor, grey color.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-05-04
PROJECT NO.:	11173234.00000	START:	1526
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1553
DATE(S):	12/04/03	SAMPLE:	1600

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	14.48	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.28	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	11.20	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	7.39	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	7.39	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	8.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	8									
pH	6.54	6.66									
SPEC. COND. (umhos)	292	265									
TEMPERATURE ^{0}C	8.87	10.16									
TURBIDITY	180	70									
DISSOLVED OXYGEN (mg/L)	1.43	2.09									
ORP (mV)	-76.3	-76.9									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.4 Oxygen

Water black in color, slight chemical odor, Black hair (animal?) in well .

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WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-05-05
PROJECT NO.:	11173234.00000	START:	847
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	915
DATE(S):	12/05/03	SAMPLE:	920

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	17.07	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	2.78	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	14.29	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	9.43	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	9.43	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	10.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	10									
pH	8.02	7.25									
SPEC. COND. (umhos)	209	173									
TEMPERATURE ^{0}C	9.05	10.01									
TURBIDITY	60	38									
DISSOLVED OXYGEN (mg/L)	1.58	1.98									
ORP (mV)	34.9	-61.4									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.6 Oxygen

Water Reddish orange in color.
Also collected QA Split from this location.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-06-01
PROJECT NO.:	11173234.00000	START:	1017
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1028
DATE(S):	12/04/03	SAMPLE:	1036

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	14.60	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	4.34	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	10.26	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.74	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.74	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	3.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	3									
pH	6.73	6.95									
SPEC. COND. (umhos)	747	1501									
TEMPERATURE ^{0}C	10.12	11.40									
TURBIDITY	255	242									
DISSOLVED OXYGEN (mg/L)	1.20	1.87									
ORP (mV)	-57.6	-133.5									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.4 Oxygen

Soft bottom
Very slight sheen.

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WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-06-02
PROJECT NO.:	11173234.00000	START:	1042
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1052
DATE(S):	12/04/03	SAMPLE:	1057

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	16.20	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	4.21	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	11.99	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.04	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.04	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.50	8"	2.60

$V=0.0408 \times (\text{CASING DIAMETER IN INCHES})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2.5									
pH	6.19	6.11									
SPEC. COND. (umhos)	190	235									
TEMPERATURE ^{0}C	9.69	11.52									
TURBIDITY	95.7	>999									
DISSOLVED OXYGEN (mg/L)	2.35	1.70									
ORP (mV)	98.0	50.4									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.2 Oxygen

Light Brown color.

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WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-06-03
PROJECT NO.:	11173234.00000	START:	1427
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1442
DATE(S):	12/04/03	SAMPLE:	1445

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	18.12	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.35	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	14.77	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.51	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.51	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	3.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	3									
pH	6.49	6.66									
SPEC. COND. (umhos)	259	231									
TEMPERATURE ^{0}C	8.43	11.84									
TURBIDITY	55	115									
DISSOLVED OXYGEN (mg/L)	1.27	1.09									
ORP (mV)	-11.5	-59.5									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.4 Oxygen

Soft bottom, Grey color, very slight H_2S odor, slight sheen.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-06-04
PROJECT NO.:	11173234.00000	START:	1218
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1237
DATE(S):	12/04/03	SAMPLE:	1240

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	18.44	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	4.19	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	14.25	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	9.41	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	9.41	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	10.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	10									
pH	6.70	6.74									
SPEC. COND. (umhos)	304	297									
TEMPERATURE ^{0}C	9.57	11.37									
TURBIDITY	174	91.5									
DISSOLVED OXYGEN (mg/L)	1.50	2.23									
ORP (mV)	4.1	-44.7									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.4 Oxygen

Also collected MS/MSD.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-07-01
PROJECT NO.:	11173234.00000	START:	917
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	925
DATE(S):	12/04/03	SAMPLE:	930

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	16.23	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	6.30	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.93	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.69	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.69	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2.5									
pH	7.65	7.01									
SPEC. COND. (umhos)	475	582									
TEMPERATURE ^{0}C	11.03	11.66									
TURBIDITY	27.9	354									
DISSOLVED OXYGEN (mg/L)	1.28	1.65									
ORP (mV)	-74.2	-74.4									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.8 Oxygen

Hard Bottom

Slight reddish color, slight H_2S odor.

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WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-07-02
PROJECT NO.:	11173234.00000	START:	1610
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1616
DATE(S):	12/03/03	SAMPLE:	1628

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	12.05	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	4.45	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	7.60	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.29	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.29	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	2.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	2.5									
pH	6.60	6.49									
SPEC. COND. (umhos)	272	310									
TEMPERATURE ^{0}C	9.63	10.67									
TURBIDITY	220	>999									
DISSOLVED OXYGEN (mg/L)	1.55	1.05									
ORP (mV)	-31.4	-51.8									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 7 LEL 0 PID 0 CO 20.2 Oxygen

Very soft bottom, Water dark grey, becomes very turbid, with decomposing type odor.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-07-03
PROJECT NO.:	11173234.00000	START:	1446
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1515
DATE(S):	12/03/03	SAMPLE:	1520

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	19.55	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	3.27	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	16.28	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.77	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.77	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	3.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	3.5									
pH	7.56	7.42									
SPEC. COND. (umhos)	458	489									
TEMPERATURE ^{0}C	8.29	10.74									
TURBIDITY	19.4	36.1									
DISSOLVED OXYGEN (mg/L)	0.78	1.15									
ORP (mV)	-167.3	-178.6									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.0 Oxygen

Slight chemical-like odor observed during purging and sampling.
Very good recharge.

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WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-07-04
PROJECT NO.:	11173234.00000	START:	949
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1004
DATE(S):	12/04/03	SAMPLE:	1007

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	16.18	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	2.69	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	13.49	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	8.90	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	8.90	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	10.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	10									
pH	6.37	6.40									
SPEC. COND. (umhos)	400	514									
TEMPERATURE ^{0}C	8.59	10.79									
TURBIDITY	97.7	309									
DISSOLVED OXYGEN (mg/L)	1.70	2.27									
ORP (mV)	100.5	-58.6									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 11 LEL 0 PID 0 CO 20.4 Oxygen

Hard Bottom
Slight orange color, turns slightly brown.

Also collected WL-FD-02

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-07-05
PROJECT NO.:	11173234.00000	START:	1635
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1648
DATE(S):	12/03/03	SAMPLE:	1650

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	14.94	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	5.24	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.70	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	6.40	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	6.40	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	7.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	7									
pH	6.60	6.89									
SPEC. COND. (umhos)	314	364									
TEMPERATURE ^{0}C	9.63	10.87									
TURBIDITY	11.4	18.9									
DISSOLVED OXYGEN (mg/L)	2.25	3.40									
ORP (mV)	-53.6	-91.9									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 1.7 PID 0 CO 20.2 Oxygen

Hard bottom, slight chemical odor, water clear.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-07-06
PROJECT NO.:	11173234.00000	START:	1537
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1600
DATE(S):	12/03/03	SAMPLE:	1605

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	16.98	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	7.03	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.95	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	6.57	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	6.57	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	8.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	8									
pH	6.86	6.74									
SPEC. COND. (umhos)	777	782									
TEMPERATURE ^{0}C	10.86	11.53									
TURBIDITY	13.7	61.9									
DISSOLVED OXYGEN (mg/L)	1.69	3.22									
ORP (mV)	-51.2	-62.7									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 19 LEL 0 PID 0 CO 20.2 Oxygen

Slight chemical-like odor observed during purging and sampling.
Very good recharge.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-08-01
PROJECT NO.:	11173234.00000	START:	
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	
DATE(S):	12/03/03	SAMPLE:	1130 Also collected MS/MSD

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	17.57	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	4.30	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	13.27	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.26	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.26	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	8.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	3.5	8.5								
pH	6.43	6.57	6.77								
SPEC. COND. (umhos)	319	429	592								
TEMPERATURE ^{0}C	8.86	10.96	11.91								
TURBIDITY	503	>999	>999								
DISSOLVED OXYGEN (mg/L)	1.48	0.64	0.70								
ORP (mV)	35.4	-27.4	-47.9								

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 20 LEL 0 PID 0 CO 20.1 Oxygen

Soft Bottom.

Also collected MS/MSD from this location.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-08-02
PROJECT NO.:	11173234.00000	START:	1415
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1440
DATE(S):	12/03/03	SAMPLE:	12/4/03 @ 9:10

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	21.32	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	4.15	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	17.17	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.92	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.92	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	4.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	4.5									
pH	11.36	11.82									
SPEC. COND. (umhos)	676	988									
TEMPERATURE ^{0}C	9.79	12.24									
TURBIDITY	NM	129									
DISSOLVED OXYGEN (mg/L)	4.73	6.10									
ORP (mV)	-99.2	-39.2									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.3 Oxygen

NM - Not Measured

Well Dry after removing 3.4 gallons. Water clear until bottom, then brown.

Well riser is cracked a few inches above ground surface.

Checked, cleaned, and re-calibrated pH probe following initial pH reading. Sample read 11.62 pH following re-calibration.

Let well recharge and returned to location on 12/4/03 @ 8:50 to complete sampling of well.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-09-01
PROJECT NO.:	11173234.00000	START:	1104
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1115
DATE(S):	12/05/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	13.64	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	13.31	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.33	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.06	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.06	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial										
pH	6.41										
SPEC. COND. (umhos)	460										
TEMPERATURE ^{0}C	10.69										
TURBIDITY	>999										
DISSOLVED OXYGEN (mg/L)	1.78										
ORP (mV)	-54.0										

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 19.5 Oxygen

Well Riser Bent.
Water black, well bailed dry. Returned to well at 14:06, well still dry.

Well not sampled.

N:\11172781.00000\EXCEL\MW Logs\[TWSP Purge Logs.xls]TWSP-01-01

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-09-02
PROJECT NO.:	11173234.00000	START:	1127
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1139
DATE(S):	12/05/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	14.09	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	11.22	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	2.87	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.49	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.49	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial										
pH	6.62										
SPEC. COND. (umhos)	613										
TEMPERATURE ^{0}C	11.98										
TURBIDITY	18										
DISSOLVED OXYGEN (mg/L)	1.48										
ORP (mV)	-51.3										

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 8 LEL 0 PID 0 CO 19.8 Oxygen

Water black, well bailed dry. Returned to well at 14:14 well still dry.
12/6/03 @ 9:25 Well dry.
Well not sampled.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-09-03
PROJECT NO.:	11173234.00000	START:	1201
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1209
DATE(S):	12/05/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	13.98	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	11.30	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	2.68	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.46	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.46	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial										
pH	7.34										
SPEC. COND. (umhos)	515										
TEMPERATURE ^{0}C	11.25										
TURBIDITY	60										
DISSOLVED OXYGEN (mg/L)	2.09										
ORP (mV)	-111.0										

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 8 LEL 0 PID 0 CO 19.5 Oxygen

Hard bottom, bailed well dry at 0.55 gallons, returned at 14:25, well still dry.
12/6/03 @ 9:45 water level at 13.83'.
Well not sampled due to insufficient volume.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-09-04
PROJECT NO.:	11173234.00000	START:	1119
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1122
DATE(S):	12/05/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	12.49	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	12.38	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.11	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.07	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.07	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
pH											
SPEC. COND. (umhos)											
TEMPERATURE ^{0}C											
TURBIDITY											
DISSOLVED OXYGEN (mg/L)											
ORP (mV)											

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 19.8 Oxygen

Hard bottom, bailed well dry to evaluate recharge.
Return at 14:16, well still dry.
Did Not Sample.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-09-05
PROJECT NO.:	11173234.00000	START:	11:40
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	11:54
DATE(S):	12/5/03-12/19/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	13.03	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	8.48	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	4.55	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	3.00	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	3.00	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	3.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	3.5									
pH	6.88	6.97									
SPEC. COND. (umhos)	502	537									
TEMPERATURE ^{0}C	11.43	12.01									
TURBIDITY	12	NM									
DISSOLVED OXYGEN (mg/L)	2.60	8.41									
ORP (mV)	-76.6	-99.4									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.0 Oxygen

12/5/2003	Water clear with black debris, slight chemical odor. Removed 1/2 gallon at 14:17.	12/9/2003	7:58	Negligible volume removed.	12/19/2003	8:00	No volume added.
		12/9/2003	15:52	Negligible volume removed.			Stopped attempting to
12/6/2003	9:30 ~6 ounces removed.	########	8:02	Negligible volume removed.			sample well. 3/4 gallons
12/7/2003	12:28 Well Dry	########	13:55	Well Dry			total recovery.
12/8/2003	8:40 1/32 gallon removed.	########	7:54	Negligible volume removed.			Volume deemed
12/8/2003	14:03 Negligible volume removed	########	15:10	Negligible volume removed.			insufficient for lab
12/8/2003	16:22 Negligible volume removed	########	8:17	Negligible volume removed.			analysis.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-01
PROJECT NO.:	11173234.00000	START:	851
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	900
DATE(S):	12/03/03	SAMPLE:	930

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	17.81	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	15.27	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	2.54	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.43	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.43	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.00	8"	2.60

$V=0.0408 \times (\text{CASING DIAMETER IN INCHES})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	1									
pH	6.17	6.32									
SPEC. COND. (umhos)	433	487									
TEMPERATURE ^{0}C	7.67	11.62									
TURBIDITY	35.8	312									
DISSOLVED OXYGEN (mg/L)	2.95	2.20									
ORP (mV)	-91.3	-50.2									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.9 Oxygen

Cord to meter was discovered to be loose following initial sample parameters, readings could be erroneous.

Collected WL-FD-01 from this location.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-02
PROJECT NO.:	11173234.00000	START:	1638
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1645
DATE(S):	12/02/03	SAMPLE:	1700

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	18.32	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	16.48	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	1.84	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.31	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.31	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.50	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	1	1.5									
pH	7.25	7.17									
SPEC. COND. (umhos)	596	592									
TEMPERATURE ^{0}C	10.58	11.58									
TURBIDITY	>999	>999									
DISSOLVED OXYGEN (mg/L)	1.88	2.09									
ORP (mV)	-23.8	-23.1									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.0 Oxygen

Rotting leaves odor from water, black color, good recharge.

H2S odor during sampling, 17ppm on MultiRae.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-03
PROJECT NO.:	11173234.00000	START:	1630
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1630
DATE(S):	12/02/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	17.78	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	DRY	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=		3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=		4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=		5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
pH											
SPEC. COND. (umhos)											
TEMPERATURE ^{0}C											
TURBIDITY											
DISSOLVED OXYGEN (mg/L)											
ORP (mV)											

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.0 Oxygen

Well Dry.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-04
PROJECT NO.:	11173234.00000	START:	1535
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1559
DATE(S):	12/02/03	SAMPLE:	1620

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	19.44	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	19.04	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.40	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.07	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.07	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	0.8									
pH	7.33	7.18									
SPEC. COND. (umhos)	602	607									
TEMPERATURE ^{0}C	9.46	9.88									
TURBIDITY	326	262									
DISSOLVED OXYGEN (mg/L)	5.93	3.69									
ORP (mV)	83.3	88.3									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.5 Oxygen

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-05
PROJECT NO.:	11173234.00000	START:	
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	
DATE(S):	12/02/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	20.35	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	20.21	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.14	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.02	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.02	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial										
pH											
SPEC. COND. (umhos)											
TEMPERATURE ^{0}C											
TURBIDITY											
DISSOLVED OXYGEN (mg/L)											
ORP (mV)											

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.1 Oxygen

When first attempted to bail well an old acetate bailer was removed from the well. There was approximately 2.0 feet of standing water in the bailer. There was only 0.14' of standing water in the well. Let well recharge.
12/3/2003 - 10:35 - Approximately 0.28' standing water, began purging, muddy brown water. Well goes dry.
12/4/2003 - 17:15 - Well still dry. Well not sampled.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-06
PROJECT NO.:	11173234.00000	START:	
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	
DATE(S):	12/02/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	21.17	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	20.88	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.29	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.05	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.05	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0.05	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial										
pH	7.13										
SPEC. COND. (umhos)	506										
TEMPERATURE ^{0}C	9.48										
TURBIDITY	>999										
DISSOLVED OXYGEN (mg/L)	2.40										
ORP (mV)	-44.8										

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.3 Oxygen

Well dry after removing ~0.05 gallons

Returned 12/2/03 at 15:32, well still dry.

Returned 12/3/03 at 10:20, well still dry.

Well not sampleable.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-07
PROJECT NO.:	11173234.00000	START:	
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	
DATE(S):	12/2/03-12/17/03	SAMPLE:	12/17/03 @ 14:38

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	23.80	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	22.13	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	1.67	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.28	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.28	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0.33	8"	2.60

$V=0.0408 \times (\text{CASING DIAMETER IN INCHES})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	0.5									
pH	6.83	6.40									
SPEC. COND. (umhos)	847	641									
TEMPERATURE ^{0}C	9.71	9.78									
TURBIDITY	161	>999									
DISSOLVED OXYGEN (mg/L)	10.15	2.44									
ORP (mV)	-125.0	-13.6									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.2 Oxygen

12/2/2003	Bailed Dry ~1/3 gallon.		12/6/2003	17:00	Well Dry.	12/10/2003	7:50	Negligible vol. removed.
	Begin filling sample containers.		12/7/2003	11:35	~2 ounces removed.	12/15/2003	13:48	1/2 gallon removed.
12/2/2003	Added negligible volume throughout day.		12/8/2003	8:26	1/10 gallon removed.	12/16/2003	7:47	1/10 gallon removed.
12/3/2003	10:05	.2' standing water removed.	12/8/2003	13:47	1/20 gallon removed.	12/16/2003	16:52	Negligible vol. removed.
12/4/2003	17:10	1/4 gallon removed.	12/8/2003	16:05	Negligible volume removed.	12/17/2003	14:38	Completed 2 gallon
12/5/2003	8:32	~ 8 ounces removed.	12/9/2003	7:40	~2 ounces removed.			Sample Set.
12/5/2003	13:39	Negligible volume removed	12/9/2003	15:43	Negligible volume removed.			

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-08
PROJECT NO.:	11173234.00000	START:	
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	
DATE(S):	12/2/03-12/17/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	23.45	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	23.08	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.37	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.06	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.06	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0.06	8"	2.60

$V=0.0408 \times (\text{CASING DIAMETER IN INCHES})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial										
pH	7.99										
SPEC. COND. (umhos)	920										
TEMPERATURE ^{0}C	9.52										
TURBIDITY	>999										
DISSOLVED OXYGEN (mg/L)	8.60										
ORP (mV)	NM										

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.8 Oxygen

12/2/2003	Bailed Dry	~0.06 gallons.	12/6/2003	17:00	Well dry.	12/10/2003	7:48	Negligible vol. removed.
	Begin filling sample containers.		12/7/2003	11:30	~2 ounces removed.	12/15/2003	13:45	1/10 gallon removed.
12/2/2003	Added negligible volume throughout day.		12/8/2003	8:25	Negligible volume removed.	12/16/2003	7:45	Negligible vol. removed.
12/3/2003	9:02	~0.06 gallons removed.	12/8/2003	13:45	~3 ounces removed.	12/16/2003	16:50	Negligible vol. removed.
12/4/2003	17:08	~5 ounces removed.	12/8/2003	16:00	Negligible volume removed.	12/17/2003	14:35	Well Dry
12/5/2003	8:24	Well Dry	12/9/2003	7:38	1/10 gallon removed.		Well unsampleable, only 2/3 gallons	
12/5/2003	13:36	Well Dry	12/9/2003	15:38	1/20 gallon removed.		recovered.	

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-09
PROJECT NO.:	11173234.00000	START:	842
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	850
DATE(S):	12/03/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	15.80	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	15.62	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.18	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.12	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.12	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
pH											
SPEC. COND. (umhos)											
TEMPERATURE ^{0}C											
TURBIDITY											
DISSOLVED OXYGEN (mg/L)											
ORP (mV)											

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.9 Oxygen

Attempted to bail, only wet muck/mud recovered.
Checked well again at 10:45, same result.
Well not sampled.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-10
PROJECT NO.:	11173234.00000	START:	1632
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	1632
DATE(S):	12/02/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	16.68	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	DRY	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=		3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=		4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=		5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
pH											
SPEC. COND. (umhos)											
TEMPERATURE ^{0}C											
TURBIDITY											
DISSOLVED OXYGEN (mg/L)											
ORP (mV)											

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 19.9 Oxygen

Well Dry.

N:\11172781.00000\EXCEL\MW Logs\[TWSP Purge Logs.xls]TWSP-01-01

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-11
PROJECT NO.:	11173234.00000	START:	
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	
DATE(S):	12/02/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	20.19	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	19.92	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.27	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.18	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.18	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0.20	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial										
pH	7.10										
SPEC. COND. (umhos)	722										
TEMPERATURE ^{0}C	9.70										
TURBIDITY	776										
DISSOLVED OXYGEN (mg/L)	5.20										
ORP (mV)	27.6										

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.6 Oxygen

Well dry after removing ~0.20 gallons

Returned 12/2/03 at 15:33, well still dry.

Returned 12/3/03 at 10:22, .07' standing water. Insufficient water volume for sampling.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-12
PROJECT NO.:	11173234.00000	START:	
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	
DATE(S):	12/02/03	SAMPLE:	12:00

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	23.34	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	22.60	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.74	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.49	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.49	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.00	8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	Initial	1									
pH	7.20	6.87									
SPEC. COND. (umhos)	1073	578									
TEMPERATURE ^{0}C	10.83	9.13									
TURBIDITY	118	129									
DISSOLVED OXYGEN (mg/L)	5.74	4.90									
ORP (mV)	148.5	160.7									

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.6 Oxygen

Good Recharge.

WELL PURGE LOG

URS Corporation

PROJECT TITLE:	SLDA Remedial Investigation	WELL NO.:	TWSP-10-13
PROJECT NO.:	11173234.00000	START:	
STAFF:	Robert Murphy/ Kevin Shanahan	STOP:	
DATE(S):	12/02/03	SAMPLE:	

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	22.70	1"	0.040
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	22.60	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.10	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.07	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.07	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

V=0.0408 x (CASING DIAMETER IN INCHES)^2

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
pH											
SPEC. COND. (umhos)											
TEMPERATURE ^{0}C											
TURBIDITY											
DISSOLVED OXYGEN (mg/L)											
ORP (mV)											

COMMENTS: Well Head Screen with MultiRae: 0 H_2S 0 LEL 0 PID 0 CO 20.2 Oxygen

Attempted to bail well; no water recovered, muddy bottom.

Revisited 12/5/03 @ 8:30, well dry.

APPENDIX N

SURFACE WATER/SEDIMENT SAMPLING LOGS

SEEP SAMPLING

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift PA PROJECT NO.: 11173233.00008

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: SEEP WATER SAMPLE ID: SP-DR-01

SAMPLING METHOD: DIRECT FILL DUP.REP. OF: SP-FD-01

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 12/7/03 TIME: 1040

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	HNO_3			

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: brownish-yellow	pH: 5.35 SU
2nd NA	ODOR: none	Sp. Cond.: 143 uS
	OTHER: slight sheen	Temp 5.35 °C
		TURBIDITY: 200 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: ROB MURPHY/TOM URBAN OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIGURE 3.3-2

SEEP SAMPLING

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift PA PROJECT NO.: 11173233.00000

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: SEEP WATER SAMPLE ID: SP-DR-02

SAMPLING METHOD: DIRECT FILL DUP.REP. OF:

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 12/7/03 TIME: 1005

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	HNO_3			

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: yellowish	pH: 4.61 SU
2nd NA	ODOR: none	Sp. Cond.: 152 uS
	OTHER:	Temp 2.08 °C
		TURBIDITY: 130 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: ROB MURPHY/TOM URBAN OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEEP SAMPLING

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift PA PROJECT NO.: 11173233.000008

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: SEEP WATER SAMPLE ID: SP-DR-03

SAMPLING METHOD: DIRECT FILL DUP.REP. OF:

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 12/7/03 TIME: 0930

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	HNO_3			

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: yellowish	pH: 5.50 SU
2nd NA	ODOR: none	Sp. Cond.: 78 us
	OTHER:	Temp. 5.67 °C
		TURBIDITY: 60 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: ____

COMMENTS: ____

SAMPLER: ROB MURPHY/TOM URBAN OBSERVER: ____

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEEP SAMPLING

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift PA PROJECT NO.: 11173233.00000

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: SEEP WATER SAMPLE ID: SP-OR-01

SAMPLING METHOD: DIRECT FILL DUP.REP. OF:

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 12/7/03 TIME: 0900

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	HNO_3			

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Clear	pH: 6.98 SU
2nd NA	ODOR: None	Sp Cond.: 298 uS
	OTHER:	Temp. 11.51 °C
		TURBIDITY: 5.91 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: ROB MURPHY/TOM URBAN OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

MINE OUTFALL

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: SP-CR-01

SAMPLING METHOD: Direct Fill DUP.REP. OF: ——

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/08/03 TIME: 1020

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3		PRIMARY	PCBs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Slightly cloudy orange	pH: 6.14 SU
2nd NA	ODOR: ND	Sp. Cond. 1381 us
	OTHER: - Artesian conditions, water	Temperature: 53.3 °F
	bubbling out of ground	Turbidity: 22 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: ____

COMMENTS: ____

SAMPLER: Eric Lovendusk / Chris McMahon OBSERVER: ____

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA ~50 yards upstream of abandoned bridge

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-CR-01

SAMPLING METHOD: Direct Fill DUP.REP. OF: —

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/07/03 TIME: 1145

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3		PRIMARY Rolcs	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Clear	pH: 7.54 SU
2nd NA	ODOR: ND	Sp. Cond. 240 us
	OTHER: —	Temperature: 33.5 °F
		Turbidity: 10.5 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovendusk / Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA ~50 yards upstream of abandoned bridge

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-CR-01

SAMPLING METHOD: ~~Split Spoon~~ Stainless steel trowel DUP.REP. OF: ——

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/07/03 TIME: 1150

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 oz/Plastic	1	UNPRESERVED		PRIMARY	ROPCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Brown coarse SAND & GRAVEL, trace	
2nd NA	ODOR: silt, trace organic material, wet, GP	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: ____

COMMENTS: ____

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ____

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA * Approx 150 yards downstream of abandoned bridge

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-CR-02

SAMPLING METHOD: Direct Fill DUP.REP. OF: ——

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/04/03 TIME: 1130

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3	PRIMARY	RHOPCs	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Clear	pH: 7.04 SU
2nd NA	ODOR: None	Sp. Cond. 233 us
	OTHER:	Temperature: 32.5°F
		Turbidity: 15 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovenduski / Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA Approx 150 yards downstream of abandoned bridge

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-CR-02

SAMPLING METHOD: ~~Split spoon~~ Stainless steel trowel DUP.REP. OF: SE-FD-02

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/07/03 TIME: 1135

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16oz/Plastic	1	UNPRESERVED		PRIMARY	ROPCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Brown Coarse Sand w/ GRAVEL,	
2nd NA	ODOR: trace silt, wet, Gt.	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

at confluence of mine outfall & Carnahan Run

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-CR-03

SAMPLING METHOD: Direct Fill DUP.REP. OF: —

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/07/03 TIME: 1030

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3		PRIMARY/SECONDARY	- ROPCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Cloudy reddish orange	pH: 6.95 SU
2nd NA	ODOR: ND	Sp. Cond. 1019 us
	OTHER:	Temperature: 43.87 °F
		Turbidity: 145 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovendusk/Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-CR-03

SAMPLING METHOD: ~~Split Spoon~~ Stainless steel trowel DUP.REP. OF: —

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/08/03 TIME: 1035

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 oz / Plastic	1	UNPRESERVED		PRIMARY/SECONDARY	120 PCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Dark reddish orange coarse SAND, trace fine angular	
2nd NA	~~ODOR~~: gravel and organic materials, wet, SP	
	~~OTHER~~:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: ____

COMMENTS: ____

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ____

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-CR-04

SAMPLING METHOD: Direct Fill DUP.REP. OF: —

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/08/03 TIME: 1100

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3		PRIMARY ROPCs	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Slightly cloudy yellow, murky	pH: 7.62 SU
2nd NA	~~OBSR~~: odor.	sp. cond. 283 us
	~~[illegible]~~:	Temperature: 32.45 °F
		Turbidity: 24 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovendusk: / Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-CR-04

SAMPLING METHOD: ~~Split Spoon~~ Stainless steel trowel DUP.REP. OF: —

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (x)

GRAB ( ) COMPOSITE ( ) DATE: 12/07/03 TIME: 1110

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 oz / Plastic	1	UNPRESERVED		PRIMARY ROPCs	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Brown ~~gray~~ GRAVELY SAND,	
2nd NA	ODOR: trace silt, wet, GP.	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA ~ 200 yards upstream of RT 66 Bridge

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-CR-05

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/07/03 TIME: 1220

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3		PRIMARY	RoPCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Clear	pH: 7.14 SU
2nd NA	ODOR: ND	sp. Cond. 274 us
	OTHER: —	Temperature: 33.15 °F
		Turbidity: 26.5 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovenduski / Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-CR-05

SAMPLING METHOD: ~~Split Spoon~~ Stainless steel trowel DUP.REP. OF:

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB ( ) COMPOSITE ( ) DATE: 12/07/03 TIME: 1225

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 oz / Plastic	1	UNPRESERVED		PRIMARY ROPCs	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Brown coarse SAND & GRAVEL, trace silt, wet, GP	
2nd NA	ODOR: —	
	OTHER: —	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: ____

COMMENTS: ____

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ____

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA ~50' upstream of RT 66 Bridge

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-CR-06

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES (X) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 12/08/03 TIME: 1205

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3		PRIMARY RCPCs	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Clear	pH: 7.23 SU
2nd NA	ODOR: ND	sp. Cond. 303 us
	OTHER: —	Temperature: 34.2 °F
		Turbidity: 1.5 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovendusti / Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA ~50 yards upstream of RT 66 Bridge

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-CR-06

SAMPLING METHOD: ~~Split spoon~~ Stainless steel trowel DUP.REP. OF: —

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES (X) NO ( )

GRAB ( ) COMPOSITE ( ) DATE: 12/02/03 TIME: 1210

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 oz / Plastic	1	UNPRESERVED		PRIMARY	POPCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Dark brown SAND+GRAVEL, trace	
2nd NA	ODOR: silt, wet, oil	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: ____

COMMENTS: ____

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ____

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-DR-04

SAMPLING METHOD: Direct Fill DUP.REP. OF: WS-FD-01

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/06/03 TIME: 1300

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3	Primary RAD		

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Slightly cloudy yellow	pH: 7.08 SU
2nd NA	ODOR: ND	sp. Cond. 81 us
	OTHER: —	Temperature: 1.76 °C
		Turbidity: 74 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovenduski / Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-DR-05

SAMPLING METHOD: Direct Fill DUP.REP. OF: ——

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/06/03 TIME: 1400

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3	Primary/secondary	ROPCs	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Slightly cloudy yellow	pH: 6.66 SU
2nd NA	ODOR: ND	sp. Cond. 87 us
	OTHER: —	Temperature: 2.30°C
		Turbidity: 124 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovenduski/Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-DR-06

SAMPLING METHOD: Direct Fill DUP.REP. OF: —

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/06/03 TIME: 1420

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3	Primary RCPCs		

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Slightly cloudy yellow.	pH: 6.15 SU
2nd NA	ODOR: ND	sp. Cond. 80 us
	OTHER: —	Temperature: 2.25 °C
		Turbidity: 345 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovenduski / Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-DR-04

SAMPLING METHOD: ~~Split Spoon~~ Stainless steel trowel DUP.REP. OF: SE FD-01

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/06/03 TIME: 1310

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16oz/Plastic	1	UNPRESERVED	Primary RAD		

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Light brown med-coarse SAND,	
2nd NA	ODOR: Some fine gravel, little organics	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-DR-05

SAMPLING METHOD: ~~Split Spoon~~ Stainless steel trowel DUP.REP. OF: —

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB ( ) COMPOSITE ( ) DATE: 12/06/03 TIME: 1410

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16oz/Plastic	1	UNPRESERVED	Primary/secondary		DOPCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Brown med.-coarse SAND, little	
2nd NA	ODOR: gravel, trace organics, wet, SP	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-DR-06

SAMPLING METHOD: ~~Split Spoon~~ Stainless steel trowel DUP.REP. OF: —

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/06/03 TIME: 1430

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16oz/Plastic	1	UNPRESERVED	Prim. PCBs		

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Brown ~~silty SAND~~ SILTY SAND,	
2nd NA	ODOR: Some fine subangular fine gravel,	
	OTHER: ~~w~~ trace organics, wet	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: SE-DR-02

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/06/03 TIME: 1130

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3		Primary ROPCs	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: slightly cloudy brown	pH: 7.77 SU
2nd NA	ODOR: ND	Sp. Cond. 84 us
	OTHER:	Temperature: 1.64 °C
		Turbidity: 238 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovenduski / Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-DR-03

SAMPLING METHOD: Direct Fill DUP.REP. OF: -QC split

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/06/03 TIME: 1220

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3		Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Slightly cloudy tan	pH: 7.20 SU
2nd NA	ODOR: NONE DETECTED	sp. Cond. 76 us
	OTHER:	Temperature: 1.59 °C
		Turbidity: 124 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: ____

COMMENTS: ____

SAMPLER: Eric Lovendusk; / Chris McMahon OBSERVER: ____

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: SP-DR-05

SAMPLING METHOD: Direct Fill DUP.REP. OF: ---

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/06/03 TIME: 1020

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3		Primary Rofc	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Slightly cloudy brown	pH: 6.95 SU
2nd NA	ODOR: ND	Sp. Cond. 457 us
	OTHER: slight sheen	Temperature: 7.06 °C
		Turbidity: 305 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovendusk / Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIGURE 3.3-2

SURFACE WATER

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Surface Water SAMPLE ID: WS-DR-01

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: NA YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/06/03 TIME: 1025

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal/plastic	2	HNO_3		Primary RPC	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: slightly cloudy brown	pH: 7.11 SU
2nd NA	ODOR: ND	Sp. Cond. 382 us
	OTHER:	Temperature: 2.91 °C
		Turbidity: 178 NTU

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Eric Lovendusk: / Chris McMahon OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-DR-03

SAMPLING METHOD: ~~Split Spoon~~ Stainless steel trowel ~~DUP.REP. OF~~: _____

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB ( ) COMPOSITE ( ) DATE: 12/06/03 TIME: 1225

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16oz/Plastic	1	UNPRESERVED	PRIMARY RDRCs		

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Light greyish brown fine SAND, some	
2nd NA	ODOR: coarse gravel, trace silt and	
	OTHER: organic fibers, wet	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION _____ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER _____

SHIPPED TO: _____

COMMENTS: _____

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: _____

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIRE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: ~~SD~~ SE-DR-01

SAMPLING METHOD: ~~Split Spoon~~ Stainless steel trowel DUP.REP. OF:

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 12/06/03 TIME: 1030

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16oz/Plastic	1	UNPRESERVED		Primary Rad	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Light brown ~~silty~~ SILTY SAND, some fine angular gravel	
2nd NA	ODOR: trace organics, wet, SP.	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIGURE 3.3-2

SEDIMENT

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: Sediment SAMPLE ID: SE-DR-02

SAMPLING METHOD: ~~Split Spoon~~ Stainless steel trowel DUP.REP. OF:

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB ( ) COMPOSITE ( ) DATE: 12/06/03 TIME: 1135

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 oz/Plastic	1	UNPRESERVED		Primary ROPCs	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st NA	COLOR: Light brown coarse sand & GRAVEL,	
2nd NA	ODOR: some silt, trace organic material,	
	OTHER: GP, wet.	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 32°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: Chris McMahon, Eric Lovenduski OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

DRY RUN SURFACE WATER

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: WS-DR-01 PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-DR-01

SAMPLING METHOD: Fill with pour cup DUP.REP. OF: ND

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/4/04 TIME: 1424

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	HNO_3			Primary ROPCS

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: generally clear slightly cloudy	Temp: 18.83
2nd	ODOR: none	Turb. 19.6
	OTHER: pH: 7.32	ORP 100.6
	Cond: 151	DO: 6.46

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 85°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: J. Doerr / S. Nozik OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

Dry Run Sampling (SEDIMENT)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.0000

SITE: USACE - SWDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: SE-DR-01

SAMPLING METHOD: Disposable plastic scooper DUP.REP. OF:

BEGINNING DEPTH: 0' MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 0.5' YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 15:05

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 oz plastic	1	NA		NAD	PAOPC

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st N/A	COLOR: TAN - LT BROWN	[illegible]
2nd N/A	ODOR: NONE	MOD [illegible] LITTLE
	OTHER: WET	MP ANG GRAV SILT

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN X WIND DIRECTION ____ AMBIENT TEMP. 85°

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER UPS

SHIPPED TO: GGL

COMMENTS:

SAMPLER: DC OBSERVER: KJM

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIELD SAMPLING REPORT

DRY RUN SAMPLING (Surface water)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-DR-02

SAMPLING METHOD: Direct Fill DUP.REP. OF: WS-DR-02

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (FIELD DUP)

END DEPTH: N/A YES (X) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 15:35

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal plastic		HNO3		Primary	

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	N/A	COLOR:	Lt Gray	pH. 6.87
2nd	↓	ODOR:	None	cond. 22.43 mS/cm
		OTHER:		Temp. 20.46°C
				Turb. 45°C

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 75°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER UPS

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC OBSERVER: KSM

MATRIX TYPE CODES

DC = DRILL CUTTINGS
WG = GROUND WATER
LH = HAZARDOUS LIQUID WASTE
SH = HAZARDOUS SOLID WASTE
SE = SEDIMENT
SL = SLUDGE
SO = SOIL
GS = SOIL GAS
WS = SURFACE WATER
SW = SWAP/WIPE

SAMPLING METHOD CODES

B = BAILER
BR = BRASS RING
CS = COMPOSITE SAMPLE
C = CONTINUOUS FLIGHT AUGER
DT = DRIVEN TUBE
W = SWAB/WIPE
G = GRAB
HA = HAND AUGER
H = HOLLOW STEM AUGER
HP = HYDRO PUNCH
SS = SPLIT SPOON
SP = SUBMERSIBLE PUMP

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

Dry Run Sampling (SEDIMENT)

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: SE-DR-02

SAMPLING METHOD: Disposable Plastic Scoop DUP.REP. OF:

BEGINNING DEPTH: 0' MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 0.5' YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 15:35

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 OZ plastic	1	None		Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st N/A	COLOR: Dk-Brown	C Sand + F Gravel / Some
2nd 1	ODOR: None	Silt.
	OTHER: Wet	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. 75° F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER UPS

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC OBSERVER: KJM

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIELD SAMPLING REPORT

DRY RUN SAMPLING (SURFACE WATER)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: WS-DR-03

SITE: SLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-DR-03

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 1610

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal plastic		HNO3		Primary	

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	N/A	COLOR:	Lt-Pale Gray	pH ~~3.5~~ 3.56
2nd	↓	ODOR:	None	Cond. 0.343 mS/cm
		OTHER:		Temp 20.15°C
				Turb. 40

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. ____

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER UPS

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC OBSERVER: KSM

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIELD SAMPLING REPORT

DRY RUN Sampling (SEDIMENT)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: ~~11173233.00000~~ SE-DR-03

SAMPLING METHOD: Disposable Scoop DUP.REP. OF: ~~SE-DR-03~~ FD

BEGINNING DEPTH: 0' MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 0.5' YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 16:15

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 OZ plastic	1	None		Primary	

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	N/A	COLOR:	Med Brown	M-F A GRAVEL, SOME-LITTLE
2nd	↓	ODOR:	None	C AN GRAV & SAND, LITTLE
		OTHER:	Wet	SILT + MF SAND,
				ORGANIC ORGANICS PRESENT

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. ____

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER UPS

SHIPPED TO: GEL

COMMENTS:

SAMPLER: KGM OBSERVER: DC

MATRIX TYPE CODES

DC = DRILL CUTTINGS
WG = GROUND WATER
LH = HAZARDOUS LIQUID WASTE
SH = HAZARDOUS SOLID WASTE
SE = SEDIMENT
SL = SLUDGE
SO = SOIL
GS = SOIL GAS
WS = SURFACE WATER
SW = SWAP/WIPE

SAMPLING METHOD CODES

B = BAILER
BR = BRASS RING
CS = COMPOSITE SAMPLE
C = CONTINUOUS FLIGHT AUGER
DT = DRIVEN TUBE
W = SWAB/WIPE
G = GRAB
HA = HAND AUGER
H = HOLLOW STEM AUGER
HP = HYDRO PUNCH
SS = SPLIT SPOON
SP = SUBMERSIBLE PUMP

FIELD SAMPLING REPORT

DRY RUN SAMPLING (Surface water)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-DR-04

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 1635

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal plastic		HNO3		Primary	

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS	
1st	N/A	COLOR:	Pale Brown	pH	7.01
2nd	N/A	ODOR:	None	Cond.	0.109 mS/cm
		OTHER:	N/A	Temp.	18.6
				Turb.	SS

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN X WIND DIRECTION ____ AMBIENT TEMP. 78°F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER UPS

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC OBSERVER: KAM

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIELD SAMPLING REPORT

Dry Run Sampling (Sediment)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: Se SAMPLE ID: Se-DR-04

SAMPLING METHOD: Disposable Scoop DUP.REP. OF: -

BEGINNING DEPTH: 0' MATRIX SPIKE / MATRIX SPIKE DUPLICATE

END DEPTH: 0.5' YES (X) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 16:40

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 OZ plastic	1	None		Primary	

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	N/A	COLOR: Brown - Dk Brown	
2nd	N/A	ODOR: None Fn Sandy Silt	
		OTHER: ~~Sticks & Rocks Sand~~ Some - Little M-C Sand	
		Trace F Angular Gravel	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ~~N/A~~ WIND DIRECTION ____ AMBIENT TEMP. 78°F

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER UPS

SHIPPED TO: GEL

COMMENTS: ____

SAMPLER: DC OBSERVER: KJM

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

Dry Run sampling (Surface water)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.08000

SITE: SLOA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-DR-05

SAMPLING METHOD: Direct Fill DUP.REP. OF: no

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 1710

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic		HNO_3		Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: light Turb. Brown	PH. 6.66
2nd	ODOR: No	cond. 0.104
	OTHER:	Temp. 21.10
		turb. 60

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION ____ AMBIENT TEMP. 85°

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: ____

COMMENTS: ____

SAMPLER: DC OBSERVER: KJM

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIELD SAMPLING REPORT

Dry Run sampling (sediment)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: SE-DR-05

SAMPLING METHOD: Disposable scoop DUP.REP. OF: N/A

BEGINNING DEPTH: 0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 1715

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 oz plastic				Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: OR saturated, Fine silty-sand and fine	
2nd	ODOR: NO gravel	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 85°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: DC OBSERVER: KJM

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

Dry Run sampling (Surface water)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11473233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-DR-06

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 1730

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal plastic	2	HNO_3		primary	

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	NA	COLOR:	Clear	PH 6.37
2nd	"	ODOR:	NO	cond. 0.115
		OTHER:		Temp. 20.40
				Turb. 13

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ____ WIND DIRECTION South AMBIENT TEMP. 85°

SHIPMENT VIA: FED-X ____ HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: GGR

COMMENTS:

SAMPLER: DC OBSERVER: KJW

MATRIX TYPE CODES

DC = DRILL CUTTINGS
WG = GROUND WATER
LH = HAZARDOUS LIQUID WASTE
SH = HAZARDOUS SOLID WASTE
SE = SEDIMENT
SL = SLUDGE
SO = SOIL
GS = SOIL GAS
WS = SURFACE WATER
SW = SWAP/WIPE

SAMPLING METHOD CODES

B = BAILER
BR = BRASS RING
CS = COMPOSITE SAMPLE
C = CONTINUOUS FLIGHT AUGER
DT = DRIVEN TUBE
W = SWAB/WIPE
G = GRAB
HA = HAND AUGER
H = HOLLOW STEM AUGER
HP = HYDRO PUNCH
SS = SPLIT SPOON
SP = SUBMERSIBLE PUMP

FIELD SAMPLING REPORT

Dry Run Sampling (Sediment)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11473233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: SE-DR-06

SAMPLING METHOD: Disposable plastic scoop DUP.REP. OF:

BEGINNING DEPTH: 0' MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 1735

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16oz plastic	1	NONE		primary	

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	N/A	COLOR: Olive Brown w/ Mod Mottling	
2nd	↓	ODOR: None	
		OTHER: Silt, Some Clay + F-M Sand,	
		Trace C Sand & F-A Gravel	

GENERAL INFORMATION

WEATHER: SUN/CLEAR X OVERCAST/RAIN ___ WIND DIRECTION South AMBIENT TEMP. 85°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER UPS

SHIPPED TO: GGL

COMMENTS:

SAMPLER: KEM OBSERVER: DC

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

DRY RUN SEEP SAMPLING

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: SP-DR-01 PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: Seep* SAMPLE ID: SP-DR-01

SAMPLING METHOD: Dedicated sampling cup DUP.REP. OF: QA SPLIT

BEGINNING DEPTH: MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: YES ( ) NO (X)

GRAB (✓) COMPOSITE ( ) DATE: 6/12/04 TIME: 1726

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1qt plastic	2	HNO3			Primary ROPCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	COLOR:	muddy w/ orange tint	Cond: 148
2nd	ODOR:	Organic odor	Eh 47.1
	OTHER:	pH 6.03	DO 1.83
		temp 16.10	Turb: >999

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 75°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: K. Shanahan / S. Nozik OBSERVER: M. Grahn USACE

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
GW seep *		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

DRY RUN SEEP SAMPLING

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: SP-DR-02 PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: DRY SAMPLE ID: SP-DR-02

SAMPLING METHOD: DUP.REP. OF:

BEGINNING DEPTH: MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: YES ( ) NO ( )

GRAB ( ) COMPOSITE ( ) DATE: 6/12/04 TIME: 1710

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
					NO SAMPLE

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: NO SAMPLE	
2nd	ODOR:	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 75°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO:

COMMENTS:

SAMPLER: K. Shanahan / S. Nozik OBSERVER: M. Grahm USACE

MATRIX TYPE CODES

DC = DRILL CUTTINGS
WG = GROUND WATER
LH = HAZARDOUS LIQUID WASTE
SH = HAZARDOUS SOLID WASTE
SE = SEDIMENT
SL = SLUDGE
SO = SOIL
GS = SOIL GAS
WS = SURFACE WATER
SW = SWAP/WIPE

SAMPLING METHOD CODES

B = BAILER
BR = BRASS RING
CS = COMPOSITE SAMPLE
C = CONTINUOUS FLIGHT AUGER
DT = DRIVEN TUBE
W = SWAB/WIPE
G = GRAB
HA = HAND AUGER
H = HOLLOW STEM AUGER
HP = HYDRO PUNCH
SS = SPLIT SPOON
SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

DRY RUN SEEP SAMPLING

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: SP-DR-03 PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: Seep SAMPLE ID: SP-DR-03

SAMPLING METHOD: Dedicated sampling cup DUP.REP. OF: No

BEGINNING DEPTH: MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 1640

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	HNO_3			Primary ROPCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: Cloudy brown to muddy brown	Cond: 58
2nd	ODOR: none	turb: 750
	OTHER: pH: 6.78	Eh: -101.2
	temp: 17.79	DO: 3.64

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 75°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: K. Shanahan / S. Nozik OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

DRY RUN SEEP SAMPLING

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: SP-DR-04 PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: seep* SAMPLE ID: SP-DR-04

SAMPLING METHOD: pour from dedicated sampling cup DUP.REP. OF: No

BEGINNING DEPTH: MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 1615

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 Gal plastic	2	HNO_3			Primary ROPCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: slight brown tint	cond: 257
2nd	ODOR: none	DO: 6.67
	OTHER: pH: 7.67	Eh: -118.1
	Temp: 13.0	turb: 80

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 75°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: R. Shanahan / S. Nozik OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
GW seep *		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

DRY RUN SEEP SAMPLING

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: SP-DR-05 PROJECT NO.: 11173233.00000

SITE: SLDA

SAMPLE INFORMATION

MATRIX: Seep * SAMPLE ID: SP-DR-05

SAMPLING METHOD: ~~NA~~ Pour from designated sampling cup DUP.REP. OF: No

BEGINNING DEPTH: NA MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 1550

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 Gal Plastic	2	HNO_3			Primary ROPCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: Slight brown tint	cond: 410
2nd	ODOR: none	DO: 2.8
	OTHER: pH: 6.51	Eh: ~94.8
	Temp: 14.68	Turbidity: 140

GENERAL INFORMATION

WEATHER: SUN/CLEAR ✓ OVERCAST/RAIN ___ WIND DIRECTION ___ AMBIENT TEMP. 75°F

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: ___

COMMENTS: ___

SAMPLER: K. Shanahan / S. Nozik OBSERVER: ___

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
ground water / seep *		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

CARNAHAN RUN Sampling (Surface water)

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE SLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-CR-01

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1450

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	HNO3		Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: clear	pH 7.72
2nd	ODOR: None	cond .246
	OTHER:	Temp. 20.30
		Turb. 5.9

GENERAL INFORMATION D.O. 9.31 ORP. 56.5

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION N AMBIENT TEMP. 80°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC/JD OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

CALLAHAN RUN sampling (sediment)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE SLDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: SE-CR-01

SAMPLING METHOD: Steel Shovel DUP.REP. OF:

BEGINNING DEPTH: 0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1455

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16oz plastic	1			Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: BRN/GRAY	
2nd	ODOR: NONE	
	OTHER: Sat. Clay silt fine course sand	
	clay trace.	

GENERAL INFORMATION

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION N AMBIENT TEMP. 80

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

CARNAHAN RUN Sampling (Surface water)

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE FSLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-CR-02

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES (X) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 6/12/04 TIME: 1430

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	HNO3		Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: Clear	pH. 7.60
2nd	ODOR: NONE	Cond 0.246
	OTHER: 5'	Temp 20.98
		Turb 21

GENERAL INFORMATION

DO. 8.4 ORP 6.8

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION N AMBIENT TEMP. 80°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC/JD OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

CALLAHAN RUN Sampling (Sediment)

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: SE-CR-02

SAMPLING METHOD: Disposable plastic scoop DUP.REP. OF:

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1435

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 oz plastic	1			Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: BRN/GRAY	
2nd	ODOR: NONE	
	OTHER: SAT F/C sand and fine	
	round gravel, some silt and clay trace	

GENERAL INFORMATION

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION ___ AMBIENT TEMP. 80°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC/TD OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

CARNAHAN RUN Sampling (Surface water)

LOCATION: Vandergrift PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-CR-03

SAMPLING METHOD: DIRECT FILL DUP.REP. OF:

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1345

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal plastic	2	HNO_3		Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: Clear	PH 6.70
2nd	ODOR: NONE	cond. .809
	OTHER:	Temp 17.23
		Turb. 18

GENERAL INFORMATION DO. 8.31

WEATHER: SUN/CLEAR X OVERCAST/RAIN X WIND DIRECTION N AMBIENT TEMP. 80°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC/JD OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

CARNAHAN RUN sampling (sediment)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA. PROJECT NO.: 11175233.00000

SITE: OSACE-SLDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: SE-CR-03

SAMPLING METHOD: Steel Shovel DUP.REP. OF:

BEGINNING DEPTH: 0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1350

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16oz plastic	1			Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: BRN	
2nd	ODOR: NONE	
	OTHER: SAT. F/C sand and fine gravel	
	some silt, trace clay	

GENERAL INFORMATION

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN ✓ WIND DIRECTION N AMBIENT TEMP. 80

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC/JD OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

CARNAHAN RUN SAMPLING (surface water)

LOCATION: Vandergrift, PA PROJECT NO.: 11178833.00000

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-CR-04

SAMPLING METHOD: DIRECT FILL DUP.REP. OF: WS-FD-02

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (FIELD DUP)

END DEPTH: N/A YES (X) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1325

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1gal plastic	2	HNO3		Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: Clear	PH. 6.53
2nd	ODOR: NO	Cond. .282
	OTHER: some slight Foam	Temp. 19.65
		Turb. 23

GENERAL INFORMATION

D.O. 9.40

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION still AMBIENT TEMP. 80°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC/JD OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

CARNAHAN RUN Sampling (Sediment)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift PA PROJECT NO.: 11173233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: SE-CR-04

SAMPLING METHOD: STEEL Shovel DUP.REP. OF:

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1330

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16oz plastic	1			Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: BRN	
2nd	ODOR: NONE	
	OTHER: Saturated F/C sand and Fine	
	round gravel, some silt trace clay	

GENERAL INFORMATION

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION North AMBIENT TEMP. 80°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC/JD OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

CANAHAN RUN sampling (Surface Water)

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-CR-05

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1120

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	HNO3		Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: GRAY BROWN	pH 7.47
2nd	ODOR: NO	cond .313 m
	OTHER:	Temp. 17.94
		turb. 5.7

GENERAL INFORMATION

D.O. 7.93

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION North AMBIENT TEMP. 78°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC/JD OBSERVER: DC, T,

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

CALLAHAN RUN sampling (sediment)

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

LOCATION: Vandergrift, PA PROJECT NO.: 11478233.00000

SITE: USACE-SLDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: SE-CR-05

SAMPLING METHOD: Steel shovel DUP.REP. OF:

BEGINNING DEPTH: 0" MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1125

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 OZ plastic	1			Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: BRN	
2nd	ODOR: NO	
	OTHER: saturated, BRN silty Sand Some	
	Clay, Fine gravel, NO Sheen	

GENERAL INFORMATION

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION north AMBIENT TEMP. 78°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: JD/DC OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

CALAHAN RUN sampling (surface water)

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: WS SAMPLE ID: WS-CR-06

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1045

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2			Primary	

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st		COLOR: Gray-Brown	PH 7.41
2nd		ODOR: No	cond. 0.313
		OTHER:	Temp. 17.48
			Turb. 6.53

GENERAL INFORMATION

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION S AMBIENT TEMP. 78°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC/JD OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

CORNAHAN RUN sampling (Sediment)

LOCATION: Vandergrift, PA PROJECT NO.: 11473233.00000

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: SE SAMPLE ID: SE-CR-06

SAMPLING METHOD: STEEL Shovel DUP.REP. OF:

BEGINNING DEPTH: 0' MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 6" YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1050

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
16 OZ plastic	1			Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st N/A	COLOR: BRN	
2nd N/A	ODOR: NO	
	OTHER: Saturated BRN silty sand some	
	clay, fine gravel, NO sheen.	

GENERAL INFORMATION

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION S AMBIENT TEMP. 78°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: QEL

COMMENTS:

SAMPLER: DC/KD OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

CARNAHAN RUN sampling (Seep/out Fall)

LOCATION: Vandergrift, PA PROJECT NO.: 11173233.00000

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: Seep SAMPLE ID: SP-CR-01

SAMPLING METHOD: Direct Fill DUP.REP. OF:

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1250

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	Hno3		Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR: Clear	PH 5.96
2nd	ODOR: NO	Cond 0.211
	OTHER: collected from center of	Temp. 11.82
	the up well	Turb. 65
		D.O. .18

GENERAL INFORMATION

WEATHER: SUN/CLEAR ___ OVERCAST/RAIN X WIND DIRECTION S AMBIENT TEMP. 80°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: JP/DC OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

FIGURE 3.3-2

FIELD SAMPLING REPORT

URS
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

CARNAHAN RUN Sampling (Seep)

LOCATION: Vandergrift PA PROJECT NO.: 11173233.00000

SITE: USACE - SLDA

SAMPLE INFORMATION

MATRIX: Seep (OUTFALL) SAMPLE ID: SP-CR-02

SAMPLING METHOD: DIRECT FILL DUP.REP. OF:

BEGINNING DEPTH: N/A MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: N/A YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/13/04 TIME: 1155

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	EXTRACTION METHOD	ANALYTICAL	ANALYSIS
1 gal plastic	2	HNO3		Primary	

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR:	PH 3.84
2nd	ODOR: NO	Cond 0.894
	OTHER:	Temp. 12.4
		Turb. 16

GENERAL INFORMATION D.O 10.75

WEATHER: SUN/CLEAR X OVERCAST/RAIN X WIND DIRECTION north AMBIENT TEMP. 79°

SHIPMENT VIA: FED-X ___ HAND DELIVER ___ COURIER ___ OTHER ___

SHIPPED TO: GEL

COMMENTS:

SAMPLER: DC/JD OBSERVER:

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC = DRILL CUTTINGS	SL = SLUDGE	B = BAILER	G = GRAB
WG = GROUND WATER	SO = SOIL	BR = BRASS RING	HA = HAND AUGER
LH = HAZARDOUS LIQUID WASTE	GS = SOIL GAS	CS = COMPOSITE SAMPLE	H = HOLLOW STEM AUGER
SH = HAZARDOUS SOLID WASTE	WS = SURFACE WATER	C = CONTINUOUS FLIGHT AUGER	HP = HYDRO PUNCH
SE = SEDIMENT	SW = SWAP/WIPE	DT = DRIVEN TUBE	SS = SPLIT SPOON
		W = SWAB/WIPE	SP = SUBMERSIBLE PUMP

URSF-113/1 OF 1/FSR/GCM

FIGURE 3.3-2

APPENDIX O

RI TDL ANALYTICAL REPORTS

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586 Telephone: (708) 755-7000 Facsimile: (708) 755-7016

ENVIRONMENTAL / LOW LEVEL DOSIMETRY REPORT

ADDRESS

ACCOUNT NO. SERIES CODE

291269

ATTN : SCOTT DAVIDSON
135 VANDERBUILT DR.
PITTSBURGH, PA 15243

FOR EXPOSURE PERIOD 10/01/2003

LOCATION ID NUMBER	IDENTIFIER (CLIENT SUPPLIED)	NOTE CODE	EXPOSURE OF DOSIMETER (MILLIREMS AMBIENT DOSE EQUIVALENT) GROSS	NET	NET CUMULATIVE TOTALS (MILLIREMS) CALENDAR QUARTER	YEAR TO DATE	PERMANENT	ADJUST-MENTS	NUMBER OF DOSIMETERS REPORTED	INCEPTION DATE OF PERM. TOTAL
00000	TRANSIT CONTROL	LP	78.7	27.2						
000X9	DEPLOY CONTOL		51.5	0.0						
00001	AREA 1		55.6	4.1	4.1	4.1	4.1		1	10/01/2003
00002	AREA 2		51.7	0.2	0.2	0.2	0.2		1	10/01/2003
00003	AREA 3		50.5	-1.0	-1.0	-1.0	-1.0		1	10/01/2003
00004	AREA 4		58.9	7.4	7.4	7.4	7.4		1	10/01/2003
00005	AREA 5		63.0	11.5	11.5	11.5	11.5		1	10/01/2003
00006	AREA 6		51.2	-0.4	-0.4	-0.4	-0.4		1	10/01/2003

NOTES (COLUMN 3) : LP Low Energy Photon (< 100 keV effective)

Q.C. Release	Process No.	Reported Date	Date Processed	Date Received	Minimum Detectable Dose In This Process, Millirems Ambient Dose Equivalent	ONLY PAGE
LD	GE873A	06/21/2004	06/21/2004	06/18/2004	0.01	1

Radon Monitoring Report

URS CORPORATION
ATTN: SCOTT DAVIDSON
1105 MARY STREET
VANDERGRIFT, PA 15690

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Acct. No. 0409707

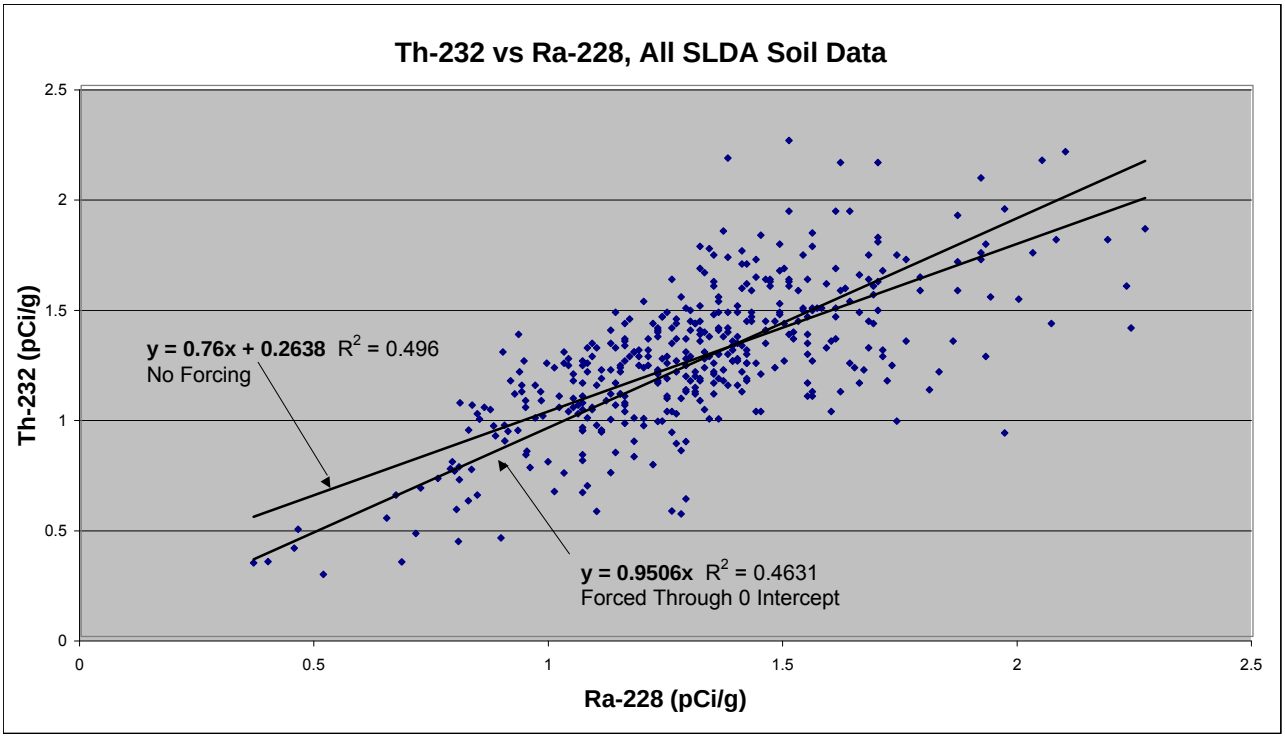
Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	
4506784	DRNM	17-SEP-03	15-JUN-04		98.1	0.4	
4506785	DRNM	17-SEP-03	15-JUN-04		39.3	0.1	
4506786	DRNM	17-SEP-03	15-JUN-04		46.2	0.2	
4506787	DRNM	17-SEP-03	15-JUN-04		63.5	0.2	
4506788	DRNM	17-SEP-03	15-JUN-04		53.1	0.2	
4506888	DRNM	17-SEP-03	15-JUN-04	* - LESS THAN INDICATED VALUE	* 30.0	* 0.1	
①	②	③	④	⑤	⑥	⑦	⑧

Q.C. Release	Process No.	Report Date	Date Received
GSA	A20523	23-JUN-04	18-JUN-04

APPENDIX P

Ra 228/Th 232 RI DATA CORRELATION PLOTS

Figure P-1



F-Test Two-Sample for Variances

	Variable 1	*Variable 2*
Mean	1.314048544	1.262269608
Variance	0.091972324	0.108102291
Observations	412	408
df	411	407
F	0.850789775	
P(F<=f) one-tail	0.051292222	
F Critical one-tail	**0.849744719**	

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	412	541.388	1.314049	0.091972
Column 2	408	515.006	1.26227	0.108102

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.549604	1	0.549604	5.496156	0.019297	**3.852847**
Within Groups	81.79826	818	0.099998			
Total	82.34786	819				

Descriptive Stats

Ra-228	
Mean	1.314048544
Standard Error	0.014941011
Median	1.31
Mode	1.07
Standard Deviation	0.303269391
Sample Variance	0.091972324
Kurtosis	0.755339561
Skewness	0.172880772
Range	1.902
Minimum	0.368
Maximum	2.27
Sum	541.388
Count	412
Confidence Level(95.0%)	0.02937036
Upper CL =	1.343418903
Lower CL =	1.284678184

Descriptive Stats

Th-232	
Mean	1.26227
Standard Error	0.016277
Median	1.26
Mode	1.24
Standard Deviation	0.328789
Sample Variance	0.108102
Kurtosis	0.663746
Skewness	-0.08228
Range	1.968
Minimum	0.282
Maximum	2.25
Sum	515.006
Count	408
Confidence Level(95.0%)	0.031998
Upper CL =	1.294268
Lower CL =	1.230271

These analyses and "decent" linear fit to the data indicate the Ra-228 and Th-232 are similarly distributed, have similar means and variances, and correlated.

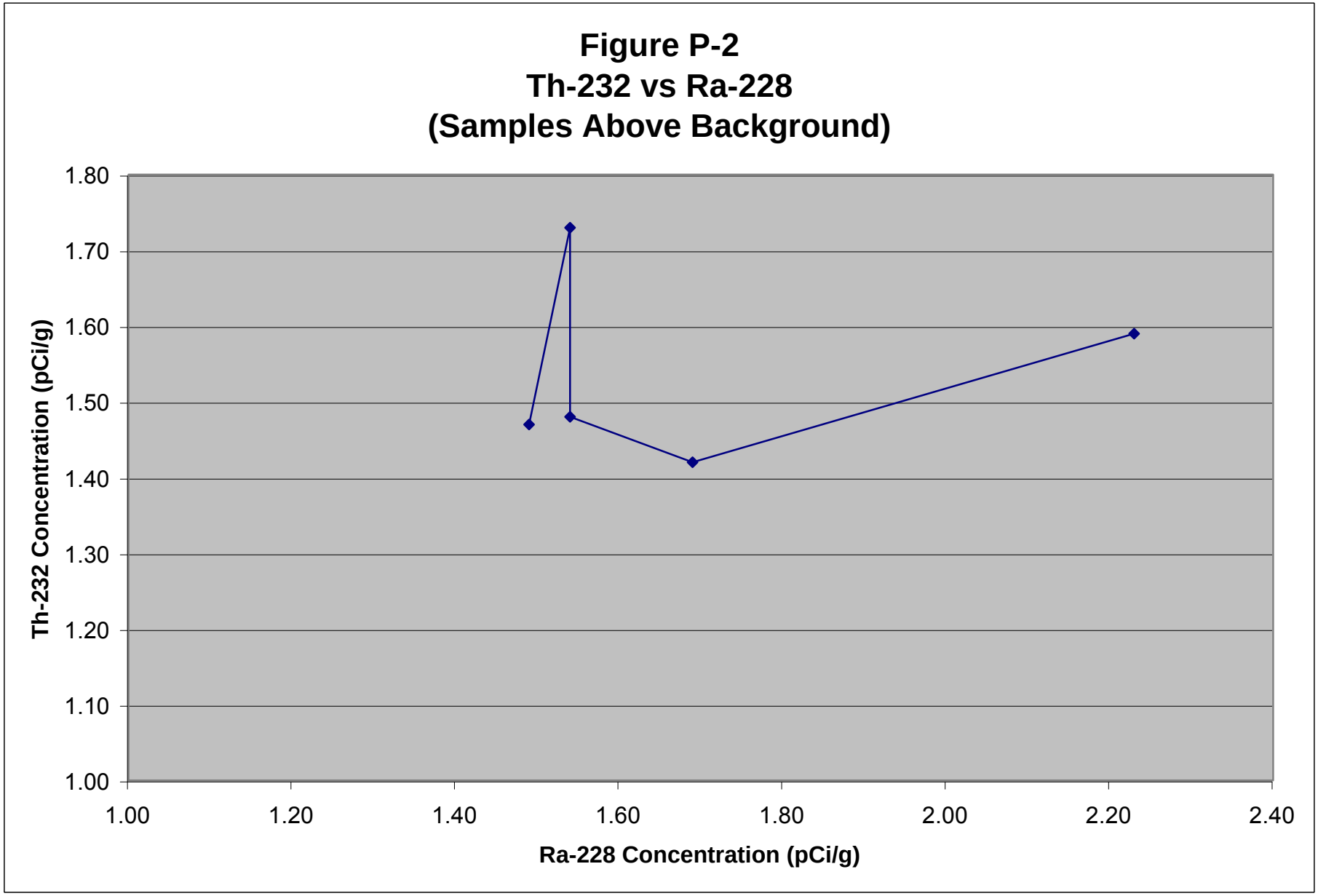
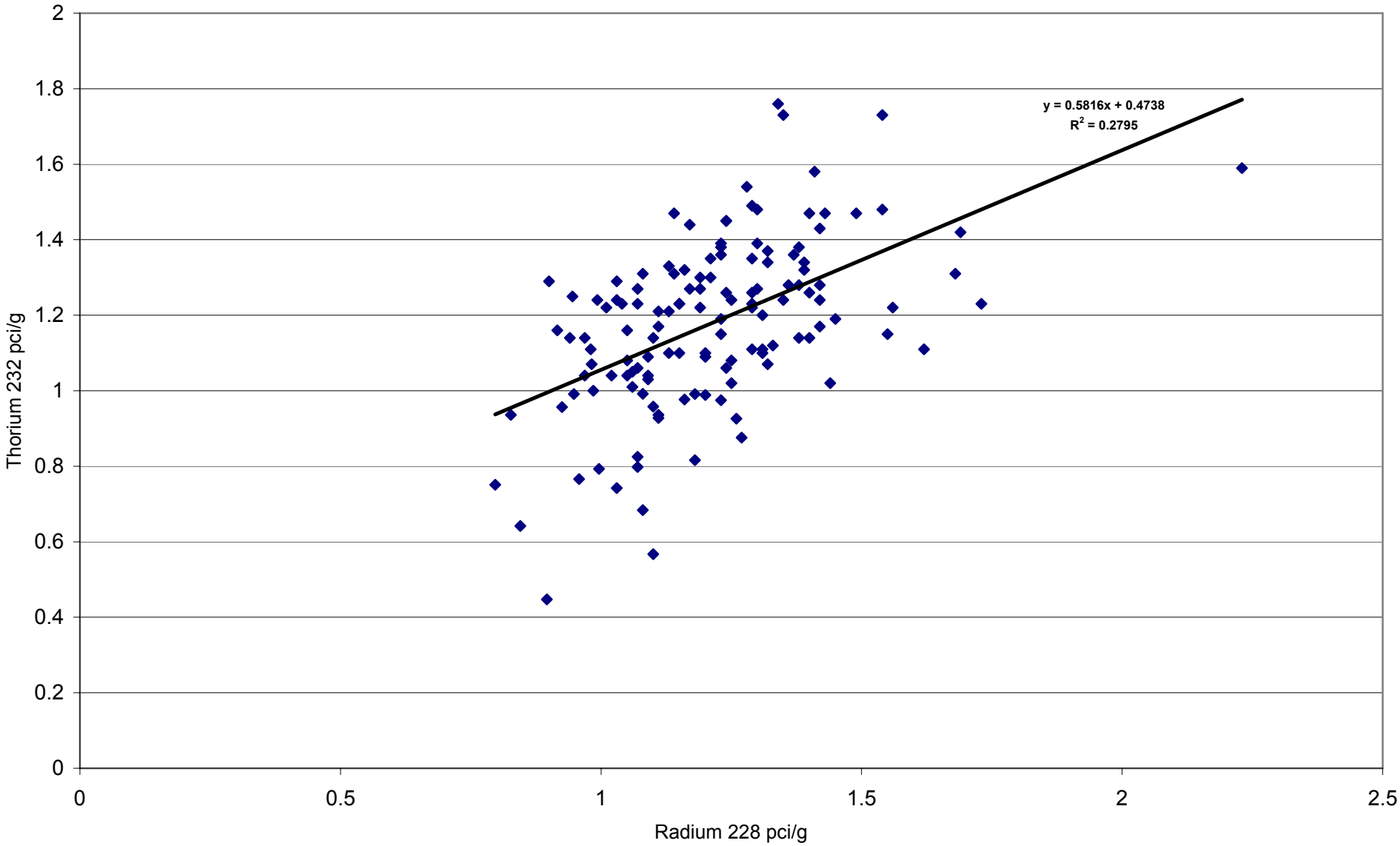


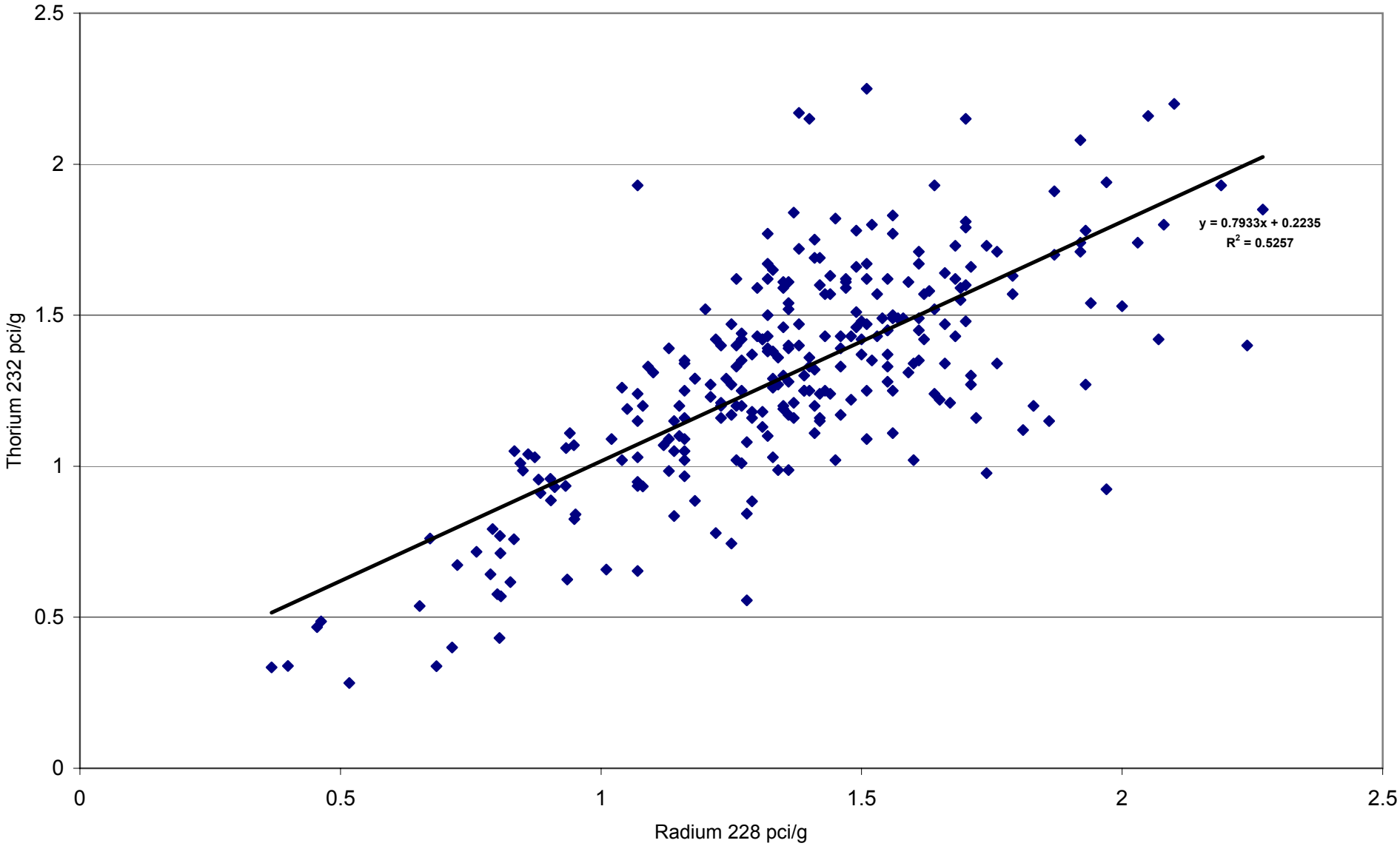
Figure P-2
Th-232 vs Ra-228
(Samples Above Background)
Th-232 Concentration (pCi/g)
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
Ra-228 Concentration (pCi/g)

Figure P-3
Radium 228 vs Thorium 232 in Surface Soil
(0 - 0.5' bgs)



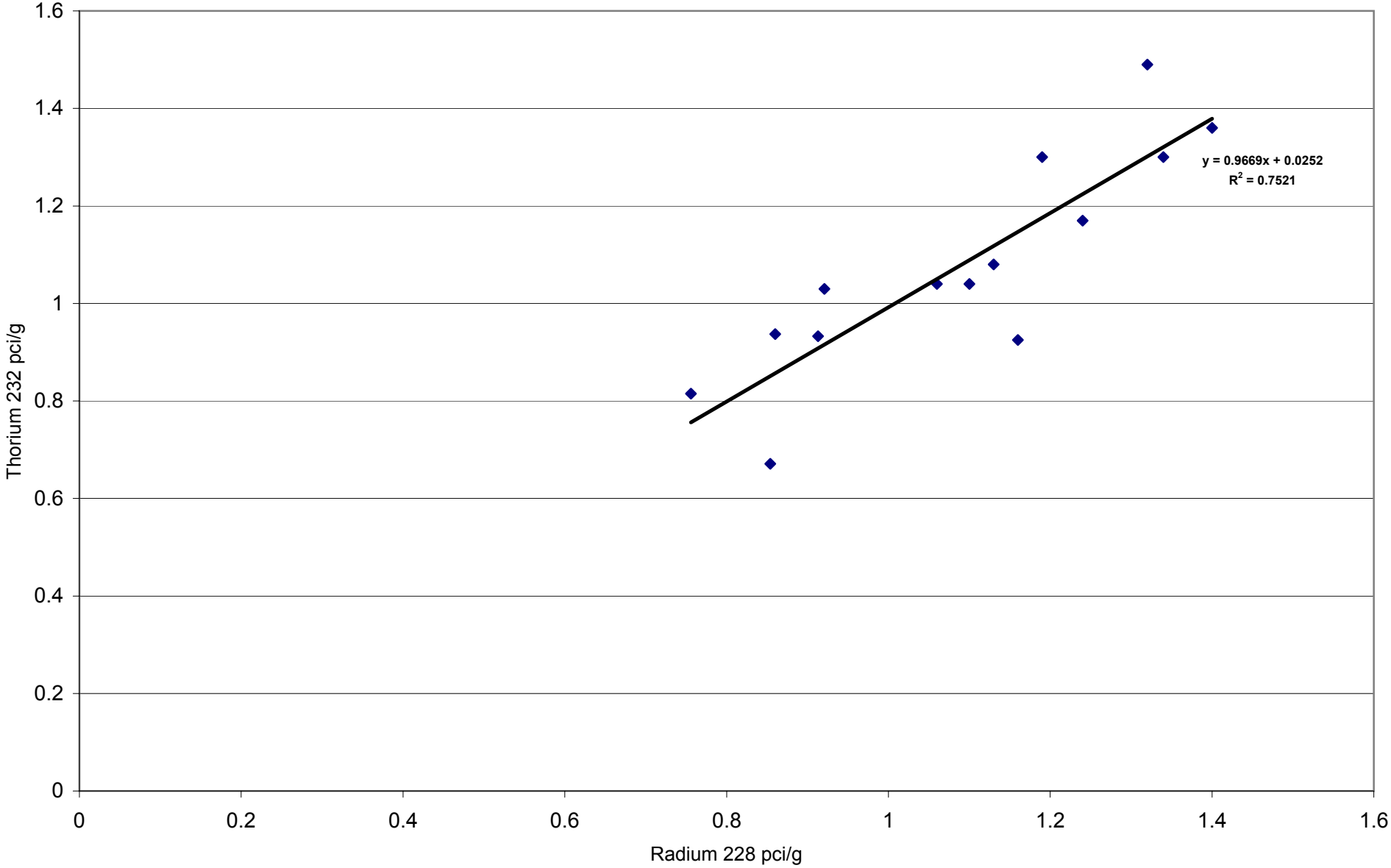
N:\11171431.00000\EXCEL\rd228_vs_th232.xls\Surface Soil Graph

Figure P-4
Radium 228 vs Thorium 232 in Subsurface Soil
(> 0.5' bgs)



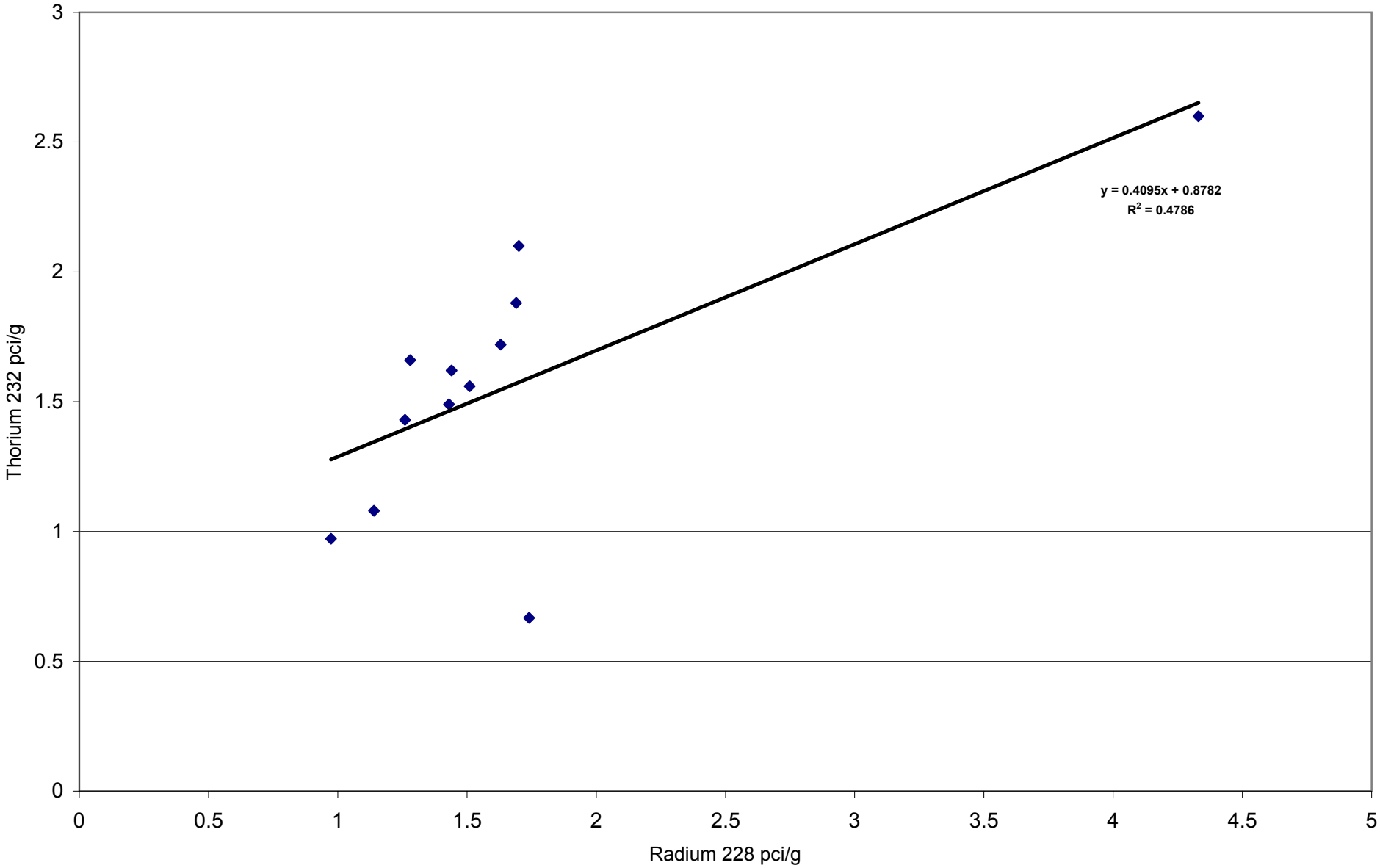
N:\11171431.00000\EXCEL\rd228_vs_th232.xls\Subsurface Soil Graph

Figure P-5
Radium 228 vs Thorium 232 in Sediment



N:\11171431.00000\EXCEL\rd228_vs_th232.xls\Sediment Graph

Figure P-6
Radium 228 vs Thorium 232 in Solid Waste Samples



N:\11171431.00000\EXCEL\rd228_vs_th232.xls\Waste Graph

APPENDIX Q

DAILY QUALITY CONTROL REPORTS

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 8/4/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-60	60-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	1	

PROJECT MANAGER Tom Frafich
PROJECT SLDA Remedial Investigation
JOB No. 11172781.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE:
Navala, Inc.

EQUIPMENT ON SITE: Bucket Truck, Backhoe, Crane Truck

WORK PERFORMED (INCLUDING SAMPLING):

Began work on electrical service to site; backhoe broke down. Pole was fitted with meter box and service entrance cable

Backhoe repaired at 1430.

Contractor glueing 2-inch conduit between distribution panel and ASL-3.

One guy wire will be installed on north end of existing distribution pole.

Set pole at 1630, backfilled hole

Glued 1 1/4" conduit in new 12 acre area

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11172781.02000

REPORT No. 1
DATE 8/4/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Confirmed air monitoring locations with air monitoring plan

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Health and safety meeting
Level D - modified to adequately address health and safety concerns

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Backhoe broke down
infestation of bugs

SPECIAL NOTES: Electrical service inspection ready for noon on 8/5/03

TOMORROW'S EXPECTATIONS:

Run conduit on fence
finish electrical service install
Contact inspector to inspect service if he doesn't show by noon.

BY Kevin Shanahan TITLE Project Engineer

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 8/5/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-60	60-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	2	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11172701.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: Sparola, Inc - Electrical Contractor

EQUIPMENT ON SITE: Backhoe, bucket truck, crane truck

WORK PERFORMED (INCLUDING SAMPLING):

Trench for electrical (steel) conduit beneath access roads entering site and to lower trench area. Backfill w/ stone

Install PVC conduit on fence

Glued PVC conduit to ASL-4

Installed galvanized U-Clamps on PVC conduit from distribution panel to ASL-5

Fished wire from distribution panel to ASL-3

Fished wire from ASL-3 to ASL-4

Fished wire from ASL-4 to ASL-5

George Johnson inspected electrical service and approved it.

URS picked up the five air monitoring stands

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 2
JOB No. 11172781.00000 DATE 8/5/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Inspection to insure PVC conduit is glued properly and trenching is completed adequately to allow heavy equipment to enter the site

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Health and Safety Meeting

Level D modified to adequately address health and safety concerns

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Bug infestation

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Complete PVC conduit installation
Complete fishing wire
Begin fused disconnect installation and outlet installation

BY Kirin Shanahan TITLE Project Engineer

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 8/5/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	3	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11172781.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE:
Mavola, Inc. (electrical contractor)

EQUIPMENT ON SITE: Crane truck, backhoe, flat bed, Dump Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Mounted 1 1/4" PVC conduit on fence from ASL-2 to ASL-1 take off from fence
- Installed U-Clamps on PVC Conduit 1 1/4" from ASL-2 to ASL-1
- Fished wire from ASL-2 to ASL-1
- Fished wire from distribution panel to ASL-2
- Spotted and installed aluminum air monitoring stands
- Installed fused disconnect on ASL-2 and outlet.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11172781.00000

REPORT No. 3
DATE 8/6/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Checking glued PVC joints
Measuring length of PVC installed
& wire installed for invoicing.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Health and Safety Meeting
Level D modified to address health
and safety concerns.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Allegheny Power has not hooked up
power to site

SPECIAL NOTES: Looked for access road to Carnahan
Run - No Trespassing sign
prohibited access

TOMORROW'S EXPECTATIONS:

BY Keith Shandler TITLE Project Engineer

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE August 18, 2003

DAY	S	M	T	W	TH	F	S
		(M)					

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
			(Overcast)		
TEMP	To 32	32-50	50-70	70-85	85 up
				(70-85)	
WIND	Still	Moder	High	Report No.	
		(Moder)			
HUMIDITY	Dry	Moder	Humid	4	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173122.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE:
None

EQUIPMENT ON SITE: None / URS Van.

WORK PERFORMED (INCLUDING SAMPLING):

- Wired air monitoring stations for one extra 220 outlet.
- Installed air pumps, hoses & filters.
- Worked on ASL's - 1, 2, 3, and 4.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 4
JOB No. 11173122.00000 DATE August 18, 2003

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

None

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Level D

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

None

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Finish wiring ASL's and start air monitoring

BY Kevin Ranehan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE August 19, 2003

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	10-32	33-60	60-70	70-85	85-up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	5	

PROJECT MANAGER Tom Frelick
PROJECT SLDA Remedial Investigation
JOB No. 11173122.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE:
None ~~/URS Van~~

EQUIPMENT ON SITE: None / URS Van

WORK PERFORMED (INCLUDING SAMPLING):

- Wired 220 receptacle for ASL-5
- Installed air pump, hose and filter for ASL-5
- Turned on all ASLs - began monitoring program

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-669/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 5

JOB No. 11173122.00000 DATE August 19, 2003

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

None

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Level D

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

None

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: None

BY Kevin Shanahan TITLE Field Manager

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 8/25/03

DAY	S	M	T	W	TH	F	S
		(M)					

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
	(Bright Sun)				

TEMP	To 32	32-50	50-70	70-85	85 up
				(70-85)	

WIND	Still	Moder	High	Report No.
		(Moder)		

HUMIDITY	Dry	Moder	Humid	
			(Humid)	1

PROJECT MANAGER TOM FRALICK
PROJECT JLDA REMEDIAL INVESTIGATION
JOB No. 11727781.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: SOUTH BEND LIMESTONE (~~MIKE STRAUB~~ DARRYL JACOBS)
FIELD ENVIRONMENTAL (BRUCE IBE)

EQUIPMENT ON SITE: NO EQUIPMENT

WORK PERFORMED (INCLUDING SAMPLING):

ROB MURPHY & KEVIN SHANAHAN DO SITE WALK OVER TO LOCATE AREAS FOR DECON PAD, ABOVE GROUND STORAGE TANKS, AND DRUM STORAGE AREA.

KEVIN DOES SURVEYED PROPERTY LINE WALKOVER WITH DARRYL JACOBS TO SHOW WHERE WELL LOCATIONS AND FENCE NEEDS TO BE CLEARED. ALSO DISCUSS SUBBASE/BASE FOR DECON PAD AND DRUM STORAGE AREA.

BRUCE IBE DROPS OFF LARGE AMOUNT OF FIELD SUPPLIES.

MIKE STRAUB ONSITE PERFORMING WELL MAINTENANCE; REPLACING LOCKS. HELPING COORDINATE SUBCONTRACTORS (PLUMBING, SITE WORK)

SHEET 1 OF 8

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA REMEDIAL INVESTIGATION REPORT No. 1

JOB No. DATE 8/25/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

VERIFY SURVEY PROPERTY LINE & NEW FENCELINE FOR CLEARING WITH SITE WORK CONTRACTOR.

CHECK OFF DELIVERED FIELD SUPPLIES.

HEALTH AND SAFETY LEVELS AND ACTIVITIES: D

HEALTH + SAFETY MEETING.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

PROBLEM WITH CLEARING FENCELINE – WILL DISCUSS WITH ARMY CORP & PROJECT MANAGER OPTIONS

TANK DELIVERY SCHEDULE IS SUSPECT – WANT TANKS BY FRIDAY SEPTEMBER 5th.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: TRAILER ARRIVING ONSITE, BEGIN TRAILER SETUP
SAMPLE AIR MONITORING STATIONS
SCOPE OUT Damaged monitoring wells
Set up weather station.

BY BOB MULGAHY TITLE GEOLOGIST

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 8/26/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-60	60-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	2	

PROJECT MANAGER TOM FRALICK
PROJECT SLDA Remedial Investigation
JOB No. 11172781.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: GE MODULAR, Tech Set

EQUIPMENT ON SITE: TRUCKS, VANS, TRACKED TRAILER JACK.
VAC TRUCK (Super Bowl)

WORK PERFORMED (INCLUDING SAMPLING):

GE MODULAR ARRIVED ONSITE IN AM. Unloaded two sections of trailer, Tech Set arrived Kevin held Safety meeting. Tech Set began trimming trailer together, jacking up, leveling Attaching siding trimming roof, etc.

Kevin + Rob begin collecting air filters, collected throughout morning in between interfacing with onsite contractors.

Begin to setup weather station; missing pole + battery charger, coordinate with Bruce Tbe (Field environmental.

Tech set finishes setup, will come back later next week for skirting.

Coordinate plumbing + electrical work at site.

Took Ride with Mike Straub to scope out Carnahan Run access. to outfall.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SCDA Remedial Investigation REPORT No. 2

JOB No. 11122781.00000 DATE 8/26/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Check Tech Set's adherence to safety periodically throughout day

HEALTH AND SAFETY LEVELS AND ACTIVITIES: Level D

Health and safety meeting

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Halt work during heavy/severe thunderstorm.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Layout Decon + Drum storage areas.
Furniture delivery
Arrange Electrical hookups.
Continue arranging site work.

BY Rob Murphy TITLE Geologist.

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 8-27-03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-60	60-70	70-85	85 up
WIND	Still	Moderate	High	Report No.	
HUMIDITY	Dry	Moderate	Humid	3	

PROJECT MANAGER Tom Fralick
PROJECT 11172781.000005
JOB No. SLDA Remedial Investigation
CONTRACT No.

SUB-CONTRACTORS ON SITE: Ge Modular, R+L, Cort Furniture

EQUIPMENT ON SITE: Delivery Trucks.

WORK PERFORMED (INCLUDING SAMPLING):

- Secured Bonding for Kiskimere Road
- Scott Davidson (URS) onsite.
- URS layed out limits of decon pad and drum storage pad.
- URS established exclusion zone line installing stakes and caution tape.
- Zarala coordinated for electrical hookup 8/28.
- R+L Trucking Delivery of Decon pad
- GE Modular Delivered and installed proper steps for trailer and removed "high" steps
- Cort Furniture delivers office/trailer furniture.
- URS Records gas line stickup marker information.
- URS offsite to purchase items for site from Home Depot, Lowes, Walmart, and Staples. in Butler.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial INVESTIGATION REPORT No. 3

JOB No. 1117 3281.00000 DATE 8/27/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Gas line verification of info for Markout purposes

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Level D. Health & Safety discussions w/ each contractor onsite.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

thunderstorm in AM. work halted.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Electrical contractor to hookup electricity
Dozer to begin site work. for Decon Pad.

BY Kab Murphy TITLE Geologist.

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 8/28/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	4	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173231.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: Zavala Electrical
South Bend Limestone

EQUIPMENT ON SITE: D-4H DOZER (CAT)
Support tracks.

WORK PERFORMED (INCLUDING SAMPLING):

Electrical contractors (Zavala) onsite hooking up/running conduit to trailer electrical boxes.

South Bend Limestone Company on-site to construct decon/drum storage pads. Tom Fralick (URS) and Kevin Shanahan (URS) revise the location of the drum storage pad to just south of trailer.

URS continuing to set-up trailer

Equitable Gas on-site to markout gas line in north central part of the site.

Truck loads of stone delivered throughout day.

USACE representatives on-site; tour site and focus on fence location.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 4
JOB No. 11173231.00000 DATE 8/28/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Adjusting ASL pumps to approximately 210 CFM
- Reviewing fence location w/ USACE personnel.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Trees along road adjacent to new 12 acre area are along proposed fence line
-

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE August 29, 2003

DAY S M T W Th F S

WEATHER Sunny Rain Snow

TEMP

WIND Low Moderate High

HUMIDITY Dry Moderate Humid

Reportable: 4A

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173231.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE:
None

EQUIPMENT ON SITE: URS Van

WORK PERFORMED (INCLUDING SAMPLING):

- Delivered Work Plans to Bud Shannon (Parks Township Supervisor).
- Unloaded 4x4's from van.
- Replaced valve on water service
- Finished staking areas where elevated gamma radiation was detected.
- Continued construction of decon pad drum storage pad.
- Cut back bushes where water meter
- Stake NWS-01 through NWS-03

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URF-4001 (7/92)(ONE)

PROJECT SLDA Remedial Investigation REPORT No. 4A
JOB No. 11173231.00000 DATE 8/29/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

None.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Level D

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

None

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Continue to Setup Site
Meet w/ fencing contractor.

BY Kevin Shanahan TITLE Field Manager.

UNIFORM OF MSCOREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9-2-03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-60	60-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	5	

PROJECT MANAGER Tom FRALICK
PROJECT SLDA MOBILIZATION
JOB No. 11173231.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: Penn Fencing
Field Environmental.

EQUIPMENT ON SITE: D4H DOZER. - Not USED TODAY

WORK PERFORMED (INCLUDING SAMPLING):

URS UNLOADS OFFICE SUPPLIES FROM BUFFALO OFFICE INCLUDING COMPUTERS AND PERIPHERALS AND SETTING UP
- Make calls concerning phone/internet service
- setup up for air filter sampling
Lacorte on site for inside trailer phone line wiring.
- Hold Health + Safety Meeting.
- Scott Davidson (URS) discusses perimeter air monitoring analytical requirements with Peter Fairbanks (URS Buff)

- Penn Fence on site, walk over work area.
- URS collects weekly air monitoring filters.
- Field Environmental on site dropping off supplies and flammable storage cabinet.
- URS unfolds and positions decon pad.
- URS walks site to determine drill rig and access well locations.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Mobilization for Investigation. REPORT No. 5

JOB No. 11173231.00000 DATE 9-2-03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

check and maintain air flow rates @ perimeter monitors.
~~Verify~~.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Health + Safety meetings.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Phone/internet at least 2 weeks away.

Discussed proper analytical requirements for perimeter sampling.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Dozer will be clearing for fence line + well access. water Meter installation.

BY Rob Murphy TITLE Geologist.

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9-3-03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-60	60-70	70-85	85 up
WIND	Still	Moder	~~Strong~~	Report No.	
HUMIDITY	Dry	Moder	Humid	6	

PROJECT MANAGER Tom Fralick
PROJECT SLDA
JOB No. 11173231.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: SOUTH BEND LIMESTONE
Municipal authority.

EQUIPMENT ON SITE: DH4 DOZER (CAT)

WORK PERFORMED (INCLUDING SAMPLING):

FENCE LINE BEING CLEARED OF TREES + BRUSH WITH BULL DOZER.

Pete (Municipal Authority) ON SITE TO INSTALL water meter. Could not complete - requires pit to be be pumped out. will return tommorow.

URS staking offset (15') from surveyed property lines for fence clear.
URS walks out access road on North side of fence line / dry run

SOUTH BEND DOZER CONTINUES CLEARING FENCE LINE THROUGHOUT DAY

URS PICKS UP - Sump Pump, hose, extension cords, and pricked chain saws.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Inv. - Mobilization. REPORT No.
JOB No. DATE 9-3-03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Marking/staking fenceline to stay within property boundary.

verify analytical requirements for perimeter air sampling

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Health + Safety Meeting

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Pit to water valve/too much water, will pump out tommorrow.
- GROUND IS TOO SOFT FOR ~~RUBBER~~ TIRE RIGS. WILL ~~WORK~~ DISCUSS ~~ON~~ GETTING TRACK RIGS with contractor

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:
- Delivery of Drop box
- Dozer will continue to clear fenceline.
- Municipal Authority to install meter for water supply.

BY Rob Murphy TITLE Geologist.

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9-4-03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	7	

PROJECT MANAGER TOM FRALICK
PROJECT SLDA Mobilization
JOB No. 11173231.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: SOUTH BEND LIMESTONE
TIP
UNITED RENTALS

EQUIPMENT ON SITE: D4H Dozer
Delivery trucks

WORK PERFORMED (INCLUDING SAMPLING): - URS pumped out water valve pit.
- URS/Southbend continue clearing for fence line + wells
- Recieved drop box and gator deliveries
- Water hooked up by municipal authority
- Site trailor organized and prepared PDF files and digital photos

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA

JOB No. 11173231.00000

REPORT No. 7

DATE 9-4-03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Staking fence along property line.

Verified access along Mary St. ROW with neighbors.

HEALTH AND SAFETY LEVELS AND ACTIVITIES: D+

Health and Safety

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Discussed Access problems for Rubber tired Rigs with Drilling Contractor (SJB) due to site wide wet soil conditions.

Delivery truck got stuck - onsite dozer pushed him out.

SPECIAL NOTES:

TOMORROWS EXPECTATIONS:
- Finish clearing access to wells and fence.
- Field Environmental to drop off remaining supplies.
- Set up weather station.
- Recieve 1500 G. poly tank (potable water.
- Plumbing hookup for yard hydrant, purchase additional supplies @ Staples.
- Prepare CD documenting last 2 weeks activities.

BY Rob Murphy TITLE Geologist

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9-5-03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-60	60-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	8	

PROJECT MANAGER Tom Fralick
PROJECT ~~##~~ SLDA
JOB No. 11173231.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: South Bend Limestone
Field Environmental.

EQUIPMENT ON SITE: D-4 Dozer
Flat Bed Trailer / Tractor.

WORK PERFORMED (INCLUDING SAMPLING):

- URS / South bend Limestone work together to clear path to NWS-01.
- URS completing / PDFing documents for week.
- Dilip on-site; walked site to determine if fence is required on small parcel adjacent to neighbors.
- Recieve additional supplies from Field Environmental
- Demobilize dozer.
- Met w/ representatives of SECOR & Earth Science who are on-site to document the contents of the storage buildings owned by ARCO

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLOA Remedial Investigation
JOB No. 11173231.00000

REPORT No. 8
DATE 9/5/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

None

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Level D.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Poly Tank never was delivered
Will deliver on 9/8.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Continue to set up site for drilling
Training for drillers

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/8/03

DAY	S	M	T	W	TH	F	S
		(M)					

WEATHER	Bright/Sun	Clear	Overcast	Rain	Snow
		(Clear)			

TEMP	To 32	32-50	50-70	70-85	85 up
				(70-85)	

WIND	Still	Moder	High	Report No.
		(Moder)		9

HUMIDITY	Dry	Moder	Humid
			(Humid)

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:

SJB Drilling, Inc.
Hamilton Delivery.

EQUIPMENT ON SITE:

CME-85 drill rig

WORK PERFORMED (INCLUDING SAMPLING):

- Trained drilling company representatives for radiation worker level 2
- Spotted the two 4,000-gallon double walled poly tanks designed for potentially contaminated water generated from decon and drilling operations
- Set up decon pad, belts and 4X4 posts w/ plastic sheeting for overspray.
- Conducted site orientation / safety briefing
- Chemicals for decon and D.I water delivered to site; stored chemicals in flamable storage shed.
- Started up weather station (station was set up 9/5/03; direction was adjusted ~~on~~ today using a compass)

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 9
DATE 9/8/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Conducted radiation training

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Conducted daily safety meeting and Rad Worker II training

Level D protection.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

None

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Continue preparing for drilling work. Complete training and corporate safety briefing from URS Project Health and Safety Officer.

BY Kevin Shanahan TITLE Kevin T. Shanahan

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/9/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	10	

PROJECT MANAGER Tom Frelick
PROJECT FLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:

SJB Drilling, Inc.
Interstate Pipe

EQUIPMENT ON SITE:

CME-85 Drill Rig, Support Trucks

WORK PERFORMED (INCLUDING SAMPLING):

- Completed radiation worker 2 training
- Installed backflow prevention valve and yard hydrant / faucet at water supply
- Collected air samples and air sampling locations ASL-1 through 5.
- Collected drill water samples.
- Shipped air / water samples to laboratory
- Interstate Pipe delivered potable water tank; spotted the tank adjacent to decon area.
- Conducted health and safety meeting - URS project safety and health officer.
- Evaluated locations for drilling acceptable for truck access.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 10
DATE 9/9/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Source check radiation instruments for radiation training

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Conducted health and safety activities (meeting & morning briefing).

Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Second drill rig and support materials not on-site yet.

SPECIAL NOTES: Need to adjust weather station mast to 8 feet.
Need to schedule fence install

TOMORROW'S EXPECTATIONS: Continue decon of rig w/ steam cleaner
Mobilize to NWS-03 and begin drilling w/ CME-85

BY Kevin Shanahan TITLE Field Manager.

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/10/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	11	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:

SJB Drilling
Field Environmental

EQUIPMENT ON SITE:

CME-85 Drill Rig and Support Vehicles
Chain Saw.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted safety meeting
- Assembled two generators
- Cleared path to NWS-03 with chain saw
- Completed decon of rig/augers w/steamcleaner
- Installed valve/fittings for potable water tank filled tank w/ water.
- Completed assembly of air monitoring equipment for work place and breathing zone sampling
- Prepared tables to allow easy scanning of split spoon samples with instruments.
- Drilled to bedrock at NWS-03 @ 21 feet below ground surface.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 11
DATE 9/10/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source check radiation monitoring equipment
- Calibrate Minirae PID

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Cut trees to avoid wet area to attempt access to NWS-03.

SPECIAL NOTES: Retain fence contractor for next week
Start Equipment Log

TOMORROW'S EXPECTATIONS:

Mobilize track rig to NWS-02
Begin to case NWS-02
Install 2-inch well at NWS-03

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/11/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	12	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:
STB Drilling, Inc.
United Rental

EQUIPMENT ON SITE: CME-85 Truck Rig
CME-850 Track Rig
GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Deconed all augers, tools, casing NW rods, track rig, PQ wire line 8 1/4 / 4 1/4 augers.
- Drillers brought new steamcleaner.
- Drillers set up on NWS-02.
- Rig No. 1 set 6-inch steel casing at NWS-03 (not completed as of end of day)
- Augered and sampled at NWS-02 to 20 feet below ground surface
- Conducted safety meeting first thing in AM.
- Installed stakes along 220 volt electrical line lying on ground to ASL-1 for visual marking purposes
- Addressed several safety issues identified by Steve Sherman (URS Regional Safety Officer) during safety briefing on 9/9/03.
- Completed work zone and breathing zone air monitoring at each drilling location.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 12
JOB No. DATE 9/11/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Minirae PID

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Cut trees to get access to NWS-01 after agreeing on location with USACE representative
- Requested driller to get new steam cleaner once his ~~gun~~ not heating the water properly

SPECIAL NOTES: Attempt to determine who the owner of the road adjacent to southwest parcel line.

TOMORROW'S EXPECTATIONS: Begin property log
Finish casing NWS-02 and 03
Begin

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/12/03

DAY	S	M	T	W	TH	F	S
WEATHER	Bright Sun	Clear	Overcast	Rain	Snow		
TEMP	To 32	32-50	50-70	70-85	85 up		
WIND	Still	Moder	High				
HUMIDITY	Dry	Moder	Humid				

Report No. 13

PROJECT MANAGER Tom Frolich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:

SJB Drilling

EQUIPMENT ON SITE:

CME-85 truck rig
CME-850 track rig
GMC-7000 flat bed truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted safety meeting.
- Setup air monitoring stations at drilling locations to monitor work zone and breathing zone air
- Installed casing at NWS-03
- Addressed additional ~~con~~ safety concerns identified by Steve Sherman (URS, see report 12).
- Moved Drill Rig No. 1 from NWS-03 to decon pad (rig was stuck, but URS/SJB crew got rig out).
- Rig No. 2 continuing to auger down to over 30+ feet at NWS-02.
- Mr. Mark Graham of USACE on-site to observe work performed.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 13
DATE 9/12/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Mini rae / PID

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted health and safety briefing with special emphasis on electrical hazards
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill rig got stuck moving from NWS-03 Organize SJB / URS crews to get rig out
- Mechanical problems with CME-BSQ related to hydraulics (malfunctioning switch) Cut line and put new switch on.
- Drill Rig No. 1 welding generator would not start; found fuel pip-ock and started generator.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Drill / sample overburden soils @ NWS-01 ~~from~~ after deconning augers, tools, etc. Finish drilling to top of rock @ NWS-02, install casing.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/13/03

DAY	S	M	T	W	TH	F	S
							(S)

WEATHER	Bright Sun	Clear	(Overcast)	Rain	Snow
TEMP	To 32	32-50	(50-70)	70-85	85 up
WIND	(Still)	Moder	High	Report No.	
HUMIDITY	Dry	Moder	(Humid)	14	

PROJECT MANAGER Tom Fralick
PROJECT SIDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:
STB Drilling

EQUIPMENT ON SITE:
CME-85 Truck Rig
CME-850 Track Rig
GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted health and safety meeting
- Set up air monitoring station at NWS-02
- Augered and sampled from 29 to 40 feet at NWS-02.
- Augered and sampled from ground surface to approximately 12 feet below ground surface after deconning augers, tools, etc and mobilizing to drill site
- Repaired winch on Rig No. 1 and switch for hydraulics on Rig No. 2.
- State truck got stuck and STB/URS crews organized to pull it out.
- NWS-01 casing was installed (19 feet) and grouted in place
- Three casing pipes had grout plugs installed

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 14
DATE 9/13/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas monitor and Miniram dust meter (model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted health and safety meeting with special emphasis on safe vehicular travel.
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Rig No. 1 got stuck at NWS-01; assembled SJB/URS crew to get rig out.
- Rig No. 1 winch needed to be repaired

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Begin coring at NWS-03
Mobilize to NWS-05 and begin overburden drilling after decanning both rigs.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/14/03

DAY	S	M	T	W	TH	F	S
	(S)						

WEATHER	Bright Sun	Clear	(Overcast)	Rain	Snow
TEMP	To 32	32-50	(50-70)	70-85	85 up
WIND	(Still)	Moder	High	Report No.	
HUMIDITY	Dry	Moder	(Humid)	15	

PROJECT MANAGER Tom Fraljik
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-090

SUB-CONTRACTORS ON SITE:

STB Drilling, Inc.

EQUIPMENT ON SITE:

CME-85 Truck Rig
CME-850 Track Rig
GMC-7000 Flat Bed Stake Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Set up air monitor stations at NWS-02 and NWS-01
- Conducted health and safety meeting
- Deconned coring equipment for planned coring at NWS-01
- Installed casing at NWS-02.
- Initiate coring at NWS-01.
- Coring at NWS-01 cancelled since driller does not have right equipment.
- Rig No. 1 mobilized to MW-57 to install casing after deconning 8¼ augers
- Rig No. 2 mobilized to NWS-05 after deconning tools, augers, etc., however, he broke down enroute to well.
- Rig No. 1 drilled down to 25 feet to top of rock; ready to install casing tomorrow.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation REPORT No. 15
JOB No. 11173233.00000 DATE 9/14/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment.
- Calibrated Multirae Plus Multigas Monitor and Miniram dust meter (model PDM-3).

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted health and safety meeting with special emphasis on hazards associated with loose clothing and long hair
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Rig No. 1 does not have proper coring equipment, as a result that rig had to demobilize to a new well location
- Rig No. 2 broke down while mobilizing to NWS-05

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Install casing at MW-57
Initiate coring at NWS-01
Drill through overburden soils at NWS-05 after rig is repaired.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/15/03

DAY	S	M	T	W	TH	F	S
		(M)					

WEATHER	Bright Sun	Clear	(Overcast)	(Rain)	Snow
TEMP	To 32	32-50	50-70	(70-85)	85 up
WIND	(Still)	Moder	High	Report No.	
HUMIDITY	Dry	Moder	(Humid)	16	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:
STB Drilling, Inc
Superbowl Portable Sanitation, Inc.

EQUIPMENT ON SITE:
CME-850 Track Rig
CME-85 Truck Rig
GMC-7000 Flat Bed Stake Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Set up air monitoring stations at MW-57
- Conducted health and safety meeting
- Installed casing at ~~MW-1~~ MW-57 to approximately 125 feet
- STB Rig No. 2 repaired enough to get to NWS 05, however could not extend derich.
- STB mechanic on-site to repair Rig No. 2
- Rig No. 1 deconed augers, tools, rig and mobilized to MW-52 to complete overburden drilling.
- Constructed ramp to storage trailer
- met with Dilip Kothari of US Army Corps and Ms. Trudy Swab of PADEP to provide an update of project status; Dilip toured the site
- STB mechanic ordered part and left site; he will repair rig in the morning
- Rig No. 1 drilled to 12 feet before rain terminated work.
- Superbowl cleaned portajon

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 16
DATE 9/15/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Miniram dust meter (model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting with special emphasis on hazards associated with adverse weather conditions.
- Level D PPE.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Rig No. 2 could not drill all day due to hydraulic problems.
- SJB does not have the retriever for the coring equipment; they have ordered the part and it will arrive to this hotel by 9/16.

SPECIAL NOTES: Need mouse for computers

TOMORROW'S EXPECTATIONS: Install casing at ~~NWS~~ MW-52
Drill through overburden soils at NWS-05 after Rig No. 2 is repaired

BY Kevin Shanahan TITLE Field Manager

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/16/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	17	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:

SJB Drilling

EQUIPMENT ON SITE:

CME-850 Track Rig
CME-85 Truck Rig
GMC-7000 Flat Bed Stake Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Set up air monitoring station at well MW-52
- Conducted health and safety meeting
- Installed casing at MW-52
- SJB mechanic repaired Rig No. 2 and they continued drilling in overburden soils after URS set up air monitoring station
- Sampled each of the perimeter air monitoring stations (ASL-1 through ASL-5) and sent the samples to be analyzed.
- Deconned equipment from Rig No. 1 and attempted to mobilize onto FLUTe well location NWS-01 to start coring, but the rig got stuck.
- Pounded in several stakes along the electrical line on the ground between the fence and ASL-4.
- Purchased equipment to build tarp to cover decon pad during four day off period to guard against accumulating alot of water in the decon pad from Hurricane Isabelle.
- Rig No. 1 set casing at 18 feet at NWS-05 after augering/sampling to depth. Mobilized to NWS-05 after deconning augers, tools, rig

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 17
DATE 9/16/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Miniram dust meter (model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D PPE

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- SJB was significantly delayed due to various pieces of equipment situated on the wrong rig or not having more than one support truck
- Rig No. 1 got stuck for over 2 hours trying to mobilize onto NWS-01, then the coring equipment would not work.
- Rig No. 2 was not working until it was repaired at about 9:30

SPECIAL NOTES:

- A neighboring

TOMORROW'S EXPECTATIONS: Core at NWS-01
Overburden drilling at NWS-04 after decon
Construct cover to decon pad.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/17/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	18	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:

SJB Drilling

EQUIPMENT ON SITE:

CME-850 Track Rig
CME-85 Truck Rig
GMC-7000 Flat Bed Stake Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Set up air monitoring station at NWS-01
- Conducted health and safety meeting
- Set up air monitoring station at NWS-04
- Secured decon pad for weekend to ensure rainwater does not accumulate.
- Pumped water present in decon pad into tanks
- Augered down to 22.5 feet at NWS-04 and took continuous split spoon samples (Rig No. 2)
- Rig No. 2 cut casing and prepared to weld together, however, grout pump was broken and therefore casing was not installed
- Rig No. 1 cored approximately 20 feet of bedrock at NWS-01 and experienced several hours of delays due to coring equipment not working properly.
- Secured air monitoring stations ASL-01 through ASL-05 with rope to protect them from winds of hurricane Isabelle.
- Analyzed work place air monitoring samples for gross alpha and gross beta using a Model 2929 alpha beta counter. Posted results on RP wall in trailer.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 18
JOB No. 11173233.00000 DATE 9/17/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Miniram dust meter (model PDM-3).

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D PPE

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- SJB was significantly delayed due to the following reasons:

  Rig No. 1 – Coring equipment was not working properly.

  Rig No. 2 – Front pump was broken; will fix on 9/22/03

SPECIAL NOTES: Requested packer testing equipment be delivered
Requested that SJB make arrangements to get blank FLUTE liners to install after packer testing

TOMORROW'S EXPECTATIONS:

- Core bedrock at NWS-01 to 100 feet
- Install casing at NWS-04 and drill overburden wells at NWS-02 and MW-47

BY Kevin Shanahan TITLE Field Manager.

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/22/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	19	

PROJECT MANAGER Tom Frafick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: Penn Fencing
SJB Drilling
Superbowl Portable Sanitation

EQUIPMENT ON SITE: Bobcat Fence Installer
CME-850 Track Rig, CME-85 Truck Rig
GMC-7000 Flat Bed Stake Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Set up air monitoring station at NWS-01
- Conducted health and safety meeting
- Walked area to be fenced with fencing contractor to review scope of work.
- Set up tent and table for frisking at ingress/egress point.
- SJB Rig No. 2 repaired grout pump, welded casing pipe and installed/grouted casing in place at NWS-05.
- SJB Rig No. 1 spent the day coring rock at NWS-01 and recovered 30 feet.
- SJB Rig No. 2 mobilized to NWS-02 to install a 2-inch well into the overburden soils water bearing zone.
- Analyzed work place air monitoring samples for gross alpha/gross beta using a Model 2929 alpha beta counter. Posted results in trailer on RP wall.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation REPORT No. 19
JOB No. 11173233.00000 DATE 9/22/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Miniram dust meter (model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D PPE

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Rig No. 1 did not core enough rock due to problems with the coring equipment getting hung up in the casing
- Rain slowed down production
- Rig No. 1 will use different techniques to remove or reduce the solids in drilling mud or use some fresh water

SPECIAL NOTES:

- STB needs to order FLUTE blanks

TOMORROW'S EXPECTATIONS:

- Core 60 feet at NWS-01
- Complete overburden well at NWS-02
- Install overburden well at MW-47
- Decon equipment of Rig No. 2

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/23/03

DAY	S	M	T	W	TH	F	S
			(T)				

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
			(Overcast)		

TEMP	To 32	32-50	50-70	70-85	85 up
			(50-70)		

WIND	Still	Moder	High	Report No.
		(Moder)		

HUMIDITY	Dry	Moder	Humid	20
		(Moder)		

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.02000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig CME-850 Track Rig GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted health and safety meeting
- Set up air monitoring station at NWS-01 and MW-147
- Completed overburden 2-inch well at NWS-02
- Completed overburden 2-inch well at MW-47
- Continued rock coring at NWS-01, however due to several factors, STB Rig No. 1 was not very productive at rock coring
- Collected air monitoring samples from the five air sampling locations (ASL-1 through ASL-5) and shipped them to the lab for analysis
- Analyzed work place air monitoring samples for gross alpha / gross beta using a model 2929 alpha beta counter. Posted results on the RP wall in trailer.
- Rig No. 2 completed the overburden 2-inch PVC well at NWS-04; USACE representative (Bill Frederich) requested that URS not install an overburden well at NWS-05 since the subsoil unit was void of water.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation REPORT No. 20
JOB No. 11173233.00000 DATE 9/23/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Minimam dust meter (Model PDM-3).

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D Protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Rig No. 1 experienced delays in coring bedrock at NWS-01 due to the equipment getting hung up in the casing.

SPECIAL NOTES:

- SJB needs to order FLUTe blanks.

TOMORROW'S EXPECTATIONS:

- Finish coring at NWS-01
- Complete overburden wells

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/24/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	21	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
Penn Fencing

EQUIPMENT ON SITE: CME-85 Truck Rig, CME-850 Track Rig, GMC-7000 Flat Bed Support Truck, Bobcat Fencing Machine & Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted health and safety meeting
- Set up air monitoring at NWS-03
- Decon'ed augers, rig, and tools (Rig No. 2)
- Installed 2-inch overburden well at NWS-03; limited split spoon sampling was completed since subsoil characterization was completed during casing installation.
- Repaired plastic sheeting adjacent to decon pad designed to capture overspray during decon operations
- Analyzed work place air monitoring samples for gross alpha / gross beta using a model 2929 alpha beta counter. Posted results on RP wall in trailer.
- Rig No. 2 mobilized to MW-58 after deconning and augered down to approximately 19 feet and will install casing on 9/25
- URS ran electric from circuit breaker panel to trailer and to one ground fault outlet for an exterior power source. Installed fluorescent lights in trailer.
- Rig No. 1 cored approximately 20 feet at NWS-01

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigations
JOB No. 11173233.00000

REPORT No. 21
DATE 9/24/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Miniram dust meter (Model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Rig No. 1 continued to have problems with coring production (20 feet today).

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Complete coring at NWS-01
Install casing at MW-58
Begin installation of one additional well in the lower trench area.

BY Kevin L. Shandler TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/25/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	22	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling, United Rental, Penn Fencing, Field Environmental

EQUIPMENT ON SITE: CME-85 Truck Rig, Bobcat Fencing Machine & Support Truck, CME-850 Track Rig, GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted Health and safety briefing
- Uncovered decon pad after pumping off rainwater
- Installed 6-inch steel casing at MW-058 (Rig 2)
- Continued coring bedrock at NWS-01 (Rig 1)
- Analyzed work place air monitoring samples for gross alpha and gross beta using a model 2929 alpha beta counter, Posted results on RP wall in trailer.
- Met with Trudy Swab of PADEP to describe recent work completed
- Rig No. 2 mobilized to decon pad and decontaminated augers, tools and rig
- Rig No. 2 mobilized to MW-55 and set up to begin augering tommorow.
- Rig No. 1 cores NWS-01 to 148.5 feet.
- Penn Fencing installed fence posts on the southern property line of the "12-acre parcel".

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 22
DATE 9/25/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Miniram dust meter (model PDM-3).

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting with special emphasis on frisking out of exclusion zone and removal of PPE.
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Heavy rain, thunder, and lightning between 0730 and 0900.
- Support truck got stuck but was pulled out within 30 minutes.
- Rig No. 1 coring production was still low

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Finish coring NWS-01
Install well at MW-55

BY Kevin Handley TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/26/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	23	

PROJECT MANAGER Tom Frabick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:

STB Drilling
Penn Fencing

EQUIPMENT ON SITE: CME-85 Truck Rig, CME-850 Track Rig
GMC-7000 Flat Bed Support Truck, Bobcat Fencing Machine

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety briefing
- Rig No. 1 setup trash pump and pumped out several surface water puddles in the vicinity of NWS-01 that caused a hazardous condition.
- Rig No. 2 was ready to begin augering at MW-55 however it appeared that the gas line was nearby and it was not marked. Therefore, Rig No. 2 moved to MW-56 and installed a 2-inch monitoring well.
- Rig No. 1 frees up drill string that was stuck late 9/25. Removing rock core from terminal depth of 148.5 feet.
- URS pumped out free water in decon pad into Tank No. 1.
- Rig No. 2 deconned augers, tools, and rig and mobilized to begin augering at MW-55 ~~tom~~ on 9/29/03.
- URS covered decon pad for weekend.
- Rig No. 1 has significant difficulty coring rock deeper than 148.5; created vibrations shaking the entire rig.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 23
DATE 9/26/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Miniram dust meter (model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Rig No. 1 coring production was very low due to vibrations while drilling
- Equitable Gas Company line was not marked

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Finish coring at NWS-01
Install well MW-55
Setup for coring at MW-52 or MW-58

BY Karen Shanahan, TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/29/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	24	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-D010

SUB-CONTRACTORS ON SITE:
SJB Drilling Superbowl Sanitation
Penn Fencing

EQUIPMENT ON SITE: CME-85 Truck Rig, CME-850 Track Rigs (2) Tracktor trailer (used to move new rig in), GMC-7000 Flat Bed Support Truck, Bobcat fencing equipment.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted brief health and safety meeting
- Augered down to top of bedrock (weathered shale @ 21.5 feet) and collect continuous split spoon samples. The overburden soils were not saturated and it was decided that a well would not be installed. (Rig No. 2)
- Rig No. 2 mobilized to decon pad area and loaded up coring equipment (HQ).
- Rig No. 1 attempted to free up drill string which was stuck at NWS-01.
- Penn Fencing installed fencing along southern property line of new 12 acre area
- Rig No. 2 mobilized to MW-52 and began coring.
- Analyzed work place air monitoring samples for gross alpha and gross beta using a model 2929 alpha beta counter. Posted results on RP wall in trailer

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 24
DATE 9/29/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment.
- Calibrated Multirae Plus Multigas Monitoring Meter and Miniram Dust Meter (model PDM-3).

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting with special emphasis on vehicular traffic in parking area.
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string of Rig No. 1 remains stuck and SJB cannot free it up.
- MW-55 was not installed since it was likely a dry hole. A suitable alternative is being contemplated by representatives of URS and USACE

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Complete rock coring at MW-52
Free up equipment at NWS-01 and finish coring

BY Kevin Donahue TITLE Field Manager.

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 9/30/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	25	

PROJECT MANAGER Tom Fralich
PROJECT SLOA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
Penn Fencing

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Mounted Rigs, Tractor Trailer (used to move rig), GMC-7000 Flat Bed Support Truck, Bobcat fencing equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted brief health and safety meeting
- Cored bedrock at MW-52 to a terminal depth of 44.5 feet.
- Rig No. 1 crew worked on freeing up drill string at NWS-01
- URS collected and shipped samples collected from perimeter air sampling locations.
- Penn Fencing continued to install chain link fence along southern property line of new 12-acre parcel
- Rig No. 2 decorned rig, augers, and tools and mobilized to NWS-03 to core bedrock.
- Analyzed work place air monitoring samples for gross alpha and gross beta using a model 2929 alpha beta counter. Posted results on RP wall in trailer.
- Rig No. 2 cored 6 feet at NWS-03.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 25
DATE 9/30/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (model PDM-3)
- Submitted filter blank for air sample analysis.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety briefing
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Drill string at NWS-01 remains stuck

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Continue rock coring at NWS-03
Begin rock coring at NWS-05

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/1/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	26	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
Penn Fencing

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, Tractor Trailer (used to move rig), GMC-7000 Flat Bed Support Truck; Bobcat Fencing equipment.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted brief health and safety meeting
- Drilled and installed monitoring well MW-54 after contacting Mr. William Frederick of USACE to discuss moving the well to the western corner of the lower trench area (Rig No. 1).
- Rig No. 1 mobilized to the decon pad and deconned rig, tools, and augers.
- Rig No. 2 cored 45 feet of bedrock at NWS-03.
- Rig No. 1 mobilized to NWS-05 and initiated coring of bedrock once water setup was complete. A total of 9.5 feet of rock was cored.
- Analyzed work place air monitoring samples for gross alpha and gross beta using a model 2929 alpha/beta counter.
- Penn Fencing continued to install fencing on the eastern and southern property lines of the new 12 acre parcel.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 26
DATE 10/1/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meetings
- Level D Protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck at NWS-01; crew abandoned drilling effort there and began work at MW-54

SPECIAL NOTES: Met with SJB Management to discuss alternatives for drilling Flute wells to avoid drill string becoming hung up.

TOMORROW'S EXPECTATIONS: Continue coring at NWS-03
Continue coring at NWS-05

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/2/03

DAY	S	M	T	W	TH	F	S
					(TH)		

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
			(Overcast)		

TEMP	To 32	32-50	50-70	70-85	85 up
		(32-50)			

WIND	Still	Moder	High	Report No.
			(High)	27

HUMIDITY	Dry	Moder	Humid
		(Moder)	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:

STB Drilling
Penn Fencing

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, Tractor Trailer (used to move rig), GMC-7000 Flat bed support Truck, Bobcat fencing equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted brief health and safety meeting
- Cored 20 feet of bedrock at well location NWS-03 with HQ coring apparatus.
- Cored 40 feet of bedrock at well location NWS-05 with HQ coring apparatus.
- Constructed wood shelves to store rock core boxes in storage trailer.
- Penn Fencing continued fence installation along the south and east property lines of "new 12 acre parcel".
- Completed contamination and radiation surveys at both drilling locations
- Screened various items for release from the Restricted Area using radiation monitoring equipment.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 27
DATE 10/2/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted brief health and safety meeting
- Level D Protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string at NWS-01 remains stuck
- Rig No. 2 is having significant difficulty removing rock core with the retriever

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Continue rock coring at NWS-03 and NWS-05

BY Kevin Sheehan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/3/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	10-32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	28	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:
STB Drilling
Penn Fencing

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, Tractor Trailer (used to move drill rigs), GMC-7000 Flat Bed Support Truck, Bobcat Fencing Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted brief health and safety meeting
- Cored 21 feet at well location NWS-03 with HQ coring equipment. The coal mine was intercepted at 111 feet below ground surface
- Cored 10 feet of bedrock at well location NWS-05 with HQ coring equipment.
- Met with Roy Woods and Trudy Swab of PADEP to brief them on the site work status
- Screened various items for release from restricted areas using radiological monitoring equipment.
- Rig No. 1 crew decomed packer testing equipment and initiated packer testing at NWS-05
- URS crew covered decon pad for the weekend.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 28
DATE 10/3/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated Multirae Plus Multigas Monitor and Minisam Dust Meter (Model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted brief health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string at NWS-01 remains stuck
- Hydraulic Jacal broke on Rig 1

SPECIAL NOTES: Requested SJB to get caught up.

TOMORROW'S EXPECTATIONS:

- Packer testing at NWS-03 and NWS-05
- Begin roller bit reaming at NWS-05

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/6/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	16-32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	29	

PROJECT MANAGER Tom Fralick
PROJECT Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
Penn Fencing
SuperBowl Portable Sanitation

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Bobcat Fencing Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted brief health and safety meeting
- Packer tested hole at NWS-05 from top of mine to bottom of casing.
- Deconned 4-inch temporary casing
- URS pumped rain water off decon pad cover and uncovered pad.
- Deconned packer testing equipment and mobilized to NWS-03
- Completed packer testing from the top of the mine void to approximately 50-feet below ground surface
- Set up for reaming at NWS-05.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 29
DATE 10/6/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment as well as batteries.
- Calibrated Multirae Plus Multigas Monitor and Minirae Dust Meter (Model PDM-3).

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted brief health and safety meeting
- Level D Protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill String at NWS-01 remains stuck
- Need higher pressure gauge for packer testing equipment

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Ream hole at NWS-05 and install casing
Finish packer testing at NWS-03 and install casing

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/7/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	30	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
Penn Fencing

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Truck, Bobcat Fencing Equipment.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted brief health and safety meeting
- Installed mail box and door / bell outside gate
- Rig No. 1 roller bits rock at NWS-05 from top of rock to top of mine.
- Rig No. 2 reams rock at NWS-03 from top of rock to 118 feet.
- Rig No. 1 installs 4-inch steel casing from ground surface to base of mine
- Rig No. 1 cores bedrock from base of mine to 126 feet.
- URS collects air samples from perimeter air sampling locations and ships samples to General Engineering Labs.
- Contamination and radiation surveys in trailer and drill rigs
- Screening items for release from the Restricted area.
- Two individuals came onto the site on an ATV and got stuck in mud. URS/SJB/USACE assisted them and requested they leave the site.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 30
DATE 10/7/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment as well as batteries
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted brief health and safety meeting
- Level D protection.
- Discussed proper protection when using Geoprobe rig.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill String remains stuck in ground at NWS-01

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Install casing at NWS-03
- Core bedrock at NWS-03 from bottom of mine to terminal well depth
- Core bedrock at NWS-01 from 126 feet to bottom of well.

BY Kevin Sparks TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/8/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	31	

PROJECT MANAGER Tom Frabik
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
Penn Fencing
Verison

EQUIPMENT ON SITE: CME-85 Truck Rig, CME-850 Track Rig (2)
GMC-7000 Flat Bed Truck, 1 Bobcat fencing equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted brief safety and health meeting
- Cored approximately 130 feet of rock at NWS-05 to the (terminal) depth of 155 feet
- Installed 4-inch diameter steel casing at NWS-03.
- Cored 0 feet of bedrock at NWS-03 due to problems with coring equipment, obstructions in hole and diamond core barrel (diamonds are gone).
- Verison connects phone lines to trailer, URS ran extra phone service to USACE office for phone and internet.
- Rig No. 2 crew pulls drill string and reams out hole with roller bit to remove obstruction.
- Rig No. 1 completes packer testing NWS-05
- Screened items for release from restricted areas
- Completed contamination surveys in trailer and drill rigs.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 31
DATE 10/8/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment as well as batteries
- Calibrated multirae plus multigas monitor and Miniram Dust Meter (PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted brief health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck at NWS-01

SPECIAL NOTES: Phone service installed

TOMORROW'S EXPECTATIONS: Continue bedrock coring at NWS-03
Begin bedrock coring at NWS-04
Begin packer testing at NWS-03

BY [signature] TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/9/03

DAY	S	M	T	W	TH	F	S
					(TH)		

WEATHER	Bright Sun	(Clear)	Overcast	Rain	Snow
TEMP	To 32	32-50	(50-70)	70-85	85 up
WIND	Still	(Moder)	High	Report No.	
HUMIDITY	Dry	(Moder)	Humid	32	

PROJECT MANAGER Tom Frolich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
Penn Fencing

EQUIPMENT ON SITE: CME-85 Truck Rig, CME-850 Track Rigs (2)
GMC-7000 Flat Bed Support Truck, Bobcat Fencing equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducting brief health and safety meeting
- Pulled packer testing equipment from NWS-05 and prepared site for FLUTe blank installation
- Installed FLUTe blank into NWS-05.
- Demobilized Rig No. 1 from NWS-05 to decon pad
- Deconned rig, tools, and other equipment and prepared for mobilization to NWS-04
- Rig No. 2 repaired pump and cored 6 feet of rock.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SCDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 32
DATE 10/9/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked batteries.
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3)
- Completed contamination surveys in areas such as rigs and trailers

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted safety meeting
- Level D Protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Rig No. 2 pump was repaired

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Mobilize to NWS-04 and begin coring.
Complete coring at NWS-03.

BY Kevin Shankar TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/10/03

DAY	S	M	T	W	TH	F	S
						(F)	

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
			(Overcast)		

TEMP	To 32	32-50	50-70	70-85	85 up
			(50-70)		

WIND	Still	Moder	High	Report No.
		(Moder)		

HUMIDITY	Dry	Moder	Humid	33
		(Moder)		

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
Penn Fencing

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Bobcat Fencing Equipment.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily safety and health meeting.
- Rig No. 1 mobilizes to NWS-04 to initiate coring after repairing core barrel
- Rig No. 2 continues coring at NWS-03
- URS collected water sample from municiple water source and shipped the sample to General Engineering Laboratory for Priority Pollutant Analysis
- URS met with Trudy Swab of PADEP to discuss the status of field work.
- Rig No. 1 cored 35 feet of bedrock at NWS-04.
- Rig No. 2 cored 44.5 feet of bedrock at NWS-03.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 33
DATE 10/10/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked batteries
- Calibrated Multirae Plus Multigas Monitor and Minirae Dust Meter (Model PDM-3).
- Completed contamination surveys for radiation on several 55-gallon drums staged at well locations as well drill rigs
- Forwarded bioassays samples to URS Buffalo

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily safety and health meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Core barrel at Rig No. 1 was fixed.
- Drill string at NWS-01 remains stuck

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Packer Test NWS-03 below mine
- Core NWS-04 to mine
- Stake geoprobe soil boring locations

BY Kevin Shanahan TITLE Field Manager.

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/11/03

DAY	S	M	T	W	TH	F	S
							(S)

WEATHER	Bright Sun	(Clear)	Overcast	Rain	Snow
TEMP	To 32	32-50	(50-70)	70-85	85 up
WIND	Still	(Moder)	High	Report No.	
HUMIDITY	Dry	(Moder)	Humid	34	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11773233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- Staked Geoprobe borings using GPS unit
- Rig No. 1 was down due to the pins on the retriever breaking. Initiating coring mid-morning.
- Rig No. 2 completed coring at NWS-03 to a total depth of 177.7 feet.
- Rig No. 1 cored approximately 35 feet to at total depth of 89.6 feet. Coal mine was encountered at about 80 feet and was about 4 foot of coal (coal pillar, no void).
- Rig No. 2 completed packer testing from bottom of hole to the bottom of mine and mobilized packer test equipment to the decon pad.
- Rig No. 1 deconned packer test equipment.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 34
DATE 10/11/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked battery
- Calibrated MultiRae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D Protection

PROBLEMS ENCOUNTEREO/CORRECTION ACTION TAKEN:

- Drill string at NWS-01 remains stuck

SPECIAL NOTES: Geoprobe locations all staked (not trench borings).

TOMORROW'S EXPECTATIONS:

Packer Test NWS-04 above mine
Ream hole NWS-04 above mine
Install Casing at NWS-04 ~~above~~
Install blank FLUTe liner at NWS-03

BY Kirin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/12/03

DAY	S	M	T	W	TH	F	S
	(S)						

WEATHER	Bright Sun	(Clear)	Overcast	Rain	Snow
TEMP	To 32	32-50	(50-70)	70-85	85 up
WIND	(Still)	Moder	High	Report No.	
HUMIDITY	Dry	(Moder)	Humid	35	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted brief daily health and safety meeting
- Reviewed labeling on 55-gallon drums of soil cutting and drill water at each well and labeled properly if not already present.
- Rig No. 1 packer tested NWS-04 from top of rock to top of coal seam (80 feet to 30 feet below ground surface).
- Rig No. 2 installed blank FLUTE liner into well NWS-03.
- Rig No. 1 reams out hole at NWS-04 with roller bit to a depth of 90 feet.
- Screened various items with frisker from radiological (restricted area) for release.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 35
DATE 10/12/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked battery.
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducting daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck (NWS-01).
- Rig No. 2 crew having difficulty installing blank liners at NWS-03

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Rig No. 2 mobilizes to NWS-02 and begins coring
Rig No. 3 cores to the terminal depth at NWS-04.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/13/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	36	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
Penn Fencing
Superbowl Portable Sanitation

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily safety meeting
- Mobilized Rig No. 2 from NWS-03 to decon pad and decontaminated rig, tools, and pipe.
- Placed stone and plywood at NWS-02 to minimize potential slip hazard.
- Mobilized Rig No. 2 to NWS-02 and cored 18-feet.
- Rig No. 1 installed 4-inch steel temporary casing to beneath coal seam.
- Rig No. 1 cored 5-feet of rock when it was determined that the casing weld was leaking. Therefore the casing was rewelded and regrouted.
- Screened various items for release from restricted area with radiological monitoring equipment.
- Penn Fencing completed fence work.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigations
JOB No. 11173233.00000

REPORT No. 36
DATE 10/13/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked batteries.
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck at NWS-01
- Rig No. 1 repaired bad weld at NWS-04

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Rig No. 1 cores to 140+/-
Rig No. 2 cores to 90+/-

BY Kirin L. Shaw TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/14/03

DAY	S	M	T	W	TH	F	S
WEATHER	Bright Sun	Clear	Overcast		Rain		Snow
TEMP	To 32	32-50	50-70		70-85		85 up
WIND	Still	Moder	High		Report No.		
HUMIDITY	Dry	Moder	Humid		37		

PROJECT MANAGER Tom Frolich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
Penn Fencing
Superbowl Portable Sanitation

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Staked Geoprobe locations in Gilpin/Leechburg Park
- Collected air samples from perimeter air sampling locations ASL-1 through ASL-5 and shipped samples to General Engineering Laboratory
- Rig No. 1 cored bedrock from 95 to 155 feet at NWS-04.
- Rig No. 2 cored bedrock from 52 to 105 feet at NWS-02.
- STB foreman worked on freeing up the drill string at NWS-01.
- URS installed temporary rain tarp over decon pad before rain storm.
- URS contacted Nancy Boro of Leechburg boro to inform her of our schedule to initiate drill at Gilpin/Leechburg Park on 10/20/03
- Walked along new chain link fence with Tom of Penn Fencing to confirm unit quantities and quality of installation (Fence length = 2060 linear feet, Two 16-foot vehicle gates).

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 37
DATE 10/14/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked batteries
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (PDM-03).
- Collected filter blank air monitor sample for laboratory analysis

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily safety and health meeting
- Level D protection
- Shut work down during thunderstorm (1700hr)

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- SJB could not pull drill string at NWS-01
- Thunderstorm terminated work at 1700 hrs

SPECIAL NOTES: Called SJB to call in utilities for drilling at park (Penn One Call).

TOMORROW'S EXPECTATIONS: Core bedrock to 120 feet at NWS-02
Core bedrock to bottom of well at NWS-04

BY Kevin Sharaban TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/15/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	38	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily safety and health meeting
- Pumped rainwater off of temporary rain cover for decon pad.
- Cored bedrock at NWS-04 from 155 feet to 185 feet below ground surface (Rig No. 1).
- Cored bedrock at NWS-02 from 103 feet to 123 feet below ground surface (Rig No. 2).
- Secured site for 4 day weekend.
- Deconned packer testing equipment for use at NWS-04.
- Screened various items with frisker for release from restricted area.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 QF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 38
DATE 10/15/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked battery
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (PDM-3).

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily safety and health meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck at NWS-01

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Packer test NWS-04 from bottom of mine to 185 feet.
- Packer test NWS-02 from top of rock to top of mine
- Sampling w/ Geoprobe in park

BY Kevin Sheehan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/20/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	39	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling, Superbowl Portable Sanitation

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Simco 2400 Geoprobe.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Pumped rain water off temporary plastic cover placed on decon pad on 10/15/03.
- Deconned 4 inch temporary casing staged near NWS-03 and mobilized pipe to NWS-02 (pipe was carried in by hand due to significant mud.
- Advanced borings 1 through 12 (BK-001 through BK-012) at Gilpin/Leechburg park. At each location soil samples were collected from 0 to 6 inches and 2 to 4 feet for primary ROPC and secondary ROPC (10%) analysis.
- Rig No. 1 completes packer testing at NWS-04 and pulls rods.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 39
DATE 10/20/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked battery.
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (PDM-3).
- QC samples at Gilpin/Leechburg Park: 2 MS/MSDs at BK-008 and one QA split sample at BK-012 (2-4')
- Field Dups: BK-001 and BK-010

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck at NWS-01
- Rig No. 1 had to replace fittings on the packer testing equipment.
- Rig No. 2 had to carry 4 inch steel casing to NWS-02.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Install blank FLUTe liner at NWS-04
- Packer test, ream and install temporary steel casing at NWS-02
- Mobilize rig to NWS-01 from NWS-04

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/21/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	40	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, SIMCO-2400 Geoprobe

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- Completed background soil sampling at Hilgin Leechburg Park (borings BK-013 through BK-018).
- Installed blank FLUTE liner at NWS-04 however the last several feet will need over night to finish ascending to the bottom.
- Packer tested hole at NWS-02 from top of rock to approximately 118 feet.
- Deconned 4-inch temporary casing for NWS-02 install.
- Reamed out hole at NWS-02 from top of rock to 80 feet.
- Screened various items out of restricted area with radiological monitoring equipment.
- Advanced soil borings SB-001, SB-002, SB-003, SB-008, SB-009, and SB-012 and collected soil samples in accordance with work plan.
- Shipped background samples to the appropriate laboratories.
- URS survey crew bringing in vertical control from known benchmark off-site.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 40
DATE 10/21/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked batteries
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3)
- Collected one field duplicate sample at BK-015 (SB-FD-013-02-4).

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily safety meeting
- Level D protection
- Refilled one eyewash station

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck at NWS-01
- Blank flight descended very slow after 90 feet; allowed last 20 feet to decend overnight

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Remove temporary casing at NWS-04
Mobilize back to NWS-01 after deconning rig & equipment, rods
Ream hole at NWS-02 to 118 feet
Install temporary casing and begin coring at NWS-02

BY Keith Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/22/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	41	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Simco-2400 Geoprobe

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Pulled temporary 4-inch diameter steel casing at NWS-04 and mobilized rig to decon pad.
- Deconned Rig No. 1, tools, rods etc. and mobilized to NWS-01 to start new hole.
- Reamed out hole at NWS-02 to 125 feet with roller bit.
- Met with Mr. William Frederick of the USACE to review depths for FLUTE liners at NWS-03 and NWS-05 (also examined rock cores).
- Also reviewed revised locations for wells NWS-01 and MW-55 with William Frederick
- Rig No. 1 augered down to approximately 20 feet at NWS-01
- Installed 4-inch steel protective casing to 125.5 feet at NWS-02.
- The Geoprobe rig advanced borings SB-101, SB-004, SB-005, SB-006, SB-007, SB-010, SB-011, SB-102 SB-013 and SB-014 and collected soil samples in accordance with the work plan.
- URS survey crew bringing in vertical control from known benchmark off-site

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation REPORT No. 41
JOB No. 11173233.00000 DATE 10/22/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked batteries.
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Collected ~~two~~ QA/QC split samples at GB-010 from 0 to 0.5 feet and 4 to 6 feet.
- Collected four field duplicate samples of boring GB-101 and MS/MSD samples at GB-101.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck at NWS-01
- Protective casing would not go in hole at NWS-02; had to pull casing and re-instale with bit on end of casing

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Core bedrock from 125 feet to 185 feet at NWS-02
Finish Geoprobe holes at lower trench area.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/23/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	42	

PROJECT MANAGER Tom Frahch
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Simco 2400 Geoprobe.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- URS scanned numerous rock core boxes with radiological equipment and stored in semi-trailer.
- Rig No. 1 installed 6-inch steel casing at MDS-01 to approximately 19-feet.
- Rig No. 1 deconned packer testing equipment and roller bit/casing/rods for work at MW-52
- Rig No. 1 completed packer testing at MW-52 and roller bit/reamed hole for well install.
- Rig No. 2 cored bedrock from 125 to 173 feet
- Geoprobe rig advanced borings at SB-015, SB-016, SB-017, SB-095, SB-094, SB-102R, SB-096, SB-057, SB-058, SB-059 and SB-061
- URS collected soil samples from each boring in accordance with the work plans.
- URS/USACE mobilized to Carnahan Run and located the mine outfall adjacent to an apparent former mine opening
- URS shipped samples to the appropriate lab.
- Parks Township police chief visited URS/USACE representatives and discussed events of 10/8/03 involving the two individuals on-site (intruders)

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigations
JOB No. 11173233.00000

REPORT No. 42
DATE 10/23/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked batteries.
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3)
- Collected field duplicate samples: at SB-101
  QA split samples at SB-010 (0-0.5 and 4-6 feet)
  MS/MSD samples at SB-101

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection
- Reiterated requirement of air horn, fire extinguisher and radio with each rig

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill rig remains stuck at NWS-01
- Problems retrieving core barrel at NWS-02
- Welder would not start at NWS-01

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Finish coring and packer testing at NWS-02
Finish well install at MW-52
Begin reaming hole at NWS-1A
Complete 12 additional geoprobe holes
Meet w/ PADEP representative

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/24/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear PM	Overcast AM	Rain	Snow
TEMP	To 32	32-50 X	50-70	70-85	85 up
WIND	Still	Moder X	High	Report No.	
HUMIDITY	Dry	Moder X	Humid	43	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Sinco-2400 Geoprobe

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Rig No. 1 installed 2-inch diameter PVC well at MW-52.
- Rig No. 2 cored bedrock from 173 to 177 feet (terminal depth of hole).
- Briefed Trudy Swab of PADEP of project status
- URS survey crew closing loop on vertical control from known benchmark off-site
- Completed an intensive survey above Rigdwall to confirm locations identified during gamma survey
- Geoprobe rig advanced borings at the following boring locations: SB-084, SB-85, SB-086, SB-056, SB-060, SB-062, SB-064, SB-065, SB-063; samples were collected at each location in accordance with the work plans.
- Completed packer testing at NWS-02 from bottom of mine to bottom of hole.
- Rig No. 1 deconned rig, tools, rods, etc. and reamed hole at NWS-01A to approximately 58 feet.
- Screened various items along control line for the presence of radiation and placed articles in semi-trailer.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigations REPORT No. 43
JOB No. 11173233.00000 DATE 10/24/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked batteries
- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Collected one field replicate sample (field duplicate of boring SB1-060).

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Kelly bar fitting broke on Rig No. 2; part ordered, rig still operational for packer testing and FLUTE installation.
- Drill string remains stuck at NWS-01.

SPECIAL NOTES: In cases where refusal was encountered at about 12-feet, the prescribed sample depth of 12-14 feet was replaced with a sample collected from 10-12 feet.

TOMORROW'S EXPECTATIONS: Install blank FLUTE at NWS-02. Roller bit at NWS-01A to beneath the mine, packer test, install casing. Advance 12 more Geoprobe Rods & and collect 1 ship samples.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/25/03

DAY	S	M	T	W	TH	F	S
							(S)

WEATHER	Bright Sun	Clear Pm	Overcast Am	Rain	Snow
TEMP	To 32	32-50	50-70 X	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	44	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Sinco-2400 Geoprobe

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Pumped water from NWS-02 with Gronfus pump to facilitate FLUTe blank liner installation
- Installed FLUTe blank liner in well NWS-02.
- Reamed bedrock at NWS-01A from 58 feet to 85 feet.
- Pumped out water from decon pad and covered pad with rain cover for night.
- URS survey crew shot elevations and coordinates of wells, TWSPs etc on-site.
- Rig No. 1 cored bedrock from 85 feet to 93 feet, however significant vibration was occurring
- Rig No. 2 attempted to install blank FLUTe however it would not go in deeper than about 145 feet; therefore SJB crew began removing the blank and will re-insert on 10/26/03 (NWS-02).
- Geoprobe rig completed the following borings: SB-099, SB-100, SB-069, SB-070, SB-098, SB-066, SB-097, SB-092, SB-068, SB-067, SB-093, GB-088 GB-087; URS collected soil samples in accordance with the work plan

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 44
DATE 10/25/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries.
- Collected two QA split samples at SB-064 from depths of 0-0.5 and 4-6. also two QA split samples at SB-056 from 0.0-0.5 and 4-6.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily safety and health meeting
- Level D protection
- Ensured each geologist is equipped with first aid kits
- Inspected rigs for fire extinguishers and replaced one at NWS-02.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- FLUTe blank would not descend to bottom of hole.
- Significant vibration was occurring during coring which slowed production

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Insert FLUTe blank liner at NWS-02.
- Core bedrock at NWS-1A.
- Geoprobe 12 new holes in upper trench area.

BY Kevin Shanahan TITLE [signature]

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/26/03

DAY	S	M	T	W	TH	F	S
	(S)						

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
			(Overcast)	(Rain)	

TEMP	To 32	32-50	50-70	70-85	85 up
			(50-70)		

WIND	Still	Moder	High	Report No.
		(Moder)		45

HUMIDITY	Dry	Moder	Humid
			(Humid)

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Sinco-2400 Geoprobe

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- URS survey crew continued to survey on-site wells and recently completed borings.
- Rig No. 1 cored bedrock to approximately 105 feet and reamed out hole at NWS-101A
- Rig No. 2 pulled blank FLUTE from hole at NWS-02 and also pulled 4-inch steel casing
- Rig No. 1 decorned packer testing equipment and set up at NWS-01 for packer testing.
- Rig No. 2 initiated reinstalling the blank FLUTE liner at NWS-02 after pumping out water. The liner was only down to 65 feet when STB left the site however it was continuing to descend.
- Rig No. 2 moved drill rig to the decon pad for repair and maintenance. Rig No. 2 also transported several lengths of casing to the decon pad.
- The Geoprobe rig advanced an additional 12 borings and collected soil samples in general accordance with the plan.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 45
DATE 10/26/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3)
- Source checked radiation monitoring equipment and checked batteries.
- Collected three QA split samples from boring SB-081
- Collected ~~two~~ the following field replicate samples:
  SO-FD-006-0-0.5, SB-FD-006-4-6, SB-FD-006-8-10, SO-FD-003-0-0.5, SB-FD-003-1-3

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily safety and health meeting
- Level D protection
- Completed an inventory of health and safety equipment and ordered depleted supplys.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Blank Flute liner decending very slowly at NWS-02.
- Collected the following MS/MSD samples:
  SO-GB-099-0-0.5-MS, SB-GB-099-1-3-MS, SO-GB-099-0-0.5-MSD, SB-GB-099-1-3-MSD

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Rig No. 1 completes coring at NWS-1A
Rig No. 2 mobilizes from NWS-2, decons rig and moves down to MW-5B
Geoprobe rig advances 12 more holes

BY Keirn Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/28/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	47	

PROJECT MANAGER Tom Fralick
PROJECT SLOA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Support Truck
Simco-2400 Geoprobe

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- URS survey crew continues to locate new borings and existing wells.
- Rig No. 2 continues to monitor the blank FLUTE liner descending to bottom of hole at NWS-02 (current depth = 115 feet).
- Rig No. 1 was coring at location NWS-01A when the coring rods snapped off and fell back into the hole. The crew spent the rest of the day trying to remove the rods from the hole. A total of 17 feet was cored from 109 to 126 feet.
- Rig No. 2 cored bedrock from 18.2 to 51.2 feet at MW-58 (33 feet).
- The Geoprobe rig advanced the following borings: SB-050, SB-049, SB-048, SB-046, SB-041, SB-042, SB-043.
- URS crew selected the locations for trench drilling for 11/3/03 and identified locations for the radiation zone, contaminant reduction zone and support zone.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 47
DATE 10/28/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitor equipment and checked batteries.
- The following samples were shipped (MS/MSD and field duplicates) ~~GB-0~~ SO-GB-054-0-0.5-MS, SB-GB-054-4-6-MS, SB-GB-054-8-10-MS, ~~SB-GB-054-12-14-MS~~ SO-GB-054-0-0.5-MSD, SB-GB-054-4-6-MSD, SB-GB-054-8-10-MSD

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck at NWS-01
- Rig No. 1 lost core rods down hole and spent the rest of the day to retrieve them without success.

SPECIAL NOTES: SB-GB-054-12-14-MSD, ~~FD-007-0-0.5~~, SO-FD-007-0-0.5, SB-FD-007-4-6, SB-FD-007-8-10, SB-FD-007-12-14

TOMORROW'S EXPECTATIONS:

- Retrieve core rods from NWS-01A
- Core 30 feet at NWS-01A
- Complete coring at ~~NWS~~ MW-5B
- Geoprobe 6 holes and collect samples
- Delineate areas for Day 1 of Level B work.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 10/29/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	48	

PROJECT MANAGER Tom Fralich
PROJECT SIDA Remedial Investigations
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Simco-2400 Geoprobe

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Rig No. 1 retrieved core rods from NWS-01A and set up to continue rock coring
- URS ships soil samples to laboratory for analysis.
- URS covers decon pad for long weekend.
- Rig No. 2 cored from 51.2 to 81.2 feet at MW-58.
- Rig No. 1 retrieved core rods from hole and cored 25 feet of bedrock.
- Rig No. 3 (Geoprobe rig) completed SB-038 and started SB-039 then rig broke down.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 48
DATE 10/29/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-03).
- Source checked radiation monitor equipment and checked batteries.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck at NWS-01
- Rig No. 11 worked on recovering core rods at NWS-01A.
- Chain broke on Geoprobe rig.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Set up for level B work (trench borings).
- Finish coring and packer test at MW-58.
- Finish coring at NWS-01A
- Start trench borings at Trench 10.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/3/03

DAY	S	M	T	W	TH	F	S
WEATHER	Bright Sun	Clear	Overcast		Rain	Snow	
TEMP	To 32	32-50	50-70		70-85	85 up	
WIND	Still	Moder	High		Report No.		
HUMIDITY	Dry	Moder	Humid		49		

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
Superbowl Portable Sanitation
United Rentals Field Environmental

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed support truck
Sincor-2400 Geoprobe

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Rig No. 1 cored rock from 150 to 176 feet at NWS-01A (terminal depth of hole)
- Rig No. 2 packer tested hole at MW-58.
- Geoprobe rig completed boring at SB-039.
- United Rentals repaired gator that was broke
- Superbowl Portable Sanitation services the two portajons on-site.
- URS uncovered decon pad after pumping off rainwater.
- URS conducted a meeting to discuss the details of the Level B work (drilling into trenches).
- Set-up to start trench borings for purposes of doing a "Dry Run" around north end of Trench 10.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 49
DATE 11/3/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Level D protection for groundwater wells and site work
- Level B protection for trench borings
- Conducted daily health and safety meeting
- Conducted meeting on details of trench work (Level B)

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drill string remains stuck at NWS-01.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Complete "Dry Run" of trench drilling work.
Install well at MW-58
Packer test hole at NWS-01A

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/4/03

DAY	S	M	T	W	TH	F	S
			(T)				

WEATHER	(Bright Sun)	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	(50-70)	(70-85)	85 up
WIND	(Still)	Moder	High	Report No.	
HUMIDITY	Dry	(Moder)	Humid	50	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, CME-850 Track Rigs (2) GMC-7000 Flat Bed Support Truck, Simco 2400 Geoprobe, Level B supplied air equipment.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily safety and health meeting
- Rig No. 1 attempted to packer test at NWS-01A however the hole was filled in with drill cuttings and washout from the mine. The crew spent the remainder of the day cleaned out down to 173 feet.
- Rig No. 2 installed a 2-inch diameter well at MW-58 and moved the rig to the decon pad.
- Geoprobe rig advanced the following borings in the upper trench area: SB-036, SB-037, SB-020, SB-019, SB-091, SB-018, SB-022, SB-023, SB-025, SB-026, SB-027.
- Collected soil samples from each geoprobe boring and shipped ~~Abab~~ samples to the laboratory.
- Collected perimeter air monitor samples and shipped the samples to the laboratory.
- Examined several temporary waste sampling point locations that were broken from grass cutting operations and developed a list of materials for repair.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 50
DATE 11/4/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries
- Shipped one field duplicate sample : SO-FD-014-0-0.5 to the laboratory for analysis

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Level D protection for groundwater wells and other site activities, Level B in the trenches
- Conducted health and safety meeting.
- Assembled and calibrated breathing zone air monitors for Level B work.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Hole was filled in at NWS-01A (spent rest of day evacuating hole to allow packer test)

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Packer test hole at NWS-01A
Finish decorning rig No. 2 and start coring bedrock at MW-57
Initiate trench borings at Trench 10

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/5/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	51	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
South Bend Limestone

EQUIPMENT ON SITE: CME-85 Truck Rig, CME-850 Track Rigs (2)
GMC-7000 Flat Bed Support Truck, Simco-2400
Geoprobe, Level B supplied air equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Rig No. 1 completed packer testing at NWS-01A from the bottom of the hole to the bottom of the mine.
- Rig No. 2 cored rock from 22 feet to 54 feet below ground surface at MW-57
- The Geoprobe rig advanced the following trench borings at Trench 10: TR10-011 and TR10-012
- Shipped samples collected to the laboratory for analysis
- Met with representatives from South Bend Limestone Company to review scope of work to place stone necessary to drill MW-55.
- Rig No. 1 installed black FLUTE liner to a depth of 120 feet below ground surface

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation REPORT No. 51
JOB No. 11173233.00000 DATE 11/5/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries.
- Calibrated breathing zone air monitoring pumps at the beginning and end of the day.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level B protection in the disposal trenches
- Level D protection for all other work.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Drill and install overburden well at ~~MW-55~~ NWS-01A
Advance several additional trench borings
Core 50 feet of bedrock at MW-57

BY Kevin Sanchez TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/6/03

DAY	S	M	T	W	TH	F	S
					(TH)		

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
			(Overcast)	(Rain)	
TEMP	To 32	32-50	50-70	70-85	85 up
			(50-70)		
WIND	Still	Moder	High	Report No.	
		(Moder)			
HUMIDITY	Dry	Moder	Humid	52	
		(Moder)			

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, CME-850 Track Rig (2) GMC-7000 Flat Bed Support Truck, Simco-2400 Geoprobe, Level B Supplied Air Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Rig No. 1 finished installing the Blank FLUTE liner at NWS-01A
- Rig No. 1 installed a 2-inch diameter PVC overburden well adjacent to the NWS-01A FLUTE well installation.
- Rig No. 2 cored 22 feet of bedrock at MW-57 from 54 feet to 76 feet below ground surface when the pump went on the rig. The crew spent the remainder of the day repairing the rig.
- The Geoprobe rig advanced borings at TR10-010, TR10-009, TR10-008, TR10-007 TR10-006, and TR10-005. Refusal was encountered three times at TR10-00 at 3.5 feet below ground surface. Since no elevated field screening or waste materials were encountered, soil samples were collected in accordance with the work plans.
- Packaged up samples collected for shipment to laboratory, however, stored cooler on-site
- Repaired damaged TWSPs at Trench 10.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 52
DATE 11/6/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3)
- Source checked radiation monitoring equipment and checked batteries.
- Calibrated breathing zone air monitoring pump at the beginning and end of the day

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level B protection in the disposal trenches
- Level D protection for all other work.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Pump broke on Rig 2; they spent the rest of the day repairing the pump.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Set Casing at MW-50
Finish Trench Boring at Trench 10
Finish coring at MW-57

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/7/03

DAY	S	M	T	W	TH	F	S
						(F)	

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
		(Clear)	(Overcast)		

TEMP	To 32	32-50	50-70	70-85	85 up
		(32-50)			

WIND	Still	Moder	High	Report No.
		(Moder)		53

HUMIDITY	Dry	Moder	Humid
		(Moder)	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Sinco 2400 Geoprobe Rig, Level B Breathing Air Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted the daily health and safety meeting.
- Rig No. 1 deconned rig, tools, rods etc. and mobilized to MW-50 to initiate casing install
- Briefed USACE and PADEP on project status.
- Analyzed air sample filters collected during trench work to evaluate potential exposure
- The Geoprobe rig advanced trench borings TR10-003 and TR-004 in Trench 10. Since no elevated field measurement readings or visable waste material were encountered, soil samples were collected as if the borings were soil borings in accordance with the work plans.
- Packaged up QA split sample and chemical sample and shipped samples to the appropriate laboratory.
- Rig No. 2 repaired rig starter and cored bedrock at MW-57 from 76.7 to 94.7 feet
- Rig No. 1 completed continuous split spoon sampling and augering to bedrock; augered rock socket 15 to 18 feet.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation REPORT No. 53
JOB No. 11173233.00000 DATE 11/7/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries.
- Calibrated breathing zone air monitoring pump
- Collected two QA split samples (SB-TR10-005-8-10 and SB-TR10-005-12-14)
- Also collected field duplicate samples from trench borings (TR-FD-001, 4 samples)

HEALTH AND SAFETY LEVELS AND ACTIVITIES: ~~TR10~~

- Conducted daily safety meeting
- Level B protection in the trenches
- Level D elsewhere on-site
- Level B supplied breathing air.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Rig No. 2 starter broke; spent over half day fixing it.

SPECIAL NOTES: Also collected four MS/MSD sample from trench boring TR10-005

TOMORROW'S EXPECTATIONS: Rig 1 to finish casing install at MW-50 decon rig and install casing at MW-51
Rig 2 to finish coring and packer testing at MW-57
Geoprobe to advance 4 more trench borings

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/8/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	54	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
Superbowl. Portable Sanitation

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Sinco 2400 Geoprobe, Level B Supplied Air Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- Rig No. 1 set casing at MW-5b at a depth of 15 feet below ground surface
- Rig No. 1 mobilized to the decon pad and steam cleaned rig, tools, rods, augers
- Rig No. 1 mobilized to MW-51 and completed split spoon sampling to 12 feet (augered to 10 feet).
- Rig No. 2 cored bedrock from 94.7 feet to 121 feet. A coal seam was encountered between 112 and 117 feet (no void). After coring, Rig No. 2 Packer tested from 120 to 110 feet.
- URS staff assisted in moving Geoprobe operation from Trench 10 to Trenches 6, 7, and 8 area. In addition, trench boring locations staked in the field were slightly modified to the center line of the trenches
- The Geoprobe rig completed trench borings TR10-001 and TR10-002 in Trench 10 and TR08-030 in Trench 8. Soil samples were collected at Trench 10 borings while one "waste" sample was collected from the Trench 8 boring.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 54
DATE 11/8/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries
- Calibrated breathing zone air monitoring pump.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily safety meeting
- Level B protection in the trenches (supplied air)
- Level D protection for other on-site activities

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROWS EXPECTATIONS: Finish packer testing at MW-57 and start reaming hole (Rig No. 2)
Finish setting casing at MW-51
Advance four more Geoprobe borings in the trenches.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/9/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	55	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-85 Truck Rig, CME-850 Track Rig (2), Simco-2400 Geoprobe, 1 GMC-7000 Flat Bed Support Truck, Level B breathing air

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Prepared draft waste characterization profile documentation for review and comment (URS/USACE/Disposal Company).
- Updated sample tracking spreadsheet with field screening data from Geoprobe borings.
- Package up samples collected from Geoprobe rig for future shipment.
- Rig No. 1 reamed hole at MW-51 from 10-13 feet and set 6 inch steel casing.
- Rig No. 1 set up on MW-53, advanced the hole with 8 1/4 hollow stem augers to 10 feet, reamed the hole to 13 feet and set 6 inch steel casing
- Rig No. 2 completed packer testing at MW-57 and reamed hole from 25 to 61 feet.
- The Geoprobe rig advanced the following trench borings: TR07-031, TR07-032, TR07-033 and TR07-034

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DOCREP

PROJECT: SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 55
DATE 11/9/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries.
- Calibrated breathing zone air monitoring pumps

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily safety meeting
- Level B protection in the trenches (supplied air)
- Level D protection for other on-site activities

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Several pipes were frozen and one valve broke from cold; repairs were made
- Gators wouldn't start from cold; battery charger was purchased.

SPECIAL NOTES: Well MW-52 was developed last week.

TOMORROW'S EXPECTATIONS: Core bedrock at MW-53
Finish reaming hole at MW-57 and install well
Geoprobe several additional trench borings
Develop MW-58

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/10/03

DAY	S	M	T	W	TH	F	S
WEATHER	Bright Sun	Clear	Overcast	Rain	Snow		
TEMP	To 32	32-50	50-70	70-85	85 up		
WIND	Still	Moder	High	Report No.			
HUMIDITY	Dry	Moder	Humid	56			

PROJECT MANAGER Tom Fralich
PROJECT SLOA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
Southbend Limestone Company

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs GMC-7000 Flat Bed Support Truck, Sinco-2400 Geoprobe Rig, Level B breathing air equipment, Kubota Front End Loader

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Worked on gators and mules that would not operate due to cold weather conditions
- Rig No. 1 cored bedrock at MW-53 from 13 to 56 feet below ground surface.
- Rig No. 2 reamed rock from 61 to 121 feet below ground surface.
- The Geoprobe rig advanced the following trench borings: TR06-035, TR06-036, TR06-037 TR06-038
- URS shipped chemical samples to GEL by FED-EX and packaged up the other samples for subsequent shipment.
- Southbend Limestone constructed a road to facilitate construction of well MW-55 and dressed up parking lot area.
- Packaged up samples for radiological analysis and retained samples on-site until authorized to ship.
- NOTE: A total of three samples have been collected from the trenches to date for chemical analysis

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 56
DATE 11/10/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries.
- Calibrated breathing zone air monitoring pumps

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level B protection in the trenches (supplied air).
- Level D protection for all other site work

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Gators wouldn't start due to cold weather
- Water supply lines were frozen despite draining them the night before.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Finish installation of well at MW-57
Finish coring and packer testing at MW-53
Complete four more trench borings with Geoprobe rig

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/11/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	57	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
Field Environmental

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Truck Rigs GMC-7000 Flat Bed Support, Linco-2400 Geoprobe Level B Supplied Air

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- The Geoprobe rig advanced trench borings TR04-039, TR04-040, TR05-041, TR05-042 TR05-043
- URS collected soil samples or waste samples as appropriate based on materials retrieved. In addition, one sample was collected from Trench 4 for chemical analysis.
- Rig No. 2 installed 2-inch diameter PVC well at MW-57 (123 feet deep).
- Rig No. 2 moved to decon pad, deconned rig, tools, rods, etc, and set up on well MW-50 to initiate coring on 11/12/03.
- Rig No. 1 cored bedrock from 56 to 71 feet at MW-53 (terminal boring depth), deconned packer equipment, packer tested hole and set up to ream hole on 11/12/03. Rig No. 1 crew also deconned CME-85 for transport off-site.
- United Rentals took gator off site and replaced it with a functional gator; Penn Barrel delivered 20 drums, recieved two FLUTE liners
- Analyzed numerous air samples collected during Level B work and from trailer.
- Collected perimeter air monitoring samples and shipped to lab

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/12/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast Fog	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	58	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
Superbowl Portable Sanitation

EQUIPMENT ON SITE: CME-85 Truck Rig, Two CME-850 Track Rigs GMC-7000 Flat Bed Support Truck, Simco-2400 Geoprobe Rig, Level B Supplied Air

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Rig No. 1 reamed hole at MW-53 from 13 feet to 56 feet below ground surface
- Rig No. 2 cored bedrock at MW-50 from 12 feet to 35 feet below ground surface
- Geoprobe rig collected one chemical sample from TR04-040 and shipped sample to laboratory.
- The Geoprobe rig advanced the following borings outside the trenches: SB-44, SB-45, SB-47
- Segregated materials with detectable radiation into the following drums:
  1. Soil
  2. PPE
  3. Acetate Liners (from geoprobe).
  4. Water

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 58
DATE 11/12/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries.
-

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection for all site activities
- Conducted radiological survey in trailer
- Analyzed air samples for radiation in trailer

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Install Well at MW-53
Packer Test hole at MW-50
Complete Trench Borings at Trench 3 and Trench 9

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/18/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	60	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
FLUTE Company

EQUIPMENT ON SITE: Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Sinco-2400 Geoprobe Rig Level B Supplied air Apparatus

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Collected perimeter air monitoring samples and shipped samples to laboratory
- FLUTE personnel pulled blank liner at NWS-01A URS video taped hole
- Rig No. 1 completed well install at MW-53.
- Rig No. 2 installed 2-inch PVC well at MW-50 and decomned rig, rods, tools, etc.
- Rig No. ~~2~~ 1 cored rock at MW-51 from 13 to 36 feet.
- Rig No. 1 completed packer test at MW-51 from 36 to 26 feet
- Rig No. 2 ~~drill~~ reinstalled temporary casing at ~~NWS~~ NWS-01A since the hole had collapsed beneath the depth of the mine

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 60
DATE 11/18/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3)
- Source checked radiation monitoring equipment and checked batteries.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection for all site activities except trench drilling when Level B protection will be worn.
- Briefed visitors of PPE requirements/hazards

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Rig No. 2 broke down

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Install well at MW-51
Install FLUTE liners at NWS-01A and NWS-02
Advance four additional trench borings

BY Kirin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/19/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	61	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTE Company
Field Environmental Inc.

EQUIPMENT ON SITE: Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Simco 2400 Geoprobe Rig Level B Supplied Air Apparatus

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Completed well development activities at the following wells: MW-54, MW-56, MW-50, MW-59, MW-47, MW-64, MW-69, MW-57
- Rig No. 2 completed casing installation at NWS-01A and reamed hole to a total depth of 176.5 feet (hole open). Rig 2 crew also assisted in FLUTE liner installations at NWS-02 and NWS-03.
- Rig No. 1 reamed hole at MW-51 from 13 to 36 feet and installed 2-inch PVC well.
- Rig No. 1 set up on MW-49 and augered down to 10 feet. Augers remained in hole overnight to see if water accumulated in augers.
- Dropped camera in hole at NWS-02 but could not film below 30 +/- feet from muddy water.
- FLUTE company installed FLUTE liner at NWS-02 down to 140 +/- feet; also attempted to remove blank at NWS-03 but encountered difficulty

Continued in Special Notes Section (Page 2)

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 61
DATE 11/19/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries.
- Collected one MS/MSD sample from trench 2 (~~samples~~ (SB-TR-02-022-4'-5.9)
- Collected one QA sample for laboratory analysis from trench 9 (TR-009-026-B-10)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection for all site activities except trench drilling when Level B protection will be worn.
- Briefed visitors of PPE requirements / hazards

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- FLUTE liners are not being installed easily due to the presence of the mine void!.

SPECIAL NOTES: Geoprobe advanced the following trench borings: TR-02-022, TR-02-021, and TR-02-020 also redrilled one hole at TR-02-023

TOMORROW'S EXPECTATIONS:

Install FLUTE liner at NWS-01A
Install well at MW-49
Install well at MW-48
Install well at MW-55
Develop Wells
Advance several Geoprobe borings in trench 1

BY Kurt Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/20/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	62	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTE Company

EQUIPMENT ON SITE: Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Sinco 2400 Geoprobe
Level B Supplied Air Apparatus

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Rig No. 1 determined that there was no water in augers at MW-49 and that no well would be installed.
- Rig No. 2 pulled rods at NWS-01A and decons rig, rods, tools, etc.
- The Geoprobe rig advanced trench borings TR01-015 through TR01-019 and collected soil samples in accordance with the plan since no waste was encountered
- Rig No. 1 deconned rig, augers, rods, tools, etc.
- Rig No. 2 mobilized to well location MW-55 and augered / sampled to terminal boring depth; no saturated soils were encountered and a well was not installed.
- Rig No. 1 crew places gravel pad at MW-54 and MW-56 and moves drums to drum storage pad.
- FLUTE Company installed liner at NWS-01A to 150+ feet.
- URS prepared punch list for new wells on-site
- URS completed well development activities on several wells (MW-64 complete).

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLOA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 62
DATE 11/20/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries
- Collected one additional field duplicate sample from trench boring TR01-017 from 6 to 8 feet.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D for all site activities except for trench drilling when Level B protection is worn
- Briefed visitors on health and safety concerns.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Drillers had only one lead auger. Rig No. 1 completed other work while waiting for Rig No. 2 to be done.
- Rig No. 1 repaired a flat tire on rig.

SPECIAL NOTES: Conducted meeting in trailer to discuss the potential benefits of screening trench samples (soils not waste) with alpha flasher. Attendees were URS ~~and~~ (HPs and Field Manager) and USACE.

TOMORROW'S EXPECTATIONS: Drill and install MW-48
Assist FLUTe company in FLUTe liner work
Install FLUTe liner in NWS-03
Complete well development.
Complete trench drawings.

BY Sean Shanahan TITLE Field Manager

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/21/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	63	

PROJECT MANAGER Tom Frolich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTE Company
Field Environmental

EQUIPMENT ON SITE: Two CME-850 Track Rigs, GMC-7000 Flat Bed Support Truck, Simco 2400 Geoprobe Rig Level B Supplied Air Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Pulled steel casing at NWS-01A; FLUTE liner in to depth.
- Rig No. 1 augered and sampled to top of rock at MW-48. Since not saturated soils were encountered a well was not installed
- The Geoprobe rig advanced borings TR01-013 and TR01-014 at Trench 1 as well as URS collection of soil samples and QA/QC samples at those locations.
- Rig No. 1 crew mobilized to several well locations and installed grout and protective casings.
- Rig No. 2 deconned rig, tools, rods, etc and loaded up some equipment for demob.
- FLUTE liner began descending again at NWS-02 from 120 feet after pumping water.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 63
DATE 11/21/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries.
- Collected field duplicate samples from trench 1 borings TR01-013 and TR01-018 (4 samples)
- Collected three MS/MSD samples from trench 1 borings TR01-013 and TR01-015.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted ~~the~~ daily health and safety meeting
- Level D protection for all site activities except drilling in the trenches when Level B will be worn
- Emphasized vehicular safety

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- FLUTe liners behind schedule and need 1 drill crew

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Finish FLUTe liner install at NWS-02 and NWS-03
Finish several new wells up (punch list stuff).
Develop several wells
Move drums to drum storage pad

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/22/03

DAY	S	M	T	W	TH	F	S
							(S)

WEATHER	Bright Sun	(Clear)	Overcast	Rain	Snow
TEMP	To 32	(32-50)	(50-70)	70-85	85 up
WIND	(Still)	Moder	High	Report No.	
HUMIDITY	Dry	(Moder)	Humid	64	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLITE Company

EQUIPMENT ON SITE: Two CME-850 Drill Rigs, GMC-7000 Flat Bed Support Truck, Simco -2400 Geoprobe Level B Supplied Air Apparatus.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Collected two samples from Trenches 6 and 7 for chemical laboratory analysis.
- Drill crews continued to finish new wells off ~~to~~ punch list work
- Rig No. 2 mobilized to NWS-03 and assisted in pumping water from blank lines in an effort to drill lines.
- Decontaminated radiation contamination from the Geoprobe rig at Trench 6 and 7 by using paper towels. Release survey performed
- Geoprobe operator cleaned up the decon pad (north end) and shoveled up 3/4 of a drum of soil.
- Repaired PVC to five additional TWSPs and purchased concrete for pads

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DOCREP

PROJECT SLDA Remedial Investigation REPORT No. 64
JOB No. 11173233.00000 DATE 11/22/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries.
- Calibrated pH, conductivity, temp, turbidity meters

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D for all site activities except for trench drilling when Level B was worn.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- FLUTe liner installation proceeded slower than expected.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Finish FLUTe liner at NWS-04
Continue working on punch list items
Stake locations of on-site sediment, seep and surface water samples.
Advance several soil borings.

BY Kirin Shankar TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/23/03

DAY	S	M	T	W	TH	F	S
	(S)		(T)				

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
		(Clear)			
TEMP	To 32	32-50	50-70	70-85	85 up
			(50-70)		
WIND	Still	Moder	High	Report No.	
	(Still)				
HUMIDITY	Dry	Moder	Humid	65	
	(Dry)				

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTE Company

EQUIPMENT ON SITE: Two CME-850 Trach Rigs, GMC-7000 Flat Bed Support Truck, Simco-2400 Geoprobe

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Advanced the following Geoprobe borings: SB-024, SB-071, SB-030, SB-029, SB-028, SB-072, SB-073, SB-033, SB-032, SB-031, SB-034, SB-035.
- URS collected soil samples from each boring and shipped the samples to the laboratory for analysis. In addition, several QA/QC samples were also collected and shipped to the laboratory for analysis
- The FLUTE Company completed the liner installation at NWS-04. In addition, several tasks were performed to aid in removal of the blank lines at NWS-05
- SJB crews continued to move drums to the drum storage pad and complete other punch list items for the new well installation
- URS crews continued to develop the new wells on-site and prepare well development logs.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation REPORT No. 65
JOB No. 11173233.00000 DATE 11/23/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3).
- Source checked radiation monitoring equipment and checked batteries
- Calibrated pH, conductivity, temperature and turbidity meters
- Collected the following field duplicate samples: SB-FD-009-0-0.5, SB-FD-009-4-6.5, SO-FD-010-0-0.5, SB-FD-010-4-6, SB-FD-010-6-7.5

HEALTH AND SAFETY LEVELS AND ACTIVITIES: SB-FD-008-4-6, SB-FD-008-6-7.9

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- FLUTE Company is having problems pulling the blank liner.

SPECIAL NOTES: • Collected the following additional QA/QC samples from the soil borings: MS/MSD Samples: SB-GB-029-6-7.5, SB-GB-029-4-6, SB-GB-035-4-6, SO-GB-029-0-0.5, SB-GB-034-3-5, SO-GB-034-0-0.5

TOMORROWS EXPECTATIONS: • Remove blank liner at NWS-05

- Sample soil drums from perimeter wells
- Complete punch list for existing wells
- Remove garbage on-site
- Complete well development
- Resolve problems at NWS-03

BY Kevin Shanahan TITLE Field Manager

Also collected the following QA samples for analysis at STL Richland: SB-GB-072-6-7.3, SB-GB-072-4-6, SB-GB-035-6-8, SB-GB-032-1.5-3.5, SB-GB-071-6-7.9, SB-GB-071-4-6, SB-GB-028-4-6.5

URS-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/24/03

DAY	S	M	T	W	TH	F	S
		M					

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	33-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	C6	

PROJECT MANAGER Tom Fralick
PROJECT SLOA Remedial Investigation
JOB No. 11732333.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling Cooney Disposal FLUTE Company Superbowl Sanitation

EQUIPMENT ON SITE: ~~CME~~ Two CME-850 Track Rigs, Simco-2400 Geoprobe, GMC-7000 Flat Bed Support Truck.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily safety meeting
- FLUTE Company continued to work at NWS-03 and NWS-05 to attempt to remove blank liners. Rig No. 2 crew worked with FLUTE Company all day but neither liner was removed since the liners were stuck in the mine
- Rig No. 1 continued to do punch list work and they finished staging most of the drums on pallets on the drum storage pad.
- The Geoprobe rig advanced soil borings at SB-040 and SB-074
- Rig No. 1 advanced soil borings SB-~~040~~ and and SB-074
- URS collected a soil sample from all of the perimeter well drums and submitted the sample for laboratory analysis.
- URS collected soil samples from geoprobe borings and shipped the samples to the laboratory for analysis.
- FLUTE Company demonstrated how to develop FLUTE wells

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11732333.00000

REPORT No. 66
DATE 11/24/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Multirae Plus Multigas Monitor and Miniram Dust Meter (Model PDM-3)
- Source checked radiation monitoring equipment and checked batteries.
- Calibrated pH, conductivity, temperature and turbidity meters

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Level D Protection for all site activities
- Conducted daily health and safety meeting
- Collected air samples from work zone during Geoprobe / Rig No. 1 sampling work

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- FLUTe blanks cannot be removed from NWS-03 and NWS-05

SPECIAL NOTES:

TOMORROWS EXPECTATIONS: Water levels from all wells / TWSPs
Coordinate sample collection from bulk liquid storage tanks
Develop FLUTe wells

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/25/03

DAY	S	M	T	W	TH	F	S
			(T)				

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
		(Clear)	(Overcast)		

TEMP	To 32	33-50	50-70	70-85	85 up
		(33-50)			

WIND	Still	Moder	High	Report No.
		(Moder)		67

HUMIDITY	Dry	Moder	Humid
		(Moder)	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.0000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
Field Environmental
Southbend Limestone

EQUIPMENT ON SITE: GMC-7000 Flat Bed Support Truck, Two CME-850 Track Rigs, Flat Bed Tractor Trailer.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Completed one round of water levels on all monitoring wells, temporary piezometers, TWSPs, piezometers, etc. except FLUTE wells and a few without keys.
- Collected air samples from the perimeter air sampling locations and shipped to the laboratory.
- Developed FLUTE wells at NWS-03 and NWS-04.
- STB Rig No. 2 crew demobilized one CME-850 Track Rig and some additional equipment.
- Southbend Limestone spread three loads of stone in parking lots

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 67
JOB No. 11173233.00000 DATE 11/25/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked batteries.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- FLUTE blank liners remain stuck at NWS-03 and NWS-05

SPECIAL NOTES:

TOMORROWS EXPECTATIONS:

- Prepare site for long weekend
- Mobilize nitrogen tanks to FLUTE well locations
- Punch list work for Geoprobe holes
- Prepare for groundwater sampling event.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 11/26/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	C8	

PROJECT MANAGER Tom Frabich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-850 Track Rig, GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Mobilized nitrogen tanks to FLUTE wells
- Developed FLUTE wells
- Pumped down decon pad and secured for long weekend.
- Updated sample tracking form to include field screening results and e-mailed Project Manager.
- Reduced groundwater level measurement data to prepare for groundwater sampling event.
- Labeled drums adjacent to decon pad.
- Backfilled geoprobe holes and put expandable plugs into repaired TWSPs
- Poured new concrete pads at all repaired TWSPs (7).
- Secured site for long weekend.
- Contamination survey performed in trailer

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 68
JOB No. 11173233.00000 DATE 11/26/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment and checked batteries
- Calibrated pH, conductivity, turbidity, temp meter.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Impacted water pump froze up.

SPECIAL NOTES:

TOMORROWS EXPECTATIONS:

- Remove FLUTE blank liners at NWS-03 and NWS-05
- Begin groundwater sampling program
- Finish development of FLUTE wells.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/1/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	33-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	69	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: Hertz
Gratto Cycle
United Rentals

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting as well as orientation meeting for new sampling crews from Albany.
- Worked with subcontractors to repair gattors.
- Purchased and installed plywood around NWS-02 to allow access
- Established decon station for groundwater sampling pumps
- Collected groundwater samples at wells MW-05, MW-64, and MW-69; field duplicates were also collected at MW-64 and MW-69. Well MW-54 was purged and the sample was partially collected.
- Packaged several soil / trench samples for shipment on 12/2/03

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 69
DATE 12/1/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated flow through cells for pH, conductivity turbidity
- Source checked radiation monitoring equipment and checked batteries
- Collected field dups and groundwater monitoring wells MW-64 and MW-69

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Conducted project orientation meeting for new personnel
- Level D protection.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Several gators were broken; service was called

SPECIAL NOTES:

TOMORROWS EXPECTATIONS: Collect groundwater samples from eight wells.
Collect Leachate Samples

BY Kevin Shandon TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/2/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	70	

PROJECT MANAGER Tom Frabich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: United Rental

EQUIPMENT ON SITE: CME-850 Track Rig, GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Continued development of FLUTE wells NWS-01A, NWS-02, and NWS-04.
- Continued purging and sampling of groundwater monitoring wells. Samples were collected from the following wells: MW-2A, MW-24, MW-14, MW-15, MW-33, MW-2, MW-40, MW-22, MW-39
- Initiated purging and sampling of the temporary waste sampling points (TWSPs) previously installed in the assumed limits of the trenches. Samples were collected from the following TWSPs:

10-04, 10-02, 10-12

- Collected air samples from the perimeter air sampling locations (ASLs) and shipped the samples to the laboratory for analysis.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigations REPORT No. 70
JOB No. 11173233.00000 DATE 12/2/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated flow through cells for pH, conductivity, turbidity
- Source checked radiation monitoring equipment and checked batteries
- Collected one MS/MSD sample from monitoring well MW-2
- Collected one QA sample from MW-24.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection
- Emphasized cold stress hazards.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Gators are broken; service called some were fixed.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Continue purging and sampling of groundwater monitoring wells
- Continue purging and sampling of TWSPs
- Continue FLUTE well development
- Sample bulk IDW water and ship to lab

BY Kevin Hanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/3/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	33-60	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	71	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE:

EQUIPMENT ON SITE: CME-850 Track Rig, GMC-7000 Flat Bed Support Truck, five gators

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Continued development of FLUTE wells NWS-01A, NWS-02 and NWS-04 despite tubing blocked by frozen ice in the morning
- Collected one sample from the drill water tank adjacent to the decon pad and shipped the sample to the laboratory for analysis.
- Continued purging and sampling of groundwater monitoring wells. Samples were collected from the following wells: MW-56, MW-36, MW-6 MW-23, MW-19, MW-7, MW-52, MW-32, MW-8, MW-9, MW-13
- Continued purging and sampling of the temporary waste sampling points (TWSPs) previously installed in the assumed limits of the disposal trenches. Leachate samples were collected from the following TWSPs: TWSP-07-05, TWSP-07-02 TWSP-07-06, TWSP-10-01, TWSP-08-01, TWSP-07-03
- Packaged up groundwater/leachate samples and shipped them to the laboratory for analysis

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

- Placed USACE sign on front gate indicating RI&FS on-going.

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 71
DATE 12/3/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated flow through cells for pH, conductivity, turbidity
- Source checked radiation monitoring equipment and checked batteries.
- Collected MS/MSD samples from the following sample locations: MW-23, TWSP-8-1
- Collected field duplicate samples from: TWSP-10-1 and MW-52
- Collected one QA split from TWSP-07-03

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection
- Emphasis on cold stress

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Complete FLUTE well development
Continue collection of groundwater and leachate samples
Continue work on removal of FLUTE well blanks at NWS-03 and NWS-05

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/4/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	33-50	50-70	70-85	85 up
WIND	Still	Moder	High		
HUMIDITY	Dry	Moder	Humid		

Report No. 72

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigations
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTE Company

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck
Five Gators

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- Continued development of FLUTE wells NWS-01A, NWS-02 and NWS-04.
- Coordinated with SJB Drilling and the FLUTE Company for outstanding work at NWS-04/05
- Continued purging and sampling of groundwater monitoring wells. Samples were collected from the following wells: MW-45, MW-30A, MW-57, MW-38, MW-51, MW-16BC, MW-58, MW-01, MW-25
- Continued purging and sampling of temporary waste sampling points (TWSPs) previously installed in the assumed limits of the trenches. Leachate samples were collected from the following TWSPs: TWSP-08-02, TWSP-07-01, TWSP-07-04, TWSP-06-01, TWSP-06-02, TWSP-06-03, TWSP-06-04, TWSP-05-01, TWSP-05-02, TWSP-05-03, TWSP-05-04
- SJB augered to top of rock adjacent to NWS-03 for a deep rock well.
- FLUTE Company attempted several techniques to pull liner at NWS-05 with no success.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

- Shipped 13 large coolers full of samples to the laboratory.

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 72
JOB No. 11173233.00000 DATE 12/4/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated flow-through cells / Horiba equipment. pH, conductivity, ORP, DO
- Source checked radiation monitoring equipment and checked batteries.
- Collected MS/MSD from TWSP-06-04
- Collected field duplicate samples from TWSP-07-04, TWSP-05-01, MW-01, MW-51
- Collected QA split samples from MW-58 and MW-25

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection
- Cold stress

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

FLUTE blank liner at NWS-05 won't come out

SPECIAL NOTES:

TOMORROWS EXPECTATIONS: Continue purging and sampling groundwater monitoring wells and TWSPs
Pull blank liners at NWS-05
Install casing at NWS-03
Complete FLUTE well development at NWS-01A, NWS-02, NWS-04!

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/5/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moderate	High	Report No.	
HUMIDITY	Dry	Moderate	Humid	73	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
FLUTe Company

EQUIPMENT ON SITE: CME-850 Track Rig, GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conduct daily health and safety meeting
- Continued development of FLUTe wells NWS-04
- Coordinated with STB Drilling and the FLUTe Company for outstanding work at NWS-03/05
- Continued purging and sampling of groundwater monitoring wells. Samples were collected from the following wells: MW-12D, MW-26, MW-35 MW-54, MW-03, MW-115, MW-41, MW-59, MW-29
- Continued purging and sampling of temporary waste sampling points (TWSPs) previously installed in the assumed limits of the trenches. Leachate samples were collected from the following TWSPs: TWSP-05-05, TWSP-04-02
- STB grouted in 6 inch steel casing to a depth of 24 feet below ground.
- The FLUTe Company attempted several different techniques to pull the lines at NWS-05 without success.
- STB moved several drums from various well locations to the drum storage pad.
- Shipped several coolers full of samples to the laboratory.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT TWSP-04-01, TWSP-02-04, TWSP-02-07, TWSP-02-03

URSF-003/1 OF 2/DQCREP

- Moved 3 drums with PPE, soil, water which contains radiation down to the decon pad and properly labeled them
- Deconned pumps used for groundwater sampling

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 73
DATE 12/5/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated flow through cells (YSI)/Horiba equipment for pH, conductivity, ORP, DO.
- Source checked radiation monitoring equipment and checked batteries.
- Collected MS/MSD samples from TWSP-02-07
- Collected field duplicate samples from TWSP-02-04, MW-12D, MW-26, MW-35,
- Collected one rinsate blank (groundwater) and QA split samples from MW-11S and MW-41.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D Protection
- Emphasized cold stress hazards

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- FLUTE Company cannot remove blank liner at NWS-03 and NWS-05.
- Heavy snow

SPECIAL NOTES:

TOMORROWS EXPECTATIONS:

- Pull liner at NWS-05
- Complete groundwater samples (non-FLUTE wells)
- Continue to purge and sample TWSPs

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/6/03

DAY	S	M	T	W	TH	F	S
							(S)

WEATHER	Bright Sun	(Clear)	Overcast	Rain	Snow
TEMP	(To 32)	33-50	50-70	70-85	85 up
WIND	(Still)	Moder	High	Report No.	
HUMIDITY	Dry	(Moder)	Humid	74	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTe Company

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily Health and safety meeting
- Sampled FLUTe well NWS-02 from the first shallow, second shallow, and coal mine water bearing zones, also started the deep rock zone sample
- Continued sampling groundwater monitoring wells that were not recovering too well. The following wells were sampled: MW-31; The following wells were also dry after purging and partial sample collection: MW-53, MW-11D, MW-50, MW-17 and MW-20.
- Continued purging and sampling of temporary waste sampling points (TWSPs). The following TWSPs were sampled: TWSP-01-04, TWSP-01-006, TWSP-02-05, TWSP-02-01
- SJB Drilling worked with the FLUTe Company to remove liner at NWS-03. SJB Drilling installed steel casing at NWS-03 to 120 feet
- URS collected six sediment and surface water samples from along Dry Run; also one seep sample was collected from the base of Dry Run.
- The FLUTe Company continued to try several actions to pull the liner at NWS-03 without success.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation REPORT No. 74
JOB No. 11173233.00000 DATE 12/6/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated flow through cell meters (YSI) and Horiba for pH, Conductivity, ORP, and DO.
- Source checked radiation monitoring equipment and checked batteries
- Collected MS/MSD samples from NWS-02-1 (upper zone)
- Collected field duplicate samples from TWSP-01-04, TWSP-01-06, WS1-DR-04 (Dry Run surface water).
- Collected QA split sample from TWSP-02-01 and WS-DR-03 (Dry Run Surface water)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection
- Emphasized cold stress and vehicular safety.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Gators got stuck in snow
- FLUTE liner could not be removed from NWS-05

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Pull FLUTE liner at NWS-05
Install FLUTE liner at NWS-03
Collect surface water, sediment, and seep samples from Carnahan Run.
Collect seep samples from Dry Run
Prepare Radiological Survey Reports

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/7/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	15-32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	75	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTE Company

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Collected six sediment and surface water samples and one mine outfall sample from Carnalan Run.
- SJB Drilling completed temporary steel casing installation at NWS-03 and reamed hole out to bottom of the hole.
- Collected four groundwater seep samples along Dry Run
- Continued purging and sampling of TWSPs; collected ~~the following~~ samples from the following TWSPs:

  TWSP-01-05, TWSP-01-11
  TWSP-03-02

- Collected groundwater samples from the following locations:

  NWS-02-4, NWS-01A-2, NWS-01A-3
  ~~NWS~~

- Initiated sample collection at NWS-04-3 and NWS-04-4. NWS-01A-1, NWS-04-1, and NWS-04-2 were dry.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DOCREP

- FLUTE Company installed the FLUTE liner to a depth of 80 feet at NWS-03.

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 75
DATE 12/7/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated Horiba groundwater sampling equipment for pH, conductivity
- Source checked Ludlum Model 12 Pancake GM and checked batteries.
- Collected MS/MSD sample from Carnahan Run surface water (WS-CR-06)
- Collected field duplicate samples from Carnahan Run sediments (SE-CR-02) and from Dry Run groundwater seep (SP-DR-01)
- Collected one rinsate blank for sediment sampling shovel

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection
- Emphasized gator/vehicular safety

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- STB Rig became unstable after sliding off the blocks; repositioned blocks.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Complete TWSP sampling
Complete groundwater sampling
Complete FLUTE liner installation at NWS-03
Begin FLUTE liner installation at NWS-05
Continue preparation for demobilization.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/8/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	76	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTe Company

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck
Five Gators

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Continued collecting groundwater samples from wells with slow recharge and FLUTe wells. The following groundwater samples were collected: NWS-01A-4
- Continued purging / sampling temporary waste sampling points (TWSPs). Samples were collected from the following TWSPs: WL-01-07, WL-001-03, WL-01-02
- SJB continued to work with FLUTe Company representatives to install the FLUTe liner at NWS-03 and remove the blank liner at NWS-05. The FLUTe liner descended to a depth of about 140 feet below ground. Several hundred gallons of water was pumped into NWS-05 in an effort to pull the liner with no success.
- Shipped about 23 coolers to the laboratory for analysis of the samples.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. DACW49-01-D-0001-0010

REPORT No. 76
DATE 12/8/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated the YSI groundwater monitoring equipment for pH, conductivity, ORP, and DO
- Source checked Ludlum Model 12 Pancake GM and checked batteries

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection
- Emphasized cold stress

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Still could not pull blank liner at NWS-05

SPECIAL NOTES:

TOMORROWS EXPECTATIONS: Continue sampling NWS-04-03 and NWS-04-04.
Remove liner at NWS-05
Collect air samples.
Continue removal of leachate TWSPs.

BY Kevin Kanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/9/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	77	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTe Company
Field Environmental

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck
Five Gators

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Collected groundwater samples from wells with slow recharge and the FLUTe wells. Samples were collected from the following wells:
  MW-42 and MW-43
- Continued sampling TWSPs that were not recharging very well. Samples were collected from the following TWSPs:
  TWSP-01-01, TWSP-01-08
- SJB Drilling continued to worked with the FLUTe Company representatives to remove the blank liner at NWS-05. Liner was pulled and new liner was installed to 82.5 feet but would not go further
- The FLUTe liner at NWS-03 descended to approximately 148 feet below ground surface
- Collected perimeter air samples from air sampling locations (ASLs) ASL-1 through ASL-5

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 77
DATE 12/9/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated the YSI groundwater monitoring equipment for pH, conductivity, ORP, and DO
- Source checked Ludlum Model 12 Pancake GM and checked batteries.
- Collected one filter blank during air sampling and submitted the sample for laboratory analysis.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- ~~Collected~~ Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Blank FLUTE liner would not come out; applied excessive tension with drill rig and liner came out. (NWS-05)
- FLUTE liner would not go in past coal mine at NWS-05.

SPECIAL NOTES: Completed a survey of TWSPs to identify TWSPs that were repaired and to ensure they all had expandable plugs and locks.

TOMORROW'S EXPECTATIONS: Prepare the site for four day weekend. Continue FLUTE liner install at NWS-03/05. Continue sampling TWSPs / MWs / FLUTE wells

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/10/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	78	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
FLUTe Company

EQUIPMENT ON SITE: CME-850 Trach Rig
GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Secured site for four day weekend.
- Continued several techniques to attempt to get liner in at NWS-05.
- Continued to monitor liner descent at NWS-03. Liner down to 155 feet
- Continued to collect groundwater samples from FLUTe well NWS-04 and leachate samples from several TWSPs that exhibited slow recharge. Leachate sample WL-03-01 was collected.
- Prepared an inventory sheet of equipment and supplies in trailers on-site.
- Returned one gator and several pieces of equipment to vendors.
- Installed emersion heaters in each 4,000-gallon water tanks to prevent heating.
- Completed general cleanup of yard areas

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SCDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 78
DATE 12/10/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated YSI groundwater monitoring equipment for pH, conductivity, DO, ORP
- Source checked Ludlum Model 12 Pancake GM and checked batteries

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

BY Kim Ranahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/15/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	79	

PROJECT MANAGER Tom Frolich
PROJECT SLDA Remedial Investigation
JOB No. 11173235.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTE Company

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck
4 Gators

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- FLUTE liner completely down at NWS-03 SJB pulled casing from 125 to 40 feet
- FLUTE Company attempted to install liner at NWS-05 with special device however had no success.
- Continued to collect leachate samples from several TWSPs that exhibit slow recharge. One sample was completed at ~~TR-01~~ TWSP-011-09.
- Measured water levels from NWS-01A from the lowest two ports as the shallower two ports are dry
- Ordered fencing & materials to attach to the bottom of the new chain link fence to address gaps.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 79
DATE 12/15/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked Ludlum Model 12 Pancake GM and checked batteries
- Checked gaps along fence line for maximum 4 inch gap.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting.
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Complete casing removal at NWS-03
Complete FLUTe well head at NWS-03
Install casing at NWS-05 and attempt to install FLUTe liner
Continue leachate / groundwater sampling
Initiate development of NWS-03 FLUTe well

BY Kevin Hanrahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/16/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	80	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling
FLUTE Company
Copney Disposal

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- STB Drilling pulled ~~liner~~ casing at NWS-03 and mobilized to NWS-05.
- STB Drilling installed casing at NWS-05 to 79.5 feet.
- Continued to collect leachate samples from several TWSPs that exhibited slow recharge.
- Packaged up soil samples collected from within the trenches in accordance with direction from the Project Team.
- FLUTE Company representatives installed the liner at NWS-05 to terminal depth.
- STB pulled casing at NWS-05.
- Water levels were measured at NWS-02 and were found to be about the same (25-30 feet below ground surface). FLUTE Company personnel indicated that the liner was not dialyted properly and that they would add water to address the problem.
- Copney Disposal on-site to pickup garbage.
- AK Supply on-site to pickup air bottles.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 80
JOB No. 11173233.00000 DATE 12/16/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked Ludlum Model 12 Pancake GM and checked batteries.
- Checked water levels at NWS-02 and found that they did not make sense; samples collected and sent to the lab were cancelled.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted health and safety meeting
- Level D protection.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Water levels at four pots at NWS-02 were similar; FLUTE reps indicated that liner was not fully dialated; added more water

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Finish off FLUTE well NWS-05
Pull steel casing at NWS-02A
Move final 4 drums to drum storage pad
Continue leachate sample collection
Attend conference call w/ NRC and meet w/ PADEP
Cover drums with tarps.

BY Kevin Hanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/17/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	81	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTE Company

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Attended conference call with NRC to review work completed on-site during RI
- Met with PADEP representative to review project status.
- Picked up 1½ foot high chain link fence for installation on chain link fence where gaps are present.
- SJB Drilling pulled extra 6-inch steel casing at NWS-3A and cleaned up area at NWS-05.
- Completed water level measurements at FLUTE wells (all ports)
- Shipped samples of trench soils, leachate, and groundwater samples to the laboratory
- Continued to collect leachate samples from several TWSPs that exhibited slow recharge. Sample 10-07 was completed at TWSP-10-07.
- Completed slug test at MW-59.
- Surveyed several sampling locations onsite and at Cabnahan Run.
- Completed well head at NWS-05 and added more water to NWS-02 to ensure proper system performance.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 81
DATE 12/17/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked Ludlum Model 12 Pancake GM and checked batteries
-

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D Protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Install chain link fencing along new fence where gaps are apparent.
Continue development of FLUTe wells NWS-02, NWS-03 and NWS-05
Continue sampling of TWSPs, continue slug testing and surveying work.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/18/03

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	82	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling
Superbowl Portable Sanitation

EQUIPMENT ON SITE: CME-850 Trach Rig
GMC-7000 Flat Bed Support Truck
Four Gators (ATVs)

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Installed fence at the base of the new chain link fence where gaps were greater than 4-inches.
- Completed slug testing at MW-56, MW-54 and MW-69
- Removed temporary snow cover from decon pad and pumped water to 4,000-gallon tank.
- SJB Drilling deconned several pieces of equipment including augers.
- SJB Drilling mobilized pro casings for FLUTE wells on-site and began installing them
- Continued to collect leachate samples from five TWSPs that exhibited slow recharge.
- Completed survey work to locate sampling locations.
- Continued FLUTE well development.
- Covered 55-gallon drums of IDW soil.
- Collected sample of parking lot gravel for laboratory analysis.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 82
JOB No. 11173233.00000 DATE 12/18/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

N

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D Protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Secure site for two week break
Cover decon pad after pumping out water
Complete pro casing installation at FLUTE wells
Complete rising head test at MW-54
Complete leachate sampling
Continue development of FLUTE wells.

BY Kim Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 12/19/03

DAY	S	M	T	W	TH	F	S
						(F)	

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
			(Overcast)		

TEMP	To 32	32-50	50-70	70-85	85 up
	(To 32)				

WIND	Still	Moder	High	Report No.
	(Still)			83

HUMIDITY	Dry	Moder	Humid
		(Moder)	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling, Field Environmental, GE Modular, Gatto Motor Sales, United Rental

EQUIPMENT ON SITE: CME-850 Track Rig, GMC-7000 Flat Bed Support Truck, Four Gators

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily Health and Safety meeting
- Covered decon pad
- Demobilized three gators and office furniture
- Completed leachate sampling and shipped parking lot sample and leachate samples to lab.
- Pumped out water line pit and shut off water
- Finished covering 55-gallon drums with Tarp
- Continued FLUTE well development at NWS-02, NWS-03 and NWS-05
- Continued installation of chain link fence along new fence where gaps exceeded 4".
- Returned equipment and unused supplies to Field Environmental.
- Secured site for two week break until crews return to finish groundwater sampling (FLUTE wells only) and abandonment of NWS-01 pipe still in ground.
- Notified Mike Strauss of BWXT of work schedule.
- Completed pro-casing installations at FLUTE wells (12-inch diameter).

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 83
JOB No. 11173233.00000 DATE 12/19/03

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting.
- Level D Protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Complete FLUTe well development
Initiate retrieval of pipe in ground at NWS-01
Complete fencing work.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE January 5, 2004

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	84	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Pumped out sediment pit where the water service enters the site
- Pumped a significant amount of rain water from the cover over the decon pad
- Measured water levels in FLUTe wells
- Mobilized the CME-850 Track Rig and pipe to NWS-01 to attempt to pull (overdrill) drill string stuck in hole.
- Ran water line from supply pit to rig for coring work.
- Pumped water from decon pad (beneath rain tarp to 4,000-gallon AST, recovered pad.
- Added 45 gallons of water to NWS-05 to bring water level back to 20 feet below ground.
- Contacted disposal firm to come on-site 1/6/04 to remove debris - cleaned up area around trailer and FLUTe wells.
- Drilled down to 35 feet with 5-inch casing at NWS-01.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 84
DATE 1/6/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Collected groundwater level measurements to aid in the evaluation of the FLUTE well performance. We found inconsistencies in water levels from previous historical site data

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Water distribution pit was full of water; pumped out water
- Water level in FLUTE lines at NWS-05 dropped about 50 feet; refilled lines
- See QA/QC section above.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Continue to core bedrock at NWS-01 to overdrill pipe.
- FLUTE well development
- Garbage removal
- Fence work to patch gaps.
- Collect monthly perimeter air monitoring samples

BY Kevin Shandler TITLE Field Manager

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 1/6/04

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	85	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck
Grator

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Continued to core bedrock over the PQ rods stuck at NWS-01
- Mobilized nitrogen bottles to NWS-02 and NWS-05 for well development.
- SJB cored to a depth of 85 feet below ground surface
- SJB loaded rods around decon pad onto support truck
- URS measured water levels in FLUTE wells NWS-04 and NWS-05. Coordinated trouble shooting procedures with URS Buffalo and FLUTE Company.
- Cleaned up trailer / decon pad area and disposed of materials with Cogney Disposal
- Pumped down last three drums of well development water into bulk storage tank.
- Collected perimeter air monitoring ~~data~~ samples and shipped them to the laboratory

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 85
DATE 1/6/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Measured the water level in the liner at FLUTE liner NWS-05 to determine the competency of the liner.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Gators became frozen; heated with a torch to free up wheel
- FLUTE water levels were inconsistent with previous site data.
- Rig water line froze

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Continue to overdrill drill pipe at NWS-01
Repair fence
Measure water levels in NWS-01, NWS-02 and NWS-03.
Continue to develop NWS-03

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE January 7, 2004

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	86	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck
Gator

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Inspected fence repair work in "new 12 acre" area
- SJB continued to core rock (overdrill) at NWS-01 in an effort to retrieve drill string stuck in hole
- SJB re-ran water line.
- URS completed an inventory of samples retained on-site and forwarded results to USACE
- Measured water levels in each of the five FLUTE wells (liner and sampling ports) and sent the data back to URS Buffalo for further evaluation
- SJB cored rock to 120 feet below ground surface
- URS repaired remaining areas of fence where a gap of 4 inches or more was present.
- URS measured water levels in FLUTE wells NWS-02, NWS-03 and NWS-05 and purged each of the four ports at NWS-02

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigations REPORT No. 86
JOB No. 11173233.00000 DATE 1/7/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Continued to collect water level measurements in the five FLUTe wells to evaluate the FLUTe well performance

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D Protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- FLUTe sampling lines freezing; heated lines to defrost

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Drill to terminal depth at NWS-01 and initiate removal of PQ rods
Continue troubleshooting FLUTe well performance.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE January 8, 2004

DAY	S	M	T	W	TH	F	S
					(TH)		

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
		(Clear)			

TEMP	To 32	32-50	50-70	70-85	85 up
	(To 32)				

WIND	Still	Moder	High	Report No.
		(Moder)		87

HUMIDITY	Dry	Moder	Humid
		(Moder)	

PROJECT MANAGER Tom Frolick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-850 Track Rig Mule
Peterbilt Low boy
GMC-7000 Flat Bed Support Truck

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- SJB re installed water line for casing installation.
- SJB continues to spin casing over the drill string stuck in hole at NWS-01 from a depth of 120 feet below ground surface
- URS continues to refine water level data from the FLUTE wells and complete several tasks to better evaluate the performance of these wells including measuring water levels and purging water from each zone.
- SJB spun casing over stuck drill rods to a total depth of 150½ feet and initiated removal of the pipe
- SJB removed all of the pipe that was stuck in the hole.
- URS added water to the liner at FLUTE wells NWS-02 and NWS-03 in an effort to continue to make sense of the water level data.
- URS completed an inventory of rock core boxes stored in the trailer.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 87
DATE 1/8/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Continue to evaluate the functionality of the FLUTe wells and how reliable the water level data is.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Begin backfilling hole at NWS-01
- Continue to troubleshoot performance of FLUTe wells

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS
282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 1/9/04

DAY	S	M	T	W	TH	F	S
						(F)	

WEATHER	Bright Sun	(Clear)	Overcast	Rain	Snow
TEMP	(To 32)	32-50	50-70	70-85	85 up
WIND	(Still)	Moder	High	Report No.	
HUMIDITY	(Dry)	Moder	Humid	88	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck
Mule Peterbilt Low boy

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Meet with SJB Drilling to review requirements of NWS-01 well abandonment.
- SJB ~~Bro~~ mixed up approximately 80 gallons of bentonite grout slurry and pumped it into the hole at NWS-01 from 150 to 103 feet below ground surface and then pulled 50 feet of steel casing
- URS measured water levels at NWS-01A, NWS-02, NWS-03, NWS-04 and NWS-05. In addition, 15 gallons of water was added to the FLUTE well NWS-01A.
- The grout at NWS-01 settled to approximately 113 feet and SJB added 10 additional feet of grout to backfill the hole to 103 feet below grade
- SJB loaded the PQ rodson the GMC-7000 flat bed support truck
- Measured vacuum in FLUTE wells with vacuum equipment supplied by FLUTE Company.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 88
DATE 1/9/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Reviewed abandonment protocols for NWS-01 and observed / documented quantities and procedures during abandonment activities
- Vacuum tested some of the tubing in FLUTe wells to ensure they are not plugged.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Mule wouldn't start
Grout settled in hole at NWS-01; STB added more to target depth.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Install plug in hole at NWS-01 above mine, fill hole with grout. Continue to measure water levels in FLUTe wells.

BY Keirn Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 1/10/04

DAY	S	M	T	W	TH	F	S
							(S)

WEATHER	(Bright Sun)	Clear	Overcast	Rain	Snow
TEMP	(To 32)	32-50	50-70	70-85	85 up
WIND	(Still)	Moder	High	Report No.	
HUMIDITY	Dry	(Moder)	Humid	89	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck
Mule Peterbilt Lowboy

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- SJB pulled 90 feet of 5-inch steel casing at NWS-01 (removed entire casing).
- SJB installed rubber plug at 90 feet below ground surface at NWS-01 (above mine)
- SJB placed 1½ bags of bentonite in hole at NWS-01 above plug at NWS-01 to a depth of 85 feet below ground surface.
- SJB installed grout from 85 to 75 feet below ground surface.
- URS measured water levels at FLUTE wells NWS-01A, NWS-02, NWS-03, and NWS-05
- URS completed a site reconnaissance along Carnahan Run to identify any mine outfalls.
- USACE representative inspected site and developed a short list of items to address prior to demobilization.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 89
DATE 1/10/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conduct daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Grout hole at NWS-01 to 50 feet
Decon remaining rods/casing.
Complete water levels across entire site

BY Kevin T. Shank TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE January 11, 2004

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	90	

PROJECT MANAGER Tom Frolick
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: STB Drilling

EQUIPMENT ON SITE: CME-850 Trach Rig
GMC-7000 Flat Bed Support Truck
Mule Peterbilt Lowboy

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- URS completed a round of water levels in all monitoring wells, FLUTE wells, piezometers, temperary piezometers and TWSPs installed on-site. A general cleanup was also completed during water level measurements.
- STB Drilling grouted the NWS-01 hole from 83 feet to 50 feet below ground surface during two episodes (one in the morning and one late in the day). NOTE: The grout level at NWS-01 went from 75 to 83 feet overnight.
- USACE continued his inspection of the site and identified a few items to address prior to demobilization. URS continued to take action to satisfy his concerns. In general, USACE indicated that the site appeared to be in very good shape.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 90
DATE 1/11/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Addressed the few concerns the USACE representative had regarding the overall site condition prior to demobilization.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D Protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Grout settled out in NWS-01 hole from 75 to 83 feet below ground surface overnight; SJB added grout back in stages.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Install ground water monitoring well at NWS-01 (to be identified as MW-60)
- Retrieve nitrogen compressed gas cylinders from FLUTE wells and store in trailer
- Continue demobilization work (URS/SJB)

BY Kevin S Randan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE January 12, 2004

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	91	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-850 Track Rig
GMC-7000 Flat Bed Support Truck
Mule Peterbuilt Lowboy

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- SJB measured grout in hole at NWS-01 to be at 43.9 feet; therefore they drilled the grout out to a depth of 50 feet.
- SJB constructed a 2-inch diameter monitoring well at NWS-01 screened from 48 to 38 feet (now referred to as MW-60).
- SJB placed a gravel pad around several wells where it had not been placed.
- URS bailed well MW-60 dry.
- URS removed the nitrogen compressed gas cylinders from the FLUTE wells and stored them in the trailer for winter and returned two to AK Supply.
- Shut off water service to site.
- Covered decon pad with cinder blocks and other wood pallets.
- Cleaned up trailer and grounds.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLOA Remedial Investigation
JOB No. 11173233.00000

REPORT No. 91
DATE 1/12/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- URS/USACE representatives monitored depths and quantities during construction of well MW-60 at hole NWS-01.
- SJB drilled out about 6 feet of extra grout in hole at NWS-01.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting.
- Level D protection.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Grout in hole at NWS-01 was up to 43.9 feet below ground surface; SJB drilled out extra grout to design depth of 50 feet

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Demobilize from site.
Measure water level in new well MW-60 after it has about 20 hours to set.

BY Kevin Shanahan TITLE Field Manager.

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 1/13/04

DAY	S	M	T	W	TH	F	S
			(T)				

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
			(Overcast)		

TEMP	To 32	32-50	50-70	70-85	85 up
	(To 32)				

WIND	Still	Moder	High	Report No.
		(Moder)		92

HUMIDITY	Dry	Moder	Humid
		(Moder)	

PROJECT MANAGER Tom Frolich
PROJECT SLDA Remedial Investigation
JOB No. 11173233.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: None

EQUIPMENT ON SITE: None

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- Packed up all materials and equipment into van that is to be removed for winter.
- Turned down temperature and secured trailer.
- Measured water level in MW-60, bailed down well and monitored recharge.
- Secured site and mobilized back to Buffalo

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA Remedial Investigation REPORT No. 92
JOB No. 11173233.00000 DATE 1/13/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

None

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN: None

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: None

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 3/9/04

DAY	S	M	T	W	TH	F	S
			X				

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
			X		

TEMP	To 32	33-50	50-70	70-85	85 up
	X				

WIND	Still	Moder	High	Report No.
		X		93

HUMIDITY	Dry	Moder	Humid
		X	

PROJECT MANAGER Thomas Fralick
PROJECT SLDA
JOB No. 11173233.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: McCutcheon Enterprises, Inc.

EQUIPMENT ON SITE: 2 semi tractor trailer + bobcat
vacuum truck

WORK PERFORMED (INCLUDING SAMPLING):

1. loading of drums on semi trailer
2. pumping of wastewater into tanker for disposal

A total of 60 drums of soil were loaded and transported off site by McCutcheon.

After two trips with the vacuum truck 4690 gallons of water was pumped out from the two water tanks and transported off site for disposal

All IDW materials were manifested, original manifests to be forwarded to USACE.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA
JOB No. 1173233.00000

REPORT No. 93
DATE 3/9/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

N/A

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

level D - leather gloves + work boots

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

1. Bobcat got stuck in mud / several loads of gravel were dumped to create a path

2. Tanker reaches capacity / call made to bring in another tanker to finish

SPECIAL NOTES: N/A

TOMORROW'S EXPECTATIONS: N/A

BY Thomas Urban TITLE Env. Tech.

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 3/10/04

DAY	S	M	T	W	TH	F	S
				X			

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
		X			

TEMP	To 32	32-50	50-70	70-85	85 up
		X			

WIND	Still	Moder	High	Report No.
	X			94

HUMIDITY	Dry	Moder	Humid
	X		

PROJECT MANAGER Thomas Fralick
PROJECT SLDA
JOB No. 11732333.00000
CONTRACT No. DACW-49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: N/A

EQUIPMENT ON SITE: S/N 12903 Air Flow Calibrator

WORK PERFORMED (INCLUDING SAMPLING):

1. repair 2 rotometers
2. calibrate all air pumps
3. Down loaded weather data from weather station
4. Collected monthly air monitoring samples from perimeter air monitoring stations
5. Made keys for USACE staff - checked keys to ensure they work.
6. Secured site

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA
JOB No. 11173233.00000

REPORT No. 94
DATE 3/10/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

ASL	1.0	1.5	2.0	2.5	3.0	ASL	1.0	1.5	2.0	2.5	3.0
01A	—	1.5	2.05	2.6	—	01 B	—	1.5	2.00	2.6	—
02A	—	1.5	2.00	2.5	—	02 B	—	1.5	2.00	2.5	—
03A	—	(.5) 1.5	(.8) 2.00	(1.0) 2.5	—	03 B	1.0	1.5	2.0	2.5	3.0
04A	—	1.5	2.05	2.55	—	04 B	—	(1.75) 1.5	(2.25) 2.0	(2.5) 2.5	—
05A	—	1.5	2.05	2.55	—	05 B	1.0	1.5	2.0	2.5	3.0

( ) = reading before ~~calibration~~ air flow adjustment

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

level D - gloves + work boots

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

N/A

SPECIAL NOTES: N/A

TOMORROWS EXPECTATIONS: N/A

BY Thomas Urban TITLE Env. Tech.

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE April 6, 2004

DAY	S	M	T	W	TH	F	S
			X				

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
	X				

TEMP	To 32	32-50	50-70	70-85	85 up
		X			

WIND	Still	Moder	High
	X		

HUMIDITY	Dry	Moder	Humid
	X		

Report No. 95

PROJECT MANAGER Tom Fralick
PROJECT 1173122.00000
JOB No. SLDA Perimeter Air Monitoring
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: N/A

EQUIPMENT ON SITE: N/A

WORK PERFORMED (INCLUDING SAMPLING):

Collection of air filter samples at 5 sampling locations.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-003/1 OF 2/DQCREP

PROJECT SLDA

JOB No. 11173122.00000

REPORT No. 95

DATE April 6, 2004

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

N/A

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

level D - work boots (steel toe); gloves, hard hat, safety glasses

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

N/A

SPECIAL NOTES: N/A

TOMORROW'S EXPECTATIONS: N/A

BY Thomas Urban TITLE Env. Tech.

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 4/26/04

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	1	

PROJECT MANAGER Tom Fralick
PROJECT SLDA
JOB No. 11173233.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: SJB Dropped CME-850 Track Rig

WORK PERFORMED (INCLUDING SAMPLING):

- S. Nozik & T. Urban set up fax, printer, scanner
- Obtained water levels at FLUTe locations
  NWS-01A, NWS-02, NWS-03, NWS-04, NWS-05
  MW-60, TPZ-01, TPZ-02

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA

JOB No. 11173233.00000

REPORT No. 1

DATE 4/26/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

T. Urban calib. PID + Tri-gas meters
Check source on FIDLER, Micro-R, Frisker

HEALTH AND SAFETY LEVELS AND ACTIVITIES: Level D

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Drillers did not arrive until 4:50 pm.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

Unload, set up water lines
decon rig
set up grout plant @ NWS-02
initiate grouting NWS-02

BY Sheldon Nozik TITLE Site Manager / Sr. Geologist

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 4/27/04 Tues.

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	2	

PROJECT MANAGER Tom Fralick
PROJECT SLDA
JOB No. 11173233.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTe

EQUIPMENT ON SITE: CME-850 Track rig
Tractor Trailer

WORK PERFORMED (INCLUDING SAMPLING):

- Unload truck of casing, PVC. Track rig, steam cleaner, grout plant
- Used track rig to mobilize grout plant to NWS-02 location. Set up grout plant
- Grouted bottom portion of FLUTe at NWS-02 177 feet to +/- 123 ft. Used +/- 2% Bentonite to Cement mixture of portland + bent. powders.
- Steam cleaned back of rig and 8 1/4" augers.
- Mobilized rig to location of new 2SB well MW-69. Augered to 27 ft bgs. contained cuttings in 55-gallon drums.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA

JOB No. 1173233.00000

REPORT No. 2

DATE 4/27/04 Tues

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

T. Urban calibrated PID, trigas meters

HEALTH AND SAFETY LEVELS AND ACTIVITIES: Level D

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Augered somewhat deeper than expected. Bedrock was very

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS:

- Grout next lift at NWS-02
- Install 6" casing @ MW-61
- Install 6" casing @ MW-62 (NWS-04)

BY [signature] TITLE Site Mngr./Sr. Geologist

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 4/28/04 Wed

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid		

PROJECT MANAGER Tom Fralick
PROJECT SLDA
JOB No. 11173233.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: STB Drilling
FLUTE

EQUIPMENT ON SITE: CME-850 Track rig
Semi-Tractor trailer

WORK PERFORMED (INCLUDING SAMPLING):

- Performed daily safety mtg
- Added second lift of grout to NWS-02 126 ft to +/- 76 ft. Measured wl's in NWS-02
- Welded 6' section of steel casing to 21 ft casing
- set 6" casing for new well MW-61
- steam cleaned 8 1/4 HSA + back of rig
- ★ Bill Frederick and S. Nozik scoped location for UF well next to NWS-04. Discussed options Bill will discuss with D. Frothingham @ USACE office on Thurs. Bill will call SLDA site to confirm location Thurs. 4/29/04 2 p.m.

See pg. 2

- Measured water levels in NWS-02

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA

JOB No.

REPORT No. 3

DATE 4/28/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Oversight of SJB activities

HEALTH AND SAFETY LEVELS AND ACTIVITIES: Level D

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Water levels in NWS-02 changed somewhat since the morning readings. Need to continue monitoring as grouting continues.

Trying to determine location of UF well next to NWS-04. Trying to place within mined area ~~see~~ inorder to monitor void space

SPECIAL NOTES:

* Used mine map to place well location (see pg. 1)

TOMORROW'S EXPECTATIONS: Complete third lift of grout in NWS-02
Water levels to be obtained to check progress

BY Sheldon Nagh TITLE Site Mngr / Sr. Geologist

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 4/29/04

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	4	

PROJECT MANAGER Tom Fralick
PROJECT SLDA
JOB No. 11173233.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: SJB Drilling
FLUTe Co.

EQUIPMENT ON SITE: CME-850 Track Rig
Grout Plant

WORK PERFORMED (INCLUDING SAMPLING):

- Performed daily safety Mtg.
- Obtained water levels in FLUTe NWS-02 ports
- Placed another lift of grout in NWS-02
- Augered with 8 1/4 HSA to 21 ft bgs. and set 6" Ø steel casing at MW-62 near NWS-04 of a UF well
- Measured grout level in afternoon at NWS-02 only came up +/- 22 ft.
- Added another 20 ft lift at end of day.
- Obtained water levels in ports at NWS-02

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA **REPORT No.** 4

JOB No. 11173233.00000 **DATE** 4/29/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Tom Urban calibrated field monitoring instruments
PID, LEL, tri-gas, dust monitor.

HEALTH AND SAFETY LEVELS AND ACTIVITIES: D

monitored drilling location + cuttings
with field instruments + RAD meters

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

eye wash fluid expired - no replacement
bought more drinking water

SPECIAL NOTES: Scott Davidson was on site +/- 2 hrs.
Inquired about eye wash

TOMORROW'S EXPECTATIONS: Grout remainder of NWS-02 +/- 50 ft
set up on MW-61 to initiate reaming
on Monday

BY Shelli Nozik **TITLE** Site Mngr / Sr. Geologist

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 4/30/04

DAY	S	M	T	W	TH	F	S
						(F)	

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
		(Clear)			

TEMP	To 32	32-50	50-70	70-85	85 up
				(70-85)	

WIND	Still	Moder	High	Report No.
		(Moder)		5

HUMIDITY	Dry	Moder	Humid
		(Moder)	

PROJECT MANAGER Tom Fralick
PROJECT SLDA
JOB No. 11173233.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-850 Track
Grout Plant

WORK PERFORMED (INCLUDING SAMPLING):

- Performed daily safety mtg
- Measured water levels in ports at NWS-02
- Measured top of grout level at NWS-02 (+/- 50')
- Added additional grout to NWS-02 (+/- 30 gals)
- Added another +/- 20 gals of grout
- Drillers set up on MW-61 to begin roller bit
- Reamed hole to 36 ft bgs.
- Measured grout again in NWS-02 at +/- 20 ft bgs.
- Off site at 1330

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA

JOB No.

REPORT No. 5

DATE 4/30/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Tom Urban calibrated field instruments

HEALTH AND SAFETY LEVELS AND ACTIVITIES: D

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

None

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: For Monday 5/3
Continue reaming MW-61
measure grout level in NWS-02

BY Shelah Norix TITLE Site Mngr / Sr. Geologist

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 5/4/04

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	7	

PROJECT MANAGER Tom Fralick
PROJECT SLDA RI
JOB No. 11173233.00000
CONTRACT No.

SUB-CONTRACTORS ON SITE: SJB Drilling

EQUIPMENT ON SITE: CME-850 Track rig
Grout plant

WORK PERFORMED (INCLUDING SAMPLING):

- Performed daily safety meeting and daily SOW
- Bailed wells MW-31 and MW-3 to assess recharge - obtained WL's during day
- Drillers continue advancing MW-61 start with 2 7/8" Ø roller bit which was successful. Continued boring with 4 7/8" Ø to target depth finished hole at 65.5 ft bgs.
- Installed 2" Ø pvc well at MW-61 screened from 65 - 55 ft bgs.
- Obtained water levels in FLUTe ports in NWS-02 level in liner is stable at 7.2 ft Spoke with Bill Frederick w/ USACE and agreed grout should be stable and no additional grout needed - grout level at 14 ft.
- Purged FLUTe ports at NWS-02 Monitored WL's during day. Levels appear to be at levels expected for each zone.
- Initiated grouting of NWS-05. Added +/- 50 gals of grout to bottom of FLUTe through tubing.
- Measured WL's in FLUTe ports at NWS-05

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

PROJECT SLDA

JOB No. 11173233.0000

REPORT No. 7

DATE 5/4/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Tom U. calibrated field instrument

HEALTH AND SAFETY LEVELS AND ACTIVITIES: Level D

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Reaming of MW-61 continued without incident.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Continue grouting NWS-05 and initiate reaming at MW-62

BY Sheldon Naik TITLE Site Mgr/Sr Geologist

URSF-003/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 6/7/04

DAY	S	M	T	W	TH	F	S
		(M)					

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
		(Clear)			

TEMP	To 32	33-60	60-70	70-85	85 up
				(70-85)	

WIND	Still	Moder	High	Report No.
	(Still)			1

HUMIDITY	Dry	Moder	Humid
			(Humid)

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11172791.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: None

EQUIPMENT ON SITE: Two 4x4 Trucks
Mini Van Cargo Van
Groundwater Sampling Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- URS conducted daily health and safety meeting
- Completed screen of each monitoring well and piezometer with a PID
- Completed one round of water levels in all wells and piezometers (except FLUTE wells)
- Conducted meeting to evaluate approach to groundwater sampling
- I met with Mike Straub and furnished him with Drawings of groundwater monitoring wells
- Mobilized to site for groundwater sampling event.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-005/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation
JOB No. 11172781.00000

REPORT No. 1
DATE 6/7/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated PID
- Calibrated YSI low flow sampling probe conductivity, pH
- Calibrated turbidity meters

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Excessive garbage in trailer, ordered a garbage pickup.

SPECIAL NOTES: Radiation Meters Onsite:
1. Ludlum Model 2 w/ HP-260
2. Ludlum Model 12 w/ 44-9
3. Ludlum Model 2929 w/ 43-10-1 alpha beta smear counter

TOMORROW'S EXPECTATIONS: Initiate groundwater sampling

BY Keirn Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 6/8/04

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To32	3260	5070	7085	85up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	2	

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11172781.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: None

EQUIPMENT ON SITE: Two 4X4 Chevy Pickup Trucks
Mini van, Cargo Van
Groundwater Sampling Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Downloaded weather station data
- Organized into two sampling crews and started groundwater sampling near Trench 10 and in the "new 12-acre area".
- Developed master list for QA/QC sampling
- Completed water levels in FLUTE wells.
- Decontaminated groundwater sampling pumps.
- Purchased supplies for rest of sampling period including a marine battery for sampling remote locations
- Collected groundwater samples from the following wells: MW-24, MW-64, MW-69, MW-14, MW-13, MW-1, MW-19, MW-56 and MW-23 (2 1-gallon bottles still need to be collected to complete MS/MSD).
- Purged zones 3, 4 and 5 at FLUTE well NWS-05.
- Collected air monitoring samples (monthly) from ASL-1 through ASL-5 and shipped to lab.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-469/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 2
JOB No. 11172781.00000 DATE 6/8/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibration of groundwater sampling was conducted on 6/7/04
- Collected upgradient field dups from MW-24, MW-64, MW-69, and initiated MS/MSD from MW-23 (still need to collect 2 of 4 bottles tomorrow AM).

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Level D protection
- Conducted daily Health and Safety meeting

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Corrosion noted on data logger download port. Review of data indicates a drift in calibration for wind direction (0-55° to 308°) and problems with wind speed. No corrective action taken.

SPECIAL NOTES: Collected one filter blank for air sampling.

TOMORROW'S EXPECTATIONS: Continue groundwater sampling

BY Kurt Sharden TITLE Field Manager

URSF-004/2 OF 2/DQCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 6/9/04

DAY	S	M	T	W	TH	F	S

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	33-60	60-70	70-85	85 up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid	3	

PROJECT MANAGER Tom Frolick
PROJECT SLDA Remedial Investigation
JOB No. 11172781.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: ~~None~~ Copsey Disposal

EQUIPMENT ON SITE: Two 4x4 Chevy Pickups
Mini Van Groundwater Sampling Equipment
Cargo Van Radiation Monitoring Meter

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Prepared new sample bottles by adding nitric acid.
- Copsey Disposal hauled rubbish off-site stored in the trailer.
- Decontaminated groundwater sampling pumps.
- Continued purging / sampling groundwater monitoring wells. The following wells were sampled: MW-15, MW-33, MW-09A, MW-38, MW-08, MW-25, MW-23 (finished) MW-58, MW-36, MW-6

- Initiated purging and sampling of FLUTe wells. The following FLUTe ports were sampled NWS-03-03 and NWS-05-04.
- The following FLUTe ports were dry or had insufficient volume for sampling: NWS-05-01, NWS-05-02, NWS-05-03, NWS-05-05, NWS-03-01, NWS-03-02, and NWS-04

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-065/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 3
JOB No. 11172781.00000 DATE 6/19/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated groundwater sampling equipment: YSI → pH, conductivity and Turbidity
- Collected QA split samples from MW-58 and NWS-03-03
- Collected one MS/MSD sample from MW-06 and MW-15 (MS/MSD sample collected from MW-23 was deemed unrepresentative and not kept)

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Level D Protection
- Conducted daily health and safety ~~plan~~ meeting.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Purged ports at NWS-02-01, NWS-02-02, NWS-02-03, and NWS-02-04. Ports NWS-02-03 and NWS-02-04 went dry quickly and would most likely not have had sufficient volume. All ports had pH elevated from the grouting of the FLUTE liners and were deemed not representative

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Continue groundwater sampling
Plan surface water, seep and sediment sampling.

BY Kevin Shanahan TITLE Field Manager

URSF-003/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE June 10, 2004

DAY	S	M	T	W	TH	F	S
WEATHER	Bright Sun	Clear	Overcast	Rain	Snow		
TEMP	To 32	32-60	60-70	70-85	85 up		
WIND	Still	Moder	High	Report No.			
HUMIDITY	Dry	Moder	Humid	4			

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11172781.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: None

EQUIPMENT ON SITE: Two 4x4 Chevy Pickup Trucks
Mini Van Groundwater Sampling Equipment
Cargo Van Radiation Monitoring Meters

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- Decontaminated groundwater sampling pumps
- Completed a reconnaissance of the surface water, groundwater seep, and sediment sampling locations to determine when and how samples are to be collected from Dry Run.
- Continued purging and sampling groundwater monitoring wells. The following samples were collected (wells): MW-59, MW-07, MW-52, MW-26, MW-39, MW-22, MW-02.
- Continued purging and sampling FLUTE ports. The following FLUTE ports were purged and sampled: NWS-01A-02 and NWS-01A-03.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-465/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 4
JOB No. 11172761.00000 DATE 6/10/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated groundwater sampling equipment
- Conducted a source check of radiation monitoring equipment.
- Collected downgradient MS/MSD sample from MW-39.
- Collected downgradient MS/MSD sample from MW-26

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Level D Protection
- Conducted daily health and safety meeting

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Lamont turbidity meter was not working; called FEI and they delivered a new meter at noon

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Continue groundwater sampling from downgradient wells

BY Kevin Shanahan TITLE Field Manager

UR3F-00A/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 6/11/04

DAY	S	M	T	W	TH	F	S
						(F)	

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
			(Overcast)	(Rain)	
TEMP	To32	32-60	60-70	70-85	85up
			(60-70)		
WIND	Still	Moder	High	Report No.	
		(Moder)	(High)		
HUMIDITY	Dry	Moder	Humid	5	
			(Humid)		

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11172781.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: None

EQUIPMENT ON SITE: Two 4X4 Chevy Pickup Trucks Mini Van Cargo Van, Groundwater Sampling Equipment, Radiation Monitoring Equipment.

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Decontaminated groundwater sampling pump
- Reviewed QA QC requirements for surface waters, sediments, seeps, mine outfalls with URS Chemist.
- Continued purging / sampling groundwater monitoring wells. The following wells were sampled: MW-29, MW-43

- Continued purging / sampling FLUTE well ports, Collected sample INWK-01A-04.

- Due to many wells not suitable for sampling (either dry or insufficient water) the number of QA / QC samples were reduced from original estimates

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-665/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 5
JOB No. 11172781.00000 DATE 6/11/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Calibrated groundwater low flow YSI equipment & Lamont turbidity meters
- Source checked radiation monitoring equipment
- Collected downgradient QA split samples from wells MW-29 ~~and~~

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Many downgradient wells exhibited very slow recharge.

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Continue groundwater sampling. Collect sediments, surface water, seep samples from Dry Run.

BY Kevin Shanahan TITLE Field Manager

URSF-99A/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 6/12/04

DAY S M T W TH F S

WEATHER Bright Sun | Clear | Overcast | Rain | Snow

TEMP To32 | 32-50 | 50-70 | 70-85 | 85-up

WIND Still | Moderate | High | Report No. 6

HUMIDITY Dry | Moderate | Humid

PROJECT MANAGER Tom Fralick
PROJECT SLDA Remedial Investigation
JOB No. 11172781.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: None

EQUIPMENT ON SITE: Two 4x4 Chevy Pickup Trucks, Mini Van, Cargo Van, Groundwater Sampling Equipment, Radiation Monitoring Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Decontaminated groundwater sampling pumps
- Collected surface water, sediments, and groundwater seeps samples from Dry Run.
- Continued purging / sampling groundwater monitoring wells. Samples were collected from the following wells: MW-51, MW-02A, MW-16BC, MW-40D, MW-41, MW-12D, MW-35
- Continued purging / sampling FLUTE wells. FLUTE well NWS-04 was purged, however no samples were collected.
- Updated Excel spreadsheet summarizing the status of which wells were sampled and which wells were deemed unsampleable due to lack of groundwater.
- Collected field dup sample from WS-DR-02 and SE-DR-03
- Collected MS/MSD sample from SE-DR-04
- Collected QA split sample from SP-DR-01
- Surface water sample WS-DR-01 and seep sample SP-DR-02 were dry.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-665/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 6
JOB No. 11172781.00000 DATE 6/12/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated YSI low flow groundwater sampling equipment.
- Collected QA split samples (downgradient) from MW-51 and MW-12D
- Collected downgradient field dup sample from MW-12D

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Well MW-32 had a bailer stuck in it; it was "fished" out with wire cable. However, the well would not allow a bailer to go into the bottom so a check valve was ordered to sample the well (6/11/04). On 6/12/04 the well was purged. ~~and sample~~

SPECIAL NOTES:

- Collected rinse blank on groundwater sampling pump

TOMORROW'S EXPECTATIONS: Conduct sediment, surface water seep sampling in Carnahan Run
Complete groundwater sampling

BY Kevin Shanahan TITLE Field Manager

UR3F-004/2 OF 2/DQCRIP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 6/13/04

DAY: S M T W TH F S

WEATHER: Bright Sun | Clear | Overcast | Rain | Snow

TEMP: To 32 | 32-50 | 50-70 | 70-85 | 85 up

WIND: Still | Moderate | High

HUMIDITY: Dry | Moderate | Humid

Report No. 7

PROJECT MANAGER Tom Fralick
PROJECT SCDA Remedial Investigation
JOB No. 11172781.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: Superbowl Portable Sanitation

EQUIPMENT ON SITE: Two 4X4 Chevy Pickup Trucks, Mini Van, Cargo Van, Groundwater Sampling Equipment, Radiation Monitoring Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting.
- Decontaminated groundwater sampling pumps
- Collected surface water, sediment, and mine outfall samples from Carnahan Run.
- Continued purging, sampling groundwater monitoring wells. Samples were collected from MW-31, MW-32.
- Updated Excel spreadsheet summarizing the status of groundwater well sampling
- Broke down decontamination station since all pumps and other equipment are no longer required.
- Reviewed all chain-of-custodies and re wrote several to correct minor deficiencies and ensure they are all the same format etc. Forwarded electronic file copies to URS Buffalo for review.
- Packaged up all samples for shipment.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-665/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigation REPORT No. 7
JOB No. 11172781.00000 DATE 6/13/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment
- Calibrated YSI groundwater sampling equipment and Hamont turbidity meter.
- Collected field dup sample from WS-CR-04.
- Collected MS/MSD sample from WS-CR-02.
- Collected rinse blank sample from water over sediment sampling shovel

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Conducted daily health and safety meeting
- Level D protection

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: Ship samples to laboratories
Demobilize from site
Return rented equipment

BY Kevin Shanahan TITLE Field Manager

URSF-004/2 OF 2/DOCREP

URS

282 Delaware Avenue
Buffalo, New York 14202
(716)856-5636

DATE 6/14/04

DAY	S	M	T	W	TH	F	S
		M					

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
		Clear	Overcast		

TEMP	To32	32-50	50-70	70-85	85up
				70-85	

WIND	Still	Moder	High	Report No.
	Still			8

HUMIDITY	Dry	Moder	Humid
		Moder	

PROJECT MANAGER Tom Fralich
PROJECT SLDA Remedial Investigation
JOB No. 11173-181.00000
CONTRACT No. DACW49-01-D-0001-0010

SUB-CONTRACTORS ON SITE: None

EQUIPMENT ON SITE: Two 4x4 Chevy Pickup Trucks, Mini Van Cargo Van, Groundwater Sampling Equipment, Radiation Monitoring Equipment

WORK PERFORMED (INCLUDING SAMPLING):

- Conducted daily health and safety meeting
- Removed nitrogen cylinders from FLUTE well locations and trailer and returned them to A-K Supply
- Removed all 55-gallon drums from well locations and consolidated purge water into the southernmost 4,000-gallon tank.
- Returned all rental equipment for ground water sampling to Field Environmental
- Completed a round of groundwater level measurements.
- Packaged and shipped 91 samples (32 coolers) to the laboratory.
- Collected surface water sample WS-DR-01 from Dry Run since it was flowing today
- Collected groundwater sample WG-MW-30A from well MW-30A.
- Picked up site and demobilized.

SHEET 1 OF 2

DAILY QUALITY CONTROL REPORT

URSF-665/1 OF 2/DQCREP

PROJECT SLDA Remedial Investigations REPORT No. 8
JOB No. 11172781.00000 DATE 6/14/04

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

- Source checked radiation monitoring equipment.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

- Level D Protection
- Conducted daily health and safety.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

SPECIAL NOTES:

TOMORROW'S EXPECTATIONS: None on-site

BY Kevin Hanahan TITLE Field Manager.

UR3F-003/2 OF 2/DOCREP

APPENDIX R

RADIONUCLIDE INTAKES, RADIATION DOSES, AND RADIOLOGICAL CANCER RISKS

APPENDIX R

RADIONUCLIDE INTAKES, RADIATION DOSES, AND RADIOLOGICAL CANCER RISKS

This appendix presents information summarizing the calculation of radionuclide intakes, radiation doses, and radiological cancer risks for each of the four hypothetical scenarios evaluated in the human health Baseline Risk Assessment (BRA) for the Shallow Land Disposal Area (SLDA) site. The estimated intakes of the primary radionuclides of potential concern (ROPCs) are given in Section R.1, and the resultant radiation doses and radiological cancer risks are given in Section R.2. These estimates are based on the characterization data, fate and transport considerations, scenario descriptions, and input parameters given in Chapters 4.0 through 6.0 of this Remedial Investigation (RI) report. Separate estimates are given for each of the three exposure units (EUs) and for site-wide exposures. The three EUs for the SLDA BRA are identified in Section 6.3.4.1.

Two additional tables are provided in Section R.3 to summarize information used in this BRA. The first table provides information previously obtained from the RESRAD computer code to support development of PRGs for the site. The PRGs were developed for a Subsistence Farmer scenario using the probabilistic version of RESRAD in accordance with current decommissioning guidance of the U.S. Nuclear Regulatory Commission (NRC). This information was used in the calculation of radiation doses and cancer risks in this BRA for the two future-use scenarios to ensure consistency with the PRGs. The second table summarizes the conversion of the uranium intakes from activity (in pCi) to mass (in mg) for oral intakes to support calculation of the noncarcinogenic hazard index (HI).

R.1 RADIONUCLIDE INTAKES

Three pathways of exposure are evaluated for radionuclides in this BRA: inhalation, ingestion, and external gamma irradiation. The radionuclide intake represents the amount of radioactivity taken into the body for internal exposures by inhalation and ingestion, and the amount of external gamma radiation to which an individual is exposed. The internal intakes are given in terms of the activity (in pCi) inhaled or ingested, while the external component is given in terms of the exposure to radioactively contaminated soil (in pCi-yr/g). The external gamma exposure depends on the areal extent and depth of contamination, as well as the possible presence of clean soil overlying contaminated subsurface soil (as is currently the case for the wastes in the trenches). The first two factors (areal extent and depth of contamination) are accounted for by the area factor (AF) and depth factor (DF) in Equation 6.3 in Section 6.3.4. Both factors are taken to be unity in this assessment, which correspond to an areal extent of contamination greater than about 1,000 m^2 (0.3 acres) and a depth of contamination more than about 0.6 m (2 ft). No credit is taken for the possible presence of overlying clean soil in calculating the external gamma exposures in this BRA. These assumptions are conservative but reasonable given the sizes of the three EUs for the SLDA and the soil contamination pattern at the site.

The intakes for the current-use scenarios are given in Tables R.1 through R.8, and the intakes for the future-use scenarios are given in Tables R.9 through R.16. These intakes incorporate the net exposure point concentrations (EPCs) given in Table 6-4. The EPCs for the current-use scenarios are based on the measured concentrations of the primary ROPCs in the top 15 cm (6 in.) of soil, and the EPCs for the future-use scenarios are based on the measured concentrations from the

surface through the entire depth of the measurement, as the future-use scenarios address exposures associated with surface and subsurface soil contamination. As noted in Section 6.1.2, these EPCs do not include the contributions associated with the radionuclides in the buried wastes. The EPCs for future use in media other than soil (groundwater, food stuffs) were obtained by RESRAD modeling from soil to the other media. The four scenarios addressed in this BRA are defined in Section 6.3.2, and the exposure pathways are given in Section 6.3.3 and summarized in Table 6-3.

The intakes for the Maintenance Worker and Adolescent Trespasser scenarios (the two current-use scenarios) are given in Tables R.1 through R.4, and R.5 through R.8, respectively. Separate estimates are given for each of the three EUs and for site-wide exposures. These intakes were developed based on the surface-soil EPCs, and the exposure assumptions and intake parameters given in Section 6.3.4. The specific intake assumptions for these scenarios are summarized in Table 6-5. These results were obtained using the equations given in Section 6.3.4 (a spreadsheet was used to expedite the process and minimize the likelihood for calculation errors), and these results were then used to calculate the radiation doses and cancer risks. These doses and risks are presented in Section R.2 of this appendix.

The intakes for the Construction Worker and Subsistence Farmer scenarios (the two future-use scenarios) are given in Tables R.9 through R.12, and R.13 through R.16, respectively. These intakes were not developed in the same manner as identified above for the two current-use scenarios, i.e., by direct use of the intake parameters and equations given in Section 6.3.4. Rather, these intakes were determined from the previous RESRAD calculations used to develop the PRGs for the site. This approach was used to ensure consistency between the intakes and radiation doses developed for two future-use scenarios in this BRA (specifically for the Subsistence Farmer scenario) with those used to develop the PRGs.

As noted in Appendix A of the Field Sampling Plan (FSP) (USACE 2003), the PRGs were developed from the mean dose-to-source ratios of the peak doses over a 1,000-year time period using the probabilistic version of RESRAD (ANL 2001). Separate evaluations were performed for each primary ROPC. The input parameters for this analysis were developed with the concurrence of the Pennsylvania Department of Environmental Protection (PADEP), and these input parameters were included in Appendix A of the FSP. The PRGs developed using this approach apply to current conditions, i.e., the radionuclide concentrations as they currently exist at the site, even though the doses may occur many years in the future. An assumption associated with developing PRGs using this probabilistic approach (and applying a sum of ratios to determined compliance with the 25 mrem/yr standard for cleanup of this site – see Section 6.1.2), is that the peak dose occurs at approximately the same time for each radionuclide. This is not the case for the primary ROPCs at the SLDA site.

The NRC acknowledges this issue in their decommissioning guidance, and notes that use of this approach to develop PRGs is conservative. That is, this approach will result in more cleanup of contaminated soil than required to simply meet the 25 mrem/yr dose standard. The NRC guidance states that because of the importance of differential radionuclide transport through the environment and differing predominant exposure pathways, there are many radionuclides and contaminated media for which peak doses do not occur simultaneously. Radionuclides that have a strong external gamma exposure component (such as Ra-228) tend to have peak doses in the very near term. For radionuclides that result in peak doses through irrigation or drinking groundwater (such as uranium isotopes), the peak dose does not occur until many years in the

future (NRC 2003). An additional complicating factor for the primary ROPCs at the SLDA is the ingrowth of radioactive decay products.

Deterministic RESRAD calculations were performed to estimate that time at which the peak doses would occur for each of the eight ROPCs. These calculations were performed using generally conservative input parameters and provided results comparable to those obtained with the probabilistic approach. These calculations indicated that three of the primary ROPCs (Am-241, Pu-239, and Ra-228) would have peak doses in the very near term, the three uranium isotopes would have peak doses well in the future (250 years and beyond), and the remaining two isotopes (Pu-241 and Th-232) would have peak doses between 50 to 100 years in the future. This evaluation was performed to obtain approximate times at which the peak doses associated with the eight ROPCs would be expected to occur to support application of these PRGs at the site.

The intakes for the two future-use scenarios were developed as follows. The mean dose-to-source ratios of the peak doses over a 1,000-year time period (mrem/yr per pCi/g) from the probabilistic RESRAD calculations for the Subsistence Farmer scenario were first tabulated by pathway for each of the primary ROPCs (see Table R.33). The parameters for this scenario were the same as those previously used in the PRG determination. The pathway-specific intake per pCi/g for each of the primary ROPCs was calculated by multiplying this value by 30 years (the assumed exposure duration for the Subsistence Farmer) and dividing the result by the dose conversion factor (DCF) (in mrem per pCi for internal exposures and mrem per pCi-yr/g for external exposures) from Table 6-6. This gives the intake (in pCi and pCi-yr/g) for an initial unit concentration of the ROPC. This unit-concentration intake was then multiplied by the EPC of each ROPC in the three EUs and on a site-wide basis to give the radionuclide intake for that exposure pathway.

This approach provides good estimates of the intakes for those radionuclides that do not have significant ingrowth of radioactive decay products, i.e., those that have peak doses in the very near term or that have long-lived decay products (which would not allow for significant ingrowth to occur over a 1,000-year time period). The deterministic RESRAD results were reviewed, and this approach was determined to be appropriate for estimating the intakes for five of the eight ROPCs (Am-241, Pu-239, Ra-228, U-234, and U-238). The peak doses for Am-241, Pu-239, and Ra-228 occur in the very near term, so there is no need to evaluate the contribution of additional decay products. (Note: the DCF for Ra-228 in Table 6-6 includes the contribution from Th-228.)

While the peak doses for U-234 and U-238 occur many years in the future (peak dose for U-234 was estimated to occur 1,000 years in the future and the peak dose for U-238 occurs in about 250 years based on the deterministic RESRAD results), significant radionuclide ingrowth does not occur for either of these two uranium isotopes in these time periods due to the presence of long-lived radioactive decay products. This can best be illustrated by considering the U-238 radioactive decay series, which is shown in Figure N.1 of U.S. Department of Energy (2002), and in other reports. Both uranium isotopes have very long half-lives; the half-life of U-238 is 4.5 billion years and the half-life of U-234 is 240,000 years. U-238 decays to U-234 through two short-lived radioactive decay products (Th-234 and Pa-234m), which are assumed to be in secular equilibrium with U-238. (The dose and cancer risk contribution of these two short-lived radionuclides are accounted for in the DCFs and cancer risk coefficients used for U-238.) U-234 decays to Th-230, which has a half-life of 77,000 years.

Since radionuclide ingrowth is a function of the decay product half-life, there will be very little ingrowth for either uranium isotope in the next 1,000 years. Radionuclide ingrowth for U-238 is limited by the presence of U-234 in the decay series, and radionuclide ingrowth for U-234 is limited by the presence of Th-230. However, a small amount of radionuclide ingrowth does occur, as evidenced in the relatively low dose contributions attributable to Rn-222 (a decay product of Ra-226) in the probabilistic RESRAD results for these two uranium isotopes. The intakes for the ROPCs in Tables R.13 through R.16 do not include the contributions of radon gas and their short-lived decay products for simplicity of presentation. However, the doses and cancer risks for the Subsistence Farmer (given in Tables R.29 through R.32) include this contribution.

The peak dose for Th-232 occurs at about 90 years in the future based on the deterministic RESRAD simulation, which will allow for significant Ra-228 in growth to occur. In 90 years, Ra-228 will be in secular equilibrium with Th-232. (In reality, secular equilibrium conditions probably already exist at the site given that disposal activities occurred more that 30 years ago. This condition was not assumed in the PRG calculations, and separate PRGs were developed for each radionuclide.) The intake for Th-232 was calculated using the same approach as for the five ROPCs identified above, except that the DCF used in the calculation was the sum of the DCFs for Ra-228 and Th-232. Hence, the Th-232 intakes given in Tables R.9 through R.16 include the contribution of Ra-228, which is assumed to be present in secular equilibrium with Th-232, i.e., the two radionuclides are assumed to be present at the same concentrations. The Th-232 intakes for the current-use scenarios do not include Ra-228 (these intakes are reported separately).

The peak dose for U-235 was estimated to occur at about 550 years in the future (allowing for the ingrowth of Pa-231 and Ac-227), and the peak dose for Pu-241 was estimated to occur at about 60 years (allowing for the ingrowth of Am-241). Neither of these two radionuclides reaches equilibrium conditions with these radioactive decay products in this time period; in fact, Am-241 never reaches equilibrium with Pu-241 since Am-241 has a longer half-life than Pu-241. The intakes of U-235 and Pu-241 were determined in the same manner as for Th-232, using an effective DCF that accounted for radionuclide ingrowth at the approximate time of peak dose. The concentrations of Pa-231 and Ac-227 are each calculated to be present at about 1.2% of the initial U-235 concentration (at 550 years), and the concentration of Am-241 is calculated to be about 2.9% of the initial Pu-241 concentration (at 60 years). Note that the Pu-241 concentration will be only about 5.5% of its initial concentration in 60 years due to radioactive decay. The intakes for U-235 and Pu-241 reflect the contributions of these radioactive decay products at the time of peak doses and the effect of radioactive decay of Pu-241. The concentration of U-235 will not diminish appreciably in 550 years given its very long half-life of 700 million years.

The intakes for the Construction Worker scenario were obtained from the Subsistence Farmer intakes by determining the ratio of the intakes for these two scenarios from the parameters and assumptions given in Section 6.3.4. The intakes given in Tables R.13 through R.16 were multiplied by this ratio (which is exposure pathway dependent) to obtain the internal radionuclide intakes (dust inhalation and groundwater ingestion) and external exposures (gamma irradiation) for the Construction Worker scenario. These intakes are given in Tables R.9 through R.12. The inhalation intake was limited to airborne particulates, i.e., it did not include the contribution from radon gases and their short-lived decay products, since the Construction Worker is limited to outdoor exposures. In determining the intake ratios, the RESRAD results were reviewed to account for the amount of time the Subsistence Farmer is indoors, and the corresponding

reduction in airborne dust concentrations and intensity of external gamma radiation. Please see Appendix A of the Field Sampling Plan (USACE 2003a) for those parameter values.

While this approach introduces some uncertainties in the intakes as reflected above, it does allow for more consistency with the PRG calculations, especially for the Subsistence Farmer scenario. It is important to note that the intakes given in Tables R.9 through R.16 reflect different times, and that the effect of radionuclide ingrowth is accounted for in those radionuclides that have peak doses in the future.

TABLE R.1
INTAKES FOR HYPOTHETICAL MAINTENANCE WORKER IN EXPOSURE UNIT 1[a]

			Intake			
Receptor	Location	Contaminant	Concentration (pCi/g) or (pCi/L)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Maintenance Worker						
EU 1 (Trenches 1 to 9)						
Surface Soil						
		Americium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-239	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-241	5.7E 00	5.4E-01	1.1E 02	1.0E 00
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	7.4E 00	7.0E-01	1.5E 02	1.3E 00
		Uranium-235	5.9E-01	5.5E-02	1.2E 01	1.1E-01
		Uranium-238	6.5E-01	6.1E-02	1.3E 01	1.2E-01

[a] The hypothetical maintenance worker is assumed to conduct general maintenance activities at the SLDA site and be exposed to contaminated surface soil in EU 1 with radionuclide concentrations as given in Table 6.4. These values represent the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface soil at the SLDA. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.2
INTAKES FOR HYPOTHETICAL MAINTENANCE WORKER IN EXPOSURE UNIT 2[a]

			Intake			
Receptor	Location	Contaminant	Concentration (pCi/g) or (pCi/L)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Maintenance Worker						
	EU 2 (Trench 10)					
Surface Soil						
		Americium-241	1.2E 02	1.1E 01	2.3E 03	2.1E 01
		Plutonium-239	2.5E 02	2.4E 01	5.0E 03	4.6E 01
		Plutonium-241	3.4E 01	3.2E 00	6.7E 02	6.1E 00
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	5.6E-01	5.3E-02	1.1E 01	1.0E-01
		Uranium-235	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-238	1.3E-01	1.2E-02	2.6E 00	2.4E-02

[a] The hypothetical maintenance worker is assumed to conduct general maintenance activities at the SLDA site and be exposed to contaminated surface soil in EU 2 with radionuclide concentrations as given in Table 6.4. These values represent the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface soil at the SLDA. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.3
INTAKES FOR HYPOTHETICAL MAINTENANCE WORKER IN EXPOSURE UNIT 3[a]

			Intake			
Receptor	Location	Contaminant	Concentration (pCi/g) or (pCi/L)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Maintenance Worker						
EU 3 (Southeast fence area)						
Surface Soil						
		Americium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-239	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	6.8E 00	6.4E-01	1.4E 02	1.2E 00
		Uranium-235	1.1E 00	1.1E-01	2.3E 01	2.1E-01
		Uranium-238	0.0E 00	0.0E 00	0.0E 00	0.0E 00

[a] The hypothetical maintenance worker is assumed to conduct general maintenance activities at the SLDA site and be exposed to contaminated surface soil in EU 3 with radionuclide concentrations as given in Table 6.4. These values represent the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface soil at the SLDA. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.4
INTAKES FOR HYPOTHETICAL MAINTENANCE WORKER FOR SITE-WIDE EXPOSURES[a]

			Intake			
Receptor	Location	Contaminant	Concentration (pCi/g) or (pCi/L)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Maintenance Worker						
Site Average						
Surface Soil						
		Americium-241	8.1E-01	7.6E-02	1.6E 01	1.5E-01
		Plutonium-239	9.9E-01	9.3E-02	2.0E 01	1.8E-01
		Plutonium-241	8.5E 00	8.0E-01	1.7E 02	1.6E 00
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	4.7E 00	4.4E-01	9.4E 01	8.5E-01
		Uranium-235	3.3E-01	3.1E-02	6.6E 00	6.0E-02
		Uranium-238	3.3E-01	3.1E-02	6.6E 00	6.0E-02

[a] The hypothetical maintenance worker is assumed to conduct general maintenance activities at the SLDA site and be exposed to contaminated surface soil across the site with radionuclide concentrations as given in Table 6.4. These values represent the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface soil at the SLDA. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.5
INTAKES FOR A HYPOTHETICAL ADOLESCENT TRESPASSER IN EXPOSURE UNIT 1[a]

			Intake			
Receptor	Location	Contaminant	Concentration (pCi/g) or (pCi/L)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Trespasser						
EU 1 (Trenches 1 to 9)						
Surface Soil						
		Americium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-239	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-241	5.7E 00	5.4E-02	1.4E 01	1.3E-01
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	7.4E 00	7.0E-02	1.9E 01	1.7E-01
		Uranium-235	5.9E-01	5.5E-03	1.5E 00	1.3E-02
		Uranium-238	6.5E-01	6.1E-03	1.6E 00	1.5E-02

[a] The hypothetical adolescent trespasser is assumed to be a teenager who intentionally trespasses onto the SLDA site and is exposed to contaminated surface soil in EU 1 with radionuclide concentrations as given in Table 6.4. These values represent the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface soil at the SLDA. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.6
INTAKES FOR A HYPOTHETICAL ADOLESCENT TRESPASSER IN EXPOSURE UNIT 2[a]

			Intake			
Receptor	Location	Contaminant	Concentration (pCi/g) or (pCi/L)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Trespasser						
EU 2 (Trench 10)						
Surface Soil						
		Americium-241	1.2E 02	1.1E 00	2.9E 02	2.7E 00
		Plutonium-239	2.5E 02	2.4E 00	6.3E 02	5.7E 00
		Plutonium-241	3.4E 01	3.2E-01	8.4E 01	7.7E-01
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	5.6E-01	5.3E-03	1.4E 00	1.3E-02
		Uranium-235	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-238	1.3E-01	1.2E-03	3.3E-01	3.0E-03

[a] The hypothetical adolescent trespasser is assumed to be a teenager who intentionally trespasses onto the SLDA site and is exposed to contaminated surface soil in EU 2 with radionuclide concentrations as given in Table 6.4. These values represent the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface soil at the SLDA. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.7
INTAKES FOR A HYPOTHETICAL ADOLESCENT TRESPASSER IN EXPOSURE UNIT 3[a]

			Intake			
Receptor	Location	Contaminant	Concentration (pCi/g) or (pCi/L)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Trespasser						
EU 3 (Southeast fence area)						
Surface Soil						
		Americium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-239	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	6.8E 00	6.4E-02	1.7E 01	1.5E-01
		Uranium-235	1.1E 00	1.1E-02	2.8E 00	2.6E-02
		Uranium-238	0.0E 00	0.0E 00	0.0E 00	0.0E 00

[a] The hypothetical adolescent trespasser is assumed to be a teenager who intentionally trespasses onto the SLDA site and is exposed to contaminated surface soil in EU 3 with radionuclide concentrations as given in Table 6.4. These values represent the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface soil at the SLDA. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.8
INTAKES FOR A HYPOTHETICAL ADOLESCENT TRESPASSER FOR SITE-WIDE EXPOSURES[a]

			Intake			
Receptor	Location	Contaminant	Concentration (pCi/g) or (pCi/L)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Trespasser						
Site Average						
Surface Soil						
		Americium-241	8.1E-01	7.6E-03	2.0E 00	1.8E-02
		Plutonium-239	9.9E-01	9.3E-03	2.5E 00	2.3E-02
		Plutonium-241	8.5E 00	8.0E-02	2.1E 01	1.9E-01
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	4.7E 00	4.4E-02	1.2E 01	1.1E-01
		Uranium-235	3.3E-01	3.1E-03	8.3E-01	7.5E-03
		Uranium-238	3.3E-01	3.1E-03	8.3E-01	7.5E-03

[a] The hypothetical adolescent trespasser is assumed to be a teenager who intentionally trespasses onto the SLDA site and is exposed to contaminated surface soil across the site with radionuclide concentrations as given in Table 6.4. These values represent the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface soil at the SLDA. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.9
INTAKES FOR A HYPOTHETICAL CONSTRUCTION WORKER IN EXPOSURE UNIT 1[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Construction Worker						
EU 1 (Trenches 1 to 9)						
Soil						
		Americium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-239	4.0E-02	4.1E-03	2.6E 00	9.4E-03
		Plutonium-241	5.8E 00	3.2E-02	2.0E 01	7.4E-02
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	3.7E 00	3.8E-01	2.4E 02	8.8E-01
		Uranium-235	1.5E-01	1.5E-02	9.6E 00	3.4E-02
		Uranium-238	3.7E-01	3.8E-02	2.4E 01	8.7E-02
Groundwater						
		Americium-241			0.0E 00	
		Plutonium-239			2.6E-03	
		Plutonium-241			1.1E-01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			2.4E 01	
		Uranium-235			1.0E-01	
		Uranium-238			2.2E 00	

[a] The hypothetical construction worker is assumed to be a worker at the SLDA site in the future who is exposed to contaminated soil (surface and subsurface) and groundwater in EU 1. The approach used to develop these intakes is described in the text. These intakes are based on the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface and subsurface soil at the SLDA as given in Table 6.4. Blank entries indicate that the exposure route is not applicable for that environmental medium. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.10
INTAKES FOR A HYPOTHETICAL CONSTRUCTION WORKER IN EXPOSURE UNIT 2[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Construction Worker						
EU 2 (Trench 10)						
Soil						
		Americium-241	2.1E 00	2.1E-01	1.3E 02	5.0E-01
		Plutonium-239	3.2E 00	3.2E-01	2.0E 02	7.5E-01
		Plutonium-241	1.1E 01	5.8E-02	3.7E 01	1.3E-01
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	1.0E-02	1.2E-03	6.5E-01	2.4E-03
		Uranium-235	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-238	0.0E 00	0.0E 00	0.0E 00	0.0E 00
Groundwater						
		Americium-241			4.3E 00	
		Plutonium-239			2.1E-01	
		Plutonium-241			2.0E-01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			6.5E-02	
		Uranium-235			0.0E 00	
		Uranium-238			0.0E 00	

[a] The hypothetical construction worker is assumed to be a worker at the SLDA site in the future who is exposed to contaminated soil (surface and subsurface) and groundwater in EU 2. The approach used to develop these intakes is described in the text. These intakes are based on the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface and subsurface soil at the SLDA as given in Table 6.4. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. Blank entries indicate that the exposure route is not applicable for that environmental medium. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.11
INTAKES FOR A HYPOTHETICAL CONSTRUCTION WORKER IN EXPOSURE UNIT 3[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Construction Worker						
EU 3 (Southeast fence area)						
Soil						
		Americium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-239	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	7.4E 00	7.5E-02	4.8E 01	1.7E-01
		Uranium-235	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-238	0.0E 00	0.0E 00	0.0E 00	0.0E 00
Groundwater						
		Americium-241			0.0E 00	
		Plutonium-239			0.0E 00	
		Plutonium-241			0.0E 00	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			4.8E 00	
		Uranium-235			0.0E 00	
		Uranium-238			0.0E 00	

[a] The hypothetical construction worker is assumed to be a worker at the SLDA site in the future who is exposed to contaminated soil (surface and subsurface) and groundwater in EU 3. The approach used to develop these intakes is described in the text. These intakes are based on the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface and subsurface soil at the SLDA as given in Table 6.4. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. Blank entries indicate that the exposure route is not applicable for that environmental medium. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.12
INTAKES FOR A HYPOTHETICAL CONSTRUCTION WORKER FOR SITE-WIDE EXPOSURES[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Construction Worker						
Site Average						
Soil						
		Americium-241	2.0E-01	2.0E-02	1.3E 01	4.7E-02
		Plutonium-239	1.7E-01	1.7E-02	1.1E 01	4.0E-02
		Plutonium-241	6.6E 00	3.6E-02	2.3E 01	8.4E-02
		Radium-228	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234	1.9E 00	1.9E-01	1.2E 02	4.4E-01
		Uranium-235	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-238	4.0E-02	4.1E-03	2.6E 00	9.4E-03
Groundwater						
		Americium-241			4.0E-01	
		Plutonium-239			1.1E-02	
		Plutonium-241			1.3E-01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			1.2E 01	
		Uranium-235			0.0E 00	
		Uranium-238			2.4E-01	

[a] The hypothetical construction worker is assumed to be a worker at the SLDA site in the future who is exposed to contaminated soil (surface and subsurface) and groundwater across the site. The approach used to develop these intakes is described in the text. These intakes are based on the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface and subsurface soil at the SLDA as given in Table 6.4. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. The blank entries indicate that the exposure rate is not applicable for that environmental medium. The inhalation and ingestion intakes (in pCi) and external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

TABLE R.13
INTAKES FOR A HYPOTHETICAL RESIDENT FARMER IN EXPOSURE UNIT 1[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Subsistence Farmer						
EU 1 (Trenches 1 to 9)						
Soil						
		Americium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-239	4.0E-02	1.0E-02	1.7E 01	3.7E-01
		Plutonium-241	5.8E 00	7.9E-02	1.3E 02	2.9E 00
		Radium-228[b]	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232[b]	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234[b]	3.7E 00	9.4E-01	1.6E 03	3.4E 01
		Uranium-235	1.5E-01	3.6E-02	6.3E 01	1.3E 00
		Uranium-238[b]	3.7E-01	9.3E-02	1.6E 02	3.4E 00
Groundwater						
		Americium-241			0.0E 00	
		Plutonium-239			7.5E-01	
		Plutonium-241			3.1E 01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			6.9E 03	
		Uranium-235			2.8E 02	
		Uranium-238			6.3E 02	
Produce						
		Americium-241			0.0E 00	
		Plutonium-239			2.4E 02	
		Plutonium-241			2.2E 03	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			4.9E 04	
		Uranium-235			3.4E 03	
		Uranium-238			4.4E 03	
Beef, Poultry and Dairy Products						
		Americium-241			0.0E 00	
		Plutonium-239			4.5E 00	
		Plutonium-241			2.6E 01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			1.4E 04	
		Uranium-235			2.5E 02	
		Uranium-238			1.3E 03	

TABLE R.13 (Continued)
INTAKES FOR A HYPOTHETICAL RESIDENT FARMER IN EXPOSURE UNIT 1[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Fish						
		Americium-241			0.0E 00	
		Plutonium-239			1.1E 00	
		Plutonium-241			6.1E 01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			2.9E 03	
		Uranium-235			1.7E 02	
		Uranium-238			2.9E 02	

[a] The hypothetical subsistence farmer is assumed to be an individual who develops a working farm at the SLDA site in the future and obtains all of his foodstuffs and drinking water from this farm. This individual is exposed to contaminated soil (surface and subsurface) and groundwater in EU 1, as well as potentially impacted foodstuffs. The approach used to develop these intakes is described in the text. These intakes are based on the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface and subsurface soil at the SLDA as given in Table 6-4. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. Blank entries indicate that the exposure route is not applicable for that environmental medium. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

[b] The intakes given here are for particulates only and do not include the contribution from radon gas (Rn-220 and Rn-222) and their short-lived decay products. This contribution is included in the estimates of radiation doses and cancer risks given in Table R.29.

TABLE R.14
INTAKES FOR A HYPOTHETICAL RESIDENT FARMER IN EXPOSURE UNIT 2[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Subsistence Farmer						
EU 2 (Trench 10)						
Soil						
		Americium-241	2.1E 00	5.3E-01	8.9E 02	1.9E 01
		Plutonium-239	3.2E 00	8.0E-01	1.4E 03	2.9E 01
		Plutonium-241	1.1E 01	1.4E-01	2.4E 02	5.2E 00
		Radium-228 [b]	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232 [b]	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234 [b]	1.0E-02	2.5E-03	4.3E 00	9.1E-02
		Uranium-235	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-238 [b]	0.0E 00	0.0E 00	0.0E 00	0.0E 00
Groundwater						
		Americium-241			1.2E 03	
		Plutonium-239			6.0E 01	
		Plutonium-241			5.7E 01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			1.9E 01	
		Uranium-235			0.0E 00	
		Uranium-238			0.0E 00	
Produce						
		Americium-241			1.3E 04	
		Plutonium-239			1.9E 04	
		Plutonium-241			4.1E 03	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			1.3E 02	
		Uranium-235			0.0E 00	
		Uranium-238			0.0E 00	
Beef, Poultry and Dairy Products						
		Americium-241			1.4E 02	
		Plutonium-239			3.6E 02	
		Plutonium-241			4.7E 01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			3.6E 00	
		Uranium-235			0.0E 00	
		Uranium-238			0.0E 00	

TABLE R.14 (Continued)
INTAKES FOR A HYPOTHETICAL RESIDENT FARMER IN EXPOSURE UNIT 2[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Fish						
		Americium-241			8.4E 02	
		Plutonium-239			8.8E 01	
		Plutonium-241			1.1E 02	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			7.7E 00	
		Uranium-235			0.0E 00	
		Uranium-238			0.0E 00	

[a] The hypothetical subsistence farmer is assumed to be an individual who develops a working farm at the SLDA site in the future and obtains all of his foodstuffs and drinking water from this farm. This individual is exposed to contaminated soil (surface and subsurface) and groundwater in EU 2, as well as potentially impacted foodstuffs. The approach used to develop these intakes is described in the text. These intakes are based on the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface and subsurface soil at the SLDA as given in Table 6-4. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. Blank entries indicate that the exposure route is not applicable for that environmental medium. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

[b] The intakes given here are for particulates only and do not include the contribution from radon gas (Rn-220 and Rn-222) and their short-lived decay products. This contribution is included in the estimates of radiation doses and cancer risks given in Table R.30.

TABLE R.15
INTAKES FOR A HYPOTHETICAL RESIDENT FARMER IN EXPOSURE UNIT 3[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Subsistence Farmer						
EU 3 (Southeast fence area)						
Soil						
		Americium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-239	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Plutonium-241	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Radium-228 [b]	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232 [b]	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234 [b]	7.4E-01	1.9E-01	3.2E 02	6.8E 00
		Uranium-235	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-238 [b]	0.0E 00	0.0E 00	0.0E 00	0.0E 00
Groundwater						
		Americium-241			0.0E 00	
		Plutonium-239			0.0E 00	
		Plutonium-241			0.0E 00	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			1.4E 03	
		Uranium-235			0.0E 00	
		Uranium-238			0.0E 00	
Produce						
		Americium-241			0.0E 00	
		Plutonium-239			0.0E 00	
		Plutonium-241			0.0E 00	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			9.6E 03	
		Uranium-235			0.0E 00	
		Uranium-238			0.0E 00	
Beef, Poultry and Dairy Products						
		Americium-241			0.0E 00	
		Plutonium-239			0.0E 00	
		Plutonium-241			0.0E 00	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			2.7E 03	
		Uranium-235			0.0E 00	
		Uranium-238			0.0E 00	

TABLE R.15 (Continued)
INTAKES FOR A HYPOTHETICAL RESIDENT FARMER IN EXPOSURE UNIT 3[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Fish						
		Americium-241			0.0E 00	
		Plutonium-239			0.0E 00	
		Plutonium-241			0.0E 00	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 01	
		Uranium-234			5.7E 02	
		Uranium-235			0.0E 00	
		Uranium-238			0.0E 00	

[a] The hypothetical subsistence farmer is assumed to be an individual who develops a working farm at the SLDA site in the future and obtains all of his foodstuffs and drinking water from this farm. This individual is exposed to contaminated soil (surface and subsurface) and groundwater in EU 3, as well as potentially impacted foodstuffs. The approach used to develop these intakes is described in the text. These intakes are based on the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface and subsurface soil at the SLDA as given in Table 6-4. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. Blank entries indicate that the exposure route is not applicable for that environmental medium. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

[b] The intakes given here are for particulates only and do not include the contribution from radon gas (Rn-220 and Rn-222) and their short-lived decay products. This contribution is included in the estimates of radiation doses and cancer risks given in Table R.31.

TABLE R.16
INTAKES FOR HYPOTHETICAL RESIDENT FARMER: SITE-WIDE EXPOSURES[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Subsistence Farmer						
	Site Average					
Soil						
		Americium-241	2.0E-01	5.0E-02	8.5E 01	1.8E 00
		Plutonium-239	1.7E-01	4.3E-02	7.2E 01	1.6E 00
		Plutonium-241	6.6E 00	9.0E-02	1.5E 02	3.3E 00
		Radium-228 [b]	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Thorium-232 [b]	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-234 [b]	1.9E 00	4.6E-01	7.9E 02	1.7E 01
		Uranium-235	0.0E 00	0.0E 00	0.0E 00	0.0E 00
		Uranium-238 [b]	4.0E-02	1.0E-02	1.7E 01	3.7E-01
Groundwater						
		Americium-241			1.2E 02	
		Plutonium-239			3.2E 00	
		Plutonium-241			3.6E 01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			3.4E 03	
		Uranium-235			0.0E 00	
		Uranium-238			6.8E 01	
Produce						
		Americium-241			1.2E 03	
		Plutonium-239			1.0E 03	
		Plutonium-241			2.5E 03	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			2.4E 04	
		Uranium-235			0.0E 00	
		Uranium-238			4.8E 02	
Beef, Poultry and Dairy Products						
		Americium-241			1.3E 01	
		Plutonium-239			1.9E 01	
		Plutonium-241			2.9E 01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			6.8E 03	
		Uranium-235			0.0E 00	
		Uranium-238			1.4E 02	

TABLE R.16 (Continued)
INTAKES FOR A HYPOTHETICAL RESIDENT FARMER: SITE-WIDE EXPOSURES[a]

			Intake			
Receptor	Location	Contaminant	Current Soil Concentration (pCi/g)	Inhalation (pCi)	Ingestion (pCi)	External Gamma (pCi-yr/g)
Fish						
		Americium-241			8.0E 01	
		Plutonium-239			4.7E 00	
		Plutonium-241			6.9E 01	
		Radium-228			0.0E 00	
		Thorium-232			0.0E 00	
		Uranium-234			1.4E 03	
		Uranium-235			0.0E 00	
		Uranium-238			3.1E 01	

[a] The hypothetical subsistence farmer is assumed to be an individual who develops a working farm at the SLDA site in the future and obtains all of his foodstuffs and drinking water from this farm. This individual is exposed to contaminated soil (surface and subsurface) and groundwater across the site, as well as potentially impacted foodstuffs. The approach used to develop these intakes is described in the text. These intakes are based on the 95% upper confidence limit (UCL) of the arithmetic average of the measured concentrations in surface and subsurface soil at the SLDA as given in Table 6-4. The background contributions have been subtracted from the 95% UCL concentrations, and zeroes indicate that the radionuclide concentration is not elevated. Blank entries indicate that the exposure route is not applicable for that environmental medium. The inhalation and ingestion intakes (in pCi) and the external gamma exposures (in pCi-yr/g) are based on the scenario descriptions and parameters provided in Sections 6.3.3 and 6.3.4. All intakes are given to two significant figures.

[b] The intakes given here are for particulates only and do not include the contribution from radon gas (Rn-220 and Rn-222) and their short-lived decay products. This contribution is included in the estimates of radiation doses and cancer risks given in Table R.32.

R.2 RADIATION DOSES AND RADIOLOGICAL CARCINOGENIC RISKS

The radiation doses and radiological carcinogenic risks for the four hypothetical scenarios considered in this BRA for the three EUs and for site-wide exposures are presented in Tables R.17 through R.32. The doses and cancer risks for the current-use scenarios are given in Tables R.17 through R.24, and the doses and cancer risks for the future-use scenarios are given in Tables R.25 through R.32. These results were obtained using the intakes given in Tables R.1 through R.16, and the radiological carcinogenic risk factors and DCFs given in Table 6.6. The intakes for the two current-use scenarios were obtained using the scenario parameters and equations given in Sections 6.3.3 and 6.3.4, and the intakes for the two future-use scenarios were obtained from the probabilistic RESRAD calculations used to develop the PRGs for the Subsistence Farmer scenario. This was done to ensure consistency between the PRG calculations and results presented herein for the Subsistence Farmer scenario. The radiation doses and cancer risk estimates for the two future-use scenarios include the contributions associated with ingrowth of radionuclides for Pu-241, Th-232, and U-235 as described in Section R.1.

The radiological carcinogenic risk gives the increased probability that an individual would develop cancer over the course of a lifetime from exposures at the SLDA. Use was made of radiological risk coefficients given in Federal Guidance Report (FGR) 13 (EPA 1999) and considers all cancers, including those that are not fatal. That is, the morbidity values identified in FGR 13 were used in this assessment. These factors account for the mode of exposure, i.e., inhalation, ingestion, and external gamma irradiation, and include the contribution of short-lived decay products. Additional discussion on these radiological risk coefficients is provided in Section 6.4.1.

Tables R.17 through R.32 also include estimates of the radiation doses associated with exposures at the SLDA in addition to the carcinogenic risks, as the remediation standard identified in the authorizing legislation for cleanup of the SLDA site is given on this basis, i.e., 25 mrem/yr for future unrestricted use of the site. These radiation doses were estimated using the DCFs given in FGRs 11 (EPA 1988) and 12 (EPA 1993). These factors are used to estimate the total effective dose equivalent (TEDE) and are based on a metabolic and anatomical model for an adult male. As for the radiological risk coefficients, the DCFs account for the mode of exposure and include the contribution of short-lived decay products. Additional discussion on the DCFs is provided in Section 6.4.1.

TABLE R.17
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL MAINTENANCE WORKER IN EXPOSURE UNIT 1[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Maintenance Worker															
EU 1 (Trenches 1 to 9)															
Surface Soil															
		Americium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-239	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-241	5E-01	4E-03	2E-10	1E 02	8E-03	3E-10	1E 00	2E-05	1E-11	1E-02	5E-10	5	0
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	7E-01	9E-02	2E-08	1E 02	4E-02	1E-08	1E 00	5E-04	3E-10	1E-01	3E-08	51	31
		Uranium-235	6E-02	7E-03	1E-09	1E 01	3E-03	1E-09	1E-01	8E-02	6E-08	9E-02	6E-08	35	56
		Uranium-238	6E-02	7E-03	1E-09	1E 01	3E-03	2E-09	1E-01	2E-02	1E-08	3E-02	1E-08	10	12
		Total		**1E-01**	**2E-08**		**6E-02**	**2E-08**		**1E-02**	**7E-08**	**3E-01**	**1E-07**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical maintenance worker in EU 1 in this table. This individual is assumed to be exposed to contaminated surface soil in EU 1 at the SLDA. These doses and risks are based on the estimated intakes given in Table R.1, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated. All values are given to one significant figure.

TABLE R.18
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL MAINTENANCE WORKER IN EXPOSURE UNIT 2[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Maintenance Worker															
EU 2 (Trench 10)															
Surface Soil															
		Americium-241	1E 01	5E 00	3E-07	2E 03	9E 00	3E-07	2E 01	9E-01	6E-07	1E 01	1E-06	34	42
		Plutonium-239	2E 01	1E 01	8E-07	5E 03	2E 01	9E-07	5E 01	1E-02	9E-09	3E 01	2E-06	66	58
		Plutonium-241	3E 00	3E-02	1E-09	7E 02	5E-02	2E-09	6E 00	1E-04	8E-11	7E-02	3E-09	0	0
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	5E-02	7E-03	1E-09	1E 01	3E-03	1E-09	1E-01	4E-05	3E-11	1E-02	3E-09	0	0
		Uranium-235	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-238	1E-02	1E-03	3E-10	3E 00	7E-04	3E-10	2E-02	3E-03	2E-09	5E-03	3E-09	0	0
		Total		**2E+01**	**1E-06**		**3E+01**	**1E-06**		**9E-01**	**6E-07**	**4E+01**	**3E-06**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical maintenance worker in EU 2 in this table. This individual is assumed to be exposed to contaminated surface soil in EU 2 at the SLDA. These doses and risks are based on the estimated intakes given in Table R.2, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated. All values are given to one significant figure.

TABLE R.19
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL MAINTENANCE WORKER IN EXPOSURE UNIT 3[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Maintenance Worker															
EU 3 (Southeast fence area)															
Surface Soil															
		Americium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-239	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	6E-01	8E-02	2E-08	1E 02	4E-02	1E-08	1E 00	5E-04	3E-10	1E-01	3E-08	41	21
		Uranium-235	1E-01	1E-02	3E-09	2E 01	6E-03	2E-09	2E-01	2E-01	1E-07	2E-01	1E-07	59	79
		Uranium-238	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Total		**1E-02**	**2E-08**		**4E-02**	**2E-08**		**2E-01**	**1E-07**	**3E-01**	**1E-07**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical maintenance worker in EU 3 in this table. This individual is assumed to be exposed to contaminated surface soil in EU 3 at the SLDA. These doses and risks are based on the estimated intakes given in Table R.3, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated. All values are given to one significant figure.

TABLE R.20
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL MAINTENANCE WORKER FOR SITE-WIDE EXPOSURES[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Maintenance Worker															
Site Average															
Surface Soil															
		Americium-241	8E-02	3E-02	2E-09	2E 01	6E-02	2E-09	1E-01	6E-03	4E-09	1E-02	8E-09	26	11
		Plutonium-239	9E-02	4E-02	3E-09	2E 01	7E-02	3E-09	2E-01	5E-05	4E-11	1E-01	7E-09	29	8
		Plutonium-241	8E-01	7E-03	3E-10	2E 02	1E-02	4E-10	2E 00	3E-05	2E-11	2E-02	7E-10	5	1
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	4E-01	6E-02	1E-08	9E 01	3E-02	9E-09	9E-01	3E-04	2E-10	8E-02	2E-08	23	28
		Uranium-235	3E-02	4E-03	8E-10	7E 00	2E-03	6E-10	6E-02	5E-02	3E-08	5E-02	3E-08	14	44
		Uranium-238	3E-02	4E-03	7E-10	7E 00	2E-03	8E-10	6E-02	8E-03	5E-09	1E-02	7E-09	4	9
		Total		**1E-01**	**2E-08**		**2E-01**	**2E-08**		**6E-02**	**4E-08**	**4E-01**	**8E-08**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical maintenance worker for site-wide exposures in this table. This individual is assumed to be exposed to contaminated surface soil across the site at the SLDA. These doses and risks are based on the estimated intakes given in Table R.4, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated. All values are given to one significant figure.

TABLE R.21
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL ADOLESCENT TRESPASSER IN EXPOSURE UNIT 1[a]

			Radiation Doses and Risks													
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Trespasser															
EU 1 (Trenches 1 to 9)															
Surface Soil															
		Americium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-239	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-241	5E-02	4E-04	2E-11	1E 01	1E-04	3E-11	1E-01	2E-06	2E-12	1E-03	5E-11	5	0
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	7E-02	9E-03	2E-09	2E 01	5E-03	2E-09	2E-01	7E-05	4E-11	1E-02	4E-09	48	29
		Uranium-235	6E-03	7E-04	1E-10	1E 00	4E-04	1E-10	1E-02	1E-02	7E-09	1E-02	8E-09	37	58
		Uranium-238	6E-03	7E-04	1E-10	2E 00	4E-04	2E-10	1E-02	2E-03	1E-09	3E-03	2E-09	11	12
		Total		**1E-02**	**2E-09**		**7E-03**	**2E-09**		**1E-02**	**9E-09**	**3E-02**	**1E-08**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical adolescent trespasser in EU 1 in this table. This individual is assumed to be exposed to contaminated surface soil in EU 1 at the SLDA. These doses and risks are based on the estimated intakes given in Table R.5, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated. All values are given to one significant figure.

TABLE R.22
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL ADOLESCENT TRESPASSER IN EXPOSURE UNIT 2[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Trespasser															
EU 2 (Trench 10)															
Surface Soil															
		Americium-241	1E 00	5E-01	3E-08	3E 02	1E 00	4E-08	3E 00	1E-01	7E-08	2E 00	1E-07	34	43
		Plutonium-239	2E 00	1E 00	8E-08	6E 02	2E 00	1E-07	6E 00	2E-03	1E-09	3E 00	2E-07	66	57
		Plutonium-241	3E-01	3E-03	1E-10	8E 01	6E-03	2E-10	8E-01	1E-05	1E-11	8E-03	3E-10	0	0
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	5E-03	7E-04	1E-10	1E 00	4E-04	1E-10	1E-02	5E-06	3E-12	1E-03	3E-10	0	0
		Uranium-235	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-238	1E-03	1E-04	3E-11	3E-01	9E-05	4E-11	3E-03	4E-04	3E-10	6E-04	3E-10	0	0
		Total		**2E+00**	**1E-07**		**3E+00**	**1E-07**		**1E-01**	**7E-08**	**5E+00**	**3E-07**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical adolescent trespasser in EU 2 in this table. This individual is assumed to be exposed to contaminated surface soil in EU 2 at the SLDA. These doses and risks are based on the estimated intakes given in Table R.6, and the risk factors and DCFs given in Table 6-6. All values are given to one significant figure.

TABLE R.23
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL ADOLESCENT TRESPASSER IN EXPOSURE UNIT 3[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Trespasser															
EU 3 (Southeast fence area)															
Surface Soil															
		Americium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-239	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	6E-02	8E-03	2E-09	2E 01	5E-03	2E-09	2E-01	6E-05	4E-11	1E-02	3E-09	38	19
		Uranium-235	1E-02	1E-03	3E-10	3E 00	8E-04	3E-10	3E-02	2E-02	1E-08	2E-02	1E-08	62	81
		Uranium-238	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Total		**1E-03**	**2E-09**		**6E-03**	**2E-09**		**2E-02**	**1E-08**	**3E-02**	**2E-08**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical adolescent trespasser in EU 3 in this table. This individual is assumed to be exposed to contaminated surface soil in EU 3 at the SLDA. These doses and risks are based on the estimated intakes given in Table R.7, and the risk factors and DCFs given in Table 6-6. All values are given to one significant figure.

TABLE R.24
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL ADOLESCENT TRESPASSER FOR SITE-WIDE EXPOSURES[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Trespasser															
	Site Average														
Surface Soil															
		Americium-241	8E-03	3E-03	2E-10	2E 00	7E-03	3E-10	2E-02	8E-04	5E-10	1E-02	1E-10	27	11
		Plutonium-239	9E-03	4E-03	3E-10	2E 00	9E-03	4E-10	2E-02	7E-06	5E-12	1E-02	7E-10	29	8
		Plutonium-241	8E-02	7E-04	3E-11	2E 01	1E-03	5E-11	2E-01	4E-06	3E-12	2E-03	8E-11	5	1
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	4E-02	6E-03	1E-09	1E 01	3E-03	1E-09	1E-01	4E-05	3E-11	9E-03	2E-09	21	26
		Uranium-235	3E-03	4E-04	8E-11	8E-01	2E-04	8E-11	8E-03	6E-03	4E-09	6E-03	4E-09	14	46
		Uranium-238	3E-03	4E-04	7E-11	8E-01	2E-04	1E-11	8E-03	1E-03	6E-10	2E-03	8E-10	4	9
		Total		**1E-02**	**2E-09**		**2E-02**	**2E-09**		**8E-03**	**5E-09**	**4E-02**	**9E-09**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical adolescent trespasser for site-wide exposure in this table. This individual is assumed to be exposed to contaminated surface soil across the site at the SLDA. These doses and risks are based on the estimated intakes given in Table R.8, and the risk factors and DCFs given in Table 6-6. All values are given to one significant figure.

TABLE R.25
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL CONSTRUCTION WORKER IN EXPOSURE UNIT 1[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Construction Worker															
EU 1 (Trenches 1 to 9)															
Soil															
		Americium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0.00E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-239	4E-03	2E-03	1E-10	3E 00	9E-03	4E-10	9.40E-03	3E-06	2E-12	1E-02	6E-10	4	1
		Plutonium-241	3E-02	8E-03	5E-10	2E 01	4E-02	1E-09	7.42E-02	2E-03	1E-09	5E-02	3E-09	19	4
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0.00E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0.00E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	4E-01	5E-02	1E-08	2E 02	7E-02	2E-08	8.78E-01	1E-02	8E-09	1E-01	4E-08	51	52
		Uranium-235	1E-02	3E-03	4E-10	1E 00	5E-03	1E-09	3.40E-02	3E-02	2E-08	4E-02	2E-08	14	26
		Uranium-238	4E-02	4E-03	9E-10	2E 01	6E-03	3E-09	8.72E-02	1E-02	8E-09	2E-02	1E-08	9	15
Groundwater															
		Americium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-239				3E-03	9E-06	5E-13				9E-06	5E-13	0	0
		Plutonium-241				1E-01	2E-04	8E-12				2E-04	8E-12	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				2E 01	7E-03	2E-09				7E-03	2E-09	3	3
		Uranium-235				1E-01	6E-04	1E-10				6E-04	1E-10	0	0
		Uranium-238				2E 00	6E-04	3E-10				6E-04	3E-10	0	0
		Total		**7E-02**	**1E-08**		**1E-01**	**3E-08**		**5E-02**	**4E-08**	**3E-01**	**8E-08**	100	100

[a] The estimated intakes, radiation does (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical construction worker in EU 1 in this table. This individual is assumed to be exposed to contaminated surface soil in EU 1 at the SLDA. These doses and risks are based on the estimated intakes given in Table R.9, and the risk factors and DCFs given in Table 6.6. Zeroes indicate that the radionuclide concentration is not elevated and blank entries indicate that the exposure route is not applicable for that environmental medium. All values are given to one significant figure.

TABLE R.26
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL CONSTRUCTION WORKER IN EXPOSURE UNIT 2[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Construction Worker															
	EU 2 (Trench 10)														
Soil															
		Americium-241	2E-01	9E-02	6E-09	1E 02	5E-01	2E-08	5E-01	2E-02	1E-08	6E-01	4E-08	39	42
		Plutonium-239	3E-01	1E-01	1E-08	2E 02	7E-01	4E-08	7E-01	2E-04	1E-10	9E-01	5E-08	55	51
		Plutonium-241	6E-02	1E-02	9E-10	4E 01	7E-02	3E-09	1E-01	3E-03	2E-09	9E-02	6E-09	6	6
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	1E-03	1E-04	3E-11	6E-01	2E-04	6E-11	2E-03	3E-05	2E-11	4E-04	1E-10	0	0
		Uranium-235	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-238	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
Groundwater															
		Americium-241				4E 00	2E-02	6E-10				2E-02	6E-10	1	1
		Plutonium-239				2E-01	7E-04	4E-11				7E-04	4E-11	0	0
		Plutonium-241				2E-01	4E-04	1E-11				4E-04	1E-11	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				7E-02	2E-05	6E-12				2E-05	6E-12	0	0
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Total		**2E-01**	**2E-08**		**1E+00**	**6E-08**		**3E-02**	**2E-08**	**2E+00**	**9E-08**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical construction worker in EU 2 in this table. This individual is assumed to be exposed to contaminated surface soil in EU 2 at the SLDA. These doses and risks are based on the estimated intakes given in Table R.10, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated and blank entries indicate that the exposure route is not applicable for that environmental medium. All values are given to one significant figure.

TABLE R.27
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL CONSTRUCTION WORKER IN EXPOSURE UNIT 3[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Construction Worker															
EU 3 (Southeast fence area)															
Soil															
		Americium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-239	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	8E-02	1E-03	2E-09	5E 01	1E-02	5E-09	2E-01	3E-03	2E-09	3E-02	8E-09	95	95
		Uranium-235	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-238	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
Groundwater															
		Americium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-239				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				5E 00	1E-03	5E-10				1E-03	5E-10	5	5
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Total		**1E-03**	**2E-09**		**1E-02**	**5E-09**		**3E-03**	**2E-09**	**3E-02**	**9E-09**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical construction worker in EU 3 in this table. This individual is assumed to be exposed to contaminated surface soil in EU 3 at the SLDA. These doses and risks are based on the estimated intakes given in Table R.11, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated and blank entries indicate that the exposure route is not applicable for that environmental medium. All values are given to one significant figure.

TABLE R.28
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL CONSTRUCTION WORKER FOR SITE-WIDE EXPOSURES[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Construction Worker															
	Site Average														
Soil															
		Americium-241	2E-02	9E-03	6E-10	1E 01	5E-02	2E-09	5E-02	2E-03	1E-09	6E-02	4E-09	25	11
		Plutonium-239	2E-02	7E-03	6E-10	1E 01	4E-02	2E-09	4E-02	1E-05	8E-12	5E-02	2E-09	20	8
		Plutonium-241	4E-02	9E-03	6E-10	2E 01	5E-02	2E-09	8E-02	2E-03	1E-09	6E-02	3E-09	24	11
		Radium-228	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234	2E-01	2E-02	5E-09	1E 02	3E-02	1E-08	4E-01	6E-03	4E-09	7E-02	2E-08	28	63
		Uranium-235	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-238	4E-03	5E-04	1E-11	3E 00	7E-04	3E-10	9E-03	1E-03	9E-10	3E-03	1E-09	1	4
Groundwater															
		Americium-241				4E-01	1E-03	5E-11				1E-03	5E-11	1	0
		Plutonium-239				1E-02	4E-05	2E-12				4E-05	2E-12	0	0
		Plutonium-241				1E-01	2E-04	9E-12				2E-04	9E-12	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				1E 01	3E-03	1E-09				3E-03	1E-09	1	4
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				2E-01	6E-05	3E-11				6E-05	3E-11	0	0
		Total		**5E-02**	**7E-09**		**2E-01**	**2E-08**		**1E-02**	**7E-09**	**2E-01**	**3E-08**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical construction worker for site-wide exposures in this table. This individual is assumed to be exposed to contaminated surface soil across the site at the SLDA. These doses and risks are based on the estimated intakes given in Table R.12, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated and blank entries indicate that the exposure route is not applicable for that environmental medium. All values are given to one significant figure.

TABLE R.29
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL SUBSISTENCE FARMER IN EXPOSURE UNIT 1[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Subsistence Farmer															
EU 1 (Trenches 1 to 9)															
Soil															
		Americium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-239	1E-02	4E-03	3E-10	2E 01	6E-02	3E-09	4E-01	1E-04	7E-11	6E-02	3E-09	0	0
		Plutonium-241	8E-02	2E-02	1E-09	1E 02	3E-01	1E-09	3E 00	7E-02	4E-08	4E-01	5E-08	1	0
		Radium-228 [b]	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232 [b]	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234 [c]	9E-01	1E 01	4E-06	2E 03	5E-01	2E-07	3E 01	5E-01	3E-07	1E 01	4E-06	26	30
		Uranium-235	4E-02	8E-03	1E-10	6E 01	4E-02	7E-09	1E 00	1E 00	7E-07	1E 00	8E-07	2	6
		Uranium-238 [c]	9E-02	1E-02	3E-09	2E 02	4E-02	2E-08	3E 00	5E-01	3E-07	6E-01	3E-07	1	2
Groundwater															
		Americium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-239				8E-01	3E-03	1E-10				3E-03	1E-10	0	0
		Plutonium-241				3E 01	6E-02	2E-09				6E-02	2E-09	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				7E 03	2E 00	7E-07				2E 00	7E-07	5	5
		Uranium-235				3E 02	2E-01	3E-08				2E-01	3E-08	0	0
		Uranium-238				6E 02	2E-01	8E-08				2E-01	8E-08	0	1
Produce															
		Americium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-239				2E 02	8E-01	4E-08				8E-01	4E-08	2	0
		Plutonium-241				2E 03	4E 00	2E-07				4E 00	2E-07	10	1
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0

TABLE R.29 (Continued)
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL SUBSISTENCE FARMER IN EXPOSURE UNIT 1[a]

			Radiation Doses and Risks													
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
		Uranium-234				5E 04	1E 01	5E-06				1E 01	5E-06	32	34
		Uranium-235				3E 03	2E 00	4E-07				2E 00	4E-07	4	3
		Uranium-238				4E 03	1E 00	5E-07				1E 00	5E-07	3	4
Beef, Poultry and Dairy Products															
		Americium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-239				4E 00	2E-02	8E-10				2E-02	8E-10	0	0
		Plutonium-241				3E 01	5E-02	2E-09				5E-02	2E-09	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				1E 04	4E 00	1E-06				4E 00	1E-06	9	10
		Uranium-235				3E 02	1E-01	3E-08				1E-01	3E-08	0	0
		Uranium-238				1E 03	4E-01	2E-07				4E-01	2E-07	1	1
Fish															
		Americium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-239				1E 00	4E-03	2E-10				4E-03	2E-10	0	0
		Plutonium-241				6E 01	1E-01	4E-09				1E-01	5E-09	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				3E 03	8E-01	3E-07				8E-01	3E-07	2	2
		Uranium-235				2E 02	1E-02	2E-08				1E-02	2E-08	0	0
		Uranium-238				3E 02	8E-02	3E-08				8E-02	3E-08	0	0
		Total		**1E+01**	**4E-06**		**3E+01**	**9E-06**		**2E+00**	**1E-06**	**4E+01**	**1E-05**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical subsistence farmer in EU 1 in this table. This individual is assumed to be exposed to contaminated soil (surface and subsurface) and groundwater in EU 1 at the SLDA, as well as impacted foodstuffs. These doses and risks are based on the estimated intakes given in Table R.13, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated and blank entries indicate that the exposure route is not applicable for that environmental medium. All values are given to one significant figure.

[b] Includes the contribution from Rn-220 and its short-lived decay products. The cancer risk was calculated using a risk factor of 1.2×10^{-7} per mrem based on information given in National Research Council (1988) and International Commission on Radiological Protection (1981).

[c] Includes the contribution from Rn-222 and its short-lived decay products. The cancer risk was calculated using a risk factor of 3.5×10^{-7} per mrem based on information given in National Research Council (1988).

TABLE R.30
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL SUBSISTENCE FARMER IN EXPOSURE UNIT 2[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Subsistence Farmer															
	EU 2 (Trench 10)														
Soil															
		Americium-241	5E-01	2E-01	1E-08	9E 02	3E 00	1E-07	2E 01	8E-01	5E-07	4E 00	7E-07	3	10
		Plutonium-239	8E-01	3E-01	3E-08	1E 03	5E 00	2E-07	3E 01	9E-03	6E-09	5E 00	3E-07	4	4
		Plutonium-241	1E-01	3E-02	2E-09	2E 02	5E-01	2E-08	5E 00	1E-01	8E-08	6E-01	1E-08	0	1
		Radium-228 [b]	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232 [b]	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234 [c]	3E-03	3E-02	1E-09	4E 00	1E-03	4E-10	9E-02	1E-03	9E-10	3E-02	1E-08	0	0
		Uranium-235	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-238 [c]	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
Groundwater															
		Americium-241				1E 03	4E 00	2E-07				4E 00	2E-07	3	2
		Plutonium-239				6E 01	2E-01	1E-08				2E-01	1E-08	0	0
		Plutonium-241				6E 01	1E-01	4E-09				1E-01	4E-09	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				2E 01	5E-03	2E-09				5E-03	2E-09	0	0
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
Produce															
		Americium-241				1E 04	5E 01	2E-06				5E 01	2E-06	32	25
		Plutonium-239				2E 04	7E 01	3E-06				7E 01	3E-06	47	49
		Plutonium-241				4E 03	8E 00	3E-07				8E 00	3E-07	6	4
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				1E 02	4E-02	1E-08				4E-02	1E-08	0	0
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				0E 00	0E 00	0E 00				0E 00	0E 00	0	0

TABLE R.30 (Continued)
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL SUBSISTENCE FARMER IN EXPOSURE UNIT 2[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Beef, Poultry and Dairy Products															
		Americium-241				1E 02	5E-01	2E-08				5E-01	2E-08	0	0
		Plutonium-239				4E 02	1E 00	6E-08				1E 00	6E-08	1	1
		Plutonium-241				5E 01	9E-02	3E-09				9E-02	3E-09	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				4E 00	1E 00	3E 00				1E 00	3E 00	0	0
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
Fish															
		Americium-241				8E 02	3E 00	1E-07				3E 00	1E-07	2	2
		Plutonium-239				9E 01	3E-01	2E-08				3E-01	2E-08	0	0
		Plutonium-241				1E 02	2E-01	8E-09				2E-01	8E-09	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				8E 00	2E-03	7E-10				2E-03	7E-10	0	0
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Total		**6E-01**	**5E-08**		**1E+02**	**6E-06**		**1E-01**	**6E-07**	**1E+02**	**7E-06**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical subsistence farmer in EU 2 in this table. This individual is assumed to be exposed to contaminated soil (surface and subsurface) and groundwater in EU 2 at the SLDA, as well as impacted foodstuffs. These doses and risks are based on the estimated intakes given in Table R.14, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated and blank entries indicate that the exposure route is not applicable for that environmental medium. All values are given to one significant figure.

[b] Includes the contribution from Rn-220 and its short-lived decay products. The cancer risk was calculated using a risk factor of 1.2×10^{-7} per mrem based on information given in National Research Council (1988) and International Commission on Radiological Protection (1981).

[c] Includes the contribution from Rn-222 and its short-lived decay products. The cancer risk was calculated using a risk factor of 3.5×10^{-7} per mrem based on information given in National Research Council (1988).

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TABLE R.31
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL SUBSISTENCE FARMER IN EXPOSURE UNIT 3[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Subsistence Farmer															
EU 3 (South West Fence Area)															
Soil															
		Americium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-239	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Plutonium-241	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Radium-228 [b]	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232 [b]	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234 [c]	2E-01	2E 00	7E-07	3E 02	9E-02	3E-08	7E 00	1E-01	6E-08	2E 00	8E-07	33	35
		Uranium-235	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-238 [c]	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
Groundwater															
		Americium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-239				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				1E 03	4E-01	1E-07				4E-01	1E-07	6	6
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
Produce															
		Americium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-239				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				1E 03	3E 00	9E-07				3E 00	9E-07	41	39
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				0E 00	0E 00	0E 00				0E 00	0E 00	0	0

TABLE R.31 (Continued)
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL SUBSISTENCE FARMER IN EXPOSURE UNIT 3[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Beef, Poultry and Dairy Products															
		Americium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-239				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				3E 03	8E-01	3E-07				8E-01	3E-07	11	11
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
Fish															
		Americium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-239				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Plutonium-241				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E-00	0E-00				0E-00	0E-00	0	0
		Uranium-234				6E 02	2E-01	5E-08				2E-01	5E-08	2	2
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Total		**2E+00**	**7E-07**		**4E+00**	**1E-06**		**1E-01**	**6E-08**	**6E+00**	**2E-06**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical subsistence farmer in EU 3 in this table. This individual is assumed to be exposed to contaminated soil (surface and subsurface) and groundwater in EU 3 at the SLDA, as well as impacted foodstuffs. These doses and risks are based on the estimated intakes given in Table R.15, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated and blank entries indicate that the exposure route is not applicable for that environmental medium. All values are given to one significant figure.

[b] Includes the contribution from Rn-220 and its short-lived decay products. The cancer risk was calculated using a risk factor of 1.2×10^{-7} per mrem based on information given in National Research Council (1988) and International Commission on Radiological Protection (1981).

[c] Includes the contribution from Rn-222 and its short-lived decay products. The cancer risk was calculated using a risk factor of 3.5×10^{-7} per mrem based on information given in National Research Council (1988).

TABLE R.32
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL SUBSISTENCE FARMER FOR SITE-WIDE EXPOSURES[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Subsistence Farmer															
	Site Wide														
Soil															
		Americium-241	5E-02	2E-02	1E-09	8E 01	3E-01	1E-08	2E 00	8E-02	5E-08	4E-01	6E-08	1	1
		Plutonium-239	4E-02	2E-02	1E-09	7E 01	3E-01	1E-08	2E 00	5E-04	3E-10	3E-01	1E-08	1	0
		Plutonium-241	9E-02	2E-02	1E-09	2E 02	3E-01	1E-08	3E 00	8E-02	5E-08	4E-01	6E-08	1	1
		Radium-228 [b]	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Thorium-232 [b]	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-234 [c]	5E-01	5E 00	2E-06	8E 02	2E-01	8E-08	2E 01	3E-01	2E-07	6E 00	2E-06	18	32
		Uranium-235	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0E 00	0	0
		Uranium-238 [c]	1E-02	1E-03	3E-10	2E 01	5E-03	2E-09	4E-01	5E-02	3E-08	6E-02	4E-08	0	1
Groundwater															
		Americium-241				1E 02	4E-01	2E-08				4E-01	2E-08	1	0
		Plutonium-239				3E 00	1E-02	6E-10				1E-02	6E-10	0	0
		Plutonium-241				4E 01	7E-02	3E-09				7E-02	3E-09	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				3E 03	1E-01	3E-07				1E-01	3E-07	3	5
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				7E 01	2E-02	8E-09				2E-02	8E-09	0	0
Produce															
		Americium-241				1E 03	4E 00	2E-07				4E 00	2E-07	14	3
		Plutonium-239				1E 03	4E 00	2E-07				4E 00	2E-07	11	3
		Plutonium-241				3E 03	5E 00	2E-07				5E 00	2E-07	16	3
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				2E 04	7E 00	2E-06				7E 00	2E-06	22	37
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				5E 02	1E-01	6E-08				1E-01	6E-08	0	1

TABLE R.32 (Continued)
RADIOLOGICAL DOSES AND RISKS FOR A HYPOTHETICAL SUBSISTENCE FARMER FOR SITE-WIDE EXPOSURES[a]

			Radiation Doses and Risks												
			Inhalation			Ingestion			External Gamma			Total by Contaminant		Percentage of Total	
Receptor	Location	Contaminant	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (pCi)	Dose (mrem)	Cancer Risk	Intake (yr-pCi soil)	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk	Dose (mrem)	Cancer Risk
Beef, Poultry and Dairy Products															
		Americium-241				1E 01	5E-02	2E-09				5E-02	2E-09	0	0
		Plutonium-239				2E 01	7E-02	3E-09				7E-02	3E-09	0	0
		Plutonium-241				3E 01	6E-02	2E-09				6E-02	2E-09	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				7E 03	2E 00	6E-07				2E 00	6E-07	6	10
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				1E 02	4E-02	2E-08				4E-02	2E-08	0	0
Fish															
		Americium-241				8E 01	3E-01	1E-08				3E-01	1E-08	1	0
		Plutonium-239				5E 00	2E-02	8E-10				2E-02	8E-10	0	0
		Plutonium-241				7E 01	1E-01	5E-09				1E-01	5E-09	0	0
		Radium-228				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Thorium-232				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-234				1E 03	4E-01	1E-07				4E-01	1E-07	1	2
		Uranium-235				0E 00	0E 00	0E 00				0E 00	0E 00	0	0
		Uranium-238				3E 01	8E-03	4E-09				8E-03	4E-09	0	0
		Total		**5E+00**	**2E-06**		**3E+01**	**4E-06**		**5E-01**	**3E-07**	**3E+01**	**6E-06**	100	100

[a] The estimated intakes, radiation doses (in mrem), and radiological carcinogenic risks for the various routes of exposure are presented for the hypothetical subsistence farmer for site-wide exposures in this table. This individual is assumed to be exposed to contaminated soil (surface and subsurface) and groundwater across the site at the SLDA, as well as impacted foodstuffs. These doses and risks are based on the estimated intakes given in Table R.16, and the risk factors and DCFs given in Table 6-6. Zeroes indicate that the radionuclide concentration is not elevated and blank entries indicate that the exposure route is not applicable for that environmental medium. All values are given to one significant figure.

[b] Includes the contribution from Rn-220 and its short-lived decay products. The cancer risk was calculated using a risk factor of 1.2×10^{-7} per mrem based on information given in National Research Council (1988) and International Commission on Radiological Protection (1981).

[c] Includes the contribution from Rn-222 and its short-lived decay products. The cancer risk was calculated using a risk factor of 3.5×10^{-7} per mrem based on information given in National Research Council (1988).

[d].

R.3 ADDITIONAL SUPPORTING INFORMATION

Additional information supporting the BRA is provided in two tables in this section. Table R.33 summarizes information from the probabilistic RESRAD calculations that were used to develop the PRGs for the primary ROPCs at the SLDA site. The PRGs were developed for a Subsistence Farmer scenario using the All Pathways results in Table R.33 (provided on the top line). The PRG for each radionuclide was obtained by taking the annual dose limit (25 mrem/yr) and dividing it by the corresponding value from Table R.33 (mrem/yr per pCi/g) to give the concentration that would result in an annual dose of 25 mrem/yr. The pathway-specific doses given in Table R.33 were also obtained from these RESRAD calculations, and were used to determine the radionuclide intakes, radiation doses, and radiological carcinogenic risks for the two future-use scenarios as described in Sections R.1 and R.2. The sum of the pathway-specific values slightly exceeds the All Pathways value (by a few percent), which provides some minor additional conservatism to the estimated doses and risks presented in this BRA.

The potential for noncarcinogenic health effects from oral intakes of uranium was also assessed in this BRA. To support this evaluation, it was necessary to convert the uranium intakes in activity (in pCi) to mass (in mg). The oral intake of uranium was determined using the ingestion intakes for the three uranium isotopes given in Tables R.1 through R.16, and multiplying these values by the following factors – U-234: 1.67×10^{-7}, U.235: 4.62×10^{-4}, and U-238: 2.98×10^{-3}. These factors are simply the reciprocals of the standard specific activities for these three uranium isotopes (Ci/g), divided by 1 billion to get the conversion factors into the correct units of mg/pCi. The intakes (in mg) for the three uranium isotopes are then summed to obtain the total oral intake of uranium for each of the four scenarios at the three EUs and for site-wide exposures. These intakes were used along with other relevant information to calculate the HI for these scenarios in Section 6.5.2.

TABLE R.33
PATHWAY-SPECIFIC DOSES (in mrem/yr per pCi/g) FOR THE SUBSISTENCE FARMER SCENARIO[a]

	U-238	U-235	U-234	Th-232	Ra-228	Pu-241	Pu-239	Am-241
All Pathways	**2.04E-01**	**7.22E-01**	**2.59E-01**	**1.85E+01**	**1.48E+01**	**2.80E-02**	**7.67E-01**	**9.04E-01**
External Gamma Exposure	4.51E-02	2.30E-01	4.51E-03	4.70E 00	2.86E 00	3.79E-04	8.98E-05	1.33E-02
Inhalation of Particulates	9.85E-04	1.73E-03	1.10E-03	1.64E-02	1.68E-03	1.10E-04	3.58E-03	3.70E-03
Inhalation of Radon Decay Products	8.60E-05	0.00E 00	9.09E-02	1.03E-01	6.06E-02	0.00E 00	0.00E 00	0.00E 00
Soil Ingestion	3.81E-03	7.91E-03	4.05E-03	6.92E-02	2.13E-02	1.53E-03	5.01E-02	5.14E-02
Water Ingestion	1.52E-02	3.54E-02	1.75E-02	2.85E-03	9.50E-08	3.57E-04	2.22E-03	6.99E-02
Fish Ingestion	6.96E-03	2.15E-02	7.31E-03	1.83E-02	4.76E-08	6.95E-04	3.26E-03	4.84E-02
Produce Ingestion	1.08E-01	4.25E-01	1.23E-01	1.18E 01	1.08E 01	2.54E-02	6.98E-01	7.20E-01
Beef and Poultry Ingestion	1.05E-02	1.05E-02	1.12E-02	2.62E-01	2.37E-01	2.55E-04	1.27E-02	6.58E-03
Dairy Product Ingestion	2.11E-02	2.10E-02	2.32E-02	1.56E 00	1.50E 00	3.75E-05	5.52E-04	1.28E-03

[a] This table summarizes information from the probabilistic RESRAD calculations used to develop the PRGs. This information was used to determine the radionuclide intakes, radiation doses, and radiological carcinogenic risks for the two future-use scenarios as described in the text.

TABLE R.34
CONVERSION OF ORAL INTAKES OF URANIUM FROM ACTIVITY TO MASS[a]

			Intake	
Receptor	Location	Contaminant	Ingestion (pCi)	Ingestion mg
Maintenance Worker				
EU 1 (Trenches 1 to 9)				
Surface Soil				
		Uranium-234	1.5E 02	2.4E-05
		Uranium-235	1.2E 01	5.5E-03
		Uranium-238	1.3E 01	3.9E-02
		Total uranium		**4.4E-02**
EU 2 (Trench 10)				
Surface Soil				
		Uranium-234	1.1E 01	1.8E-06
		Uranium-235	0.0E 00	0.0E 00
		Uranium-238	2.6E 00	7.7E-03
		Total uranium		**7.7E-03**
EU 3 (Southeast fence area)				
Surface Soil				
		Uranium-234	1.4E 02	2.2E-05
		Uranium-235	2.3E 01	1.0E-02
		Uranium-238	0.0E 00	0.0E 00
		Total uranium		**1.0E-02**
Site Average				
Surface Soil				
		Uranium-234	9.4E 01	1.5E-05
		Uranium-235	6.6E 00	3.0E-03
		Uranium-238	6.6E 00	2.0E-02
		Total uranium		**2.3E-02**

TABLE R.34 (Continued)
CONVERSION OF ORAL INTAKES OF URANIUM FROM ACTIVITY TO MASS[a]

			Intake	
Receptor	Location	Contaminant	Ingestion (pCi)	Ingestion mg
Trespasser				
EU 1 (Trenches 1 to 9)				
Surface Soil				
		Uranium-234	1.9E 01	3.0E-06
		Uranium-235	1.5E 00	6.8E-04
		Uranium-238	1.6E 00	4.8E-03
		Total uranium		**5.5E-03**
EU 2 (Trench 10)				
Surface Soil				
		Uranium-234	1.4E 00	2.2E-07
		Uranium-235	0.0E 00	0.0E 00
		Uranium-238	3.3E-01	9.7E-04
		Total uranium		**9.7E-04**
EU 3 (Southeast fence area)				
Surface Soil				
		Uranium-234	1.7E 01	2.7E-06
		Uranium-235	2.8E 00	1.3E-03
		Uranium-238	0.0E 00	0.0E 00
		Total uranium		**1.3E-03**
Site Average				
Surface Soil				
		Uranium-234	1.2E 01	1.9E-06
		Uranium-235	8.3E-01	3.8E-04
		Uranium-238	8.3E-01	2.5E-03
		Total uranium		**2.8E-03**

TABLE R.34 (Continued)
CONVERSION OF ORAL INTAKES OF URANIUM FROM ACTIVITY TO MASS[a]

			Intake	
Receptor	Location	Contaminant	Ingestion (pCi)	Ingestion mg
Construction Worker				
EU 1 (Trenches 1 to 9)				
Soil				
		Uranium-234	2.4E 02	3.9E-05
		Uranium-235	9.6E 00	4.4E-03
		Uranium-238	2.4E 01	7.1E-02
Groundwater				
		Uranium-234	2.44E 01	3.9E-06
		Uranium-235	9.98E-01	4.6E-04
		Uranium-238	2.20E 00	6.6E-03
		Total uranium		**8.2E-02**
EU 2 (Trench 10)				
Soil				
		Uranium-234	6.47E-01	1.0E-07
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
Groundwater				
		Uranium-234	6.53E-02	1.0E-08
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
		Total uranium		**1.1E-07**

TABLE R.34 (Continued)
CONVERSION OF ORAL INTAKES OF URANIUM FROM ACTIVITY TO MASS[a]

			Intake	
Receptor	Location	Contaminant	Ingestion (pCi)	Ingestion mg
Construction Worker				
EU 3 (Southeast fence area)				
Soil				
		Uranium-234	4.79E 01	7.7E-06
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
Groundwater				
		Uranium-234	4.83E 00	7.7E-07
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
		Total uranium		**8.4E-06**
Site Average				
Soil				
		Uranium-234	1.2E 02	1.9E-05
		Uranium-235	0.0E 00	0.0E 00
		Uranium-238	2.6E 00	7.6E-03
Groundwater				
		Uranium-234	1.21E 01	1.9E-06
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	2.38E-01	7.1E-04
		Total uranium		**8.4E-03**

TABLE R.34 (Continued)
CONVERSION OF ORAL INTAKES OF URANIUM FROM ACTIVITY TO MASS[a]

			Intake	
Receptor	Location	Contaminant	Ingestion (pCi)	Ingestion mg
Subsistence Farmer				
EU 1 (Trenches 1 to 9)				
Soil				
		Uranium-234	1.60E 03	2.6E-04
		Uranium-235	6.35E 01	2.9E-02
		Uranium-238	1.57E 02	4.7E-01
Groundwater				
		Uranium-234	6.934E 03	1.1E-03
		Uranium-235	2.842E 02	1.3E-01
		Uranium-238	6.269E 02	1.9E 00
Produce				
		Uranium-234	4.86E 04	7.8E-03
		Uranium-235	3.41E 03	1.6E 00
		Uranium-238	4.44E 03	1.3E 01
Beef, Poultry and Dairy Products				
		Uranium-234	1.36E 04	2.2E-03
		Uranium-235	2.53E 02	1.2E-01
		Uranium-238	1.30E 03	3.9E 00
Fish				
		Uranium-234	2.89E 03	4.6E-04
		Uranium-235	1.73E 02	8.0E-02
		Uranium-238	2.87E 02	8.6E-01
		Total uranium		**2.2E+01**

TABLE R.34 (Continued)
CONVERSION OF ORAL INTAKES OF URANIUM FROM ACTIVITY TO MASS[a]

			Intake	
Receptor	Location	Contaminant	Ingestion (pCi)	Ingestion mg
Subsistence Farmer				
	EU 2 (Trench 10)			
Soil				
		Uranium-234	4.29E 00	6.9E-07
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
Groundwater				
		Uranium-234	1.859E 01	3.0E-06
		Uranium-235	0.000E 00	0.0E 00
		Uranium-238	0.000E 00	0.0E 00
Produce				
		Uranium-234	1.30E 02	2.1E-05
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
Beef, Poultry and Dairy Products				
		Uranium-234	0.00E 00	0.0E 00
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
Fish				
		Uranium-234	7.75E 00	1.2E-06
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
		Total uranium		**2.6E-05**

TABLE R.34 (Continued)
CONVERSION OF ORAL INTAKES OF URANIUM FROM ACTIVITY TO MASS[a]

			Intake	
Receptor	Location	Contaminant	Ingestion (pCi)	Ingestion mg
Subsistence Farmer				
EU 3 (Southeast fence area)				
Soil				
		Uranium-234	3.18E 02	5.1E-05
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
Groundwater				
		Uranium-234	1.38E 03	2.2E-04
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
Produce				
		Uranium-234	9.65E 03	1.5E-03
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
Beef, Poultry and Dairy Products				
		Uranium-234	2.70E 03	4.3E-04
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
Fish				
		Uranium-234	5.73E 02	9.2E-05
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	0.00E 00	0.0E 00
		Total uranium		**2.3E-03**

TABLE R.34 (Continued)
CONVERSION OF ORAL INTAKES OF URANIUM FROM ACTIVITY TO MASS[a]

			Intake	
Receptor	Location	Contaminant	Ingestion (pCi)	Ingestion mg
Subsistence Farmer				
Site Average				
Soil				
		Uranium-234	7.94E 02	1.3E-04
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	1.70E 01	5.1E-02
Groundwater				
		Uranium-234	3.44E 03	5.5E-04
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	6.78E 01	2.0E-01
Produce				
		Uranium-234	2.41E 04	3.9E-03
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	4.80E 02	1.4E 00
Beef, Poultry and Dairy Products				
		Uranium-234	6.75E 03	1.1E-03
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	1.41E 02	4.2E-01
Fish				
		Uranium-234	1.43E 03	2.3E-04
		Uranium-235	0.00E 00	0.0E 00
		Uranium-238	3.11E 01	9.3E-02
		Total uranium		**2.2E+00**

[a] This table summarizes the conversion of uranium intakes from activity to mass to support calculation of the HI. The activities (in pCi) were converted to mass (in mg) using the following factors as described in the text – U-234: 1.67×10^{-7}, U-235: 4.62×10^{-4}, and U-238: 2.98×10^{-3}.

R.4 REFERENCES

ANL, 2001, *User's Manual for RESRAD Version 6.0*, ANL/EAD-4, Environmental Assessment Division, Argonne National Laboratory, Argonne, Illinois, prepared for U.S. Department of Energy, Washington, D.C., July.

DOE, 2002, *Summary Fact Sheets for Selected Environmental Contaminants to Support Health Risk* Analyses, prepared by Argonne National Laboratory, Environmental Assessment Division, Argonne, Illinois, July (available at http://www.ead.anl.gov/pub/dsp_detail.cfm?PubID=1472).

EPA, 1988, *Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion*, Federal Guidance Report No. 11, EPA-520/1-88-020, Office of Radiation Programs, Washington, D.C., September.

EPA, 1993, *External Exposure to Radionuclides in Air, Water, and Soil*, Federal Guidance Report No. 12, EPA 402-R-93-081, Office of Radiation and Indoor Air, Washington, D.C., September.

EPA, 1999, *Cancer Risk Coefficients for Environmental Exposure to Radionuclides*, Federal Guidance Report No. 13, EPA 402-R-99-001, Office of Radiation and Indoor Air, Washington, D.C., September.

ICRP, 1981, *Limits for Inhalation of Radon Daughters by Workers*, ICRP Publication 32, Annals of the ICRP, 6(1), Oxford, England, March.

National Research Council, 1988, *Health Risks of Radon and Other Internally Deposited Alpha-Emitters*, BEIR IV Report, report of the Committee on the Biological Effects of Ionizing Radiations, National Academy Press, Washington, D.C.

NRC, 2003, *Consolidated NMSS Decommissioning Guidance, Characterization, Survey, and Determination of Radiological Criteria, Final Report*, NUREG/CR-1757, Volume 2, Office of Nuclear Material Safety and Safeguards, Division of Waste Management, Washington, D.C., September.

USACE, 2003, *Final Remedial Investigation Sampling and Analysis Plan, Part I – Field Sampling Plan, Project Work Plans, Acquisition of Field Data and Technical Support for Shallow Land Disposal Area (SLDA), Parks Township, Armstrong County, Pennsylvania*, prepared by URS Group, Inc., Buffalo, New York, August.